

## **Profile of the Use of Mathematics Learning Media for Strengthening Numerical Learning in Senior High Schools in Kendari City**

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### **ABSTRACT**

The purpose of this study is to describe the profile of the use of mathematics learning media to strengthen numeracy learning in senior high schools in Kendari City. This type of research is exploratory with a qualitative approach. The subjects of this study were high school mathematics teachers in Kendari City. Data collection techniques in this study using interview techniques. The data analysis technique follows the Miles, Huberman, and Saldana analysis model, which consists of three activities that coincide: data compaction, data presentation, and concluding/verification. Based on the research results and discussion, it can be concluded that the learning media used by teachers in learning mathematics still uses PowerPoint media, textbooks, zoom applications, and WhatsApp. Package books and power points are still the primary media for learning mathematics. There are no android-based mathematics learning media used by teachers. The provision of practice questions and evaluation of learning related to algebraic material, data and uncertainty, as well as geometry, is first given an initial test, and then an increase in the level of difficulty of the exercises is carried out. Students' numeracy skills are still very low because the learning process has not yet been implemented to support students' numeracy abilities. Students' numeracy skills are only facilitated by solving problems such as fractions. Numerical ability has not been associated with the problems students usually face daily.

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## 1. INTRODUCTION

Mathematics in learning seems difficult for most students. Learning difficulties are caused by students who cannot relate mathematical concepts to their daily activities (Hasibuan, 2018). The inability of students to understand mathematics is due to the difficulty of linking new contextual knowledge with previous knowledge (Waskitoningtyas, 2016). This causes numeracy ability from year to year is always low in international level assessments. The 2018 PISA results show that students' mathematics learning achievement in Indonesia is ranked 72 out of 78 countries (OECD, 2019). Likewise, the 2015 TIMSS results show that Indonesian students' math scores are ranked 45th out of 50 countries (Mullis et al., 2016). In order to support the improvement of students' mathematics achievement and scores, an appropriate and dynamic learning design is needed following current development trends. Learning in the new paradigm adapts the concepts in the Merdeka curriculum, which is oriented to learning outcomes by considering the potential and characteristics of students, so teacher competence is needed in designing good learning flows.

Success in implementing the independent learning curriculum is measured through a national assessment which includes a minimum competency assessment, a character survey, and a learning environment survey. The assessment of the minimum competencies measured on student competencies, namely the ability to reason using language (literacy) and the ability to reason using mathematics (numbering) (Ahmad et al., 2021). Numerical literacy is defined as a person's ability to use reasoning (Ekowati et al., 2019). The focus of this numeracy literacy ability is that students can formulate, apply, and interpret mathematics in various contexts, including mathematical reasoning and use mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena in everyday life (Puspaningtyas & Ulfa, 2020). The ability to use numbers, data, and mathematical symbols is related to numeracy literacy (Pangesti, 2018).

Numerical literacy is an urgent problem in learning mathematics. However, not all teachers have implemented lessons that can support students' numeracy skills. This also happened in Kendari Senior High Schools; when referring to the results of initial observations, there were findings indicating that teachers had not specifically implemented learning that could help students have numeracy skills. This is also supported by the release of education report cards by the ministry of education, culture, research and technology of the Republic of Indonesia on April 1, 2022, which shows that from the results of the identification of the education reports on the research subjects that have been determined, it is found that the average aspect of students' numeracy abilities is quite low.

