

## DEVELOPMENT OF CONTEXTUAL-BASED MODULES ON LINES AND ANGLES FOR SEVENTH GRADE STUDENTS AT SMP NEGERI 1 ULUSUSUA

**Yunuli Laia**

Guru SMP Negeri 2 Susua

([yunulilaia@gmail.com](mailto:yunulilaia@gmail.com))

### **Abstract**

This research aims to develop a module focused on lines and angles to enhance students' contextual skills. The study employs a Research and Development (R&D) approach using the 4D model (define, design, development, disseminate), with data collected through validation, questionnaires, and tests, analyzed both qualitatively and quantitatively. Based on the findings, the lines and angles module is proven to be valid, practical, and effective. Subject matter experts rated it as valid (75%), media experts also rated it valid (74.07%), and language experts rated it as very valid (75%). In limited class trials, practicality was rated very high (average 4.57), and similarly high in field trials (average 4.43). Effectiveness in improving learning outcomes was moderately good in limited class trials (average 0.65) and field trials (average 0.68). The developed module is intended to support independent learning among students and assist teachers in effectively teaching mathematics.

**Keywords:** *Module; Lines and Angles; Contextual.*

### **Abstract**

Mathematics is often difficult for students, especially due to their lack of interest and ability to solve problems, making the subject less enjoyable and hindering their learning activities. This research aims to create a module that focuses on lines and angles to improve students' contextual skills. This research uses a Research and Development (R&D) approach using a 4D model (define, design, development, disseminate), with data collection through validation, questionnaires and tests, and analyzed qualitatively and quantitatively. Based on the findings obtained, the line and angle module is proven to be valid, practical and effective. Material experts rated it as valid (75%), media experts also rated it as valid (74.07%), and language experts rated it as very valid (75%). In limited class trials, practicality was very high (average 4.57), as was practicality in field trials (average 4.43). Effectiveness in improving learning outcomes is classified as moderate in both limited class trials (average 0.65) and field trials (average 0.68). The module developed is intended to support independent learning among students and assist teachers in teaching mathematics effectively.

**Keywords:** *Module; Lines and Angles; Contextual.*

## A. Introduction

Education is a process of transforming the attitudes and behaviors of individuals or groups to mature humans through teaching and training. It can also be seen as an effort to develop self-capacity. According to Wikipedia, education is the learning of knowledge, skills, and habits of a group of people passed down from one generation to the next through teaching, research, and training. Education is a crucial aspect of enhancing and developing a nation's resources. It can be acquired through learning and experiences obtained anywhere and at any time. Therefore, education represents an effort of self-development through learning and experiences.

Essentially, education is vital in all aspects of human life, and high-quality education is needed to keep pace with the times. The quality of education heavily relies on educators, who serve as the source of knowledge. The curriculum is also a significant means of improving educational quality by reforming it to align with contemporary developments. Enhancing educational quality through curriculum improvement is closely tied to formal learning. Formal learning aims to improve students' abilities and skills while uncovering their potential for further development. Learning occurs extensively at all levels of education, including mathematics, a subject intimately related to daily human activities.

Mathematics is one discipline frequently encountered in daily life. Ismail et al. (in Hamzah, 2014: 48) define mathematics as a field related to numbers, calculations, and numerical problems regarding quantities, exploring relationships among patterns, shapes, and structures, while also serving as a reasoning method encompassing systems, structures, and tools. Mathematics often poses significant challenges for students, primarily due to their lack of interest and skill in solving mathematical problems effectively. This lack of engagement can make learning mathematics unenjoyable and hinder students' ability to participate in learning activities. Students' difficulties arise from challenges in understanding, analyzing, and applying the explanations provided by teachers during the learning process, which in turn diminishes their overall learning capacity.

To enhance the quality of mathematics education, educators employ various approaches, one of which is contextual learning. According to Johnson (2002:67), contextual learning is an educational strategy that helps students understand the relevance of academic content by connecting it to their daily experiences. Through contextual learning, students can demonstrate their understanding of the lesson content by explaining it in their own words, even if their sentence structures differ, as long as the meaning remains consistent.

