

**PENGEMBANGAN E-MODUL UNTUK *BLENDED LEARNING* DALAM
PENCAPAIAN KEMAMPUAN PEMECAHAN MASALAH DAN
RESILIENSI MATEMATIS SISWA KELAS VII**

DISERTASI

Diajukan untuk Memenuhi Sebagian Syarat Memperoleh Gelar Doktor
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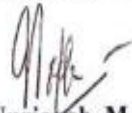
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ABSTRAK

Fitriani (2023). Pengembangan E-Modul untuk *Blended Learning* dalam Pencapaian Kemampuan Pemecahan Masalah dan Resiliensi Matematis Siswa Kelas VII.

Penelitian ini bertujuan untuk memperoleh hasil desain e-modul segiempat dan segitiga yang valid, praktis dan efektif serta untuk mengetahui pencapaian kemampuan pemecahan masalah dan resiliensi matematis siswa dari hasil implementasi e-modul. Penelitian ini merupakan penelitian desain (*design research*) dengan menggunakan desain model *Integrative Learning Design Framework* (ILDF) melalui empat tahapan. Tahapan pertama dilakukan eksplorasi yang terdiri dari analisis karakteristik siswa, analisis kebutuhan, survei literatur dan *theory develop*. Tahapan kedua dilakukan penyusunan yang terdiri dari desain pengembangan, pengembangan prototipe dan desain detail. Tahapan ketiga dilakukan evaluasi lingkup lokal yang terdiri dari tes formatif, perbaikan sistem dan hasil evaluasi. Tahapan keempat dilakukan evaluasi lingkup luas yaitu menerbitkan hasil, difusi, adopsi, adaptasi dan konsekuensi. Subjek penelitian yaitu siswa SMP Negeri 1, 2, 4 dan 6 Langsa. Teknik dan instrumen pengumpulan data yang digunakan adalah wawancara, observasi, video, tes kemampuan pemecahan masalah dan angket resiliensi matematis siswa. Data penelitian dianalisis secara deskriptif. Hasil penelitian menunjukkan bahwa desain e-modul segiempat dan segitiga sudah dalam kategori valid, praktis dan efektif. Valid berdasarkan ahli materi dan media dari hasil kelayakan isi, penyajian, bahasa, kontekstual, dan kegrafisan (ukuran e-modul, desain kover dan desain isi e-modul). Praktis berdasarkan hasil uji kepraktisan respon siswa pada kriteria penyajian, bahasa, isi dan waktu. Efektif berdasarkan hasil tes kemampuan pemecahan masalah matematis siswa yang menunjukkan nilai ketuntasan siswa dan hasil resiliensi matematis siswa yang menunjukkan kriteria sangat positif.

Kata Kunci: E-Modul, *Blended Learning*, Kemampuan Pemecahan Masalah Matematis, Resiliensi Matematis.

ABSTRACT

Fitriani (2023). Development of E-modules for blended learning in achieving problem-solving ability and mathematical resilience of grade VII students.

This study aims to obtain valid, practical, and effective quadrilateral and triangular e-module design results and to determine the achievement of students' problem-solving ability and mathematical resilience from the results of e-module implementation. This research is *design research* using the *Integrative Learning Design Framework* (ILDF) model design, with four stages. The first stage, exploration consists of student characteristics, needs analysis, literature survey, and theory develop. The second stage, drafting consists of a development design, prototype development, and detailed design. The third stage, a local scope evaluation consists of formative tests, system improvements, and evaluation results. The fourth stage, a broad-scope evaluation is carried out, publishing results, diffusion, adoption, adaptation, and consequences. The study subjects were students of SMP Negeri 1, 2, 4, and 6 Langsa. The data collection techniques and instruments are interviews, observations, videos, problem-solving ability tests, and student mathematical resilience questionnaires. The research data were analyzed descriptively. The results showed that the design of quadrilateral and triangular e-modules is already in the category of valid, practical, and effective. Valid based on material and media experts from content feasibility, presentation, language, context, and graphics (e-module size, cover design, and e-module content design). Practical based on the results of the practicality test of student responses on the presentation criteria, language, content, and time. Effective based on the results of the student's mathematical problem-solving ability test, which shows the student's completeness value, and the student's mathematical resilience result, which shows very positive criteria

Keywords: Quad and Triangle E-Modul, Blended Learning, Mathematical Problem Solving Ability, Mathematical Resilience.

