Design of a Literacy-Based Mathematics Learning Model to Construct the Numeracy Skills of Junior High School Students

Hanifah Nurus Sopiany[1(✉)], Turmudi Turmudi[2], Dadang Juandi[2], and Iyan Rosita Dewi Nur[1]

[1]Universitas Singaperbangsa Karawang, Karawang, Indonesia
hanifah.nurussofiany@fkip.unsika.ac.id
[2]Universitas Pendidikan Indonesia, Bandung, Indonesia

Abstract. This research discusses the impact of the School Literacy Movement (Gerakan Literasi Sekolah or GLS) program on student's mathematical literacy abilities in Indonesia. The study is motivated by Indonesia's low ranking in the Program for International Student Assessment (PISA) and the government's efforts to improve student literacy abilities by replacing the National Examination (UN) with the National Assessment (AN), which focuses more on literacy and numeracy skills. The research methodology involves collecting data from 8th grade students in Class 8-A, divided into two groups: Online PMBL (Literacy-Based Mathematics Learning) and Offline PMBL. The results of daily evaluations over four sessions are compared to analyze performance differences between the two groups. The evaluation results indicate that the average score for the Online PMBL group is higher than the Offline PMBL group, although the average scores still do not reach the minimum completeness criteria (KKM). The findings of this research suggest that despite the performance differences between Online PMBL and Offline PMBL groups, the overall average scores remain low. This indicates that students still need to enhance their mathematical and numeracy literacy. The research concludes that further improvements are necessary in the PMBL approach to achieve better results in developing student's mathematical literacy abilities in Indonesia.

Keywords: Literacy-Based Mathematics Learning Model, Numeracy Skills.

1 Introduction

Two years GLS program running it seems Not yet Enough influential to ability literacy student. Based on results test 2018 conducted by the Program for International Student Assessment (PISA) which was released on 3 December 2019 shows Indonesia's position in the ranking 74th out of 79 participating countries. Circumstances this also shows descent results test every aspect Indonesia 's capabilities are compared with PISA results in 2015 with comparison as following:

Z. B. Pambuko et al. (eds.), *Proceedings of 5th Borobudur International Symposium on Humanities and Social Science (BISHSS 2023)*, Advances in Social Science, Education and Humanities Research 856,
https://doi.org/10.2991/978-2-38476-273-6_64

Table 1. PISA Results of Indonesian Students in 2015 and 2018

PISA YEAR	Ability Score		
	Read	**Mathematics**	**Science Performance**
2015	397	386	403
2018	371	379	396

Table 1 shows happening decline score on all ability literacy student. it can see that acquisition ability literacy Indonesian students in 2015 more tall from in 2018 however You're welcome is in rank down, so can assumed that quality Indonesian education is not in accordance with standard world community [1][2][3].

See effort government for increase achievement on PISA in form descent policy Ministry of Education and Culture on 11 December 2019 concerning No use again UN (exam national) as evaluation student. UN replaced with AN (National Assessment) consisting of 2 types assessment, namely: (1) AKM (Assessment General Competency) that provides questions based on practice best PISA that emphasis more to ability reasoning literacy as well as numeration; and (2) Survey Character [4]. kindly No direct policy the push student for more increase ability literacy.

PISA study results as well as policies government that's what makes one of reason writer, for now and contribute in strengthening literacy appropriate math with government programs. For know whether the GLS program in Indonesia has walk with good and touching on learning math, then step beginning writer that is conduct an attainment survey implementation activity habituation, development, and learning at the level unit school middle school (junior high school, high school and vocational school). Refer to the GLS guidelines for implementation through three stages that is habituation, development, and learning, then studies implementation started with related data collection achievement implementation activity stage habituation for school's mid-term conducted in October - December in 2019. However, remember time, distance, and costs are not possible for take population samples throughout Indonesia, then writer take population sample which is smaller that is schools in the CIUTA sub -district in West Java province.

