Indonesian Journal of Educational Development (IJED)
Volume 4, Issue 3, 2023, pp. 307-317
ISSN 2722-1059 (Online); ISSN 2722-3671 (Print)
DOI: https://doi.org/10.59672/ijed.v4i3.3252

IMPROVING STUDENT'S SCIENCE NUMERATION CAPABILITY THROUGH THE IMPLEMENTATION OF PBL MODEL BASED ON LOCAL WISDOM

Gusti Ayu Agung Purnadewi*)1, I Wayan Widana2
[1]SDN 1 Dajan Peken, Tabanan, Indonesia; purnadewi35@gmail.com
[2]Universitas PGRI Mahadewa Indonesia, Denpasar, Indonesia; iwayanwidana@mahadewa.ac.id
*)Corresponding author; E-mail addresses: purnadewi35@gmail.com

ARTICLE INFO

Article history:
Received September 02, 2023
Revised September 10, 2023
Accepted October 2, 2023
Available online November 30, 2023

Keywords: learning activities, local wisdom, PBL model, science numeracy

Copyright ©2023 by Author. Published by Lembaga Pengembangan Pembelajaran, Penelitian, dan Pengabdian Masyarakat Universitas PGRI Mahadewa Indonesia

Abstract. This research aims to analyze the implementation of a PBL model based on local wisdom can improve science numeracy skills as well as evaluating and reflecting on the implementation of a PBL model based on local wisdom can improve learning activities. This research is classroom action research with research subjects in the VA class students of SDN 1 Dajan Peken Semester 1 of the 2023/2024 academic year and the research objects is science numeracy abilities and students' learning activities. This research was carried out in 2 cycles where each cycle consisted of planning, implementation, observation and reflection stages. Science numeracy ability data was collected using written tests referring to the Minimum Competency Assessment question model, while student learning activities were collected using observation sheets. This classroom action research to be successful and the cycle can be stopped, if it meets the following criteria: (a) the average value of science numeracy, absorption capacity, and percentage of completion respectively is at least 70.00; 70.00% and 85%; (b) minimally active student learning activities. If one or both of the success criteria above are not met, then the action research continues to the next cycle. Research data was analyzed descriptively qualitatively. The research results showed that: (1) in the initial reflection activity, the average science numeracy score was 62.94; absorption capacity 62.94%, and completion percentage 61.76%; (2) in cycle I, the average science numeracy score was 71.76; absorption capacity 71.76% and completion percentage 74.47%; and (3) in cycle II, the average science numeracy score was 77.06; absorption capacity 77.06% and completion percentage 88.24%. Classroom action research has met the success criteria in 2 cycles. Conclusion, the implementation of PBL model based on local wisdom can improve students' science numeracy skills and learning activities.

INTRODUCTION

Numeracy ability (mathematical literacy) refers to two important aspects related to the application of mathematics, namely mathematical literacy and numeracy (Dewayani et al., 2021). Mathematical literacy concerns an individual's ability to reason mathematically in formulating, using, and interpreting mathematics to solve problems in various real-world contexts. Mathematical literacy includes concepts, procedures, facts, and tools to describe, explain, and predict phenomena. Mathematical literacy also enables individuals to understand the benefits of mathematics in everyday life to draw conclusions and make appropriate decisions based on mathematical reasoning and logic (Care et al., 2019).

Meanwhile, the numeracy aspect concerns knowledge, skills and practices related to the use of mathematical concepts in non-mathematical contexts and specifically how mathematics is used in the world of work and society (Fitriana & Khoiri Ridlwan, 2021). The concept of numeracy is not only limited to the application of skills in number operations but is also related to the mastery of concepts and mathematical thinking skills in general (Rachman et al., 2021). Thus it can be concluded that mathematical literacy and numeracy are not only oriented towards understanding mathematical concepts but more broadly on the ability to apply these mathematical concepts.

Based on the education report data from SDN 1 Dajan Peken above, it can be seen that the achievement of numeracy skills is in the medium category with a score of 66.67 where there are 33.00% of students with numeracy skills below the minimum competency and 3.33% of students with numeracy skills far below minimum competency. This means that 33.33% of students have not reached the minimum competency.

