# Development of Differentiated Learning Tools in Mathematics Learning in Elementary School

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**Abstrak.** Pembelajaran berdiferensiasi belum diterapkan secara optimal karena perangkat pembelajaran yang digunakan sulit dipahami, dan belum mampu mengakomodasi perbedaaan gaya belajar peserta didik. Penelitian ini bertujuan untuk mengembangkan perangkat pembelajaran berdiferensiasi pada pembelajaran matematika di SD/MI. Subjek penelitian terdiri atas enam dosen sebagai validator ahli (dua ahli materi, dua ahli bahasa dan dua ahli media), satu guru matematika dan 26 peserta didik kelas IV-1 MIN 8 Aceh Besar. Metode penelitian menggunakan model 4-D dengan tahapan pendefinisian *(Define),* perancangan *(Desain),* pengembangan *(Develop),* Penyebaran *(Dissemination).* Teknik pengumpulan data menggunakan Angket uji kelayakan dan angket uji kepraktisan. Data dianalisis melalui teknik kuantitatif, yang digunakan untuk mengukur tingkat kelayakan dan kepraktisan perangkat pembelajaran berdiferensiasi. Hasil penelitian menunjukkan perangkat pembelajaran, penilaian dari dua ahli media memperoleh presentase 92,5% dengan kriteria sangat layak, dari dua ahli materi memperoleh presentase 89,53 % dengan kriteria sangat layak, ahli bahasa memperoleh presentase 82,5% dengan kriteria sangat layak. Uji kepraktisan menunjukkan, presentase penelitian dari guru 95% dengan kriteria sangat praktis, dan memperoleh presentase dari peserta didik kelas IV-1 87,66% dengan kriteria sangat praktis. Perangkat pembelajaran dinilai mampu mengakomodasi perbedaan gaya belajar peserta didik, serta dilengkapi dengan kode batang digital untuk memudahkan akses, sehingga perangkat pembelajaran dinyatakan valid dan praktis digunakan dalam pembelajaran.

**Kata *Kunci :*** Perangkat Pembelajaran, Berdiferensiasi, Pembelajaran Matematika.

**Abstract.** The implementation of differentiated instruction remains ineffective due to learning materials that are overly complex and fail to fully address students' diverse learning needs. This study aims to develop differentiated instructional materials for mathematics learning in elementary schools (SD/MI). The participants of this research consisted of six lecturers serving as expert validators (two material experts, two language experts, and two media experts), one mathematics teacher, and 26 fourth-grade students (Class IV-1) at MIN 8 Aceh Besar. This research utilized the 4-D development model consisting of four stages: defining, designing, developing, and disseminating. Data were collected through observation, expert validation forms, and practicality questionnaires. The data were analyzed using quantitative techniques to assess the feasibility and practicality of the developed instructional materials. The results indicated that the instructional materials were highly feasible. Validation scores were 92.5% from media experts, 89.53% from material experts, and 82.5% from language experts, all categorized as "very feasible." Additionally, practicality scores were 95% from the teachers and 87.66% from the students, both were categorized as "very practical". The developed instructional materials are capable of accommodating students' diverse learning styles and are equipped with a digital barcode to facilitate access. There fore these instructional materials are considered valid and practical for use in the learning process.

**Keywords:** Instructional Materials, Differentiated Instruction, Mathematics Learning.

## INTRODUCTION

The Indonesian education system has undergone changes over time. This development is evident in the prevailing regulations and educational benchmarks, including changes to the curriculum for the Indonesian education system (Dwijendra & Ganesha, 2022). At the end of 2019, the Minister of Education and Culture of the Republic of Indonesia launched the "Merdeka Belajar" (Freedom to Learn) policy, which serves as the basis for implementing the "Merdeka Curriculum". The "Merdeka Curriculum" is designed to enable students to develop their abilities according to their interests and talents, or through the guidance of teachers (Fauzia & Ramadan, 2023). The "Merdeka Curriculum" is a curriculum designed to foster children's interests and potential from an early age, emphasizing essential material that supports character and competency development (Marlina & Aini, 2024). Therefore, teachers have a professional responsibility to develop students' abilities to improve the quality of education.