In the national assessment, in addition to the assessment of numeracy skills, there is also a learning environment survey to identify the overall portrait of the quality of education starting from the input, process, and output of each education unit. One aspect of the learning environment survey related to classroom learning is the quality of learning. To ensure the achievement of good quality, it is necessary to have good learning management carried out by teachers diligently and seriously starting from the planning, implementation, and assessment stages (Sutama et al., 2020). Another supporting factor in increasing student learning achievement is by utilizing media in classroom learning. This is in line with the opinion expressed by (Amir, 2016) that the use of media in learning can help students learn to understand abstract material concepts to be made more concrete. According to (Sumarsih & Mukminan, 2016), not using media in learning can hinder the learning process. Therefore, teachers need to prepare appropriate learning media to support the learning process to increase the achievement of better student learning outcomes (Masykur et al., 2017). In line (Lakoy, 2022), teachers have a central role in choosing learning media according to students' learning styles to have an impact on the achievement of students' literacy and numeracy abilities. This is also in accordance with the opinion (Noerbella, 2022) that the obstacle in implementing literacy and numeracy learning in schools is one of the factors, including the lack of available learning media that can be used by teachers for literacy and numeracy learning.

Several previous studies also discussed the importance of numeracy skills possessed by students, including research conducted by (Siregar, 2022), which suggests that numeracy literacy learning can run well when the stages of planning, implementation, and evaluation of learning carried out by

teachers are prepared more optimally and the availability of facilities and school infrastructure to support student learning success. Likewise, research conducted by (Cahayani et al., 2022) provides recommendations that the efforts made by teachers on students who experience low numeracy skills are the need for assistance in the use of learning media to improve their numeracy skills. With these two results, the main concern of the author in this study is that a more detailed description of the reality of the use of learning media by mathematics teachers is needed to support the strengthening of numeracy learning in schools so that a strategy design for strengthening numeracy learning can be taken by utilizing learning media as a catalyst key to make changes and developing students' numeracy skills. The purpose of this study is to describe the profile of the use of mathematics learning media to strengthen numeracy learning in senior high schools in Kendari City.

## 2. METHODS

This type of research is exploratory with a qualitative approach. In exploratory research, the researcher conducts a thorough and in-depth examination (exploration) of what was thought, done, written, and said during the research activity. In a qualitative approach, the researcher prioritizes the things that are thought and done by the subject during the research activity rather than the final result of the problem itself. The subjects of this study were high school mathematics teachers in Kendari City. The process of selecting subjects begins with the determination of the high school where the research is located, and two public schools and one private school are assigned. The results of consultations with principals from each school determined that the research subject was one mathematics teacher from each school, with the requirements of having a minimum of 10 years of teaching experience and being able to apply IT.

Data collection techniques in this study include two kinds of instruments: the main and supporting instruments. An in-depth exploration of the profile of the use of mathematics learning media for strengthening numeracy learning in senior high schools was carried out through interviews. So that the main data used in this study is data from interviews. Collecting data from interviews that are truly accurate can only be done by the researcher himself. Therefore, in this study, the main instrument is the researcher himself. While the interview guide tools.

The data analysis technique follows the analysis model of Miles, Huberman, and Saldana (Misu, 2019), which consists of three activities that occur simultaneously: data compaction, data presentation, and concluding/verification. Data condensation refers to the process of selecting, focusing, simplifying, abstracting, and transforming data that approximates the entirety of written field notes, interview transcripts, documents, and other empirical materials. The presentation of this research data is more dominant in narrative form, although in summarizing everything that has been narrated, a schema (network) is also used. This schema is intended to provide an easier description of all data presentations in narrative form. Data presentation is based on data categorization, as previously stated. Conclusion Drawing/Verification is the final stage of the whole series of research data processing activities, namely analyzing the data obtained and drawing conclusions based on the findings from the results of data analysis. Conclusions are made based on data processing results to answer the research question, namely, finding the numeracy ability profile of high school students.

