



Development of numeracy skills: Analysis of students in junior high schools in Ambon City based on teacher's perspective

R. H. Yanti Silitonga* 

*Pendidikan Matematika, Universitas Pattimura, Maluku 97233, Indonesia

*rhyantisilitonga@gmail.com

Received: October 15, 2023 | Revised: November 30, 2023 | Accepted: December 24, 2023 | Published: December 31, 2023

*Corresponding author

Abstract:

Numeration is important as it is a fundamental skill, but based on the evaluation of the Programme for International Student Assessment, showed that the student's numeration ability is still low. This study aims to analyze the various problems that occur in the development of numeration skills of high school students. The research was carried out at the Catholic High School in Ambon, with the subject of the research being teachers of mathematics and non-mathematics. This research is qualitative research using methods of narrative inquiry. Data collection techniques include questionnaires, interviews, and recording and documentation. The results of this research indicate that there are a number of issues with developing numeracy skills, one of which is the lack of implementation of classic game-based learning strategies. School facilities are inadequate to encourage increased student numeracy. The implementation of training for teachers to improve teacher numeracy is still rare, so it affects the lack of innovation of teachers in teaching by applying games as well as traditional games to improve numeracy.

Keywords: Curriculum; Development; Numeracy Skills; Problems.

How to Cite: Silitonga, R. H. Y. (2023). Development of numeracy skills: Analysis of students in junior high schools in Ambon City based on teacher's perspective. *Alifmatika: Jurnal Pendidikan dan Pembelajaran Matematika*, 5(2), 298-310. <https://doi.org/10.35316/alifmatika.2023.v5i2.298-310>

Introduction

Numeracy is one of the most important things in various aspects of life, not only in work but also in everyday life; many activities require numeracy. For example, planning shopping activities and making a business, even when we convey information in numbers. According to Mariamah et al. (2021), numeracy is the ability to utilize various numbers or symbols related to basic mathematics to solve problems in everyday life. In addition, numeracy was also associated with the ability to analyze information presented in various forms, such as graphics, tables, and charts (Yunarti & Amanda, 2022; Mariamah et al., 2021). Hartatik and Nafiah (2020); Anridzo et al. (2022) stated that numeracy prioritizes analyzing numbers to obtain a resolution or solution. Knowledge of mathematics does not necessarily make someone have numeracy abilities.



Content from this work may be used under the terms of the [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/) that allows others to share the work with an acknowledgment of the work's authorship and initial publication in this journal.

Numeracy abilities include skills in applying mathematical concepts and rules in real, everyday situations, usually found in unstructured problems, has various ways of solving, there is no complete solution, and is related to non-mathematical factors. Additionally, Mustofa (2020); Bukit and Sarbaini (2021) demonstrated the importance of numeration skills, pointing out that most data in daily life is given in numerical form in a variety of social, economic, political, and other domains. A lot of information is presented using various symbols, for example information related to signs, advertisements containing information on health, population and various other fields. Students must have numeracy skills so they are able to analyze to solve problems from the data presented.

The majority of Group of Twenty developing country members remain to have serious worries concerning student numeracy. With the participation of the European Union and 19 major countries, the G20 provides a venue for multilateral collaboration. The G20 working group on education's plan of action, which addresses the requirement to improve reading and numeracy, makes this clear. A significant issue, namely a discrepancy in the percentage of pupils from G20 countries obtaining the minimum skill in the numeration test, was brought up at a meeting in India on June 19–22, 2023. Developing nations still attain a relatively low percentage of minimum competency. Argentina was down by almost 7%, or 54%, compared to Brazil's just 61%. Indonesia only managed to get 50%; even South Africa and India, with their planned minimum competence rates of 19% and 39%, respectively, are still far below Indonesia. As the meeting's host country, India claimed it was important or urgent to address the issue of increasing numbering capacities. According to a study by de Barros and Ganimian (2023), the numerical ability of students in India is still lower than is reported. The survey included 101,084 public school pupils in grades four, six, and eight from 19 Indian states. As a result, only 52% of students mastered the regularly examined skills, while only 27% possessed the ability to govern the rarely evaluated talents. The National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN) initiative was launched in India to improve numeration.