The role of teachers in developing students' abilities is one of them in mathematics learning, this is because mathematics learning in elementary schools/Islamic elementary schools plays an important role in developing logical, analytical and systematic thinking skills for students (Miagusttin et al., 2025). Mathematics is one of the core subjects that must be understood by students from elementary school to high school, even to college level (Jarmita et al., 2024). Mathematics learning needs to be structured according to the characteristics of students, but in practice it often does not pay attention to interests and readiness to learn, so adaptive and student-centered learning is needed.

One approach that can be used to address diverse learning challenges is differentiated learning. Differentiated learning is a teacher's effort to provide adaptive, student-centered learning that is tailored to each individual's learning needs. Through this approach, teachers are required to use a variety of learning strategies and methods to ensure each student receives learning opportunities tailored to their characteristics and needs. One important aspect to consider in differentiated learning is the student's learning style. Learning style is a strategy or method used by a person to understand, receive, and process information effectively and purposefully (Hendriana, 2018).

In general, students' learning styles can be grouped into three categories: visual, auditory, and kinesthetic (Derici & Susanti, 2023). Visual learning is a learning style that relies on the sense of sight to absorb learning information (Supit et al., 2023). Auditory learning is a learning style that relies more on hearing to understand learning material (Wardani & Sulaeman, 2025). Meanwhile, kinesthetic learning is a learning style that emphasizes physical or motor activity in the process of obtaining and understanding information (Wudda & Adri, 2025). Therefore, differentiated learning seeks to adapt content, processes, products, and learning environments to accommodate the diverse learning needs of students (Juwana et al., 2025).

The importance of implementing differentiated learning is increasingly relevant in the implementation of the Independent Curriculum, which places students at the center of learning. However, a needs analysis conducted through interviews with the homeroom teachers of grade IV-1 at MIN 8 Aceh Besar indicates that differentiated learning has not been optimally implemented. Teachers expressed that differentiated learning tools are still considered complicated, difficult to understand, and do not provide clear guidelines for their implementation. Furthermore, the needs analysis also indicates that the mathematics learning tools used at MIN 8 Aceh Besar still use conventional learning approaches and have not systematically integrated the principles of differentiated learning.

This situation is a crucial concern, particularly in mathematics learning in elementary schools. Mathematics plays a strategic role in developing students' logical, systematic, critical, and creative thinking skills from an early age. Therefore, mathematics learning should be designed contextually and meaningfully so that students can connect mathematical concepts to real-life situations. However, in practice, mathematics learning in elementary schools often focuses on abstract and procedural presentation. As a result, students tend to memorize steps to solve problems without deeply understanding the meaning and interconnectedness of the concepts being studied (Misla, 2020).

Although various teaching modules based on differentiated learning have begun to be developed, the development of comprehensive differentiated learning tools, particularly for mathematics in elementary schools (SD/MI), remains

relatively limited. However, the existence of learning tools designed based on the principles of differentiation can assist teachers in implementing learning that is tailored to the characteristics, learning readiness, interests, and learning profiles of students. Having structured and easy-to-use tools will further assist teachers in designing learning experiences that accommodate the diverse needs of students in the classroom.

Based on this description above, innovation is needed in the form of developing differentiated learning tools for mathematics learning in elementary schools (SD/MI). The developed learning tools are expected to accommodate the differences in students' learning needs through the development of comprehensive learning components aligned with the principles of differentiated learning. Therefore, this study aims to develop differentiated learning tools for mathematics learning in elementary schools (SD/MI) and to test their feasibility and practicality in supporting learning implementation that meets students' learning needs.