This research is motivated by preliminary studies indicating a lack of development of modules on lines and angles, which hinders students' understanding of concepts related to these topics. This presents an opportunity for researchers to contribute to the field of education, particularly in developing a learning module for lines and angles.

Lines and angles are mathematical concepts frequently encountered in everyday life, almost always present in our surroundings. Connecting these concepts to real-life situations, such as room angles or lines on flat surfaces, has the potential to spark students' interest in learning them. However, the reality often falls short of this expectation, as students generally exhibit limited enthusiasm for studying lines and angles. Many educational books provide various contextual problems as examples, yet students continue to face challenges in learning mathematics, particularly on the topic of lines and angles.

Based on observations conducted on April 21, 2022, and interviews with teachers, the researcher gathered information about the current state of mathematics education. The learning approach tends to be teacher-centered, with most teaching methods being conventional lectures. Teachers typically begin by explaining the material and then demonstrating problem-solving techniques to students, often resulting in students being disengaged in the learning process.

Additionally, there is a lack of connection between the learning materials and real-life situations. This negatively impacts the learning process, leading to difficulties for students in understanding the material taught.

Furthermore, instructional materials rely solely on student workbooks aligned with the 2013 Curriculum Revision of 2017 provided by the school. As a result, both teachers and students depend heavily on these workbooks for instruction without utilizing additional resources. However, students require supplementary materials to enhance their learning processes.

Based on a student questionnaire administered on April 21, 2022, students expressed that the textbook content hindered their understanding and contributed to low academic performance in mathematics due to a lack of interest in the subject. The presentation of the text was not engaging enough to capture students' attention, and some students faced difficulties in language comprehension, especially those who were not fluent in Indonesian. In this regard, the development of a module is crucial, as modules are systematically structured to align with students' characteristics, including academic ability, teamwork skills, learning motivation, and attitudes.

Students' learning difficulties and lack of motivation impact their academic performance, which can be influenced by both school learning experiences and

personal efforts. In mathematics education, teachers are encouraged to innovate their teaching methods to improve student outcomes. Effective learning requires not only appropriate instructional materials but also engaging approaches that capture students' interest. Contextual approaches, such as using real-life contexts in teaching, are beneficial because they help educators convey learning material effectively. Therefore, using modules based on real-life contexts is a promising solution to address students' difficulties in understanding the material, as it encourages greater engagement and effectiveness in achieving learning goals.

Modules are educational tools designed to facilitate students' understanding of specific topics through systematic preparation and operational guidelines. These guides are intended for student use and include instructions for teachers, aiming to enhance focus and organization in learning activities. According to Daryanto and Dwicahyono (2014: 186), modules promote planned, independent, and comprehensive learning with clear outcomes. In mathematics education, the use of modules fosters independent learning and encourages students to enhance their critical thinking skills, empowering them to take a more active role in the learning process. Thus, the researcher aims to develop a mathematics

learning module as an accessible alternative teaching resource.

A contextual-based module is expected to benefit students by enhancing their interest and independence in learning, as well as improving their understanding of mathematics education. Students can assess their own learning outcomes through module-based learning that accommodates individual learning paces. This approach ensures that module-based learning is more effective, efficient, and applicable to students' needs.

Based on the points discussed above, the researcher is motivated to conduct research titled "Development of Contextual-Based Modules on Lines and Angles for Seventh Grade Students at SMP Negeri 1 Ulususua, Ulususua District."

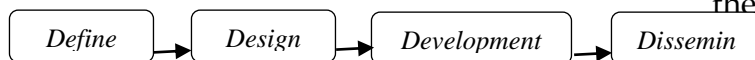
## **B. Research Methodology**

The type of research used in this study is Research and Development (R&D). This research aims to produce a specific product and test its effectiveness. According to Borg & Gall in Setyaosari (2013:276), development research is a process or effort to develop a product and validate that product. The intended product includes materials, media, tools, or learning strategies used to help resolve issues encountered in the learning process. The product developed in this research is teaching material in the form of a contextual-based module on lines and angles.