Implementation survey stage habituation and development of GLS activities in the CIUTA sub-district, resulting in two schools with Codes P19 and P30 indicating achievement indicator implementation in category "enough carried out". Although there by results interview related implementation learning to second school such, find expression stated situation that implementation learning in accordance GLS principles in subjects' mathematics Not yet held the same once. Not implemented yet learning mathematics based compatible literacy with this GLS, it becomes base writer for designing learning pilot studies mathematics-based literacy (PMBL). Based on the stage GLS implementation test habituation, development and learning, ideally school to be pilot studies for taking subject research and experiment design is schools P19 and P30. However, because condition a prolonged and creating pandemic the condition of the CIUTA region entered the red zone for quite a long time, making implementation pilot studies No can quick carried out. When studying stare advance limited start held only in the green and yellow zones, researchers also started own required task domiciled in Karawang Regency. at the moment That Kab. Karawang start do stare advance limited.

For speed up research, researcher look for schools in Karawang Regency which have characteristics implementation of the same GLS with P19 or P30.

Together with phenomenon study online in Century pandemic it appears policy government in PP Number 57 of 2021 concerning National Education Standards. Policy the related curriculum independent emphasized learning achievement ability digital literacy, numeracy and character for all level unit education. It means with policy that, learning at the junior high school level can involve digital literacy, numeracy and character learning.

Recent research indicates that numeracy literacy has become a crucial aspect of mathematics education, especially at the junior high school level. In a study by Rakhmawati and Mustadi (2022), numeracy literacy in Indonesia has been the focus, with the research revealing that the implementation of the School Literacy Movement (GLS) has not been optimal in developing numeracy literacy among students. This research highlights the urgent need to enhance the numeracy literacy skills of students in Indonesia [5]. On the other hand, a study by Mumpuniarti (2016) revealed the challenges faced by teachers in teaching literacy and numeracy to slow learners [6]. This study underscores the necessity for new pedagogical approaches to improve literacy and numeracy skills among slow learners. Additionally, Chinnappan and Pandian (2009) investigated the representations and explanations of children in numeracy problem-solving, emphasizing the importance of a problem-based approach in enhancing mathematical understanding [7]. These findings indicate the need for the development of literacy-based mathematics learning models to strengthen students' numeracy skills. Furthermore, Connolly, Carr, and Knox (no year) explored cross-curricular professional development to enhance students' numeracy skills, demonstrating the importance of integrating mathematical concepts across various subjects [8]. Finally, Vasoya and Vansdadiya (2023) provided an overview of effective strategies to promote literacy and numeracy in early childhood education, highlighting the importance of evidence-based approaches in developing these foundational skills [9]. These studies provide an in-depth understanding of the challenges and potentials in improving numeracy literacy across various educational contexts, laying a crucial foundation for designing effective literacy-based mathematics learning models.

Numeration the more stand out and show up in document applied curriculum government around the world. Ability numeration student pushed with Study mathematics in context application practical so that student more capable buil linkages from various type their knowledge meet in life every day, so numeration can used for objective practical, social, organizational, personal, and knowledge [10-12]. So that No amazed If there is view that ability numeration is literacy math. PMBL learning structured customized with principles learning on GLS.

PMBLonline with using an LMS on an integrated google -site with G- MaPt , google form and google meet This seen in: a) 15 minute activity read what is on the google site ; b) utiliz tion various literacy strategies in learning cross shown discipline with activity find and understand material through G- Mapt and confirm result through google meets with the inner teacher time 15 minutes ; c) utilization various organizers For unde standing and production various type text showed with use various media (google site, google form, google meet, and G- MaPt) in One design learning in the form of LMS;

d) assessment demonstrated academic _ with gift instrument test based literacy on google form ; and e) Development environment physical , social , affective , and academic showed with gift task / job House in a manner individual or group. Refe ring to the exposure above, then question in study This is "How results Study students using PMBL online and students using PMBL offline (reviewed from test numeration on each meeting)?".

2 Method

Process starts with collect and analyze data in form qualitative Miles and Huberman [13]. With condition learning stare advance limited as consequence from covid-19, then from a total of 39 students' class 8-A was taken by 36 students for investigated later shared into two groups, namely PMBL-online with 18 students and PMBL offline with 18 students. Total 18 subjects This supported by Ruseffendi [14] and Roscoe, 1975 [15] that study experimental simple cantake 10 to 20 subjects. As for division online and offline groups were conducted with math teacher help in the classroom. In research trials field This student in each group shared into the three-category based on mark results PTS (ability initial), because based on interview, moment will do trials field, school the new finished implement PTS, where PTS questions given is results from discussion making math AKM questions at MGMP math teachers school.