## 3. FINDINGS AND DISCUSSION

This research was conducted by conducting interviews with three mathematics teachers at schools in Kendari City. There are several interview questions related to learning mathematics in the classroom, which are the basis for the profile of mathematics learning, namely: (a) the media used in learning mathematics; (b) Techniques for giving practice questions and evaluation of learning; (c) students' numeracy skills; and (d) the use of gadget media in learning. The following is a detailed explanation of the results of the interviews for each component of the questions above:

### 3.1 Media used in Mathematics Learning

The results of interviews with research subjects related to the media used in mathematics learning are presented as follows:

- P: What media are used in learning related to algebra, data, and uncertainty and geometry materials that schools have carried out so far?
- N1: "The medium is PPT; for offline learning, I usually prepare PPT but I don't show it in class. Later, when I have finished teaching PPT I will share it with students the same with online learning."
- N2: "For offline learning, I actually don't use any media. I use electronic books whose contents I look for from various sources on the internet because the textbooks provided by the school I see are too heavy in content. Now for online learning, the media used are zoom, and WA to send material."
- N3: "We don't use that media, for PPT itself because infocus is not provided so we don't use it in class, but sometimes we send PPT directly to students through WA we don't show it in class like that."

Based on the results of interviews with subjects N1, subjects N2, and subjects N3 it was found that the learning media used by teachers in learning mathematics still used PowerPoint media, textbooks, zoom applications, and WhatsApp. This finding shows that textbooks and power points are still the main media used in learning mathematics. This is because PowerPoint is a medium with various designs and displays that can be replaced easily (Damayanti & Qohar, 2019). Meanwhile, WhatsApp is the most frequently used social media application by students because it has been equipped with various easy-to-understand features that make it easier for students to use it (Saputra & Salim, 2020). Nevertheless, these findings emphasize that there is no digital-based mathematics learning media yet, especially by using applications developed by teachers and schools themselves.

### 3.2 Techniques for Giving Practice Questions and Evaluation of Learning

The results of interviews with research subjects related to the technique of giving practice questions and evaluation of learning are presented as follows:

- P: What are the techniques for giving practice questions and evaluating learning related to algebraic material, data and uncertainty, and geometry?
- N1: "Usually, after I teach the material and the concept, I give practice questions so I can see if they understand or not about the material I teach. Of course, the evaluation cannot be separated from what I have explained."
- N2: "When students enter class, they are given an understanding of the concept, after which they are given practice questions. If they already understand, then I raise the level of difficulty a little bit to see if they really understand. For the evaluation, it is usually every two weeks."
- N3: "The same as giving practice questions in general, named after the material is discussed, we give practice questions to be discussed together, then students who can answer are welcome to answer in the future. For my own assignments, I usually give them too. Then they study at home."

This finding indicates that there is always a provision of practice questions and evaluation of learning carried out by the teacher in the form of a written test. This problem should be solved with a learning assessment using learning applications because practice questions using written tests require extra performance, from making questions to examining questions after the exam (Ariyani et al., 2021). Another problem that occurs is that the provision of written tests costs a lot of money. The teacher must also provide plenty of time to check the practice test questions that students have done.

### 3.3 Students' Numerical Ability

Results of interviews with research subjects related to students' numeracy abilities are presented as follows:

- P: What is the current profile of students' numeracy abilities?
- N1: "students' numeracy skills are still very low, this is evidenced by the ability of students to work on simple problems such as fractions is still very difficult."
- N2: "the percentage of students' numeracy abilities is still around 30% of the number of students."
- N3: "students' numeracy skills are still standing because of the transition from middle school to high school, and even their algebra skills are still half-assed."

The results of the interviews indicated that students' numeracy skills were still very low because the learning process had not yet been implemented to support students' numeracy skills. Students' numeracy skills are only facilitated by solving problems such as fractions. Numerical ability has not been associated with students' problems in everyday life. Numerical abilities are shown by being comfortable with numbers and being able to use mathematical skills practically to meet the demands of life (Mahmud & Pratiwi, 2019). If numeracy skills become a major part of learning, it will increase student learning outcomes. The findings (Anderha & Maskar, 2021) show a unidirectional relationship between numeracy ability and student learning achievement, so if the numeracy ability is high, the learning achievement will also be increased.