The model used in this study is the 4-D development model, which consists of four stages: Define, Design, Develop, and Disseminate. The development procedures will follow the framework provided by this model.

The development procedures to be undertaken are as follows:

**Figure 1. 4-D Development Procedure**



*Sourche: Sugiyono (2016)*

The activities at this stage are conducted to fulfill the requirements for development, which include learning objectives and instructional materials. In other models, this stage is often referred to as needs analysis. This stage consists of five activities:

1. **Material Analysis:** In this phase, the researcher reviews the content that will be used to create the mathematics learning module. This material analysis enables the researcher to produce content suitable for classroom use when developing a product.
2. **Student Skills Analysis:** This involves assessing students' abilities to solve problems related to the material that will be developed into a module.
3. **Objective Analysis:** This is crucial for establishing the objectives of the teaching materials in the form of a module. This phase allows the researcher to define the goals of the module development

project, specifically aimed at enhancing students' problem-solving skills as instructed by the teacher.

4. **Product Specifications:** At this stage, the detailed characteristics of the intended module product are outlined to ensure clarity and precision in the development process.

This systematic approach ensures that the developed module is effective and meets educational needs of the students.

### C. Research Results and Discussion

The research development process resulted in the creation of instructional materials in the form of a module focused on lines and angles, aimed at enhancing problem-solving skills. Following the 4D model (Define, Design, Develop, and Disseminate), these modules were validated by a team of experts and tested on seventh-grade students at SMP Negeri 1 Ulususua. The mathematics learning module includes comprehensive material, example problems, and solutions, meeting the criteria of being valid, practical, and effective for improving contextual mathematical abilities. The description of previous research results outlines the systematic approach used in developing this educational tool, starting with defining needs, designing content, and progressing through the development stages.

1. **Validity of the Lines and Angles Module for Enhancing Contextual Mathematical Abilities**



The lines and angles module successfully met the validity criteria, as evidenced by assessments from material experts, media experts, and language experts. The validation by material experts resulted in an average score of 75%, categorized as valid. Media validation, focusing on graphic feasibility, obtained a score of 74.07%, also categorized as valid. Language validation yielded a score of 75%, rated as very valid. Overall, the module achieved an average validity score of 74.69%, meeting the validity criteria set by the validators. These findings align with the research conducted by Ekawati (2019) at Raden Intan Lampung State Islamic University, which also concluded that mathematics problem-solving strategy modules are feasible and valid for use.

## **2. Practicality of the Lines and Angles Module for Enhancing Contextual Mathematical Abilities**

The practicality of the module was assessed through feedback collected from student response questionnaires and suggestions regarding the module they used in their studies. The evaluation of the module's practicality was based on student responses after using the module. The practicality assessment was conducted during limited trials and field trials to measure effectiveness. The results from the limited trial yielded an average score of 4.44, categorized as practical, while the results from the field trial yielded an average score

of 4.43, categorized as very practical. The practicality findings from this study align with research conducted by Yani et al. (2022) titled "Development of Contextual Approach-Based Modules Accompanied by QR Codes on Logarithm Material." The results indicate that the developed mathematics module received positive responses from both educators and students.

## **3. Effectiveness of the Lines and Angles Module for Enhancing Contextual Mathematical Abilities**

The effectiveness of the module was analyzed based on student performance in assignments and final assessments. This test measured students' understanding of the module content and their problem-solving skills. The assessment method used was written tests employing descriptive questions, yielding an average effectiveness score of 0.66, categorized as moderate.

The effectiveness results of this module align with research conducted by Anita Nasution (2016). Positive student responses and learning outcomes were evident, with 85% of all students scoring above the minimum competency standard (KKM).