The results of interviews with teachers at SDN 1 Dajan Peken stated that: (1) teachers' understanding of numeracy is still low, several teachers admitted that they did not understand what abilities were measured in numeracy, what content was tested in numeracy, what contexts were used in development of numeracy assessments, how to model numeracy questions, and how to develop numeracy skills in learning; (2) teachers have not provided real experience to students on strategies for completing numeracy assessments in class through learning; (3) teachers have not been able to develop numeracy assessments for various reasons such as a lack of literature, rarely opening the Merdeka Mengajar Platform (PMM), or other urgent tasks that must be completed; and (4) the learning model used is not connected to the assessment used to measure learning outcomes.

Based on the empirical facts above, real efforts need to be made to improve the numeracy skills of students at SDN 1 Dajan Peken. These efforts should be carried out comprehensively and integrated through intra-curricular, co-curricular and extra-curricular activities. In extracurricular activities, the development of students' numeracy skills is carried out through learning and assessment. Therefore, the solution offered to improve students' numeracy skills through learning in science subjects is to carry out classroom action research with the title "Improving the Science Numeracy Abilities of Class VA Students at SDN 1 Dajan Peken through the Implementation of the PBL Model Based on Local Wisdom".

Constructivist experts argue that the role of the teacher in front of the class should be shifted from teacher center to student center. In fact, teachers play more of a role as mediators and facilitators who help students' learning process run well. The role as mediator and facilitator in question is: a) providing learning experiences that allow students to explore and elaborate, so that giving lectures is not the teacher's main task; b) provide facilities that can stimulate students to think creatively and productively; c) facilitate students in the exploration process and provide confirmation of what students have obtained, so that this experience can be used as knowledge which is the result of students' own construction (Naufal, 2021 & Kusumawati et al., 2022).

The PBL (problem-based learning) model is implemented with five learning steps (phases) (Kardoyo et al., 2020), namely: (1) orient students to the problem (2) organize students in learning (organize students for study), (3) guiding individuals and groups to carry out investigations (assist independent and group investigation), (4) developing and presenting work results (develop and present artifacts and exhibits), and (5) analyzing and evaluating the problem solving process (analyze and evaluate the problem-solving process). To support the effectiveness of problem-based learning, various media and learning resources can be used. Therefore, teachers can use various learning sources, for example from news in newspapers, magazines, radio, television, the internet, and from the surrounding environment.

Problem-based learning is an effective approach for teaching higher-level thinking processes (Widana & Diartiani, 2021). The thinking process is a set of mental operations, which include: concept formation, principle formation, understanding, problem solving, decision making, and research (Djonomiarjo, 2020 & Harefa et al., 2023). The processes of problem solving, decision making, and research are applications of concepts, principles, and understanding (Anggraeni, 2019). The PBL model is designed to assist the problem solving process according to the steps contained in the problem solving pattern, namely starting from analysis, planning, solving and assessing through heuristics inherent in each stage (Suryawati et al., 2020 & Hotimah, 2020).

Local wisdom is defined as customs and customs that have been traditionally carried out by a group of people for generations and which to this day are still maintained by certain communities. Local wisdom shows the way people behave and act to respond to changes in the physical and cultural environment. Local wisdom can be understood as local ideas that are wise, full of wisdom, have good value, which are embedded and adhered to by members of the community (Istiawati, 2016 & Widana, 2023).

Thus, local wisdom can be interpreted as local ideas that are wise, full of wisdom, have good value, which are embedded and followed by members of the community (Widana, Sumandya, Citrawan, et al., 2023). Habits used in society, which grow and develop from generation to generation in the consciousness of certain people, are related to sacred or profane life (everyday parts of life and are of an ordinary nature). Local wisdom is an idea that arises and develops continuously in a society in the form of customs, rules/norms, culture, language, beliefs and daily habits (Widana et al., 2023). Local wisdom can also be termed as a culture created by experts or local community leaders through a process that is repeated continuously, through the internalization and interpretation of religious and cultural teachings which are socialized in the form of norms and used as guidelines in everyday life. for society. Local wisdom is also a form of unwritten rules proposed as a reference by certain communities, covering all aspects of life involving relationships between human beings, such as in social interactions, both individuals and individuals or individuals and groups (Hasan, 2021; Hermansyah & Gunawan, 2021).