Student categorized as to in three categories, namely: category high, medium and low. Data collection for answer on research. This use sheet test evaluation results Study daily/ repetition daily based question numeration given at the end learning. Evaluation questions given listed in the RPP and not done validation special Because already enter the RPP validation. Assessment results on answer subject served in table Then percentage to criteria minimum completeness (KKM) for PMBL-online and PMBL-offline classes, then done withdrawal conclusion.

3 Results And Discussion

On each end student PMBL activities always given question exercise or question evaluation. Following This is results processing evaluation PMBL-online and PMBL-offline students in four meeting.

Repeat average results daily from four meeting students in the PMBL-online class shown in Table 2, it can be seen AWL students can pass repeat average value daily QNA and PRAF. Highest average rating test daily student this PMBL-online class is on repeat 2nd daily i.e. of 38.61. Test 4th day to be average repeat results daily highest second. Following this diagram represents mark fourth test daily student PMBL-online class (Fig. 1).

Table 2. Results of evaluation / repetition daily PMBL-online students on each end meeting

No	Name	Evaluation				Score	Average
		1	2	3	4		
1	JACS	30.8	26.7	100.00	100.00	257	64.4
2	TVR	69.2	70.00	100.00	100.00	339	84.81
3	QNA	30.8	56.7	1.33	40.00	129	32.19
4	FRAF	3.08	30	24.00	10.00	67.1	16.77
5	AWL	30.8	56.7	100.00	40.00	227	56.86
6	FWA	15.4	40.0	0.00	10.00	65.4	16.35
7	GR	15.4	50.0	0.00	40.00	105	26.35
8	SWN	38.5	16.7	38.46	40.00	134	33.40
9	FRW	0.00	30.00	0.00	10.00	40.00	10.00
10	MAN	0.00	0.00	0.00	10.00	10.00	2.50
11	TRP	0.00	5.00	0.00	10.00	15.00	3.75
12	AIS	0.00	46.7	8.33	10.00	65.00	16.25
13	FPF	0.00	50.00	0.00	10.00	60.00	15.00
14	MYAN	0.00	13.3	0.00	10.00	23.3	5.83
15	FRAR	3.08	46.7	0.00	10.00	59.75	14.94
16	HZ	0.00	50.00	0.00	10.00	60.00	15.00
17	MFR	0.00	50.00	0.00	10.00	60.00	15.00
18	IL	7.69	56.7	0.00	10.00	74.4	18.59
Average		13.59	38.61	20.67	26.67	99.54	24.89

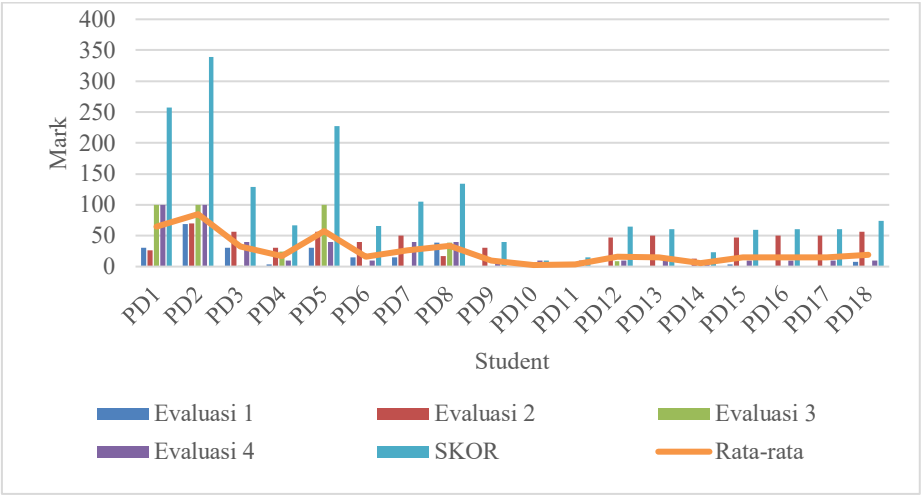

Fig. 1. Gain diagram mark test daily PMBL-online students

As for the results test daily students in the PMBL-offline class are shown in Table 3. Repeat average results daily highest students in the offline PMBL class shown in Table 3 above obtained of 53.30 on repetition 2nd daily. Condition This The same with PMBL-online, only big the average value different with difference 14.68, where repeat average value daily second More PMBL-offline classes tall from repeat average value daily second from PMBL-online class. Repeat average daily with score highest second

for this PMBL-offline class are in the results test daily first. This different with conditions in the PMBL-online class. Table 3 also shows WP and FAP students in groups category moderate, the average value of the test daily capable pass mark test daily GAP and KNP students who are in the group high.

