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Eighth Grade Students' Geometric Writing Ability Based on Van Hiele's Theory in the Geogebra-Assisted PBL Model

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ABSTRACT

Geometric writing ability is part of written mathematical communication abilities that focus on representing mathematical ideas in written form. Research observations show that this ability is still relatively low among eighth-grade students. The Geogebra-assisted Problem-Based Learning model is considered effective in encouraging active student engagement. Van Hiele's theory was chosen to classify students' geometric thinking stages. The purpose of this study was to describe the geometric writing ability of eighth-grade students based on Van Hiele's theory through the application of the Geogebra-assisted Problem-Based Learning model. The method used in this study was descriptive qualitative. The population in this study were eighth-grade students of SMP Negeri 32 Purworejo in the 2024/2025 academic year, with a purposive sampling technique. The instruments used included the Van Hiele geometry level test questions and interview guidelines. Data analysis was done by reducing the data, presenting the data, and drawing conclusions/verification. The results of this study are (1) the Van Hiele geometry level test results show that most students are at stage 2 (informal deduction), and (2) there are differences in students' geometric writing abilities based on groups, with the upper group able to achieve three of the four indicators, the middle group able to achieve two of the four indicators, and the lower group only able to achieve one of the four indicators. Based on these results, it is found that Van Hiele's theory, the PBL model, and Geogebra can help develop students' geometric writing ability.

Keywords: *Geogebra; Geometric Writing Ability; Problem Based Learning; Van Hiele Theory.*

ABSTRAK

Kemampuan menulis geometris merupakan bagian dari kemampuan komunikasi matematis tulis yang memfokuskan aspek representasi ide matematis ke dalam bentuk tulisan. Hasil observasi penelitian menunjukkan bahwa kemampuan ini masih tergolong rendah pada siswa kelas VIII. Model *Problem Based Learning* berbantuan *Geogebra* dinilai efektif untuk mendorong keterlibatan aktif siswa. Teori Van Hiele dipilih untuk mengklasifikasikan tahap berpikir geometris siswa. Tujuan dari penelitian ini adalah untuk mendeskripsikan kemampuan menulis geometris siswa kelas VIII berdasarkan teori Van Hiele melalui penerapan model *Problem Based Learning* berbantuan *Geogebra*. Metode yang digunakan pada penelitian ini adalah kualitatif deskriptif. Populasi dalam penelitian ini adalah siswa kelas VIII G SMP Negeri 32 Purworejo tahun ajaran 2024/2025, dengan teknik pengambilan sampel menggunakan *purposive sampling*. Instrumen yang digunakan diantaranya soal tes tingkatan geometri Van Hiele dan pedoman wawancara. Analisis data dilakukan dengan mereduksi data, penyajian data, serta penarikan kesimpulan/verifikasi. Hasil penelitian ini adalah (1) hasil tes tingkatan geometri Van Hiele menunjukkan bahwa sebagian besar siswa berada pada tahap 2 (deduksi informal), dan (2) terdapat perbedaan kemampuan menulis geometris siswa berdasarkan kelompok, kelompok atas mampu mencapai tiga dari empat indikator, kelompok menengah mampu mencapai dua dari empat indikator, dan kelompok bawah hanya mampu mencapai satu dari empat indikator. Berdasarkan hasil tersebut, diketahui bahwa teori Van Hiele, model PBL, dan *Geogebra* dapat membantu mengembangkan kemampuan menulis geometris siswa.

Keywords: *Geogebra; Kemampuan Menulis Geometris; Problem Based Learning; Teori Van Hiele.*

INTRODUCTION

The development of information technology today has had a major impact on various aspects of life, one of which is education. Through the internet, we can easily obtain information quickly from all over the world, allowing us to find out what is happening in other parts of the world, communicate with people far away, and easily search for various information. This means that everyone is required to constantly adapt to technological advances so as not to be left behind. According to Pranasiwi et al. (2015), due to the demands of the times, children are required to understand technology from an early age and use it wisely. According to Rhilmanidar et al. (2020), the use of computer media in mathematics learning can enhance the effectiveness and depth of concepts learned by students. Liana & Leonard (2016) also state that computer media can increase students' motivation and interest in learning and align with the times. Learning media used are not limited to books but can also include technology-based media such as computers or laptops. Education is considered effective if it makes the learning process easier for students, the learning is enjoyable, and the goals are achieved in accordance with the expectations that have been set (Shidqiya & Suyitno, 2022). Thus, teachers are required to innovate in teaching through the use of technology, one of which is the Geogebra application.