Science numeracy is the ability a person has to use their mathematical knowledge in explaining events, solving problems, reasoning, or making decisions in daily life related to science subjects. This can help someone understand the benefits of mathematics in real life so that they can evaluate and make decisions based on mathematical reasoning and logical thinking (Ekowati et al., 2019; Ayuningtyas & Sukriyah, 2020). Aspects of mathematical reasoning are related to three processes in mathematical literacy, namely: formulate, employ, and interpret. The relationship between these three processes in the use of mathematics to solve problems in the context of the everyday world is shown in the following figure (OECD, 2017).

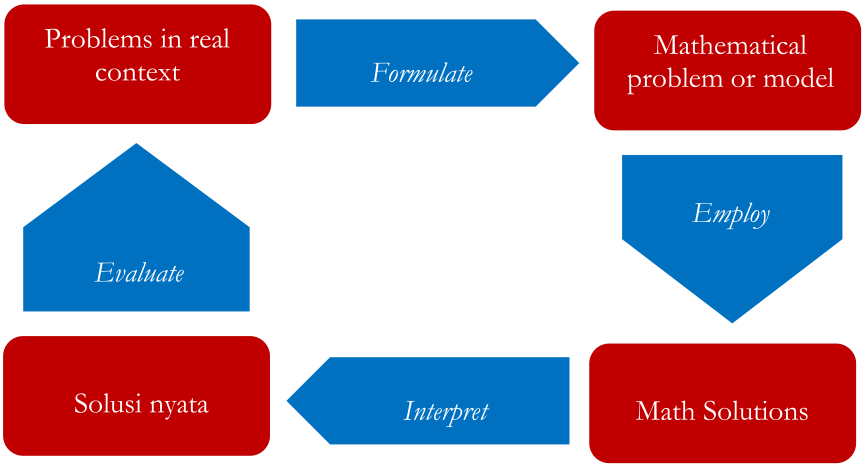

Figure 1. Thinking process in mathematical literacy

Numeracy content consists of 4 domains, namely: (a) numbers, namely students' competence in thinking using concepts, procedures, facts and mathematical tools in number content; (b) Algebra, namely students' competence in thinking using concepts, procedures, facts and mathematical tools in algebra content; (c) Geometry, namely students' competence in thinking using concepts, procedures, facts and mathematical tools in geometry content; and (d) Data and Uncertainty, namely students' competence in thinking using concepts, procedures, facts and mathematical tools on data content and uncertainty to solve everyday problems (Narut & Supradi, 2019).

Activities are all activities carried out both physically and spiritually. Student activities during the learning process are one indicator of students' desire to learn. Students are said to be active if the following characteristics are found (Jumarniati & Anas, 2019): 1) enthusiastic in participating in learning activities, 2) there is interaction between students and teachers, 3) there is interaction between students and students, 4) the existence of group collaboration, 5) student activity in groups, 6) student activity in carrying out learning, 7) student skills in using teaching aids and 8) student participation in concluding lesson material.

Learning activities are all knowledge that must be obtained by own observation, own investigation, by working alone both spiritually and technically (Salim et al., 2018). In learning there must be activity, without activity the learning process is impossible (Dewi et al., 2019). Learning is not a process in a vacuum, nor is it ever empty of various activities. We have never seen anyone studying without involving physical activity, especially if the learning activity is related to learning problems such as writing, taking notes, looking, reading, remembering, thinking, training or practicing and so on (Purnadewi et al., 2023).

Based on the description above, in this research the activities that will be observed consist of 6 aspects of student behavior which are modified from the behavioral characteristics above, namely: 1) enthusiasm in participating in learning activities, 2) interaction between students and teachers, 3) interaction between students and students, 4) cooperation in groups, 5) student activity in group discussions, and 6) student participation in concluding lesson material.

METHOD

This action research was carried out at SDN 1 Dajan Peken which is located at Jalan Diponogoro No. 19 Tabanan, Dajan Peken, Tabanan District, Tabanan Regency, Bali Province. This research is classroom action research carried out in the form of cycles where the design of each cycle consists of four stages, namely: a) planning, b) implementation, c) observation and d) reflection. In this research, the research procedure can be described as follows.