Pursuant to research, the Vietnamese Ministry of Education and Training has many problems with enumeration. The number of pupils, particularly in outlying locations, is still relatively low (Cao Thi et al., 2023). Program for International Student Assessment (PISA) initiated by the Organisation for Economic Co-operation and Development (OECD) is a study to evaluate education systems participated in by more than 79 countries around the world. Indonesia's ranking achievement in the PISA assessment has been constant since the beginning of Indonesia's participation in the evaluation, namely from 2000 to 2018. Indonesia's ranking for assessing abilities in mathematics and science is very low. Indonesia is ranked 9th from the bottom of 79 in science. In mathematics, Indonesia's order is worse than that of the bottom seven countries, namely 73rd (Hewi & Shaleh, 2020). Based on research by Setianingsih et al. (2022) at SMPN 1 Bungkal district of Ponorogo in East Java Province, the ability of learners to solve type evaluation of minimum competence problems falls under the primary numeration compensation category. Students can still not solve many real-world problems using various numbers or symbols associated with basic mathematics.

The government implemented a new Merdeka Curriculum curriculum starting in February 2022. The 2013 curriculum was utilized before the implementation of the Merdeka curriculum. However, the Covid-19 pandemic hit the world, including Indonesia, which makes it difficult for teachers to carry out the learning process using

the 2013 curriculum (Rusmiati et al., 2023; Faiz & Kurniawaty, 2020; A. Fauzi, 2022). The government launched a new policy through the Ministry of Education and Culture, namely replacing the curriculum with an emergency curriculum. The emergency curriculum is a simplification of the curriculum previously focused only on essential and prerequisite competencies needed for continuing learning at the next level (Kementerian Pendidikan Nasional, 2020). Subsequently, the government developed a curriculum for drivers, which underwent a name change to a prototype curriculum before becoming more popularly known as a Merdeka curriculum (Faiz et al., 2022; A. Fauzi, 2022). The government's intention to carry out learning recovery between 2022 and 2024 is one of the reasons behind introducing the Merdeka curriculum. The Merdeka curriculum also seeks to enhance students' numeracy abilities while assessing the efficacy of the use of outdated courses (Wiguna & Tristaningrat, 2022; Ijtahidah & Nisa', 2023). s

Increasing student proficiency with numbers is one way to help Indonesia rank higher in maths. Ministry of Education and Culture (2021) claims that teaching students to numerate can be done in several ways. Increasing numeracy across subject areas is one approach that can be used. Students use mathematics not only in mathematics lessons but students are made to be able to use mathematics in various other subjects. In other words, strengthening numeracy in mathematics is carried out by viewing other subjects as providing a meaningful context in which mathematical concepts are introduced and developed (Lessy et al., 2023). Likewise, Perdana and Suswandari (2021) have shown that one approach to enhancing students' numeration abilities is to augment the number of educators with expertise in mathematics and non-mathematics. Alternative strategies are boosting the difficulty of project-based learning and problem-based mathematics (Palobo & Tembang, 2019).

According to Kartikasari et al. (2016), one of the reasons why students do not have numeracy skills is that teachers do not get students used to solving numeracy questions. One possible cause is that teachers, especially elementary school teachers, cannot prepare numeracy-based questions. The questions that teachers usually give to students are routine closed questions; students can immediately solve the questions using just one formula. Fauzi (2016) explained that several obstacles to the development of numeracy in elementary schools are that students' interest in learning related to mathematics is still relatively low, and the ability to understand problems in elementary school students is still lacking. Apart from that, the teachers' skills in developing learning materials are far from optimal. Inayah et al. (2022), while children can typically understand basic mathematical concepts, such as number counting procedures, their ability to apply them to real-world scenarios and unstructured problems is still lacking (Ratumanan et al., 2022).

Yulinggar (2019) stated that the obstacle to developing numeracy is the unavailability of special learning modules for numeracy activities. The learning carried out by the teacher uses general learning modules so that numeracy activities are not visible or are not related to numeracy. Based on data in the Education Report Card of the Ministry of Education, Culture, Research, and Technology for 2022, at the junior high school level, students' literacy and numeracy skills are still below 50%, which meets the minimum competency, more precisely, only 40.63%. Meanwhile, in 2021, the percentage of numeracy skills that meet the minimum competency is only 36,84%. Results of the 202 National Assessment: The education quality in Ambon is still in the yellow zone for junior high school numeracy. 2022 there will be a slight increase, but the quality of

junior high school education for numeracy will remain in the same zone, namely the yellow zone. Based on the previously provided information, the researchers are interested in doing a study linked to field problems while developing the numerical skills of students at the high school in Ambon City. This study differs from previous studies in that the authors wish to identify all barriers to developing students' numerical abilities from the perspectives of mathematics and non-mathematics teachers. This investigation will also examine if the difficulties discovered in this research school are the same as the findings of earlier studies.