## **4. Improvement in Contextual Mathematical Abilities**

The improvement in students' contextual mathematical abilities can be observed from the test results provided by the researcher to students during the limited trial and field trial. The average score for the

limited trial was 0.65, and the average score for the field trial was 0.68. It can be concluded that the use of the lines and angles module contributes to enhancing students' contextual mathematical abilities.

#### D. Conclusion

##### Conclusion

Based on the results and discussion, the conclusions drawn from the development of the lines and angles module in enhancing students' contextual mathematical abilities at SMP Negeri 1 Ulususua are as follows:

1. The lines and angles module aimed at improving contextual mathematical abilities has been deemed valid, with an average score of 74.69%. The module is considered very practical, with average scores of 4.44 in the limited trial and 4.43 in the field trial. It has proven effective, achieving average scores of 0.65 (moderate category) for the limited trial and 0.68 for the field trial.
2. Based on the effectiveness tests conducted in both limited trials and field trials, which yielded moderate results, it can be concluded that the lines and angles module effectively enhances students' contextual mathematical abilities.

##### Suggestions

1. It is hoped that the developed lines and angles module is suitable for use by both teachers and students.

2. Educators are encouraged to create specialized modules to facilitate learning and empower students for independent study.
3. Future researchers should continue to develop and conduct trials of this module in various schools.
4. This research should be expanded to a broader scale to produce high-quality modules.

#### E. References

- A.M, Sardiman. (2009). *Interaksi & Motivasi Belajar Mengajar*. Jakarta: PT Rajawali Pers.
- Anggreni, D. A. Dini. (2021). "Pengembangan Modul Berbasis Etnomatematika Pada Materi Bangun Ruang Sisi Datar Di SMP Negeri 2 Satap Sabbang Kabupaten ...."
- Aunurrahman. (2016). *Belajar Dan Pembelajaran*. Bandung: Alfabeta.
- Buulolo, W. C. D. (2024). "Pengaruh Gaya Belajar Matematika Siswa Kelas X Terhadap Kemampuan Komunikasi Matematis Pada Materi Matrik Di SMK Negeri 1 Toma." *Afore: Jurnal Pendidikan Matematika*, 3(1), 99-112. <https://doi.org/10.57094/afore.v3i1.1686>
- Darmawan Harefa, M., Sarumaha, M., Telaumbanua, K., Tatema, T., & Laia, F. H. (2023). "Relationship Student Learning Interest To The Learning Outcomes Of Natural Sciences." *International Journal of Educational*

- Research and Social Sciences (IJERSC)*, 4(2), 240–246.  
<https://doi.org/10.51601/ijersc.v4i2.614>
- Djamaluddin, Ahdar, & Wardana. (2019). *Belajar Dan Pembelajaran*. Semarang: CV. Kaaffah Learning Center.
- Fathani, Abdul Halim. (2009). *Matematika Hakikat & Logika*. Jogjakarta: Ar-Ruzz Media.
- Fau, A. D. (2022a). “Budidaya Bibit Tanaman Rosela (Hibiscus Sabdariffa) Dengan Menggunakan Pupuk Organik Gebagro 77.” *Tunas: Jurnal Pendidikan Biologi*, 3(2), 10–18.  
<https://jurnal.uniraya.ac.id/index.php/Tunas/article/view/545>
- Fau, A. D. (2022b). *Kumpulan Berbagai Karya Ilmiah & Metode Penelitian Terbaik Dosen Di Perguruan Tinggi*. CV. Mitra Cendekia Media.
- Fau, Amaano. D. (2022). *Teori Belajar dan Pembelajaran*. CV. Mitra Cendekia Media.
- Febriyanto, Budi, et al. (2018). “Peningkatan Pemahaman Konsep Matematis Melalui Penggunaan Media Kantong Bergambar Pada Materi Perkalian Bilangan Di Kelas II Sekolah Dasar.” *Cakrawala Pendas*, 4(2).
- Foahonoa Zisokhi Nehe. (2024). “Pengaruh Model Pembelajaran Contextual Teaching and Learning (CTL) Terhadap Kemampuan Pemahaman Konsep Matematis Siswa Pada Materi Dimensi Tiga.” *Afore: Jurnal Pendidikan Matematika*, 3(1), 41-56.  
<https://doi.org/10.57094/afore.v3i1.1684>
- Gaurifa, M., & Darmawan Harefa. (2023). “Development Of A Cartesian Coordinate Module To The Influence Of Implementing The Round Club Learning Model On Mathematics Student Learning Outcomes.” *Afore: Jurnal Pendidikan Matematika*, 2(2), 45-55.  
<https://doi.org/10.57094/afore.v2i2.1130>
- Gulo, J. (2024). “Analisis Kesalahan Konsep Berdasarkan Gaya Belajar Pada Materi Operasi Bentuk Aljabar.” *Afore: Jurnal Pendidikan Matematika*, 3(1), 84-98.  
<https://doi.org/10.57094/afore.v3i1.1697>
- Hake, Richard R. (1998). “Interactive-Engagement versus Traditional Methods: A Six-Thousand-Student Survey of Mechanics Test Data for Introductory Physics Courses.” *American Journal of Physics*, 66(1), 64–74.
- Halawa, M. (2024). “Perbedaan Kemampuan Pemecahan Masalah Matematika Siswa Dengan Metode Team Quiz Dan Metode Individual Quiz Pada Materi Barisan Dan Deret Di Kelas.” *Afore: Jurnal Pendidikan Matematika*, 3(1), 57-70.