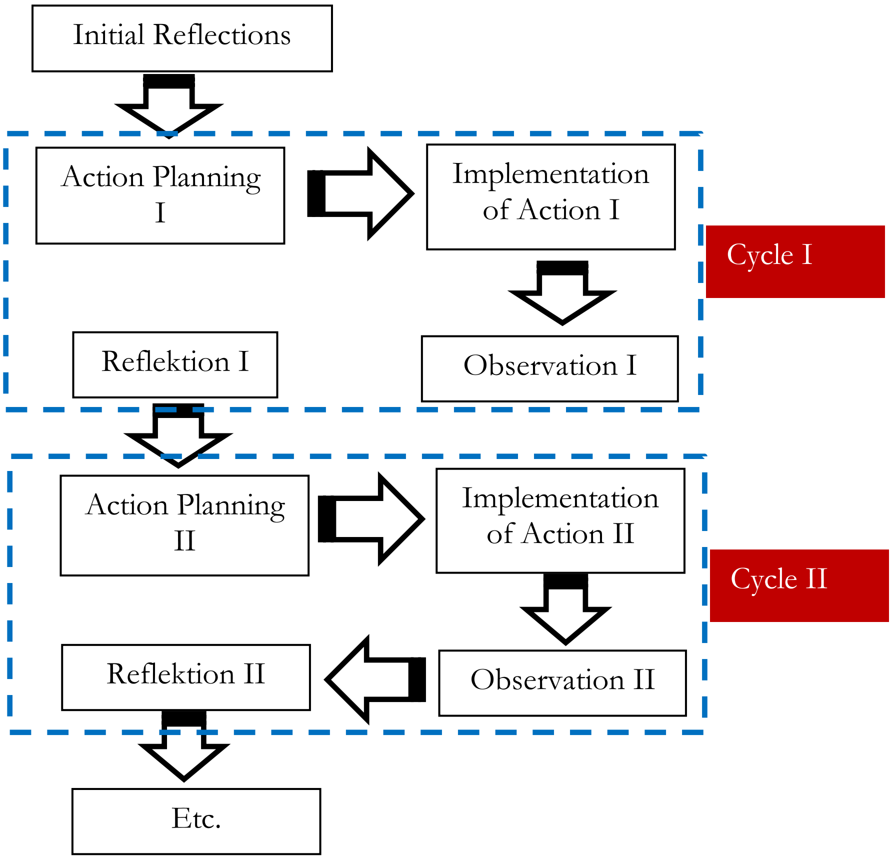

Figure 2. Classroom Action Research Procedure

In the 2023/2024 academic year, class V students will consist of 4 groups. The distribution of the number of class V students in each class at SDN 1 Dajan Peken is as follows.

Table 1. Data on Class V Students of SDN 1 Dajan Peken

No.	Class	Number of Students		Total
		Man	Woman	
1.	V-A	20	14	34
2.	V-B	19	19	38
3.	V-C	19	19	38
4.	V-D	25	14	39
Total		83	66	149

The research subjects were students in class V-A semester 1 of the 2023/2024 academic year. This research was carried out in accordance with the principal's assignment decree, where

the researcher was a teacher in class V-A with a total of 34 students. Meanwhile, the object of research is the science numeracy abilities and learning activities of class V-A students at SDN 1 Dajan Peken.
Data on students' science numeracy abilities is collected using tests that are in accordance with the numeracy question model in AKM. The science numeracy questions were developed independently by the research team referring to the form and model of numeracy assessment tested in AKM. Meanwhile, data on students' learning activities in the learning process was collected using observation sheets. The observation sheet contains descriptors stating indicators of student behavior which were developed from the theory of student learning activities. The indicators of student behavior are 1) enthusiasm in participating in learning activities, 2) interaction between students and teachers, 3) interaction between students and students, 4) cooperation in groups, 5) student activity in group discussions, and 6) student participation in concluding the lesson material.

Science numeracy data was analyzed descriptively, namely by determining the class average score using a formula: $\bar{X} = \frac{\sum X}{N}$

Information:

$\bar{X}$ = class average score

$\sum X$ = total student scores

N = Many students

Whether or not students have mastered classical subject matter successfully can be seen from their absorption capacity (DS) and the percentage of students who have completed (KT) or achieved the Learning Goal Achievement Criteria (KKTP). The formula for calculating DS and KT is as follows.

$$DS = \frac{\bar{X}}{100} \times 100\%$$

$$KT = \frac{\text{Many students have achieved (KKTP)}}{N} \times 100\%$$

Information:

$\bar{X}$ = class average score

DS = Absorption

KT = Completion percentage

N = Many students

Analysis of student activity data in learning was carried out descriptively. The criteria for classifying student activities are determined based on the ideal mean (Mi) and ideal standard deviation (SDi). The formula for Mi and SDi is as follows.