Research Methods

This study used a qualitative research method to address the challenges teachers encounter in developing students' numeration skills thoroughly and comprehensively. The study took place in Ambon's Catholic High School. Questionnaires, interviews, recording, and documentation are methods of data collection. Questionnaires and interview guidelines are the tools employed. Concerning the issues considered for the drafting of statements in the questionnaire and questions during the interview sent to the Ministry of Education and Culture (2021).

Researchers have developed two questionnaires: one for math teachers and another for teachers of other subjects. In a similar vein, there are two types of guidelines for research interviews. Before going down to the school to do research, three expert lecturers in mathematics education validated the raising and interview guidelines. The three expert teams' validation averages add up to 3.80. To utilize the questionnaire and interview instructions, the instrument validation requirements for $x = 3.80$ are at a gap of $3.00 \leq x < 4.00$, including the category is very valid. This research uses primary data sources by filling out leaflets and interviews with two research informants: a mathematics teacher and a non-mathematical teacher. Several factors are considered when choosing a study subject, including the teacher's training, interview preparation, and at least five years of teaching experience.

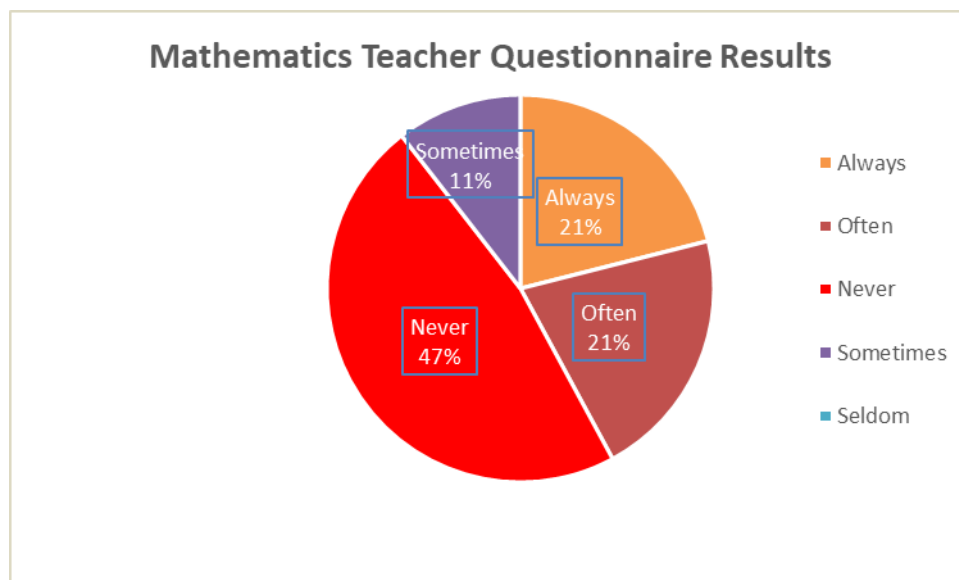
The form of the questionnaire in this study is a closed questionnaire using the Likert scale and five alternative categories of answers: never, seldom, sometimes, often, and always. The mathematics teacher's questionnaire sheet comprises 19 assertions, while the non-mathematical teacher's has 16. The following are some examples of statements found on the questionnaire: "Teachers diagnose student over-and-deficiency numbering to improve student numbering," offering the options never, rarely, sometimes, often, and always. The type of interview used is a structured interview, and there was a recording at the time the interview was conducted. Questions asked during the interview include: "Do teachers perform diagnostic assessment through the assessment of minimum class competence, then proceed with remedial learning?"

The interactive analysis model is being used in this study to analyze data. First, when collecting data, do a technical analysis of the research data with interactive model analysis. The data was collected by filling out the questionnaires and interviews with mathematics teachers and non-mathematical teachers, represented by social science teachers. The result of the lift filling will indicate the teacher's difficulty in carrying out the development of numeration skills. Subsequently, a data reduction is carried out from the data already collected. Researchers search for data, themes, and important patterns by selecting, making a summary, or delineating with the appropriate sentence. Then, the

researchers will perform a presentation of the data. Data will be presented in the form of text as a narrative or in table form. The final stage is concluding. Withdrawal, the conclusion of this research, is a description and description in the form of a narrative obtained from interviews and questionnaires about the problems experienced by informants in developing students' numeracy skills.