Mathematics is a universal science that underpins the development of modern technology. This is because mathematics plays an important role in various fields and enhances human thinking abilities. In Permendiknas No. 22 of 2006, it is stated that mathematics learning aims to develop logical, analytical, systematic, and creative thinking abilities. The same regulation also states that one of the objectives of mathematics education is for students to develop problem-solving skills, including the ability to understand a problem, design a mathematical model, solve the mathematical model, and interpret the obtained solution. One branch of mathematics, geometry, plays a crucial role in developing visualization skills, spatial reasoning, and problem-solving abilities. According to Usiskin (in Ma'rifah et al., 2019), geometry is a branch of mathematics that analyzes visual patterns and connects mathematics with the real world. Rohimah & Nursuprianah (2016) add that geometry studies points, lines, planes, and spatial objects along with their properties and relationships. According to Bernard & Setiawan (2020), by studying geometry, students will gain an understanding of geometric shapes and structures and analyze their characteristics and relationships. Geometry enables students to develop geometric writing skills, critical thinking skills, and problem-solving skills.

However, in practice, many students still have difficulty understanding and writing down the process of solving geometry problems. Based on observations and interviews with eighth-grade mathematics teachers at SMP Negeri 32 Purworejo, it was found that students' geometric writing skills were uneven. Active students have a higher level of curiosity than passive students. If there is something they do not understand, active students will ask the teacher. Meanwhile, passive students tend to be less enthusiastic and more dependent on others.

According to Junaedi (2010), writing is an important form of communication that should be developed in mathematics learning. Through writing activities, the learning process of students can be seen clearly. Students' ideas or thoughts can be documented from their written work, which can later be used as a tool for evaluating learning. Riyadi et al. (2021) emphasize that mathematical writing skills are closely related to a deep understanding of concepts. Therefore, developing geometric writing skills is important in learning, as writing is a reflection of thinking skills. Hoffer (in Susanto & Mahmudi, 2021) suggests there are five basic skills in learning geometry, namely: visual skills, verbal skills (descriptive skills), drawing skills, logical skills, and applied skills.

This problem is closely related to students' level of geometric thinking, which can be analyzed using Van Hiele's theory. This theory divides the levels of geometric thinking into five levels: visualization, analysis, informal deduction, deduction, and rigor (Kennedy et al., 2008). Mulyadi & Muhtadi (2019) concluded that ineffective learning that is not in line with the level of geometric thinking causes low levels of geometric thinking in students. Muhassanah et al. (2014) argue that understanding the level of geometric thinking of students can help teachers in choosing effective geometry learning methods. By applying Van Hiele's theory, this study seeks to describe students' geometric writing ability through a better understansing of geometric concepts at various levels of geometric thinking.

One approach considered appropriate is Problem-Based Learning (PBL). This model uses contextual problems as triggers for learning, encouraging students to think critically, discuss, and seek solutions together. Nafiah & Suyanto (2014) state that Problem-Based Learning (PBL) is a model that uses contextual problems as a backdrop for students to hone their critical thinking and problem-solving skills, as well as to understand important knowledge and concepts from the subject matter. In the context of geometry, PBL encourages students to connect geometric concepts with real life and write them down logically.

On the other hand, Geogebra is software that combines geometry, algebra, and calculus in one interactive visual platform (Hohenwarter et al., 2008). According to Budiman & Rosmiati (2020), Geogebra enables simple visualization of geometric concepts, and students who learn using the Geogebra application experience an increase in Van Hiele's theoretical thinking skills compared to students who learn through exposition. Hermawan et al. (2022) also found that students are more enthusiastic about learning geometry when assisted by Geogebra. Based on the interview results, geometry learning at SMP Negeri 32 Purworejo has not utilized Geogebra and only relies on simple teaching aids. Additionally, the initial test results indicate that many students do not yet understand units of area and volume accurately and are unable to formulate solutions logically and systematically.

Previous studies have mostly examined students' geometry learning using Van Hiele's levels, the effectiveness of Problem-Based Learning, or the use of Geogebra separately. However, research that integrates Van Hiele's theory, the Problem-Based Learning model, and Geogebra to specifically analyze students' geometric writing ability is still limited. This research highlights the need to investigate how these three elements can be combined to provide a description of students' geometric writing ability. Therefore, this study combines the Problem-Based Learning model with Geogebra and analyzes students' geometric writing ability based on Van Hiele's theory. The purpose of this study is to describe the geometric writing ability of eighth-grade students based on Van Hiele's theory through the implementation of Geogebra-assisted Problem-Based Learning.