Mi = ½ (maximum score + minimum score)

SDi = 1/6 (maximum score - minimum score)

Classical classification of student learning activities uses the following criteria.

Table 2. Calculation of Student Activity Criteria

Rentang Skor	Kriteria
$Mi + 1,5\ SD \leq \bar{M} \leq Mi + 3,0\ SD$	Very active
$Mi + 0,5\ SD \leq \bar{M} < Mi + 1,5\ SD$	Active

Mi – 0,5 SD $\leq \bar{M} <$ Mi + 0,5 SD	Quite Active
Mi – 1,5 SD $\leq \bar{M} <$ Mi – 0,5 SD	Less Active
Mi – 3,0 SD $\leq \bar{M} <$ Mi – 1,5 SD	Very Less Active

This classroom action research is said to be successful and the cycle can be stopped, if it meets the following criteria: (1) a science numeracy score with a class average ($\bar{X}$), DS and KT respectively of at least 70.00; 70.00% and 85%; and (2) Student learning activities are minimally active. If one or both of the success criteria above are not met, then the action research continues to the next cycle.

RESULTS AND DISCUSSION

Initial Reflections

Before carrying out research, VA class students are first given a diagnostic test, which aims to find out who the students are in relation to the science material that will be discussed. The diagnostic test was developed independently by the research team, consisting of 5 questions. The diagnostic test form was developed according to the numeracy test model, namely ordinary multiple choice, complex multiple choice, matching and short answer forms. The diagnostic test results are as follows.

Table 3. Diagnostic test results for VA class SDN 1 Dajan Peken

No.	Statistics	Achievement
1.	The class average score	62,94
2.	Completeness, 21 people out of 34 students	61,76%

If the results of the diagnostic tests above are compared with the research success criteria, it shows that the average score is only 62.56, far below the KKTP score of 70. Likewise, classical completeness only reaches 61.76%, still far below the success criteria, namely at least 85%.

Cycle I

Planning. Some of the activities carried out by researchers related to action planning are as follows: (1) preparing a classroom action research schedule, (2) preparing a Teaching Module, which contains minimum components, namely learning objectives, learning steps, and assessment through discussion with the research team, (3) compiling LKPD and learning media for the material to be taught in accordance with the PBL model based on local wisdom, (4) compiling observation sheets to record teacher and student activities during learning in each cycle, (5) establishing heterogeneous groups with members 4-5 people, (6) compose final test questions for cycle I based on the science numeracy model questions.

Implementation. The first cycle of classroom action research was carried out in 3 meetings in accordance with the syntax of the local wisdom-based PBL model. The first meeting was held on July 21 2023 with the main topic being the properties of light. The second meeting was held on July 25 2023 with the main material being about how the eye works. The third meeting will be on July 28 2023, with the main material being about eye disorders and how to care for eye health. Learning is presented directly by the VA Class Teacher, implementing a PBL model based on local wisdom. The learning steps are in accordance with the PBL model syntax with 3 main steps, namely introduction, core activities and conclusion.

Observation. Observation activities were carried out by PGRI Mahadewa Indonesia lecturer collaborators. The focus of observations was made on student activities and teacher activities during the learning process. The results of the observations are recorded on the observation sheet during the implementation of the action. Each indicator/descriptor carried out by students is given a score of 1 and those that are not carried out are given a score of zero. The results of observations in cycle I showed that the teacher had implemented learning in accordance with the learning scenario that had been previously designed using the PBL model syntax. Teachers have also used local wisdom as a medium for presenting learning. It's just that most of the students come from the city, so teachers need to sharpen their understanding of Tabanan's local wisdom.