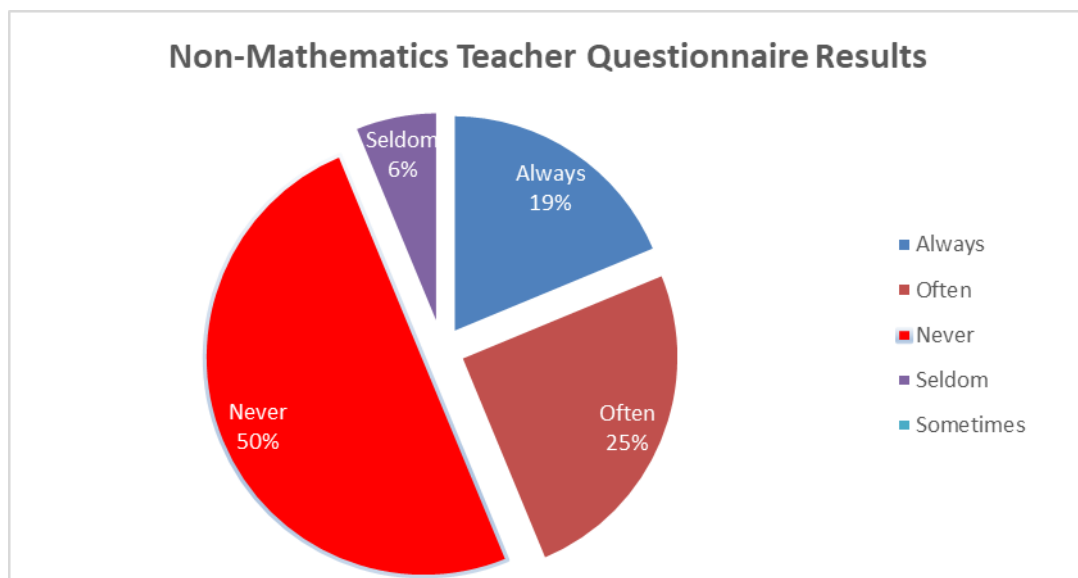
Results and Discussions

Based on the results of research carried out at Ambon Catholic Middle School in Sirimau District, Ambon City, Maluku Province, in 2023, there are several problems in the development of numeracy skills. Of the 19 statements given to be filled in by the mathematics teacher, there are nine statements with choices: the answer is never, and two with the answer choice sometimes. There are four statements with always answers and four declarations with often solutions. No information was answered by selecting an answer seldom. Details The complete results of the mathematics teacher's filling out the questionnaire can be seen in Picture 1.



Picture 1. Mathematics Teacher Questionnaire Results

Picture 1 shows there are 11 statement answers, or 58% of the barriers to developing the numbering ability of students faced by non-mathematics teachers. The non-mathematics teacher filled out 16 statements, with eight statements answered with never answers and 1 statement replied with rare answers. There are three statements with always answers and four declarations with often answers. No statement is responded to by choosing answers sometimes. Picture 2 shows the complete results of filling out the questionnaire carried out by non-mathematics teachers.



Picture 2. Non-Mathematics Teacher Questionnaire Results

Picture 2 shows 9 statement answers, or 56%, and obstacles to developing students' numeracy skills faced by non-mathematics teachers.

Table 1. Results of Problematic Analysis of Numeracy Ability Development

No.	Forms of Difficulty	Mathematics Teacher	Non-Mathematics Teacher
1	There are training activities for teachers to improve teacher numeracy competency.	Sometimes	Seldom
2	Numeracy programs through either traditional games, such as congklak, or board games, for example, a snake game, staircases, and others.	Never	Never
3	The program creates a numbering game that invites students to create and play simple numbering games that can be brought home to be played at home.	Never	Never
4	Books on numeration, both fictional and non-fiction reading books, how to teach numeration, and how to construct numeration tools are available in classrooms and school libraries.	Sometimes	Often
5	Development of supporting facilities by utilizing the school environment as a medium for numeracy learning to create an ecosystem rich in numeracy.	Never	Never

No.	Forms of Difficulty	Mathematics Teacher	Non-Mathematics Teacher
6	Displays information that generates numeration in different contexts. For example, in a small room, information is displayed about how much volume of water is poured out if the tap is not fully closed and still drops water for a day, or information about how to estimate the time of 20 seconds to wash hands with soap as a health protocol.	Never	Never
7	The information display, usually only in text form, is enriched with numeric elements. For example, library staff displays information about the number of book borrowers (for example, by genre, gender, etc.) every month using pie charts, tables, or graphs.	Never	Never
8	Use of school facilities to exhibit numeracy displays, such as height measuring tools, room temperature thermometers, fascinating classroom numbers, etc.	Never	Never
9	The availability of facilities or numeracy displays in school gardens encourages students to play with numeracy.	Never	Never
10	The availability of a numeracy environment or workspace allows students to interact using mathematical tools and conventional games, as well as board games that demand and develop numeracy abilities.	Never	Never
11	School numeracy programs to relate mathematics to real life, for example, in the form of a series of topics on mathematics in life at home, mathematics in various jobs today, mathematics in future work, and mathematics in social life.	Never	Never