RESEARCH METHODS

This research uses a descriptive qualitative approach. According to Murdiyanto (2020) qualitative research is a research method that produces findings that cannot be obtained by statistical procedures or other quantitative approaches. The qualitative approach describes a different approach in conducting scientific research than the quantitative approach method where the qualitative approach relies on data in the form of text and images that have different steps in data analysis (Creswell, 2009). The qualitative approach in this study aimed at providing an in-depth description of the geometric writing ability of VIII G grade students at SMP Negeri 32 Purworejo based on Van Hiele's theory, in the context of the Problem Based Learning (PBL) learning model assisted by Geogebra. Sugiyono (2022) revealed that the qualitative approach aims to provide a deeper understanding of social situations, identify patterns, develop hypotheses, and build theories. The research was held at SMP Negeri 32 Purworejo in the even semester of the 2024/2025 school year.

The research subjects consisted of all 32 students of class VIII G, selected using purposive sampling, namely choosing the class that best matched the research needs. Students were then grouped into three categories based on the test results: upper group, middle group, and lower group. This grouping aims to describe the variation in their geometric writing ability.

The research data sources consisted of: (1) primary data, in the form of geometric writing test results and in-depth interviews with research subjects; (2) secondary data, obtained from literature, journals, and articles that have relevance to this research.

Data collection was done through several techniques: (1) Van Hiele's geometry level test, which consists of five contextual questions developed based on indicators of geometric writing ability; (2) interviews, to reinforce the analysis of test results, identify students' geometric thinking characteristics, and explore difficulties in using Geogebra; (3) documentation.

Indicators of geometric writing ability in this study consist of four important aspects: (1) writing mathematical ideas, (2) writing reasons; (3) rearranging ideas, (4) evaluation of other ideas (Riyadi et al., 2021).

The data analysis technique used according to Milles & Huberman (1984) is done interactively through the process of data reduction, data display, and verification (Sugiyono, 2022), namely: (1) data reduction, (2) data display, and (3) drawing conclusions and verification. The validity of the data was tested using the triangulation technique, by comparing the result of tests, interviews, and documentation to ensure data consistency. With this method, the research is expected to provide a complete in-depth picture of students' geometric writing ability in PBL learning and GeoGebra, which is systematically analyzed based on Van Hiele's theory of geometric thinking.

RESULTS AND DISCUSSION

1.1 Results

In this analysis, students are grouped based on their ability in geometric writing. After the Van Hiele geometry level test, students were classified into three groups based on their answer scores, including the upper group totaling 8 students, the middle group totaling 17 students, and the lower group totaling 7 students. Based on the results of the Van Hiele geometry level test, it was found that the upper and middle group students were only able to reach stage 2 (informal deduction). Although upper group students can work on problems at stage 3 and stage 4, students have not been able to compose arguments logically. Meanwhile, lower group students have not even reached stage 0 (visualization) so that researchers include them in the Pre 0 group as done in the research of Ma'rifah, et al. (2019). These results are in line with research conducted by Muhassanah, et al. (2014), namely the Van Hiele's levels that can be achieved by junior high school students are level 0 (visualization) to level 2 (informal deduction).

1.1.1 Level 0 (Visualization)

Based on the answers of the upper group students, all upper group students have shown a very good visual understanding of the triangular prism. Students are able to identify the shapes of the shapes that make up the triangular prism and explain the roles of these shapes. Based on the answers of the middle group students, some of the answers of the middle group students have shown very good visual understanding of the triangular prism. Students are able to identify the shapes of the shapes that make up the triangular prism and explain the role of the shapes. Even so, there are still some students who have not been able to explain the role of the shapes. Based on the answers of the lower group students, some of the lower group students' answers have shown a good visual understanding of the triangular prism. Students are able to identify the shapes of the figures that make up the triangular prism and explain the role of these figures.

1.1.2 Level 1 (Analysis)

Based on the answers of the upper group students, all upper group students have shown a very good analytical understanding of the rectangular pyramid. Students were able to identify the shape of the base of the rectangular pyramid and describe the base of the building. The answers of the middle group students shows that they have reflected a good analytical understanding of the rectangular pyramid. Middle group students are able to identify and describe the shape of the base of a rectangular pyramid. Based on the answers of the lower group students, some students have shown a good analytical understanding of the rectangular pyramid. However, there are still students who have not been able to analyze the characteristics of the shape of the base.