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DAFTAR PUSTAKA

- Abdullah, A. H., Rahman, S. N. S. A., & Hamzah, M. H. (2017). Metacognitive Skills of Malaysian Students in Non-Routine Mathematical Problem Solving. *Bolema*, 31(57), 310–322. <https://doi.org/http://dx.doi.org/10.1590/1980-4415v31n57a15>
- Acree, L., Gibson, T., Mangum, N., Wolf, Mary AnnKellogg, S., & Branon, S. (2017). Supporting School Leaders in Blended Learning with Blended Learning. *Journal of Online Learning Research*, 3(2), 105–143.
- Adaobi Ubah, I. J., Spangenberg, E. D., & Ramdhany, V. (2020). Blended Learning Approach to Mathematics Education Modules: An Analysis of Pre-Service Teachers' Perceptions. *International Journal of Learning, Teaching and Educational Research*, 19(7), 298–319. <https://doi.org/10.26803/IJLTER.19.7.17>
- Ahdhianto, E., Marsigit, Haryanto, & Santi, N. N. (2019). The Effect of Metacognitive-Based Contextual Learning Model on Fifth- Grade Students' Problem-Solving and Mathematical Communication Skills. *European Journal of Educational Research*, 9(2), 753–764. <https://doi.org/10.12973/eu-er.9.2.753>
- Aiken, L. R. (1980). Content Validity and Reliability of Single Items or Questionnaires. In *Educational and Psychological Measurement* (40th ed., pp. 995–959). <https://doi.org/10.1177/001316448004000419>
- Aiken, L. R. (1985). Three Coefficients For Analyzing The Reliability and Validity of Ratings. In *Educational and Psychological Measurement* (45th ed., pp. 131–142).
- Aliah, S. N., & Bernard, M. (2020). Analisis Kesulitan Siswa dalam Menyelesaikan Soal Pemecahan Masalah Berbentuk Cerita pada Materi Segitiga dan Segiempat. *Suska Journal of Mathematics Education*, 6(2), 111–118. <https://doi.org/http://dx.doi.org/10.24014/sjme.v6i2.9325>
- Alyusfitri, R., Sari, S. G., Jusar, I. R., & Pratiwi, N. (2023). Pengembangan E-

- Modul Berbasis Multimedia Interaktif Dengan Pendekatan Kontekstual Teaching and Learning Untuk Siswa Sekolah Dasar Pada Materi Bangun Ruang. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 07(1), 302–311.
- Angreanisita, W., Mastur, Z., & Rochmad. (2019). Mathematical Literacy Seen from Learning Independency in Blended Learning with Project Based Learning Assisted by Moodle. *Unnes Journal of Mathematics Education Research*, 10(2), 155–161.
- Anik, K., Sudana, I. N., & Setyosari, P. (2019). The Effects of Electronic Modules in Constructivist Blended Learning Approaches to Improve Learning Independence. *International Journal of Innovation, Creativity and Change*, 9(10), 82–93.
- Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). Impacts of the COVID-19 Pandemic on Life of Higher Education Students: A Global Perspective. *Sustainability*, 12(20), 1–34. <https://doi.org/10.3390/su12208438>
- Ariyanto, L., Herman, T., Sumarmo, U., & Suryadi, D. (2019). Prospective Teachers' Mathematical Resilience After Participating in Problem-Based Learning. *Journal of Physics: Conference Series*, 1280(4), 1–8. <https://doi.org/10.1088/1742-6596/1280/4/042036>
- Ariyanto, L., Herman, T., Sumarmo, U., & Suryadi, D. (2017). Developing Mathematical Resilience of Prospective Math Teachers. *Journal of Physics: Conference Series*, 895(1–6). <https://doi.org/10.1088/1742-6596/895/1/012062>
- Armah, R. B., & Kissi, P. S. (2019). Use of the Van Hiele Theory in Investigating Teaching Strategies used by College of Education Geometry Tutors. *EURASIA Journal of Mathematics, Science and Technology Education*, 15(4), 1–13. <https://doi.org/10.29333/ejmste/103562>
- Bachri, S., Irawan, L. Y., & Aliman, M. (2021). *E-Module in Blended Learning: Its Impact on Students' Disaster Preparedness and Innovation in Developing Learning Media*. 14(4), 187–208. <https://doi.org/https://doi.org/10.29333/iji.2021.14412a>
- Bahasoan, A., Ayuandiani, W., Mukhram, M., & Rahmat, A. (2020). Effectiveness of Online Learning In Pandemic Covid-19. *International Journal of Science*,