After the end of cycle I, the teacher gave a science numeracy ability test using the minimum competency assessment model. There were 5 questions given, all developed by the research team. The stimulus questions all use local wisdom content. The forms of questions vary from ordinary multiple choice, complex multiple choice, matching, and short answers. The results of the science numeracy ability test in cycle I can be presented as follows. The average score for science numeracy is 71.76. A total of 26 people have achieved KKTP out of 34 students or around 76.47%. The results of observations of student activities are in the quite active category. The research results in cycle I were then compared with the success criteria. The average score for science numeracy skills meets the requirements of above 70 with an absorption capacity of above 70%. However, classical completeness only reached 76.47%, which is far below 85%. Likewise, student activities have not reached the minimum active criteria. Thus, the cycle continues to cycle II.

Reflection. Even though the research in cycle I has not yet reached the criteria for success, the progress that has been achieved must be maintained and improved, as the student learning atmosphere is very enjoyable because students are directly involved in problem solving through discussion and presentation activities. Likewise, students' science numeracy abilities have increased above the established criteria. The obstacles encountered in the implementation of cycle I were sought for the best solution so that they could be minimized. For example, students with good science numeracy skills tend to dominate in class discussions and presentations. This obstacle will be overcome by providing equal opportunities for all students in the group to express their opinions. The teacher will prompt questions for students who are not yet active. Likewise, student learning activities need to be increased by involving all students in problem-solving discussion activities. Students who are not yet active in discussion activities will be guided and directed so that they are able to be actively involved in learning.

Cycle II

Planning. The activities carried out in the planning stage are almost the same as planning cycle I. It's just that learning planning is directed at the next lesson material, namely ecosystem components, food chains, as well as energy flows and food pyramids in ecosystems. The products produced in cycle II planning activities are the same as cycle I.

Implementation. Cycle II was carried out in 3 meetings. The presentation of lesson material is carried out by the VA class teacher, in accordance with the syntax of the PBL model based on local wisdom. The first meeting was held on August 22 2023 with the main topic of components in the ecosystem. At the first meeting all students attended. The second meeting, held on August 29 2023 with the main topic of food chains in ecosystems, all students attended. The third meeting was held on September 1 2023 with the main topic of energy flow and food pyramids in ecosystems.

Observation. As in the first cycle of observation activities, carried out by collaborators from PGRI Mahadewa University lecturers in Indonesia. The focus of observation is also focused on student activities and teacher activities during the learning process. The results of the observations are recorded on the observation sheet during the implementation of the action. The results of observations in cycle II showed that the teacher had implemented learning according to the learning scenario that had been previously designed using the PBL model syntax. A striking difference in teacher activities in cycle II can be seen in the pattern of student guidance. The teacher carries out more intensive individual guidance compared to cycle I. The teacher gives special trigger questions to students who are less active. In this way, student learning activities look more lively and interactive. Teachers have also used local wisdom as a medium for presenting learning.

After the implementation of cycle II ended, the teacher again gave a science numeracy ability test according to the minimum competency assessment model. There were 5 questions given, all developed by the research team. The results of the science numeracy ability test in cycle II are as follows. The average score for science numeracy is 77.06. A total of 30 people have achieved KKTP out of 34 students or around 88.24%. The results of observations of student activities are in the active category. The research results in cycle II were then compared with the success criteria. The average value of science numeracy ability and absorption capacity has met the success criteria. Likewise, classical completion and student activities have met the criteria for success. Thus, the implementation of classroom action research has achieved success in two cycles.

Reflection. The success of the research in cycle II cannot be separated from the teacher's efforts to make improvements to the implementation of learning, especially in individual coaching patterns. Student activity has increased as seen from group discussion activities and class discussions, almost all students are actively involved. There is no longer domination by students with high abilities because the teacher has managed the discussion by giving all students the opportunity to express their opinions. Group discussions and class discussions look very interactive and fun for students.

CONCLUSION

Based on the description above, it can be concluded that the implementation of the Problem Based Learning (PBL) model based on local wisdom can improve students' science numeracy skills and learning activities. Recommendations that can be conveyed from this research are: (1) teachers should be creative in implementing the PBL model in the classroom by providing individual guidance so that all students are actively involved in learning, (2) the AKM (minimum competency assessment) model assessment needs to be developed by teachers in order to provide students with habituation to working on AKM model questions, and (3) content based on local wisdom needs to be optimized in learning so that the character values that have been passed down from generation to generation remain sustainable and maintained by the community of adherents.