The majority of teachers typically respond "never" to the following topics: creating a supporting tool that uses the classroom as a way to teach numeration; using school facilities for numeration appearances; creating programs that connect mathematics to real-world situations; and creating traditional games as a means of teaching numeration. According to a report from discussions with math teachers, the school recently worked with the service to provide teachers with training exercises to enhance their numerical competency; however, not all teachers participated, with one person serving as a representative for the entire group. Moreover, unlike math teachers who have completed independent training arranged by outside non-school organisers, non-

mathematics teachers only participate in one school training and never engage in additional independent training activities. According to Mariska & Wiryanto's research from 2023, instructors are still having trouble teaching pupils arithmetic. Instructors must receive training targeted at enhancing their numeracy abilities. According to the transcript of an interview conducted with a math teacher, the teacher in question has participated in a mobility teacher program.

However, Imron et al. (2023) analysis of the numbering program from the perspective of teacher mobilization education concluded that the new teacher education program concentrated on the development of pedagogical competence and that the training materials did not specifically address how to improve the professional competence of the teachers in the field of enumeration. The teacher said, "There is no numbering program in schools for all students that associates mathematics with real life," based on the findings of his interview. In the words of the Ministry of Education and Culture (2021), implementing a curriculum in schools that links mathematics to real-world applications is one strategy to enhance numeration. One of these involved the application of mathematics to the workplace. It establishes a link between mathematics and potential future employment and current jobs. These are a few quotes from the professors' interviews.

- [1] "We never use traditional games like games congklak or something else to support students' numeracy skills because they haven't thought. We play games to refresh, like a kind of icebreaker. But It's not a traditional game either."
- [2] "Yes, here are traditional games that can improve the numeracy skills of students according to the material; for example, integer material seems to be able to be done through opening and closing games, gici-gici game for flat material. It is also possible to employ Hanoi games. The congklak game is for number material, maybe also for material number pattern."
- [3] "There has been no development of supporting facilities in the school environment for students learning numeracy, as well as displaying information that brings out inner numeracy in various contexts."
- [4] "Because the school doesn't have a garden, students from elementary and high schools share the volleyball court, so it's not a school park as a playground for numeracy lessons."
- [5] "The school provides numeracy books for students, but only for eighth graders, not yet for seventh and ninth graders."

According to the findings of interviews with math and non-math teachers, they never completed enumeration tasks through either traditional or non-traditional games. The teacher offered several explanations, one of which was that using the game to complete numerical chores had not been considered. Furthermore, teachers observe that children are increasingly interested in utilizing gadgets; therefore, students' interest in learning through conventional games is relatively low. It is consistent with earlier studies indicating that as science and technology improve, pupils are more likely and interested in playing games on gadgets rather than traditional games (Hadi et al., 2018; Astri et al., 2021). Based on the research results conducted by Marhaeni and Thohir (2022), one of the obstacles to increasing traditional game-based numeracy ability is that some students are interested in playing, so modifications to classic games are needed so that all students are interested in playing the game (Kementerian

Pendidikan dan Kebudayaan, 2021; Akmalia, 2023). A complete support facility in the school setting is a supportive component that is equally vital for the development of numeration skills. There is currently no support infrastructure for numerical learning media that uses the school space at the research site. Notice boards with instructions or descriptions do not yet contain numerical knowledge in classrooms, restrooms, canteens, fields, and libraries. The teacher claims that it is possible to update the explanation and make frequent appearances in the school area. However, this was not considered until recently, when it was understood to be crucial for aiding pupil numeration. Although there are already weight scales and high measures in schools, the quantity is still quite modest to fulfill the needs of a single school. Owing to the school's restricted land size, the numerals could not be concretized in the school park; up to this point, elementary school, primary high school, and upper secondary school students shared the fields. According to a study by Adawiyah et al. (2023), there are a number of significant factors that contributed to students' poor numeracy abilities, such as a lack of resources and facilities for them to improve their numeracy.