- Technology & Management*, 1(2), 100–106.
<https://doi.org/10.46729/ijstm.v1i2.30>
- Baloran, E. T. (2020). Knowledge, Attitudes, Anxiety, and Coping Strategies of Students During COVID-19 Pandemic. *Journal of Loss and Trauma*, 25(8), 635–642. <https://doi.org/10.1080/15325024.2020.1769300>
- Bannan, B. (2003). The Role of Design in Research: The Integrative Learning Design Framework. *Educational Researcher*, 31(1), 21–24. <https://doi.org/10.3102/0013189X032001021>
- Batac, K. I. T., Baquiran, J. A., & Agaton, C. B. (2021). Qualitative Content Analysis of Teachers' Perceptions and Experiences in Using Blended Learning During the COVID-19 Pandemic. *International Journal of Learning, Teaching and Educational Research*, 20(6), 225–243. <https://doi.org/10.26803/IJLTER.20.6.12>
- Bolatov, A. K., Gabbasova, A. M., Baikanova, R. K., Igenbayeva, B. B., & Pavalkis, D. (2022). Online or Blended Learning: the COVID-19 Pandemic and First-Year Medical Students' Academic Motivation. *Medical Science Educator*, 32(1), 221–228. <https://doi.org/10.1007/s40670-021-01464-y>
- Bordoloi, R., Das, P., & Das, K. (2021). Perception Towards Online/Blended Learning at the Time of Covid-19 Pandemic: an Academic Analytics in the Indian Context. *Asian Association of Open Universities Journal*, 16(1), 41–60. <https://doi.org/10.1108/AAOUJ-09-2020-0079>
- Bryan, A., & Volchenkova, K. N. (2016). Blended Learning: Definition, Models, Implications for Higher Education. *Bulletin of the South Ural State University Series "Education. Education Sciences,"* 8(2), 24–30. <https://doi.org/10.14529/ped160204>
- Calamlam, J. M. M. (2020). The Development of 21st-Century E-Learning Module Assessment Tool. *Journal of Educational Technology*, 0(0), 1–21. <https://doi.org/10.1177/0047239520953792>
- Calamlam, J. M. M. (2023). Digital Note-Taking : An Effective Self-Regulation Tool in Increasing Academic Achievement of Filipino Students in a Business Mathematics Online Learning Course. *Asian Journal for Mathematics Education*, April 2022, 1–25. <https://doi.org/10.1177/27527263221149754>

- Cesaria, A., & Herman, T. (2019). Learning Obstacle in Geometry. *Journal of Engineering Science and Technology*, 14(3), 1271–1280.
- Chaturvedi, K., Vishwakarma, D. K., & Singh, N. (2021). COVID-19 and Its Impact on Education, Social Life and Mental Health of Students: A Survey. *Children and Youth Services Review*, 121, 1–6. <https://doi.org/10.1016/j.chilyouth.2020.105866>
- Christenses, M., Horn, M. B., & Staker, H. (2013). *Is K-12 Blended Learning Disruptive? An introduction to the theory of hybrids* (Issue May). Clayton Christenses Institute.
- Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online Teaching and Learning in Higher Education During the Coronavirus Pandemic: Students' Perspective. *Sustainability*, 12(24), 1–24. <https://doi.org/https://doi.org/10.3390/su122410367>
- Crowley, M. (1987). The Van Hiele Model of the Development of Geometric Thought. In *Learning and teaching geometry, K-12* (pp. 1–16). Reston: National Council of Teachers of Mathematics.
- Daroini, A. F., & Alfiana, H. (2022). Kesulitan Pembelajaran Matematika di Masa Pandemi: Kebutuhan Akan Modul untuk Belajar Mandiri. *JNPM (Jurnal Nasional Pendidikan Matematika)*, 6(1), 1–19. <https://doi.org/10.33603/jnpm.v6i1.4604>
- Daryanto. (2013). *Menyusun Modul: Bahan Ajar untuk Persiapan Guru dalam Mengajar*. Yogyakarta: Gava Media.
- Departemen Pendidikan Nasional. (2006). *Peraturan Menteri Pendidikan Nasional No. 22 Tahun 2006 tentang Standar Isi*. Jakarta.
- Deviana, T., & Sulistyani, N. (2021). Analisis Kebutuhan Pengembangan E-Modul Matematika HOTS Beroerintasi Kearifan Lokal Daerah di Kelas IV Sekolah Dasar. *JP2SD: Jurnal Pemikiran Dan Pengembangan Sekolah Dasar*, 9(2), 158–172. <https://doi.org/https://doi.org/10.22219/jp2sd.v9i2.18147>
- Dewi, W. S., Maimunah, M., & Roza, Y. (2022). Analisis Kesulitan Siswa dalam Pembelajaran Daring pada Materi Geometri Kelas VII SMP Kota Pekanbaru. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(1), 635–642. <https://doi.org/10.31004/cendekia.v6i1.624>