BIBLIOGRAPHY

Anggraeni, A. (2019). Urgensi Penerapan Pendekatan Kontruktivisme pada Pembelajaran PKn SD untuk Meningkatkan Minat Belajar Siswa. *Jurnal PPKn & Hukum*, *14*(2), 18–37. https://pbpp.ejournal.unri.ac.id/index.php/JPB/article/download/7867/6753

Ayuningtyas, N., & Sukriyah, D. (2020). Analisis pengetahuan numerasi mahasiswa matematika calon guru. *Delta-Pi: Jurnal Matematika Dan Pendidikan Matematika*, *9*(2), 237–247. https://doi.org/10.33387/dpi.v9i2.2299

Care, E., Kim, H., Vista, A., & Anderson, K. (2019). Education System Alignment for 21st Century Skills: Focus on Assessment. *Center for Universal Education at the Brookings Institution.*, *January*, 1–40. https://www.brookings.edu/wp-content/uploads/2018/11/Education-system-alignment-for-21st-century-skills-012819.pdf

Dewayani, S., Retnaningdyah, P., Susanto, D., Ikhwanudin, T., Fianto, F., Muldian, W., Syukur, Y., Setiakarnawijaya, Y., & Antoro, B. (2021). *Panduan Penguatan Literasi dan Numerasi di Sekolah*. Dirjen PAUD, Dikdas, dan Dikmen Kemendikbud.

Dewi, L. V., Ahied, M., Rosidi, I., & Munawaroh, F. (2019). Pengaruh Aktivitas Belajar Terhadap Hasil Belajar Siswa Menggunakan Model Pembelajaran Discovery Learning Dengan Metode Scaffolding. *Jurnal Pendidikan Matematika Dan IPA*, *10*(2), 299–213. https://doi.org/10.26418/jpmipa.v10i2.27630

Djonomiarjo, T. (2020). Pengaruh Model Problem Based Learning Terhadap Hasil Belajar. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, *5*(1), 39. https://doi.org/10.37905/aksara.5.1.39-46.2019

Ekowati, D. W., Astuti, Y. P., Utami, I. W. P., Mukhlishina, I., & Suwandayani, B. I. (2019). Literasi Numerasi di SD Muhammadiyah. *ELSE (Elementary School Education Journal) : Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar*, *3*(1), 93. https://doi.org/10.30651/else.v3i1.2541

Fitriana, E., & Khoiri Ridlwan, M. (2021). Pembelajaran Transformatif Berbasis Literasi Dan Numerasi Di Sekolah Dasar. *TRIHAYU: Jurnal Pendidikan Ke-SD-An*, *8*(1), 1284–1291. https://doi.org/10.30738/trihayu.v8i1.11137

Harefa, M., Harefa, J. E., Harefa, A., & Hendrikus, O. N. (2023). *Kajian Analisis Pendekatan Teori Konstruktivisme Dalam Proses Belajar Mengajar*. *2*(1), 289–297.

Hasan. (2021). Membangun masyarakat melalui kearifan lokal budaya Bima "Lamba Angi." *Jurnal Ilmu Budaya*, *9*(2), 109–114. https://journal.unhas.ac.id/index.php/jib/article/view/15002

Hermansyah, W., & Gunawan, H. (2021). Nilai-nilai pendidikan karakter yang terkandung dalam khazanah Leksikon Istana Raja Sumbawa (Dalam Loka) di Kabupaten Sumbawa: Menemukan Model Baru Penguatan Karakter Berbasis Kearifan Lokal. *Jurnal Ilmu Sosial Dan Pendidikan (JISIP)*, *5*(4), 1544–1552. https://doi.org/10.36312/jisip.v5i4.2612/http

Hotimah, H. (2020). Penerapan Metode Pembelajaran Problem Based Learning Dalam Meningkatkan Kemampuan Bercerita Pada Siswa Sekolah Dasar. *Jurnal Edukasi*, *7*(3), 5–11. https://doi.org/10.19184/jukasi.v7i3.21599

Istiawati, F. N. (2016). Pendidikan karakter berbasis nilai-nilai kearifan lokal adat ammatoa dalam menumbuhkan karakter konservasi. *Cendikia*, *10*(1), 1–18.