Conclusions and Suggestions

According to the study's findings, teachers face impediments to developing students' numeration skills. Non-mathematics teachers selected eight never, one seldom answer, nine questions with a choice of replies never, and two statements with the option occasionally. It suggests that roughly 58% of mathematics teachers are still encountering difficulties. Some of the problems faced in the development of numeration skills include (a) lack of training for teachers to improve teachers' numeracy skills; (b) no school numeracy program relates mathematics to real life; (c) not having a numeration program through traditional games; (d) there are no supporting facilities that utilize the school environment as a Media for learning numeracy; (d) the information displayed does not evoke numeration in many contexts; (e) no school facilities for numeration display; and (f) There is no ad at Ataman School for a place for students to play numeracy. This study has limitations because it is based solely on the perspectives of the instructor, the mathematics teacher, and the non-mathematics teacher. According to this study, research should be done with the viewpoints of parents, teachers, and students in mind. Afterwards, more schools should be surveyed to collect comprehensive data on the barriers to helping students become more numerate. Advanced research was conducted to solve problems that arose while developing students' numeration skills. Providing training to all teachers, not just a select few, will help them become more proficient in mathematics. Provide a school numerical program that incorporates teachers and students outside the classroom and ties mathematics to real-world situations. After that, the program runs continuously. Then, we have to finish the numbered programs with traditional games.

Acknowledgment

The authors thank the Faculty of Teacher Training and Education, Pattimura University, for financial support through Non-Tax State Revenue research grants.

References

- Adawiyah, N., Makki, M., & Nisa, K. (2023). Analisis faktor penyebab rendahnya kemampuan numerasi siswa [Analysis of factors causing students' low numeracy skills]. *Journal of Classroom Action Research*, 5(1), 239–244. <https://doi.org/10.29303/jcar.v5i1.2845>
- Akmalia, N. (2023). *Analisis kemampuan literasi numerasi siswa SMP/MTs kelas VIII di kelurahan Belendung [Analysis of the numeracy literacy skills of class VIII SMP/MTs students in Belendung Village]*. Bachelor's thesis, Jakarta: FITK UIN Syarif Hidayatullah Jakarta. <https://repository.uinjkt.ac.id/dspace/handle/123456789/67076>
- Anridzo, A. K., Arifin, I., & Wiyono, D. F. (2022). Implementasi supervisi klinis dalam penerapan kurikulum merdeka di sekolah dasar [Implementation of clinical supervision in implementing the independent curriculum in elementary schools]. *Jurnal Basicedu*, 6(5), 8812–8818. <https://doi.org/10.31004/basicedu.v6i5.3990>
- Astri, A., Harjono, A., Jaelani, A. K., & Karma, I. N. (2021). Analisis kesulitan guru dalam penerapan kurikulum 2013 di sekolah dasar [Analysis of teachers' difficulties in implementing the 2013 curriculum in elementary schools]. *Renjana Pendidikan Dasar*, 1(3), 175–182. <https://prospek.unram.ac.id/index.php/renjana/article/view/113>
- Bukit, S., & Sarbaini, W. (2021). Pemahaman guru sekolah dasar terhadap RPP merdeka belajar di Kecamatan Sibolangit tahun ajaran 2020/2021 [Elementary school teachers' understanding of the independent lesson plans for learning in Sibolangit District for the 2020/2021 academic year]. *Prosiding Seminar Nasional Pendidikan Dasar Mahesa Research Center*, 1(1), 58–66. <https://doi.org/10.34007/ppd.v1i1.171>
- Cao Thi, H., Le, T. A., Tran Ngoc, B., & Phan Thi Phuong, T. (2023). Factors affecting the numeracy skills of students from mountainous ethnic minority regions in Vietnam: Learners' perspectives. *Cogent Education*, 10(1), 1–17. <https://doi.org/10.1080/2331186X.2023.2202121>
- de Barros, A., & Ganimian, A. J. (2023). The foundational math skills of Indian children. *Economics of Education Review*, 92(102336), 1–28. <https://doi.org/10.1016/j.econedurev.2022.102336>
- Faiz, A., & Kurniawaty, I. (2020). Konsep merdeka belajar pendidikan Indonesia dalam perspektif filsafat progresivisme [The concept of Merdeka learning in Indonesian education from the perspective of progressivism philosophy]. *Konstruktivisme: Jurnal Pendidikan Dan Pembelajaran*, 12(2), 155–164. <https://doi.org/10.35457/konstruk.v12i2.973>
- Faiz, A., Parhan, M., & Ananda, R. (2022). Paradigma baru dalam kurikulum prototipe [New paradigm in prototype curriculum]. *Edukatif: Jurnal Ilmu Pendidikan*, 4(1), 1544–1550. <https://doi.org/10.31004/edukatif.v4i1.2410>
- Fauzi, A. (2022). Implementasi kurikulum merdeka di sekolah penggerak [Implementation of the Merdeka curriculum in driving schools]. *Pahlawan: Jurnal*