- Diana, N., Suryadi, D., & Dahlan, J. A. (2020). Analysis of Students' Mathematical Connection Abilities in Solving Problem of Circle Material: Transposition Study. *Journal for the Education of Gifted Young Scientists*, 8(2), 829–842. <https://doi.org/10.17478/jegys.689673>
- Dio, R. V. (2022). Utilization of Digital Module for Asynchronous Online Independent Learning in Advanced Mathematics Education. *Mathematics Teaching Research Journal*, 14(1), 80–98.
- Ester, P., Morales, I., Moraleda, Á., & Bermejo, V. (2021). The Verbal Component of Mathematical Problem Solving in Bilingual Contexts by Early Elementary Schoolers. *Mathematics*, 9(5), 564. <https://doi.org/10.3390/math9050564>
- Fauzy, A., & Nurfauziah, P. (2021). Kesulitan Pembelajaran Daring Matematika Pada Masa Pandemi COVID-19 di SMP Muslimin Cililin. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, 5(1), 551–561. <https://doi.org/10.31004/cendekia.v5i1.514>
- Ferdiani, R. D., Manurahawati, & Khabibah, S. (2022). Activist Learners' Creative Thinking Processes in Posing and Solving Geometry Problem. *European Journal of Educational Research*, 11(1), 117–126. <https://doi.org/https://doi.org/10.12973/eu-jer.11.1.117>
- Fisher, D., & Kusumah, Y. S. (2018). Developing Student Character of Preservice Mathematics Teachers Through Blended Learning. *Journal of Physics: Conference Series*, 1132(1). <https://doi.org/10.1088/1742-6596/1132/1/012040>
- Fitri, S., Syahputra, E., & Syahputra, H. (2019). Blended Learning Rotation Model of Cognitive Conflict Strategy to Improve Mathematical Resilience in High School Students. *International Journal of Scientific and Technology Research*, 8(12), 80–87.
- Fitriani, Fatimah, S., & Herman, T. (2021). Blended Learning Based on Ebook Integrated Youtube in Learning Mathematics. *Journal of Physics: Conference Series*, 1806(1), 1–7. <https://doi.org/10.1088/1742-6596/1806/1/012065>
- Fitriani, Herman, T., & Fatimah, S. (2022a). Meta-Analysis : Blended Learning as Solution in Learning Mathematics During the Covid-19 Pandemic. *AIP Conference Proceedings*, 2468, 1–4.