## RESEARCH METHODOLOGY

This research is a *research and development (R&D) study* becouse the purpose of this research is to produce differentiated learning tools for mathematics learning in elementary schools (SD/MI). The development model used in this study is the 4D model proposed by Thiagarajan, Semmel, and Semmel (1974), which includes four stages: definition , design , development , *and dissemination* ( Rahmi, 2021) . These four stages are depicted in the following diagram.

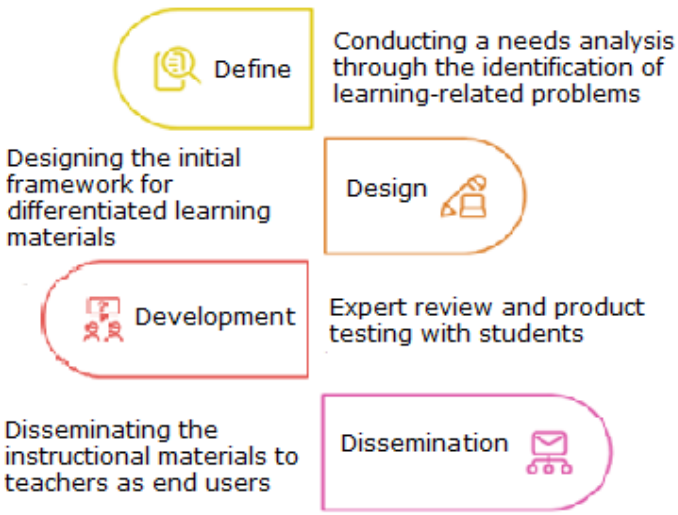


**Figure 1.**

Stages of Differentiated Learning Device Development

This research was conducted from September 11, 2025, to February 7, 2026. The subjects in this study included two material expert validators, two language expert validators, two media expert validators, one mathematics teacher, and 26 students of class IV-1 MIN 8 Aceh Besar. The research instruments included expert validation sheets (material, language, and media), as well as teacher and student practicality questionnaires. Data collection techniques were carried out by analyzing problems through interviews, the instruments in this study were validation questionnaires and practicality questionnaires.

The data obtained were analyzed using quantitative techniques to determine the feasibility and practicality of the learning tools. Before calculating the percentage, the scores from each validator were first calculated using the expert representation score formula to obtain a more objective value, because each aspect was assessed by two validators in each field. The expert representation score formula used is:

$$\bar{X} = \frac{V1 + V2}{2}$$

Information :

$\bar{X}$ = Average Score from experts

V1 = first validator score

V2 = Second validator score

Next, the results are used to calculate the percentage of feasibility and practicality using the following formula:

$$p = \frac{Fr}{N} \times 100\%$$

Information:

| | | |
|---|---|---|
| P | = | Percentage Which searching for |
| *Fr* | = | Frequency/number of values obtained |
| N | = | maximum value |
| 100% | = | Number Constant |

*Source: Suharsimi Arikunto*

The percentage results from the data analysis are used to determine the feasibility and practicality of differentiated learning devices by referring to the following criteria table.

**Table 1.**

Practicality percentage based on Likert scale.

| Presentation of achievements | Mark | Information |
|---|---|---|
| 81% - 100% | 4 | Very Practical |
| 61% - 80% | 3 | Practical |
| 41% - 60% | 2 | Quite Practical |
| ≤ 40% | 1 | Impractical |

## RESULTS AND DISCUSSION

### Results

This research developed a differentiated learning tool for mathematics instruction in elementary schools (SD/MI). The developed learning tool meets practical criteria and is suitable for use in the learning process, taking into account the characteristics of the independent curriculum that focuses on student needs. The material used in this differentiated learning tool is geometric shapes and geometric elements for fourth-grade elementary school (SD/MI) students. This research resulted in a differentiated learning tool for the fourth-grade elementary school (SD/MI) mathematics material, compiled in print and electronic formats. The development was carried out using a 4D model that includes the Define, Design, Develop, and Disseminate stages.