Table 3. Results of evaluation / repetition daily PMBL-offline students on each end meeting

No	Name	Evaluation				Score	Average
		1	2	3	4		
1	AK	38.46	53.30	3.33	28.00	123.1	30.77
2	AAPH	23.08	93.30	100	28.00	244.4	61.10
3	GAP	56.92	70.00	3.33	28.00	158.3	39.56
4	KNP	60.00	53.30	8.33	30.00	151.6	37.91
5	AH	30.77	30.00	25	28.00	113.8	28.44
6	EAB	18.46	43.30	8.33	10.00	80.09	20.02
7	FAP	46.15	46.60	8.33	100.00	201.1	50.27
8	HRAS	46.15	30.00	16.7	20.00	112.8	28.20
9	HRF	46.15	63.30	3.33	20.00	132.8	33.20
10	KLK	23.08	53.30	3.33	28.00	107.7	26.93
11	MDH	46.15	66.60	16.7	20.00	149.4	37.35
12	NHA	27.70	63.30	8.33	28.00	127.3	31.83
13	RN	100.00	46.60	8	0.00	154.60	38.65
14	TNI	46.15	53.30	6.66	28.00	134.1	33.53
15	WP	69.23	53.30	8.33	100.00	230.9	57.72
16	ZA	7.70	70.00	3.33	32.00	113	28.26
17	GNH	7.70	46.60	3.33	0.00	57.63	14.41
18	ZS	30.76	23.30	20	10.00	84.06	21.02
Average		40.26	53.30	14.15	29.89	137.59	34.40

Following this diagram represents mark fourth test daily student PMBL-offline class.

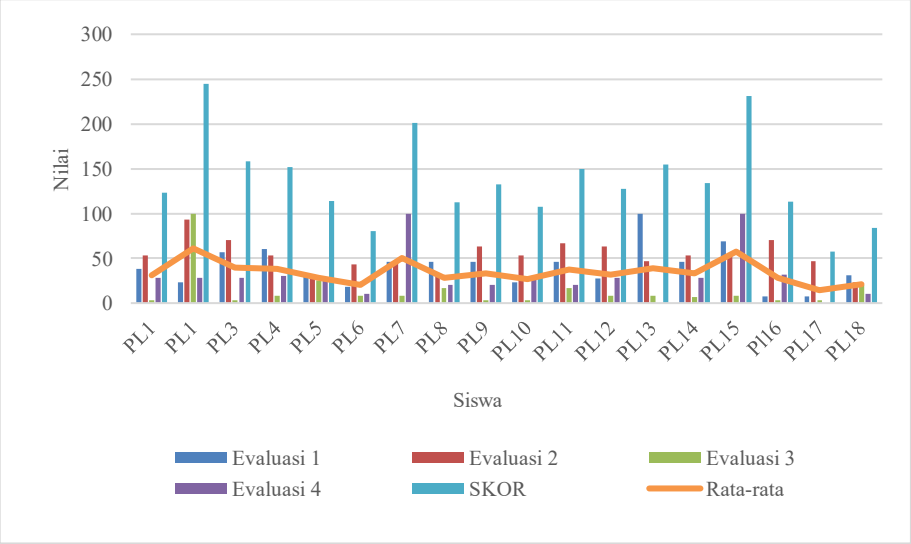

Fig. 2. Gain diagram mark test daily PMBL-online students

After seen based on the average value of each class, then researcher try see the average value evaluation student based on group category. Following This results analysis:

3.1 Average value results evaluation group student category tall

Table 4 below This show fourth results evaluation students in categories tall PMBL-online and PMBL-offline classes.