<https://doi.org/10.57094/afore.v3i1.1702>

- Hamdani, M. A. (ed.). (2017). *Strategi Belajar Mengajar*. Bandung: CV Pustaka Setia.
- Harefa, A. D. (2022). *Kumpulan Strategi & Metode Penulisan Ilmiah Terbaik Dosen Ilmu Hukum Di Perguruan Tinggi*.
- Harefa, D. (2022). "Edukasi Pembuatan Bookchapter Pengalaman Observasi Di SMP Negeri 2 Toma." *Haga Jurnal Pengabdian Kepada Masyarakat*, 1(2).
- Harefa, D. (2022). "Student Difficulties in Learning Mathematics." *Afore: Jurnal Pendidikan Matematika*, 1(2), 1-10.  
<https://doi.org/10.57094/afore.v1i2.431>
- Harefa, D. (2023). "Efektivitas Model Pembelajaran Talking Chips." *Tunas: Jurnal Pendidikan Biologi*, 4(1).
- Harefa, D. (2023). "The Relationship Between Students' Interest In Learning And Mathematics Learning Outcomes." *Afore: Jurnal Pendidikan Matematika*, 2(2), 1-11.  
<https://doi.org/10.57094/afore.v2i2.1054>
- Hayati, S. I., & Marlina, R. (2021). "Analisis Kemampuan Pemahaman Konsep Matematis Siswa Kelas VII SMP Pada Materi Bentuk Aljabar Di SMP IT Nurul Huda Batujaya." 4(4), 827-34.
- Hidayat, E. (2014). "Faktor-Faktor Yang Mempengaruhi Mutu Sekolah (Pengaruh Dari Faktor Kinerja Mengajar Guru Dan Pemanfaatan Sumber Belajar)." *Jurnal Administrasi Pendidikan*, 21(1), 81-88.
- Himmi, N., & Hatwin, L. B. A. (2018). "Pengembangan Modul Sistem Pertidaksamaan Dua Variabel Berbasis Geogebra Terhadap Kemampuan Visual Thinking Matematis Siswa Kelas X." *Pythagoras*, 7(1), 35-46.
- Hulu, A. J. (2024). "Pengembangan Lembar Kerja Peserta Didik Berbasis Contextual Teaching Learning Materi Integral Tak Tentu Fungsi Aljabar." *Afore: Jurnal Pendidikan Matematika*, 3(1), 1-10.  
<https://doi.org/10.57094/afore.v3i1.1678>
- Idris Harta, et al. (2014). "Pengembangan Modul Pembelajaran Untuk Meningkatkan Pemahaman Konsep Dan Minat SMP." *Pengembangan Modul Pembelajaran untuk Meningkatkan Pemahaman Konsep dan Minat SMP*, 9(2), 161-74.
- Iyam Maryati, Y., Suzana, Y., & Harefa, D. (2022). "Analisis Kemampuan Komunikasi Matematis dalam Materi Aljabar Linier." *PRISMA*, 11(1), 210-220.
- Laia, F. (2024). "Analisis Kesulitan Siswa Kelas VIII Dalam Menyelesaikan Soal Sistem Persamaan Linear Dua Variabel." *Afore: Jurnal Pendidikan Matematika*, 3(1), 127-139.