1. Define Stage

A needs analysis was conducted through learning observations and interviews with mathematics teachers on September 11, 2025. The analysis showed that differentiated learning had not been optimally implemented. Teachers stated that available learning tools were still complicated, difficult to understand, and did not provide clear guidance for accommodating students' differing learning styles. Therefore, more practical, simpler learning tools are needed, aligned with the principles of differentiated learning.

**Table 2.**

Needs Analysis Results

| Aspect | Findings |
|---|---|
| Implementation of differentiated learning | Not yet implemented optimally |
| Teacher constraints | The device is difficult to understand and use. |
| Need | A practical and easy to implement device |
| Development objectives | Support differentiated learning according to student needs |

2. Design *stage*

During the design stage, an initial draft of differentiated learning tools was developed, tailored to student characteristics and the principles of the Independent Curriculum. The tools were designed to support the learning of plane geometry in grade IV elementary schools (SD/MI) by accommodating the students' differing learning styles.

**Table 3.**

Components of Designed Learning Devices

| Component | Description |
|---|---|
| Teaching Module | Compiled according to the Independent Curriculum for the material on flat shapes for class IV |
| Learning objectives | Referring to the learning outcomes of geometric elements |
| Learning model | Project Based Learning (PjBL) |
| Instructional Media | Learning videos, slides, and plastometry projects |
| LKPD | Arranged according to the interests and characteristics of students |

| | |
|---|---|
| Assessment Instrument | Assessment of attitudes, knowledge, and skills |
| Assessment Rubric | Skills and presentation rubric |
| Learning Evaluation | Final learning evaluation questions |
| Follow-up | Remedial and enrichment activities |
| E-Device | Electronic devices that can be accessed via QR Code |

3. Development *Stage*

After the initial product design was completed, validation was conducted by six validators: two subject matter experts, two language experts, and two media experts. This was done to assess the feasibility of the differentiated learning device. The validation results from all validators are shown in the following table.

**Table 4.**

Expert Team Validation Results

| Validator | Rated aspect | Percentage | Criteria |
|---|---|---|---|
| Media Expert | Design of learning devices, component layout, display of materials and LKPD, suitability of images, and use of color | 92.50% | Very Worthy |
| Subject Matter Expert | Suitability of material with curriculum, accuracy of mathematical concepts, suitability with the Independent Curriculum, suitability of learning objectives, completeness of material, learning assessment, and presentation of material | 89.53% | Very Worthy |
| Linguist | Readability of text, clarity of sentences, suitability of language to student development, consistency of use of terms, and use of vocabulary | 82.50% | Very Worthy |

Based on the validation results by two media experts, two material experts, and two language experts, the differentiated learning device received a very suitable category in all assessment aspects. These results indicate that the developed device has met the eligibility criteria in terms of content, appearance, and language so that it can be used in the learning process after being revised according to the validator's suggestions. The main revisions include changing the font from Times New Roman to Comic Sans MS and adding a barcode (QR Code) to the E-learning device to facilitate user access.

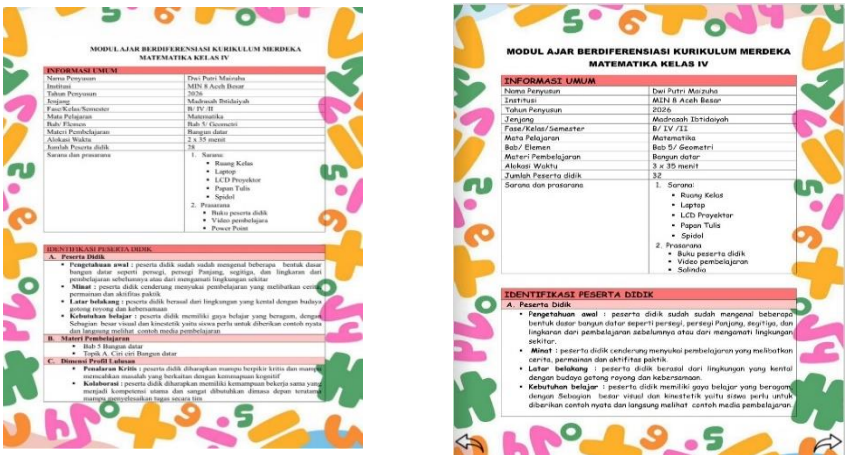


**Figure 2**

Device display design before revision using Times New Roman font and after revision using Comic Sans MS font