Table 4. value results evaluation student category tall

Evaluation 1		Evaluation 2		Evaluation 3		Evaluation4	
online	offline	online	offline	online	offline	online	offline
30.77	38.46	26.67	53.30	100.00	3.33	100.00	28.00
69.23	23.08	70.00	93.30	100.00	100	100.00	28.00
30.77	56.92	56.67	70.00	1.33	3.33	1.33	28.00
3.08	60.00	30	53.30	24.00	8.33	24.00	30.00
				Average			
33.46	44.62	45.84	67.48	56.33	28.75	56.33	28.50

Evaluation results student group category high in Table 4 shows the average value of the evaluation of 1 and 2 students More PMBL-offline classes tall from PMBL-online students. however different things on the average value of evaluation 3 and 4 where student more PMBL-online classes tall from student PMBL-offline class.

3.2 Average value results evaluation group student category currently

Table 5 below This show fourth results evaluation students in categories currently PMBL-online and PMBL-offline classes.

Table 5. Result values evaluation student category currently

Evaluation 1		Evaluation 2		Evaluation 3		Evaluation 4	
online	offline	online	offline	online	offline	online	offline
30.77	30.77	56.67	30.00	100.00	25	40.00	28.00
15.38	18.46	40.0	43.30	0.00	8.33	10.00	10.00
15.38	46.15	50.0	46.60	0.00	8.33	40.00	100.00
38.46	46.15	16.67	30.00	38.46	16.66	40.00	20.00
0.00	46.15	30.00	63.30	0.00	3.33	10.00	20.00
0.00	23.08	0.00	53.30	0.00	3.33	10.00	28.00
0.00	46.15	5.00	66.60	0.00	16.66	10.00	20.00
0.00	27.70	46.67	63.30	8.33	8.33	10.00	28.00
0.00	100.00	50.00	46.60	0.00	8	10.00	0.00
0.00	46.15	13.33	53.30	0.00	6.66	10.00	28.00
	69.23		53.30		8.33		100.00
	7.70		70.00		3.33		32.00
				Average			
10.00	42.31	30.83	51.63	14.68	9.69	19.00	34.50

Evaluation results student group category while in Table 5 shows the average value of the evaluation of 1, 2 and 3 students More PMBL-offline classes tall from PMBL online students, however different things on the average value of the evaluation 3 where student more PMBL-online classes tall from student PMBL-offline class.

3.3 Average value results evaluation group student category low

Table 6 shows fourth results evaluation students in categories low PMBL online and PMBL-offline classes.

Table 6. Result values evaluation student category low

Evaluation 1		Evaluation 2		Evaluation 3		Evaluation 4	
online	offline	online	offline	online	offline	online	offline
3.08	7.70	46.67	46.60	0.00	3.33	10.00	13.33
0.00	30.76	50.00	23.30	0.00	20	10.00	30
0.00		50.00		0.00		10.00	
7.69		56.67		0.00		10.00	
			Average				
2.69	19.23	50.84	25.42	0.00	0.00	10.00	5.00

Evaluation results student group category low in table 6 shows evaluation average value of 1 student More PMBL-offline classes tall from PMBL-online students, however different things on the average value of evaluation 2 and 4 where student more PMBL-online classes tall from student PMBL-offline class.

PMBL activities designed for each the meeting presenting activity evaluation-based literacy, as effort in grow prowess literacy student for reach ability understanding good math. In line with Steen, Turner, Burkhardt and OECD stating that prowess literacy mathematics characterize achievement of students' mathematical understanding abilities because mathematical literacy can be expressed as the ability to use mathematical knowledge and understanding to formulate, interpret mathematics in various contexts, and use mathematics to solve problems in these contexts [16-17].

Evaluation / repetition daily in study This consists from four evaluation. Evaluate 1 question related sub-topic discussion for corner center, corner circumference, length arc, and area wedge circle, as well relationship. Evaluation 2 related sub-topic discussion connection corner center and corner around circle. Evaluation 3 related sub-topic discussion long bow. Evaluation 4 related sub-topic discussion wide juring and halves. Evaluation questions arranged in form question literacy math. The average value of the results evaluation / review daily the highest in PMBL-online and PMBL-offline classes alike is at is in the 2nd evaluation. However, if seen based on group category, then seen difference between both. In groups category high, the average value of the results evaluation PMBL-online students is in evaluation 3 and 4 i.e of 56.33. It different with Where are PMBL-offline students? mark highest evaluation are on evaluation to 2 of 67.48. In evaluations 3 and 4, the average value of the results evaluation PMBL- online students outperformed acquisition evaluation average value PMBL-offline students

while in evaluations 1 and 2 it was the other way around. Following This example difference answer students in evaluation 1.