- <https://doi.org/10.57094/afore.v3i1.1679>
- Majid, Abdul. (2017). *Strategi Pembelajaran*. Bandung: PT. Rosda Karya.
- Mesrawati Ndruru. (2024). "Analisis Kemampuan Pemahaman Konsep Matematis Siswa Kelas VIII SMP Negeri 1 Ulususua Pada Materi Koordinat Kartesius." *Afore: Jurnal Pendidikan Matematika*, 3(1), 113-126.  
<https://doi.org/10.57094/afore.v3i1.1693>
- Rahmat Penius Halawa. (2024). "Analisis Pemahaman Konsep Matematika Siswa Pada Materi Teorema Pythagoras Ditinjau Dari Motivasi Belajar Kelas VIII SMP Negeri 1 Lolo Fitu Moi." *Afore: Jurnal Pendidikan Matematika*, 3(1), 26-40.  
<https://doi.org/10.57094/afore.v3i1.1706>
- Sarumaha, E. R. P. (2023). "Development of a Module on Equations and Square Functions to Improve the Mathematical Problem Solving Capability of Class IX Private Christian SMP BNKP Telukdalam." *Afore: Jurnal Pendidikan Matematika*, 2(2), 69-82.
- <https://doi.org/10.57094/afore.v2i2.1132>
- Sihombing, R. (2023). Application of the Problem Based Instruction (PBI) Learning Model on Tube Materials to Improve Student Learning Outcomes. *Afore: Jurnal Pendidikan Matematika*, 2(2), 115-127.  
<https://doi.org/10.57094/afore.v2i2.1135>
- Telaumbanua, L. (2023). Development of Learning Modules with Data Presentation Materials to Increase Students' Interest in Learning. *Afore: Jurnal Pendidikan Matematika*, 2(2), 83-98.  
<https://doi.org/10.57094/afore.v2i2.1134>
- Telaumbanua, M., & Harefa, D. (2020). Teori Etika Bisnis dan Profesi: Kajian bagi Mahasiswa & Guru. Yayasan Pendidikan dan Sosial Indonesia Maju (YPSIM) Banten.
- Tonius Gulo, D. H. (2023). Identifikasi Serangga (Insekta) yang Merugikan Pada Tanaman Cabai Rawit di Desa Sisarahili Ekholo Kecamatan Lolowau

Kabupaten Nias Selatan. *Jurnal Sapta Agrica*, 2(1), 50–61.

Umi Narsih, D. (2023). Bunga Rampai “Kimia Analisis Farmasi.” Nuha Medika.

<https://www.numed.id/produk/bunga-rampai-kimia-analisis-farmasi-penulis-umi-narsih-faidliyah-nilnaminah-dwi-ana-anggorowati-rini-kartika-dewi-darmawan-harefa-jelitawetri-febrina-a-tenriugi-daeng/>

Ziliwu, S. H., dkk. (2022). Analisis Kemampuan Koneksi Matematika pada Materi Transformasi Siswa Kelas XI SMK Negeri 1 Lahusa Tahun Pembelajaran 2020/2021. *Afore: Jurnal Pendidikan Matematika*, 1(1), 15–25.