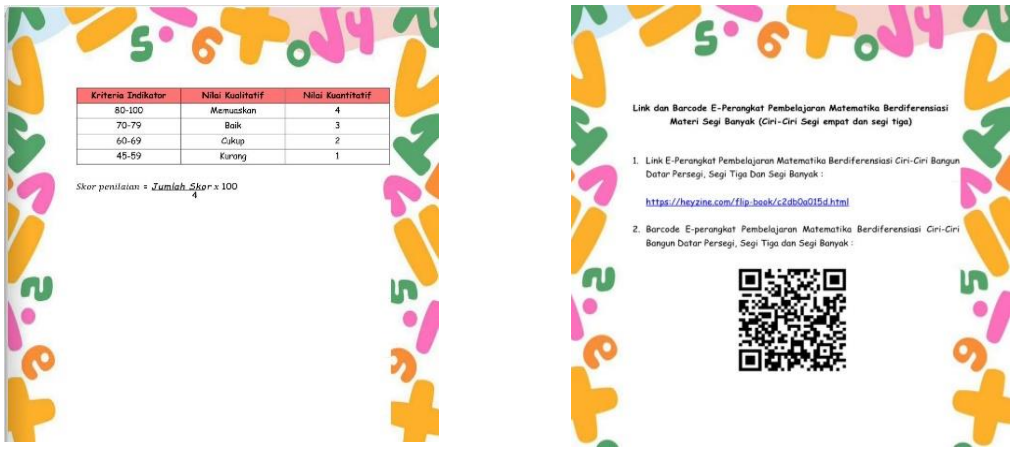


**Figure 3**

Final view of differentiated learning device before revision without QR code and after revision with the addition of a QR code.

Next, product testing was conducted on teachers and grade IV-1 students to assess the practicality of the learning tools through a questionnaire. The results of the questionnaire given to teachers and students are presented in the following table.

**Table 5.**

Overall Practical Results Data

| No | Respondents | presentation | Criteria |
|---|---|---|---|
| 1. | Mathematics Teacher IV-1 | 95% | Very practical |
| 2. | Grade IV-1 Students | 87.66% | Very practical |

Based on the practicality results, the learning device met the criteria of being very practical. Based on Table 5, the assessment results of the grade IV-1 mathematics teacher obtained a percentage of 95%, while the response of grade IV-1 students at MIN 8 Aceh Besar was 87.66%. These results indicate that the learning device is easy to use, can be implemented well in learning activities, and generates positive responses from both teachers and students. Thus, the developed learning device is not only theoretically feasible, but also practically in its application in the classroom.

4. Dissemination Stage *(Disseminate)*

At this stage, the validated and practical learning tools are then disseminated to teachers as the primary users. This stage aims to disseminate the differentiated learning tools and recommend their use in a more effective learning process that meets student needs.

**Discussion**

1. Feasibility of Differentiated Learning Tools

Validation results showed that the differentiated learning device developed was categorized as very feasible in all assessment aspects. Validation by media experts was 92.50%, by material experts 89.53%, and by language experts 82.50%. These results indicate that the developed learning device met the feasibility criteria in terms of appearance, content, and language use.