- Pendidikan-Sosial-Budaya*, 18(2), 18–22. <https://doi.org/10.57216/pah.v18i2.480>
- Fauzi, K. (2016). Peranan kemampuan metakognitif dalam pemecahan masalah matematika sekolah dasar [The role of metacognitive abilities in solving elementary school mathematics problems]. *Jurnal kultura*, 10(1), 1162-1166. <http://digilib.unimed.ac.id/1011/>
- Hadi, P., Sinring, A., & Aryani, F. (2018). Pengaruh permainan tradisional dalam meningkatkan keterampilan sosial siswa SMP [The influence of traditional games in improving the social skills of junior high school students]. *Jurnal Psikologi Pendidikan Dan Konseling: Jurnal Kajian Psikologi Pendidikan Dan Bimbingan Konseling*, 4(1), 32. <https://doi.org/10.26858/jpkk.v4i1.4474>
- Hartatik, S., & Nafiah, N. (2020). Kemampuan numerasi mahasiswa pendidikan profesi guru sekolah dasar dalam menyelesaikan masalah matematika [Numeracy abilities of elementary school teacher professional education students in solving mathematical problems]. *Education and Human Development Journal*, 5(1), 32–42. <https://doi.org/10.33086/ehdj.v5i1.1456>
- Hewi, L., & Shaleh, M. (2020). Refleksi Hasil PISA (programme for international student assessment): Upaya perbaikan bertumpu pada pendidikan anak usia dini [Reflection on the results of PISA (programme for international student assessment): Improvement efforts focus on early childhood education]. *Jurnal Golden Age*, 4(01), 30–41. <https://doi.org/10.29408/jga.v4i01.2018>
- Ijtahidah, F. F. (2023). Pengembangan soal literasi numerasi SMP yang terintegrasi Islam [Development of Islamic integrated junior high school numeracy literacy questions]. *Primatika: Jurnal Pendidikan Matematika*, 12(1), 1-8. <https://doi.org/10.30872/primatika.v12i1.1596>
- Imron, I., Pramono, S. E., Rusilowati, A., & Sulhadi, S. (2023). Program literasi dan numerasi dalam perspektif pendidikan guru penggerak [Literacy and numeracy programs from a driving teacher education perspective]. *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS)*, 6(1), 1131–1139.
- Inayah, A., Nagari, G., Setiawan, K., & Anisah, N. (2022). Kemampuan literasi numerasi untuk mengembangkan pemahaman konsep dalam pembelajaran matematika [Numeracy literacy skills to develop understanding of concepts in mathematics learning]. *Jurnal Ilmiah Mahasiswa Pendidikan Matematika*, 2(2), 106–113. <https://jim.unindra.ac.id/index.php/himpunan/article/view/6333>
- Kartikasari, M., Kusmayadi, T. A., & Usodo, B. (2016). Kreativitas guru SMA dalam menyusun soal ranah kognitif ditinjau dari pengalaman kerja [The creativity of high school teachers in preparing cognitive domain questions is seen from work experience]. *Prosiding Seminar Matematika Dan Pendidikan Matematika*, November, 431–442. <https://jurnal.fkip.uns.ac.id/index.php/snmpm/article/view/10852>
- Kementerian Pendidikan dan Kebudayaan, Indonesia. (2021). *Panduan penguatan literasi dan numerasi [Guide to strengthening literacy and numeracy]*. Kemdikbud
- Kementerian Pendidikan Nasional, Indonesia. (2020). *Pedoman pelaksanaan kurikulum pada satuan pendidikan dalam kondisi khusus menteri [Guidelines for implementing*

curriculum in education units in special conditions minister]. Pemerintah Indonesia.