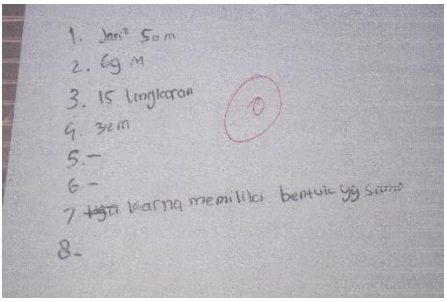

Fig. 3. Evaluation of 1 student's online PMBL class answer

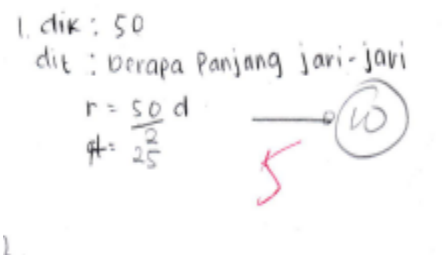

Fig. 4. Answer's evaluation of 1 student PMBL-offline class

Fig. 3 and 4 shows that PMBL- offline grade 5 represents mark the smallest in evaluation 1 while in PML-online there is a number of students who achieve value 0 like example in Figure 3 for evaluation 1.

Same thing with group category is, where PMBL-offline students more superior from PMBL-online students on evaluations 1 and 2, and PMBL-online students outperformed evaluation average value from PMBL students were offline on evaluations 3 and 4 though value You're welcome low once. Different gains shown by the results group average score category low. PMBL-online students excel from PMBL-offline students on the average score of the results evaluations 2 and 4. More PMBL-offline students superior from PMBL-online students in evaluation 1, but in evaluation 4, the second average score class on category low. This worth the same, that is 0.

With thereby so can stated that there is difference in achievement results evaluation/ review daily between students who use PMBL-online and students who use PMBL-offline. From the fourth evaluation, the highest average score on each group was on the 2nd evaluation, however there is group differences category high, medium, and low.

By looking at the average score of the evaluation results between the two classes, which has not yet reached the minimum standard score of 70, it can be assumed that the mathematical literacy skills of both classes still really need to be improved.

especially daily evaluation/review questions are presented in the form of story-based mathematical literacy questions. This is in line with what is explained by Alberta Education (1997) that one of the literacy skills is that students use language rules to acquire, construct and communicate meaning in solving problems [18]. This also shows the lack of students' numeracy abilities because students' numeracy abilities are encouraged by learning mathematics in the context of practical application so that students are better able to build connections between the various types of knowledge they encounter in everyday life, so that numeracy can be used for objective, social, organizational, personal, and knowledge [10-12].

Evaluation of the results of each PMBL implementation meeting using question-based calculations shows that there are differences between classes. The evaluation score for each PMBL-online class meeting is higher than the PMBL-offline class score,

but the average between two class evaluation score has not reached the minimum KKM standard. It is suspected that students do not have adequate mathematics/numeracy literacy skills The experimental study conducted showed that there were differences in the achievement of daily evaluation results between students who used PMBL-online and students who used PMBL-offline in the GLS program in the numerical field. The evaluation results show that PMBL-online and PMBL-offline students achieved the highest evaluation scores in the second evaluation. However, there are differences between classes based on group categories. PMBL-offline high category students have a higher average evaluation score in evaluations 1 and 2, while PMBL-online high category students have the highest average evaluation score in evaluations 3 and 4. This shows that there are differences in the way students of both groups processed information and answered questions. Apart from that, significant differences were also seen in low category students, where PMBL-online students were superior to PMBL-offline students in evaluations 2 and 4, while PMBL-offline students were superior in evaluation 1. These findings indicate that the literacy-based learning approach mathematics such as PMBL can help improve students' mathematical understanding, but also highlight the need for improvements in mathematical literacy skills especially in the context of practical application. Therefore, further efforts are needed to improve students' numeracy skills so they can connect their knowledge with everyday life situations.