<https://doi.org/https://doi.org/10.1063/5.0102796>

- Fitriani, Herman, T., & Fatimah, S. (2022b). The Phenomenology of Indonesian Coastal Students: Are They Ready for Online Blended Learning? *European Journal of Educational Research*, *11*(4), 2181–2194. <https://doi.org/10.12973/eu-jer.11.4.2181>
- Fitriani, Herman, T., & Fatimah, S. (2023). Considering the Mathematical Resilience in Analyzing Students' Problem- Solving Ability through Learning Model Experimentation. *International Journal of Instruction*, *16*(1), 219–240. <https://doi.org/>. <https://doi.org/10.29333/iji.2023.16113a>
- Fuys, D. (2014). Van Hiele Levers of Thinking in Geometry. In *Education and Urban Society* (pp. 447–462). New York: SAGE Publication.
- Ginting, D., Fahmi, Barella, Y., Linarsih, A., & Hamdani, B. (2021). Foreign Language Students' Voices on Blended Learning and Fully Online Classes During the COVID-19 Pandemic. *World Journal of English Language*, *11*(2), 62–70. <https://doi.org/10.5430/WJEL.V11N2P62>
- Goos, M., O'Donoghue, J., Ní Ríordáin, M., Faulkner, F., Hall, T., & O'Meara, N. (2020). Designing a National Blended Learning Program For “Out-of-Field” Mathematics Teacher Professional Development. *ZDM - Mathematics Education*, *52*(5), 893–905. <https://doi.org/10.1007/s11858-020-01136-y>
- Güner, P., & Erbay, H. N. (2021). Prospective Mathematics Teachers' Thinking Styles and Problem-Solving Skills. *Thinking Skills and Creativity*, *40*(February), 1–14. <https://doi.org/10.1016/j.tsc.2021.100827>
- Hafiizh, M., Rahmadani, D., Pusawidjayanti, K., & Wahyuningsih, S. (2022). Developing Android-Based Interactive E-Modules on Trigonometry to Enhance the Learning Motivation of Students. *International Journal of Interactive Mobile Technologies*, *16*(02), 159–170. <https://doi.org/https://doi.org/10.3991/ijim.v16i02.27503> Asmianto(?)
- Hafiz, M., Darhim, & Dahlan, J. A. (2017). Comparison of Mathematical Resilience among Students with Problem Based Learning and Guided Discovery Learning Model. *Journal of Physics: Conference Series*, *895*(1), 1–7. <https://doi.org/10.1088/1742-6596/895/1/012098>
- Hakim, F., & Murtafiah. (2020). Adversity Quotient and Resilience in

- Mathematical Proof Problem-Solving Ability. *MaPan: Jurnal Matematika Dan Pembelajaran*, 8(1), 87–102. <https://doi.org/10.24252/mapan.2020v8n1a7>
- Harsela, K., Asih, E. C. M., & Dasari, D. (2021). Level of Mastery of Mathematical Skills and Mathematical Resilience. *Journal of Physics: Conference Series*, 1806(1), 1–8. <https://doi.org/10.1088/1742-6596/1806/1/012078>
- Haryanti, M. D., Herman, T., & Prabawanto, S. (2019). Analysis of Students' Error in Solving Mathematical Word Problems in Geometry. *Journal of Physics: Conference Series*, 1157(4), 1–7. <https://doi.org/10.1088/1742-6596/1157/4/042084>
- Hasan, B. (2020). Kesulitan Siswa dan Scaffolding dalam Menyelesaikan Masalah Geometri Ruang. *Jurnal Numeracy*, 7(1), 49–64. <https://doi.org/https://doi.org/10.46244/numeracy.v7i1.998>
- Helsa, Y., & Kenedi, A. K. (2019). Edmodo-Based Blended Learning Media in Learning Mathematics. *Journal of Teaching and Learning in Elementary Education (Jtlee)*, 2(2), 107–117. <https://doi.org/10.33578/jtlee.v2i2.7416>
- Hendriana, H., Johanto, T., & Sumarmo, U. (2018). The Role of Problem-Based Learning to Improve Students' Mathematical Problem-Solving Ability and Self Confidence. *Journal on Mathematics Education*, 9(2), 291–299. <https://doi.org/10.22342/jme.9.2.5394.291-300>
- Hendriana, H., Rohaeti, E. E., & Sumarmo, U. (2018). *Hard Skills dan Soft Skills Matematik Siswa*. Bandung: Refika Aditama.
- Herbst, P., Fujita, T., Halverscheid, S., & Weiss, M. (2017). *The Learning and Teaching of Geometry in Secondary Schools* (3rd ed.). New York: Routledge.
- Herman, T. (2000). Strategi Pemecahan Masalah (Problem Solving) dalam Pembelajaran Matematika. *Makalah. Tidak Diterbitkan*, 1–12.
- Hidayat, C. R., Rosjanuardi, R., & Juandi, D. (2019). Epistemological Obstacle on the Topic of Triangle and Quadrilateral. *Journal of Physics: Conference Series*, 1157(4), 1–7. <https://doi.org/10.1088/1742-6596/1157/4/042110>
- Hidayati, N., & Permana, D. (2019). Assessment of Problem Solving Abilities and Student Learning Activities Based on Learning Tools: The Basis of Problem Based Learning dDevelopment. *International Journal of Scientific and*