The high level of validity of learning tools is influenced by several factors. First, the tools are structured based on differentiated learning principles that

accommodate the learning needs, interests, and characteristics of students. Second, the tools are designed in accordance with the learning outcomes of the Independent Curriculum and are equipped with integrated learning components, including teaching modules, worksheets (LKPD), learning media, assessment instruments, remedial activities, and enrichment. Third, the tools are developed with attention to visual aspects, making them easy for teachers and students to use. Visual appearance, including color, shape, icons, and layout, are important components that influence user interaction with a learning product (Putra et al., 2021).

High material validation results indicate that the device's content aligns with learning objectives, mathematical concepts, and the characteristics of differentiated learning. Differentiated learning is an approach that adapts learning content, processes, and products based on students' learning readiness, interests, and learning profiles (Tomlinson, 2017). Therefore, devices that can accommodate the diversity of students' learning needs tend to achieve a high level of suitability.

In terms of language, the learning device received a very good rating because it used communicative language, was easy to understand, and was appropriate for the developmental level of elementary school students. Good language use in learning devices is crucial because it can help students understand the material more effectively. Correct sentence construction and adherence to linguistic rules will improve the readability of the learning material (Wijayanti et al., 2023). Furthermore, effective sentences convey information clearly and are easily understood by readers (Fitriana et al., 2023). However, the validator still provided several suggestions for improvements regarding the use of punctuation and writing consistency, allowing for further refinement of the device's quality.

The results of this research align with previous research showing that differentiated learning tools have a high level of validity because they are able to integrate students' learning needs into the learning process (Aisyah & Sutisna, 2024). These findings also support the results of other studies showing that learning tools developed based on student characteristics and the demands of the Independent Curriculum tend to be categorized as very appropriate by experts (Lestari et al., 2024).

2. Practicality of Differentiated Learning Tools

In addition to meeting the feasibility criteria, the developed learning device also received a very practical rating. Practicality test results showed that teachers gave it a 95% rating, while students gave it an 87.66% rating. These results demonstrate that the learning device is easy to use and can be effectively implemented in the learning process.

The device's high level of practicality is influenced by the various features available within the product. The device is presented not only in printed form but also in electronic form equipped with a barcode (QR Code), making it easier for teachers to access teaching modules, learning media, student worksheets (LKPD), and assessment instruments. Furthermore, the device is equipped with learning videos, slides, learning projects, assessment rubrics, and remedial and enrichment activities that can be directly used in the learning process. The completeness of these components makes the device more efficient and easier for teachers to implement.

Practicality is an important indicator in developing learning tools. According to Nieveen (1999), an educational product is considered practical if it is easy to use and can be applied to actual learning conditions (Rohmad, 2012). The results of this study indicate that the developed learning tools have met these characteristics, as they received positive responses from both teachers and students.

From the students' perspective, learning devices are considered engaging because they combine various learning resources and activities. Meanwhile, from the teachers' perspective, the devices are considered helpful in planning, implementing, and evaluating learning because all learning components are available in one package. This finding aligns with research showing that differentiated learning devices supported by digital media have a high level of practicality because they are easy to use and support effective learning (Zahara & Nurasifa, 2024). Similar results also indicate that technology integration in learning devices can improve teacher work efficiency and ease of use of the devices in learning (Nurhayati et al., 2024).

3. Product Implications and Advantages

The developed differentiated learning tools have several important implications for teachers and students. For teachers, these tools can serve as a guide for implementing differentiated learning more systematically. Teachers not

only receive teaching modules but also learning media, student worksheets (LKPD), assessment instruments, and follow-up activities, all integrated into one tool. This can help teachers save time in lesson planning and improve the quality of the Independent Curriculum implementation.

For students, learning tools provide opportunities to learn according to their individual characteristics, interests, and learning styles. The availability of a variety of learning resources and activities allows students to be more actively involved in the learning process. This aligns with the notion that differentiated learning provides each student with the opportunity to achieve learning goals through learning experiences tailored to their needs (Tomlinson, 2017).