- Lessy, D., Nukuhaly, N. A., & Rumasoreng, M. I. (2023). Pengembangan lembar kerja siswa (LKS) matematika berbasis literasi numerasi [Development of student worksheets (SW) for mathematics based on numeracy literacy]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 12(1), 814. <https://doi.org/10.24127/ajpm.v12i1.6449>
- Marhaeni, A. P., & Thohir, M. A. (2022). Kendala peningkatan kemampuan literasi numerasi berbasis permainan tradisional di SDN Plosokerep 2 Blitar [Obstacles to improving numeracy literacy skills based on traditional games at SDN Plosokerep 2 Blitar]. *Jurnal Karya Pendidikan Matematika*, 9(1), 57–65. <https://doi.org/10.26714/jkpm.9.1.2022.57-65>
- Mariamah, Suciwati, & Hendrawan. (2021). Kemampuan numerasi siswa sekolah dasar ditinjau dari jenis kelamin [Elementary school students' numeracy abilities in terms of gender]. *TUNAS: Jurnal Penelitian Pendidikan Dasar*, 1(1), 17-19. <https://jurnal.fkip.unmul.ac.id/index.php/tunas/article/view/818>
- Mariska, T. N. P., & Wiryanto. (2023). Analisis kesulitan guru dalam mengajar analisis kesulitan guru dalam mengajarkan numerasi pada persiapan AKM di sekolah dasar [Analysis of teacher difficulties in teaching analysis of teacher difficulties in teaching numeracy in AKM preparation in elementary schools]. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, 11(6), 1284–1294. <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/53661>
- Mustofa, Z. (2020). Kompetensi numerasi siswa SMK ditinjau dari Gender dan berbagai kesulitannya [Vocational school students' numeracy competency is viewed from gender and various difficulties]. *Jurnal Pendidikan Matematika Universitas Lampung*, 8(4), 227-237. <http://doi.org/10.23960/mtk/v8i2.pp.227-237>
- Palobo, M., & Tembang, Y. (2019). Analisis kesulitan guru dalam implementasi kurikulum 2013 di Kota Merauke [Analysis of teacher difficulties in implementing the 2013 curriculum in Merauke City]. *Sebatik*, 23(2), 307–316. <https://doi.org/10.46984/sebatik.v23i2.775>
- Perdana, R., & Suswandari, M. (2021). Literasi numerasi dalam pembelajaran tematik siswa kelas atas sekolah dasar [Numeracy literacy in thematic learning of upper elementary school students]. *Absis: Mathematics Education Journal*, 3(1), 9-15. <https://doi.org/10.32585/absis.v3i1.1385>
- Ratumanan, T. G., Salamor, R., & Mataheru, E. E. (2022). Analisis kemampuan literasi numerasi siswa SMP Kristen Kalam Kudus Ambon [Analysis of the numeracy literacy skills of Kalam Kudus Christian Middle School students in Ambon]. *Jurnal Pendidikan Matematika Unpatti*, 3(3), 110–117. <https://doi.org/10.30598/jpmunpatti.v3.i3.p110-117>
- Rusmiati, M. . N., ASHifa, & Herlambang. (2023). Analisis problematika implementasi kurikulum merdeka di sekolah dasar [Analysis of the problems of implementing the independent curriculum in elementary schools]. *Jurnal Ilmiah KONTEKSTUAL*, 4(02), 67–75. <https://doi.org/10.46772/kontekstual.v4i02.995>

- Setianingsih, W. L., Ekayanti, A., & Jumadi, J. (2022). Analisis kemampuan numerasi siswa smp dalam menyelesaikan soal tipe asesmen kompetensi minimum (AKM) [Analysis of junior high school students' numeracy skills in solving minimum competency assessment (MCA) type questions]. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 11(4), 3262. <https://doi.org/10.24127/ajpm.v11i4.5915>
- Wiguna, I. K. W., & Tristaningrat, M. A. N. (2022). Langkah mempercepat perkembangan kurikulum merdeka belajar [Steps to accelerate the development of the Merdeka learning curriculum]. *Edukasi: Jurnal Pendidikan Dasar*, 3(1), 17. <https://doi.org/10.55115/edukasi.v3i1.2296>
- Yulinggar, E. (2019). Pengembangan modul pendamping literasi numerasi di kelas SD Muhammadiyah 8 KH Mas Mansur Malang [Development of a companion module for numeracy literacy in elementary school class Muhammadiyah 8 KH Mas Mansur Malang]. *Skripsi Program Studi Pendidikan Sekolah Dasar Universitas Muhammadiyah Malang*.
- Yunarti, T., & Amanda, A. (2022). Pentingnya kemampuan numerasi bagi siswa [The importance of numeracy skills for students]. *Seminar Nasional Pembelajaran Matematika, Sains Dan Teknologi*, 2(1), 44–48. <http://e-jurnal.fkip.unila.ac.id/index.php/SINAPMASAGI/article/view/92>