- Technology Research*, 8(11), 453–456.
- Hiele, P. M. Van. (1999). Developing Geometric Thinking Through Activities That Begin With Play. *Teaching Children Mathematics*, 6(February), 310–316.
- Hobri, H., Ummah, I. K., Yuliati, N., & Dafik, D. (2020). The Effect of Jumping Task Based on Creative Problem Solving on Students' Problem Solving Ability. *International Journal of Instruction*, 13(1), 387–406. <https://doi.org/10.29333/iji.2020.13126a>
- Hrastinski, S. (2019). What Do We Mean by Blended Learning? *TechTrends*, 63(5), 564–569. <https://doi.org/10.1007/s11528-019-00375-5>
- Hsiao, H. S., Lin, C. Y., Chen, J. C., & Peng, Y. F. (2017). The Influence of a Mathematics Problem-Solving Training System on First-Year Middle School Students. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(1), 77–93. <https://doi.org/10.12973/ejmste/77902>
- Husamah. (2014). *Pembelajaran Bauran (Blended Learning)*. Jakarta: Prestasi Pustaka.
- IEA. (2015). International Mathematics Achievement. In *TIMSS & PIRLS*. <http://timssandpirls.bc.edu/timss2015/international-results/timss-2015/mathematics/student-achievement/>
- Ike, E., & Okechukwu, I. B. (2015). Effective Learning Systems Through Blended Teaching Modules in Adult Secondary Education Systems in Developing Nations: Need for Partnership. *Journal of Adult and Continuing Education*, 21(1), 18–30. <https://doi.org/10.7227/jace.21.1.3>
- Ilmi, R., Arnawa, I. M., Yerizon, & N, B. N. (2021). Development of an Android-Based for Math E-Module by using Adobe Flash Professional CS6 for Grade X Students of Senior High School. *Journal of Physics: Conference Series*, 1742(1), 1–8. <https://doi.org/10.1088/1742-6596/1742/1/012026>
- Indrapangastuti, D., Surjono, H. D., Sugiman, & Yanto, B. E. (2021). Effectiveness of the Blended Learning Model to Improve Students' Achievement of Mathematical Concepts. *Journal of Education and E-Learning Research*, 8(4), 423–430. <https://doi.org/10.20448/journal.509.2021.84.423.430>
- Irmawati, I., Syamsuri, S., Nindiasari, H., & Fatah, A. (2021). Analisis Kebutuhan E-Modul Matematika SMP Berbasis Teori Polya Pada Materi Segiempat.

- TIRTAMATH: Jurnal Penelitian Dan Pengajaran Matematika*, 3(2), 158–171.
<https://doi.org/10.48181/tirtamath.v3i2.12652>
- Jamieson, S. (2004). Likert scales: How to (ab)use them. *Medical Education*, 38(12), 1217–1218. <https://doi.org/10.1111/j.1365-2929.2004.02012.x>
- Johnson, D. T., Mason, M. M., & Adelson, J. (2021). The Van Hiele Levels of Geometric Understanding. *Polygons Galore!*, 4, 10–11. <https://doi.org/10.4324/9781003237204-6>
- Johnston-Wilder, S., & Lee, C. (2010). Developing Mathematical Resilience. *BERA Annual Conference 2010, University of Warwick, 1-4 September 2010.*, 1–16. <https://doi.org/http://www.beraconference.co.uk/2010/> Copyright
- Johnston-Wilder, S., Pardoe, S., Almehrzi, H., Evans, B., Marsh, J., & Richards, S. (2016). Developing Teaching for Mathematical Resilience in Further Education. *ICERI2016 Proceedings*, 1(March 2017), 3019–3028. <https://doi.org/10.21125/iceri.2016.1652>
- Kablan, Z., & Uğur, S. S. (2020). The Relationship Between Routine and non-Routine Problem Solving and Learning Styles. *Educational Studies*, 00(00), 1–16. <https://doi.org/10.1080/03055698.2019.1701993>
- Kapasiasa, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., Barman, B., Das, P., & Chouhan, P. (2020). Impact of Lockdown on Learning Status of Undergraduate and Postgraduate Students During COVID-19 Pandemic in West Bengal, India. *Children and Youth Services Review*, 116, 1–26. <https://doi.org/10.1016/j.childyouth.2020.105194>
- Kariman, D., Harisman, Y., Sovia, A., Charitas, R., & Prahmana, I. (2019). Effectiveness of Guided Discovery-Based Module: A Case Study in Padang City, Indonesia. *Journal on Mathematics Education*, 10(2), 239–250. <https://doi.org/https://doi.org/10.22342/jme.10.2.6610.239-250>
- Kashefi, H., Ismail, Z., & Yusof, Y. M. (2012). Supporting Engineering Students' Thinking and Creative Problem Solving through Blended Learning. *Procedia - Social and Behavioral Sciences*, 56(Icthe), 117–125. <https://doi.org/10.1016/j.sbspro.2012.09.638>
- Kemendikbud. (2015). *Persentase Siswa Yang Menjawab Benar SMP Tahun Ajaran 2014-2015.*