The main advantage of the developed product lies in the integration of differentiated learning principles with the use of digital technology. The device is available in both print and electronic formats, equipped with QR codes, learning videos, slides, and project activities that support mathematics learning in the field of plane geometry. This combination is the novelty of this research, as it not only produces a valid and practical learning device but also provides an alternative solution for teachers in implementing differentiated learning more easily, flexibly, and in accordance with the demands of the Independent Curriculum.

Based on the feasibility and practicality tests, it can be concluded that the differentiated learning device developed is of very good quality and very practical for use in fourth-grade elementary school mathematics lessons. This device has the potential to support more effective, engaging, and meaningful learning, tailored to the diverse learning needs of students.

## CONCLUSION

This 4D (Define, Design, Develop, and Disseminate) development research successfully produced differentiated learning tools for fourth-grade elementary school (SD/MI) plane geometry. The tools developed comprise teaching modules, teaching materials, student worksheets (LKPD), learning media, assessment instruments, remedial and enrichment activities, and are available in both print and electronic formats accessible via QR code.

The validation results show that the learning device received a very suitable category with a percentage of 92.50% from media experts, 89.53% from material

experts, and 82.50% from language experts. These results indicate that the device has met the feasibility standards in terms of media, material, and language aspects, making it suitable for use in mathematics learning in elementary schools/Islamic elementary schools. The results of the practicality test show that the learning device received a very practical category with a percentage of 95% from teachers and 87.66% from students. These findings indicate that the device is easy to use, helps teachers in implementing differentiated learning, and supports students in learning according to their needs and characteristics.

Thus, the differentiated learning tools developed are of very good quality and very practical for use in mathematics learning for grade IV elementary schools/Islamic elementary schools and have the potential to support the implementation of the Independent Curriculum through more effective, flexible, and student-centered learning.

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## REFERENCES

Aisyah, I. N., & Sutisna, A. (2024). Pengembangan Perangkat Pembelajaran Berbasis Google Sites Pada Pembelajaran Berdiferensiasi Kurikulum Merdeka Siswa Kelas IV Sdn Karanganyar. Didaktik: Jurnal Ilmiah PGSD STKIP Subang, 10(3), 593-601.

Derici, R. M., & Susanti, R. (2023). Analisi Gaya Belajar Peserta Didik Guna Menerapkan Pembelajaran Berdiferensiasi di Kelas X SMA Negeri 10 Palembang. *Research and Development Journal of Education*, 9(1), 414–420. https://doi.org/10.30998/rdje.v9i1.16903.

Dwijendra, U., & Ganesha, U. P. (2022). Analisis Kurikulum Merdeka dan Platform Merdeka Belajar Untuk Mewujudkan Pendidikan Yang Berkualitas*. Jurnal Penjaminan Mutu*. *8(2)*, 238–244.

Fauzia, R., & Ramadan, Z. H. (2023). Implementasi Pembelajaran Berdiferensiasi

Dalam Kurikulum Merdeka. *jurnal ilmu pendidikan, 9*(3), 1608–1616. https://doi.org/10.31949/educatio.v9i3.5323

Fitriana, M. M., Fatmasari, D., Munadziroh, A. H., & Sabila, E. S. (2023). Analisis Kalimat Efektif dalam Teks Pidato pada Buku Bahasa Indonesia Kelas VIII Kurikulum Merdeka. *Jurnal Kajian Penelitian Pendidikan Dan Kebudayaan. 1(3)*. 100-110.

Hendriana, E. C. (2018). Pengaruh Model Pembelajaran Problem Based Learning dan Gaya Belajar Auditorial Terhadap Hasil Belajar IPS di Sekolah Dasar. *Jurnal Pendidikan Dasar Indonesia. 3(1).* 1–8.