Strengthening numeracy learning requires concrete efforts by the teacher so that students' understanding of mathematical concepts is increasingly well understood so that it can be implemented in everyday life. The results of this study also reveal the teacher's efforts in implementing learning to train students' numeracy skills, such as excerpts from an interview with subject N1 that "I was just repeating the basic concepts, then given practice questions. Because the most important thing is the basic concept, then subject N2 said "to train students' numeracy skills, there is a tutoring in this school". Subject N3 also said, "During the learning process, we were practicing the calculations. After the material has been discussed, I give practice questions which they then discuss and work on together". The results of this research reveal that efforts to improve students' numeracy skills are only limited to providing exercises with questions in the form of calculations carried out in the learning process. This is proof that teachers' understanding of numeracy learning is still low. One of the reasons why teachers do not understand the concept of numeracy, as expressed by (Westwood, 2021) in his research, is that numeracy is defined as the same as mathematics. According to (Mahmud & Pratiwi, 2019) that numeration is not only the application of mathematical concepts but is more likely to be applied in daily life. As explained (Perdana & Suswandari, 2021), teachers need to fully understand numeracy literacy, which consists of 3 aspects: counting, numeracy relations, and arithmetic operations. Numerical relations are related to the ability to distinguish the quantity of an object, such as more, less, taller, or shorter. Meanwhile, arithmetic operations are the ability to perform basic mathematical operations in addition and subtraction.

### 3.4 Use of Gadget Media in Learning

The results of interviews with research subjects related to the use of gadget media in learning are presented as follows:

- P: How is the use of gadget media in learning algebra, data and uncertainty and geometry materials?
- N1: "In terms of geometry, some teachers have used the GeoGebra application."
- N2: "I use gadget media to find material and carry out the learning process using the zoom application."

N3: "the media is only PPT which we distribute to students."

This research shows that gadget media is only used to search for materials, distribute materials in PPT form, and use existing applications such as GeoGebra. These results prove that the gadget media has not yet been developed in a learning media complexity that is neatly arranged according to the learning design so that students can use it independently to study at home. This is in line with the results of the researcher's confirmation by asking questions about media development using gadgets to support learning. Subject N1 said, "I think the media using gadgets will be more interesting, but for now, we have not developed it. Subject N2 gives a different perspective. According to him "gadget media is less effective because gadgets will make students not focus on learning like students will be more likely to see social media". Furthermore, the subject of N3 revealed "usually if the teacher is unable to attend, then students are given material in the form of learning videos. The findings of this research generally indicate that there are no gadget-based media developed by teachers in learning mathematics. Gadget media is still limited to being used as a tool to find information or additional learning resources related to the material being taught, as stated (Doni, 2017); gadget media can be used to read news and send letters using email. Gadgets that are connected to the internet network can penetrate the boundaries of the dimensions of life, space, and time of their users (Angriani et al., 2020).

#### 4. CONCLUSION

Based on the results and discussion of the study, it can be concluded that the learning media used by teachers in learning mathematics still uses PowerPoint media, textbooks, zoom applications, and WhatsApp. Package books and power points are still the main media used in learning mathematics. There are no android-based mathematics learning media used by teachers. The provision of practice questions and evaluation of learning related to algebraic material, data and uncertainty, as well as geometry, is first given an initial test, and then an increase in the level of difficulty of the exercises is carried out. Students' numeracy skills are still very low because the learning process has not yet been implemented to support students' numeracy abilities. Students' numeracy skills are only facilitated by solving problems such as fractions. Numerical ability has not been associated with students' problems in everyday life. This research is still limited to the use of media, and numeracy skills, and only chooses 3 research subjects from high school mathematics teachers in Kendari City, so there is still quite a lot of room for the selection of research subjects that can be explored by further researchers. The recommendation, according to the findings in this study, is that mathematics learning should be developed using gadget media and has been conceptualized according to the learning design stages so that it can become a learning medium that can facilitate all student characteristics.