1.1.3 Level 2 (Informal Deduction)

Based on the work of the upper group students, the answers of the upper group students have shown a good understanding of informal deduction. Students are able to connect the nets with the formula for the surface area of a rectangular pyramid. Based on the work of the middle group students, not all students from the middle group showed a good understanding of informal deduction. There were some students who answered incorrectly. These students have not been able to connect the net with the formula for the surface area of a rectangular pyramid, even the formula for the surface area of a rectangular pyramid that is written is wrong. However, there are also some students who have been able to connect the net with the formula for the surface area of a rectangular pyramid. Based on the work of the lower group students, only a few students showed a good understanding of informal deduction. Other students have not shown this understanding. Some students were even still wrong in writing the formula for the surface area of a rectangular pyramid. However, there are also some students who have been able to connect the nets with the formula for the surface area of a rectangular pyramid.

1.1.4 Level 3 (Deduction)

Based on the work of the upper group students, the answers of the upper group students have shown a good understanding of formal deduction. Students are able to solve contextual problems regarding the surface area of triangular prisms. However, some upper group students are still not correct when doing calculations. Based on the work of the middle group students, the answers of some middle group students have shown good understanding of formal deduction. Students were able to solve contextual problems regarding the surface area of triangular prisms. However, some middle group students are still not correct when doing calculations. Based on the work of lower group students, the answers of lower group students have not shown good understanding of formal deduction. Students have not been able to solve contextual problems regarding the surface area of triangular prisms. All students' answers show that they have not been correct when doing calculations.

1.1.5 Level 4 (Rigor)

Based on the work of the upper group students, the answers of the upper group students have shown good rigor understanding. Students are able to solve contextual problems regarding the comparison of two three-dimensional shapes. However, some of the upper group students were still incorrect when doing calculations. Based on the work of the middle group students, the answers of some middle group students have shown good rigorous understanding. Students were able to solve contextual problems regarding the comparison of two three-dimensional shapes. However, some middle group students were still not correct when doing calculations. Based on the work of the lower group students, the answers of the lower group students did not show good rigorous understanding. Students have not been able to solve contextual problems regarding the comparison of two three-dimensional shapes. All students' answers show that they have not been correct when doing calculations.

1.2 Discussion

The tables below show student's achievement on geometric writing ability indicators based on their group. Geometric writing ability indicators consist of four important aspects: (1) writing mathematical ideas, (2) writing reasons; (3) rearranging ideas, (4) evaluation of other ideas (Riyadi et al., 2021).

The following are the results of the analysis of the geometric writing ability of upper group students.

Subject Code	Geometric Writing Ability Indicator			
	1	2	3	4
S-5	✓	✓	✓	×
S-13	✓	×	✓	×
S-14	✓	×	✓	×
S-15	✓	✓	✓	×
S-17	✓	✓	✓	×
S-23	✓	✓	✓	×
S-30	✓	✓	✓	×
S-31	✓	✓	✓	×

Table 1.1 Geometric Writing Ability of Upper Group

From the table above, the upper group students show that they have not fully met the indicators of geometric writing ability. All upper group students have not yet reached the evaluation indicator of other ideas. S-13 and S-14 do not fulfill the second indicator. They were only able to reach 2 out of 4 indicators. This is in accordance with what Ma'rifah, et al. (2020) that geometric writing ability in the upper group showed good mastery of written mathematical communication and was able to solve geometry problems appropriately. Indicators of geometric writing ability have generally been fulfilled, but there is still one indicator that has not been accomplished.

The following are the results of the analysis of the geometric writing ability of middle group students.

Subject Code	Geometric Writing Ability Indicator			
	1	2	3	4
S-1	×	×	✓	×
S-2	×	✓	✓	×
S-3	✓	×	✓	×
S-4	×	×	×	×
S-6	×	✓	✓	×
S-8	✓	×	✓	×
S-9	✓	×	✓	×
S-10	×	✓	×	×
S-11	×	×	✓	×
S-18	✓	✓	×	×
S-19	✓	✓	×	×
S-22	✓	✓	×	×
S-24	✓	✓	×	×
S-25	✓	✓	×	×
S-27	✓	×	✓	×
S-28	✓	×	✓	×
S-29	✓	✓	×	×

Table 1.2 Geometric Writing Ability of Middle Group

From the table above, intermediate group students show that they have not fully met the indicators of geometric writing ability. S-4 did not fulfill any of the indicators. S-1, S-10, and S-11 only able to reach 2 out of 4 indicators. This is in accordance with what Ma'rifah, et al. (2020) that the geometric writing ability in the middle group shows sufficient mastery of written mathematical communication, but has not been able to present the solution steps systematically. This happens because of the lack of ability of middle students in solving geometry problems.