4 Conclusion

Yield value evaluation every meeting on implementing PMBL with question-based numeration show difference between second class. Evaluation value every meeting more PMBL-online class tall from mark PMBL-offline classes, however the average value of the results evaluation second class Not yet reach KKM minimum standards. This suspected student not enough own prowess literacy math / numeracy

Acknowledgement. This research is funded by Universitas Singaperbangsa Karawang through the SIHIPKA that is managed by the Center of Research, Development, and Community Services of Universitas Singaperbangsa Karawang.

References

1. OECD. Indonesia – Country Note – PISA 2018 Result. 2018. https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf
2. Tohir, M. Hasil PISA Indonesia Tahun 2018 Turun Dibanding Tahun 2015 (Indonesia's PISA Results in 2018 are Lower than 2015). *Open Science Framework, 2(January), 1–2.* 2019. https://doi.org/10.17605/OSF.IO/8Q9VY
3. Hewi, L., & Shaleh, M. Refleksi Hasil PISA (The Programme For International Student Assesment): Upaya Perbaikan Bertumpu Pada Pendidikan Anak Usia Dini). *Jurnal Golden Age*, *4*(01), 30–41. 2020. https://doi.org/10.29408/jga.v4i01.2018

4. Kemendukbud-Ristek. Survey Karakter. 2021. https://pusmendik.kemdikbud.go.id/an/page/survei_karakter
5. Rakhmawati Y, Mustadi A. The circumstances of literacy numeracy skill: Between notion and fact from elementary school students. J Prima Edukasia [Internet]. 2022; Available from: https://scholar.archive.org/work/eeie4qpchzcq5imu2ebtqrk6uq/access/wayback/https://journal.uny.ac.id/index.php/jpe/article/download/36427/pdf
6. Mumpuniarti M. Challenges Faced by Teachers in Teaching Literacy and Numeracy for Slow Learners. J Sustain Dev. 2017;10(3):243.
7. Chinnappan M, Pandian A. Malaysian and Australian children's representations and explanations of numeracy problems. Educ Res Policy Pract. 2009;8(3):197–209.
8. Connolly C, Carr E, Knox S. Diving deep into numeracy, cross-curricular professional development. Int J Math Educ Sci Technol. 2023;54(6):1034–53.
9. Vasoya N, Vansdadiya R. Effective Strategies for Promoting Foundational Literacy and Numeracy in Early Childhood Education. J Soc Sci. 2023;19(1):92–5.
10. Liljedahl, P., & Liu, M. Numeracy. In *Issue In Math Education* (pp. 34–39). Universitas Simon Fraser. 2013. https://peterliljedahl.com/wp-content/uploads/NR-Numeracy.pdf
11. Kus, M. Numeracy. *Brock Education Journal*, *27*(2). 2018. https://doi.org/10.26522/brocked.v27i2.579
12. Ginsburg, L., Manly, M., & Schmitt, M. J. The Components of Numeracy. *National Center for the Study of Adult Learning and Literacy*, *December*, 1–79. 2006. http://eric.ed.gov/?id=ED495440
13. Miles. Huberman. & Saldana. Qualitative Data Analysis A Methods Sourcebook, Third Edition. United States of America: Sage Publication. 2014.
14. Ruseffendi, E.T. *Dasar-dasar Penelitian & Bidang. Non Eksata Lainnya*. Bandung: PT. Tarsito. 2005.
15. Indrawan, R., & Yaniawati, P. Metode Penelitian Kuantitatif, Kualitatif, dan Campuran untuk Manajemen, Pembangunan, dan Pendidikan. Bandung : PT. Refika Aditama. 2014.
16. Steen L.A., Turner R., Burkhardt H. Developing Mathematical Literacy. In: Blum W., Galbraith P.L., Henn HW., Niss M. (eds) Modelling and Applications in Mathematics Education. New ICMI Study Series, vol 10. Springer, Boston, MA. 2007. https://doi.org/10.1007/978-0-387-29822-1_30
17. OECD. Education at a Glance 2019. In *Education at a Glance: OECD Indicators*. 2014. https://doi.org/10.1787/f8d7880d-en
18. Alberta Government. *Literacy* (pp. 1–3). 2015. https://education.alberta.ca/media/3402193/lit-fact-sheet.pdf