Jarmita, N., Hayati, Z., & Meilita, F. (2024). *Penerapan Model Direct Instruction dengan Metode Jarimatika untuk Meningkatkan Hasil Belajar Pada Materi Pecahan di Kelas III Madrasah Ibtidaiyah*. Indonesian Journal Of Teaching and Teacher Education. 4(*2*). 50-57

Juwana, I. D. P., Adi, N. L. S. P., & Ariyana, I. M. (2025). Peningkatan Kemampuan Matematis Peserta didik Melalui Penerapan Model Problem Based Learning Dengan Pendekatan Pembelajaran Berdiferensiasi. *Emasains: Jurnal Edukasi Matematika Dan Sains*, *14(2*), 308–314. https://doi.org/https://doi.org/10.59672/emasains.v14i2.3882

Marlina, I., & Aini, F. Q. (2024). Belajar Peserta didik Universitas Negeri Padang. *Kemandirian Edusaintek : Jurnal Pendidikan*. *11*(1), 392–404.

Miagusttin, A. P., Toingah, N., & Handayani, N. (2025). Matematika Sebagai Alat Untuk Mengasah Nalar dan Logika Peserta didik. *Prosiding Diskusi Panel Nasional Pendidikan Matematika*, *11(1)*, 445–450.

Misla, M., & Mawardi, M. (2020). Efektifitas PBL dan Problem Solving Siswa SD Ditinjau dari Kemampuan Berpikir Kritis. Jurnal Ilmiah Sekolah Dasar, 4(1), 60–65. https://doi.org/10.23887/jisd.v4i1.24279

Putra, D. H., Asfi, M., & Fahrudin, R. (2021). Perancangan Ui / Ux Menggunakan Metode Design Thinking Berbasis Web Pada Laportea Company. *Jurnal Ilmiah Teknologi Informasi Terapan. 8*(1). 111-117.

Rahmi, A. (2021). Pengembangan Media Pembelajaran Multimedia Interaktif Lectora Inspire Mata Pelajaran Pekerjaan Dasar. *Journal of Electrical Vocational Teacher Education*, *1*(2), 114–122.

Rochmad, R. (2012). Desain model pengembangan perangkat pembelajaran matematika. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 3(1), 59-72.

Supit, D., Meiske, E., Lasut, M., & Tumbel, N. J. (2023). Gaya Belajar Visual , Auditori , Kinestetik terhadap Hasil Belajar Peserta didik. *Journal On Education. 05*(03), 6994–7003.

Tomlinson, C. A. (2017). How to differentiate instruction in academically diverse classrooms. Ascd. tersedia di

https://books.google.co.id/books?hl=id&lr=&id=DYzgEAAAQBAJ&oi=fnd&pg=PP4&dq=Tomlinson+(2017)+&ots=C9Tir4ElYt&sig=koaPt10UbeivDCZT7U5YAUiXrhM&redir_esc=y#v=onepage&q=Tomlinson%20(2017)&f=false

Wardani, R. B., & Sulaeman, N. F., Haryanto, Z. (2025). Pembelajaran berdiferensiasi pada materi energi terbarukan berdasarkan gaya belajar VAK (visual, auditori, dan kinestetik). Serang: CV. Dotplus Publisher.

Wijayanti, D. A., Yumna'Aqilah, I. R., Ningrum, W., Utomo, A. P. Y., & Sabbardi, M. (2023). Analisis Frasa Teks Narasi pada Buku Pembelajaran IPS Kelas 8 Kurikulum Merdeka. *Jurnal Riset Rumpun Ilmu Bahasa*, *2*(2), 15–29.

Wudda, R. F., & Adri, H. T. (2025). Analisis gaya belajar peserta didik dalam pembelajaran berbasis proyek di SDN Bojonglok. Jurnal Ilmu Kependidikan, 2(2), 193–208.

Zahara, R., & Nursafira, F. D. (2024). Implementasi Pembelajaran Berdiferensiasi Dengan Memanfaatan Media Digital Di Sekolah Dasar Negeri Keumuneng Hulu. *Edelweiss: Journal Of Innovation In Educational Research*, 2(2), 7-14.