The following are the results of the analysis of the geometric writing ability of the lower group student subjects.

Subject Code	Geometric Writing Ability Indicator			
	1	2	3	4
S-7	×	×	✓	×
S-12	×	×	×	×
S-16	✓	×	×	×
S-20	×	×	×	×
S-21	×	×	×	×
S-26	×	×	×	×
S-32	×	×	×	×

Table 1.3 Geometric Writing Ability of Lower Group

From the table above, the lower group students show that they have not met the indicators of geometric writing ability well. Only S-7 and S-16 were able to achieve one indicator, while the others in lower group were unable to reach any of the four indicators. This is in accordance with what Ma'rifah, et al. (2020) that the geometric writing ability of the lower group showed poor mastery of written mathematical communication. Students have difficulty in communicating mathematical ideas in writing. Students have not been able to present the solution appropriately due to the lack of student understanding in mastering the material.

CONCLUSION

Based on the results of research that has been done at SMP Negeri 32 Purworejo regarding students' geometric writing ability based on Van Hiele's theory on Problem Based Learning model assisted by Geogebra obtained the results that the geometric writing ability of class VIII students according to Van Hiele's geometry level has varying results. Based on the results of the Van Hiele geometry level test and interview results, most students are at stage 2 (informal deduction). This indicates that problem-based learning with the help of technology can improve the development of students' geometric thinking. At level 0 (visualization), students are able to recognize and name shapes based on their visual appearance. At level 1 (analysis), students are able to describe the properties of three-dimensional shapes and their two-dimensional components. At level 2 (informal deduction), students are able to connect the properties of three-dimensional shapes to solve the problem, although not fully using deductive arguments. Indicators of geometric writing ability include (1) writing mathematical ideas, (2) writing reasons, (3) rearranging ideas, and (4) evaluating other ideas. Students in the upper group achieved three of the four indicators. Students in the middle group only achieved two of the four indicators. While students in the lower group were only able to achieve one of the four indicators. Based on these results, it is found that Van Hiele's theory, the PBL model, and Geogebra can help develop students' geometric writing ability.

SUGGESTION

Based on the conclusions above, the researchers gave the following suggestions.

1) The development of Geogebra-assisted Problem Based Learning model in three-dimensional shapes material is needed.
2) In addition, adequate infrastructure is needed in the use of technology in learning, such as devices, laptops, computers, and internet access.
3) It is hoped that students will be more active in participating in learning in using Geogebra as a learning tool to help in understanding geometry concepts.

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BIBLIOGRAPHY

Bernard, M., & Setiawan, W. (2020, April). Development of geometry analysis using geogebra scripting in terms of student cognitive capabilities. In *Journal of Physics: Conference Series* (Vol. 1521, No. 3, p. 032103). IOP Publishing.

Budiman, H., & Rosmiati, M. (2020). Penerapan teori belajar Van Hiele berbantuan geogebra untuk meningkatkan kemampuan penalaran matematis siswa. *Prisma*, *9*(1), 47-56.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Hermawan, R. M., Yuspriyati, D. N., & Purwasih, R. (2022). Analisis Minat Belajar Siswa SMP Kelas VIII pada Materi Pokok Bangun Ruang Sisi Datar Berbantuan Aplikasi Geogebra. *Prisma*, *11*(1), 203-209.

Hohenwarter, M., Hohenwarter, J., Kreis, Y., & Lavicza, Z. (2008). *Teaching and learning calculus with free dynamic mathematics software GeoGebra*.

Junaedi, I. (2010). Pembelajaran matematika dengan strategi Writing in Performance Tasks (WiPT) untuk meningkatkan kemampuan menulis matematis. *Jurnal Kreano*, *1*(11).

Kennedy, L. M., Tipps, S., & Jhonson, A. (2008). *Guiding children's learning of mathematics* (11th ed.). Thomson Higher Educations.

Liana, D., & Leonard, L. (2017). Pengembangan Media Belajar Berbasis Komputer dalam Pembelajaran Matematika.