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#### REFERENCES

- Ahmad, D. N., Setyowati, L., & Ati, A. P. (2021). Kemampuan Guru dalam Asesmen Kompetensi Minimum (AKM) untuk Mengetahui Kemampuan Literasi dan Numerasi Peserta Didik. *Prosiding Diskusi Panel Nasional Pendidikan MATEMATIKA*, 129–134.
- Amir, A. (2016). Penggunaan Media Gambar Dalam Pembelajaran Matematika. *Eksakta*, 2(1), 34–40.
- Anderha, R. R., & Maskar, S. (2021). Pengaruh Kemampuan Numerasi Dalam Menyelesaikan Masalah Matematika Terhadap Prestasi Belajar Mahasiswa Pendidikan Matematika. *Jurnal Ilmiah Matematika Realistik*, 2(1), 1–10.

<http://jim.teknokrat.ac.id/index.php/pendidikanmatematika/article/view/774>

- Angriani, A. D., Kusumayanti, A., & Nur, F. (2020). Pengembangan Media Pembelajaran MathSC Berbasis Android Menggunakan App Inventor 2 Pada Materi Barisan dan Deret Aritmatika. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, 4(2), 926–938. <https://doi.org/10.31004/cendekia.v4i2.322>
- Ariyani, I. E., Hibatullah T., N. L., Indrijati, Y., & Huda, M. (2021). Aplikasi Latihan Soal Bahasa Indonesia Berbasis E-Learning. *Jurnal Imiah Pendidikan Dan Pembelajaran*, 5(2), 184–191. <https://doi.org/10.23887/jipp.v5i2.24594>
- Cahayani, N. N., Witono, A. H., & Setiawan, H. (2022). Profil Kemampuan Numerasi Siswa Kelas III SDN 2 Kuta Tahun Pelajaran 2021/2022. *Jurnal Ilmiah Profesi Pendidikan*, 7(2b), 534–538. <https://doi.org/10.29303/jipp.v7i2b.546>
- Damayanti, P. A., & Qohar, A. (2019). Pengembangan Media Pembelajaran Matematika Interaktif Berbasis Powerpoint pada Materi Kerucut. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 10(2), 119–124. <https://doi.org/10.15294/kreano.v10i2.16814>
- Doni, F. R. (2017). Perilaku Penggunaan Smartphone Pada Kalangan Remaja. *Indonesian Journal on Software Engineering*, 9(2), 16–23.
- Ekowati, D. W., Astuti, Y. P., Utami, I. W. P., Mukhlisina, I., & Suwandayani, B. I. (2019). Literasi Numerasi di SD Muhammadiyah. *ELSE (Elementary School Education Journal) : Jurnal Pendidikan Dan Pembelajaran Sekolah Dasar*, 3(1), 93–103. <https://doi.org/10.30651/else.v3i1.2541>
- Hasibuan, E. K. (2018). Analisis Kesulitan Belajar Matematika Siswa Pada Pokok Bahasan Bangun Ruang Sisi Datar Di Smp Negeri 12 Bandung. *AXIOM : Jurnal Pendidikan Dan Matematika*, 7(1), 18–30. <https://doi.org/10.30821/axiom.v7i1.1766>
- Lakoy, F. A. (2022). Pengembangan Media Rotasi Dinamis untuk Membangun Kemampuan Literasi Numerasi pada Pembelajaran Transformasi. *Jurnal Didaktika Pendidikan Dasar*, 6(2), 381–396. <https://doi.org/10.26811/didaktika.v6i2.692>
- Mahmud, M. R., & Pratiwi, I. M. (2019). Literasi Numerasi Siswa Dalam Pemecahan Masalah Tidak Terstruktur. *KALAMATIKA Jurnal Pendidikan Matematika*, 4(1), 69–88. <https://doi.org/10.22236/kalamatika.vol4no1.2019pp69-88>
- Masykur, R., Nofrizal, N., & Syazali, M. (2017). Pengembangan Media Pembelajaran Matematika dengan Macromedia Flash. *Al-Jabar : Jurnal Pendidikan Matematika*, 8(2), 177–186. <https://doi.org/10.24042/ajpm.v8i2.2014>
- Misu, L., Budayasa, I. K., Lukito, A., Hasnawati, & Rahim, U. (2019). Profile of Metacognition of Mathematics Education Students in Understanding the Concept of Integral in Category Classifying and Summarizing. *International Journal of Instruction*, 12(3), 481–496. <https://doi.org/10.29333/iji.2019.12329a>
- Noerbella, D. (2022). Implementasi Program Kampus Mengajar Angkatan 2 Dalam Meningkatkan Kompetensi Literasi Dan Numerasi Peserta Didik. *Jurnal Cakrawala Pendas*, 8(2), 480–489. <https://doi.org/10.31949/jcp.v8i2.2087>
- OECD. (2019). PISA 2018 Results (Volume II): Where All Students Can Succeed. In *OECD Publishing: Vol. II*. [https://www.oecd.org/pisa/publications/PISA2018\\_CN\\_IDN.pdf](https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf)
- Pangesti, F. T. P. (2018). Menumbuhkembangkan Literasi Numerasi Pada Pembelajaran Matematika Dengan Soal Hots. *Indonesian Digital Journal of Mathematics and Education*, 5(9), 566–575. <http://idealmathedu.p4tkmatematika.org>
- Perdana, R., & Suswandari, M. (2021). Literasi Numerasi Dalam Pembelajaran Tematik Siswa Kelas Atas