Jumarniati, J., & Anas, A. (2019). Pengaruh Motivasi Belajar dan Aktivitas Belajar terhadap Hasil Belajar Mahasiswa Program Studi PGSD. *Cokroaminoto Journal of Primary Education*, *2*(2), 41–47. https://doi.org/10.30605/cjpe.222019.113

Kardoyo, Nurkhin, A., Muhsin, & Pramusinto, H. (2020). Problem-based learning strategy: Its impact on students' critical and creative thinking skills. *European Journal of Educational Research*, *9*(3), 1141–1150. https://doi.org/10.12973/EU-JER.9.3.1141

Kusumawati, I. T., Soebagyo, J., & Nuriadin, I. (2022). Studi Kepustakaan Kemampuan Berpikir Kritis Dengan Penerapan Model PBL Pada Pendekatan Teori Konstruktivisme. *JURNAL MathEdu*, *5*(1), 13–18.

Narut, Y. F., & Supradi, K. (2019). Literasi Sains Peserta Didik Dalam Pembelajaran IPA di Indonesia. *Jurnal Inovasi Pendidikan Dasar*, *3*(1), 61–69.

Naufal, H. (2021). Model Pembelajaran Konstruktivisme pada Matematika untuk Meningkatkan Kemampuan Kognitif Siswa di Era Merdeka Belajar. *Seminar Nasional Pendidikan Matematika*, *2*(1), 143–152.

OECD. (2017). *PISA 2015 Assessment and Analytical Framework*. OECD Publishing.

Purnadewi, G. A. A., Arnawa, N., & Tatminingsih, S. (2023). The influence of school culture, learning interest, and learning motivation on science learning outcomes. *Indonesian Journal of Educational Development (IJED)*, *4*(2), 126-138. https://doi.org/10.59672/ijed.v4i2.3040

Rachman, B. A. R., Firyalita Sarah Fidaus, Nurul Lailatul Mufidah, Halimatus Sadiyah, & Ifit Novita Sari. (2021). Peningkatan Kemampuan Literasi dan Numerasi Peserta Didik Melalui Program Kampus Mengajar Angkatan 2. *Dinamisia : Jurnal Pengabdian Kepada Masyarakat*, *5*(6), 1535–1541. https://doi.org/10.31849/dinamisia.v5i6.8589

Salim, N., Moh Nasuka, & M. Novailul Abid. (2018). Upaya Meningkatkan Motivasi Belajar, Aktivitas Belajar Dan Prestasi Belajar Melalui Strategi Direct Instruction. *Jurnal At-Tarbiyat : Jurnal Pendidikan Islam*, *3*(1), 67–85. https://doi.org/10.37758/jat.v3i1.202

Suryawati, E., Suzanti, F., Zulfarina, Putriana, A. R., & Febrianti, L. (2020). The implementation of local environmental problem-based learning student worksheets to strengthen environmental literacy. *Jurnal Pendidikan IPA Indonesia*, *9*(2), 169–178. https://doi.org/10.15294/jpii.v9i2.22892

Widana, I. W. (2023). *Evaluative study: Literacy outreach program based on local wisdom at SDN 1 Apuan Bangli*. *9*(1), 26–36. https://doi.org/https://doi.org/10.21009/JISAE JISAE

Widana, I. W., & Diartiani, P. A. (2021). Model Pembelajaran Problem Based Learning Berbasis Etnomatematika untuk Meningkatkan Aktivitas dan Hasil Belajar Matematika. *Jurnal Edukasi Matematika Dan Sains*, *X*(1), 88–98.

Widana, I. W., Sumandya, I. W., & Citrawan, I. W. (2023). The special education teachers ' ability to develop an integrated learning evaluation of Pancasila student profiles based on local wisdom for special needs students in Indonesia. *Kasetsart Journal of Social Sciences*, *44*(2), 527–536. https://doi.org/https://doi.org/10.34044/j.kjss.2023.44.2.23

Widana, I. W., Sumandya, I. W., Citrawan, I. W., Suka Widana, I. N., Ibarra, F. P., Quicho, R. F., Santos, M. R. H. M. D., Velasquez-Fajanela, J. V., & Mukminin, A. (2023). The Effect of Teacher ' s Responsibility and Understanding of the Local Wisdom Concept on Teacher ' s Autonomy in Developing Evaluation of Learning Based on Local Wisdom in Special Needs School. *Journal of Higher Education Theory and Practice*, *23*(10), 152–167.