Ma'rifah, C., Sa'dijah, C., Subanji, S., & Nusantara, T. (2020). Profil kemampuan komunikasi matematis peserta didik dalam pemecahan masalah soal cerita. *Edu Sains: Jurnal Pendidikan Sains dan Matematika*, *8*(2), 43-56.

Ma'rifah, N., Junaedi, I., & Mulyono, M. (2019). Tingkat Kemampuan Berpikir Geometri Siswa Kelas VIII. In *Prosiding Seminar Nasional Pascasarjana (PROSNAMPAS)* (Vol. 2, No. 1, pp. 251-254).

Muhassanah, N., Sujadi, I., & Riyadi, R. (2014). Analisis keterampilan geometri siswa dalam memecahkan masalah geometri berdasarkan tingkat berpikir Van Hiele. *Jurnal Pembelajaran Matematika*, *2*(1).

Mulyadi, I., & Muhtadi, D. (2019). Proses berpikir siswa dalam menyelesaikan masalah geometri berdasarkan Teori Van Hiele ditinjau dari gender. *JP3M (Jurnal Penelitian Pendidikan dan Pengajaran Matematika)*, *5*(1), 1-8.

Murdiyanto, E. (2020). Penelitian Kualitatif (Teori dan Aplikasi disertai contoh proposal).

Nafiah, Y. N., & Suyanto, W. (2014). Penerapan Model Problem-Based Learning untuk Meningkatkan Keterampilan Berpikir Kritis Dan Hasil Belajar Siswa. *Jurnal Pendidikan Vokasi, 4*(1), 125-143.

Pranasiwi, O., & Iqbal, M. (2015). Pengembangan Aplikasi Kunci Determinasi Berbasis Android.
Rhilmanidar, R., Ramli, M., & Ansari, B. I. (2020). Efektivitas modul pembelajaran berbantuan software geogebra pada materi bangun ruang sisi datar. *Jurnal Didaktik Matematika*, *7*(2), 142-155.
Riyadi, S., Noviarti, K., & Abidin, Z. (2021). Kemampuan Komunikasi Matematis Tulis Siswa Samin dalam Memecahkan Masalah Geometri. *Ethnomathematics Journal, 2*(1), 31-37.
Rohimah, I., & Nursuprianah, I. (2016). Pengaruh Pemahaman Konsep Geometri Terhadap Kemampuan Siswa dalam Menyelesaikan Soal-Soal Bidang Datar (Studi Kasus Kelas VII di SMP Negeri 1 Cidahu Kabupaten Kuningan). *Eduma : Mathematics Education Learning and Teaching*, *5*(1). https://doi.org/10.24235/eduma.v5i1.680
Shidqiya, A. I., & Suyitno, A. (2022, February). Meta Analisis Kemampuan Berpikir Geometri Berbasis Van Hiele Ditinjau dari Self Efficacy. In *PRISMA, Prosiding Seminar Nasional Matematika* (Vol. 5, pp. 475-482).
Sugiyono. (2022). Metode Penelitian Kuantitatif. Bandung: ALFABETA.
Susanto, S., & Mahmudi, A. (2021). Tahap berpikir geometri siswa SMP berdasarkan teori Van Hiele ditinjau dari keterampilan geometri. *Jurnal Riset Pendidikan Matematika, 8*(1), 106–116. https://doi.org/10.21831/jrpm.v8i1.17044

Short Biography of the Authors

Anya Rizkya Ramadhani was born in Bandar Lampung on November 13, 2002. She just completed her studies in mathematics education at Universitas Negeri Semarang (UNNES) in August 2025. During her education, she actively participated in academic activities that supported her development as a prospective educator. She is interested in the development of innovative mathematics learning. Her thesis research focused on geometric writing ability. He has teaching experience as a participant in the 7th Kampus Mengajar Program at SDN Pageron with the aim of improving literacy and numeracy.

Dr. Iwan Junaedi, M.Pd. is a lecturer in the Mathematics Education Study Program at Universitas Negeri Semarang (UNNES). He also serves as Director of School Principals, School Supervisors, and Educators at the Ministry of Primary and Secondary Education of the Republic of Indonesia (Kemendikdasmen RI). He is actively developing learning innovations and educational quality in the field of mathematics education. In addition to being a lecturer, he is also an active speaker at seminars, training sessions, and conducts research by writing scientific articles. With his extensive academic and practical experience, he is committed to improving the quality of education through the integration of theory and practice in schools and universities.