- Sekolah Dasar. *Absis: Mathematics Education Journal*, 3(1), 9–15. <https://doi.org/10.32585/absis.v3i1.1385>
- Puspaningtyas, N. D., & Ulfa, M. (2020). Pelatihan Soal Matematika Berbasis Literasi Numerasi pada Siswa SMA IT Fitrah Insani. *J. Pengabdian Masyarakat MIPA Dan Pendidikan MIPA*, 4(1), 113–121.
- Saputra, H. N., & Salim, S. (2020). Potret Sikap Mahasiswa dalam Penggunaan Literasi Digital. *Jurnal Komunikasi Pendidikan*, 4(2), 94–101. <https://doi.org/10.32585/jkp.v4i2.667>
- Siregar, P. (2022). Pelaksanaan Pembelajaran Literasi Numerasi Pada Siswa Kelas 5b SD Negeri 101880 Aek Godang Padang Lawas Utara. *Al-Madrasah: Jurnal Pendidikan Madrasah Ibtidaiyah*, 6(2), 366–376. <https://doi.org/10.35931/am.v6i2.944>
- Sumarsih, S., & Mukminan, M. (2016). Pengembangan Multimedia Akuntansi Biaya Metode Harga Pokok Pesanan Bagi Mahasiswa Jurusan Pendidikan Akuntansi Uny. *Jurnal Inovasi Teknologi Pendidikan*, 3(1), 92–105. <https://doi.org/10.21831/tp.v3i1.8266>
- Sutama, Narimo, S., Anif, S., Prayitno, H. J., Sari, D. P., & Adnan, M. (2020). The development of student worksheets: Questions of PISA model to analyze the ability of mathematical literacy in junior high school. *Journal of Physics: Conference Series*, 1538(1), 1–10. <https://doi.org/10.1088/1742-6596/1538/1/012065>
- Waskitoningtyas, R. S. (2016). Analisis Kesulitan Belajar Matematika Siswa Kelas V Sekolah Dasar Kota Balikpapan Pada Materi Satuan Waktu Tahun Ajaran 2015/2016. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, 5(1), 24–32. <https://doi.org/10.25273/jipm.v5i1.852>
- Westwood, P. S. (2021). *Teaching for Numeracy Across the Age Range*. Singapore: Springer. [https://doi.org/10.1007/978-981-16-3761-2\\_6](https://doi.org/10.1007/978-981-16-3761-2_6).