https://hasilun.puspendik.kemdikbud.go.id/#2015!smp!daya_serap!99&99&99!T&03&T&T&1&!1!&

Kemendikbud. (2016). *Persentase Siswa Yang Menjawab Benar SMP Tahun Ajaran 2015-2016.*

https://hasilun.puspendik.kemdikbud.go.id/#2017!smp!daya_serap!99&99&99!T&03&T&T&1&!1!&

Kemendikbud. (2017). *Persentase Siswa Yang Menjawab Benar SMP Tahun Ajaran 2016-2017.*

https://hasilun.puspendik.kemdikbud.go.id/#2016!smp!daya_serap!99&99&99!T&03&T&T&1&!1!&

Kemendikbud. (2018). *Persentase Siswa Yang Menjawab Benar SMP Tahun Ajaran 2017-2018.*

https://hasilun.puspendik.kemdikbud.go.id/#2017!smp!daya_serap!99&99&99!T&03&T&T&1&!1!&

Kemendikbud. (2019). *Persentase Siswa Yang Menjawab Benar SMP Tahun Ajaran 2018-2019.*

https://hasilun.puspendik.kemdikbud.go.id/#2017!smp!daya_serap!99&99&99!T&03&T&T&1&!1!&

Kholid, M. N., Sa'Dijah, C., Hidayanto, E., & Permadi, H. (2022). Students' Reflective Thinking Pattern Changes and Characteristics of Problem Solving. *Reflective Practice*, 23(3), 319–341. <https://doi.org/10.1080/14623943.2021.2025353>

Khumalo, V. L., van Staden, S., & Graham, M. A. (2022). Weathering the Storm: Learning Strategies that Promote Mathematical Resilience. *Pythagoras*, 43(1), 1–11. <https://doi.org/10.4102/pythagoras.v43i1.655>

Klang, N., Karlsson, N., Kilborn, W., Eriksson, P., & Karlberg, M. (2021). Mathematical Problem-Solving Through Cooperative Learning-The Importance of Peer Acceptance and Friendships. *Frontiers in Education*, 6(August), 1–10. <https://doi.org/10.3389/educ.2021.710296>

Kooken, J., Welsh, M. E., McCoach, D. B., Johnston-Wilder, S., & Lee, C. (2015). Development and Validation of the Mathematical Resilience Scale. *Measurement and Evaluation in Counseling and Development*, 49(3), 1–26.

<https://doi.org/10.1177/0748175615596782>

- Korkmaz, Ö. (2012). The Impact of Critical Thinking and Logico-Mathematical Intelligence on Algorithmic Design Skills. *Journal of Educational Computing Research*, 46(2), 173–193. <https://doi.org/10.2190/EC.46.2.d>
- Laelasari, Darhim, & Prabawanto, S. (2019). Analysis of Students' Mathematics Resilience Abilities on Linear Program Material. *Journal of Physics: Conference Series*, 1280(4), 1–5. <https://doi.org/10.1088/1742-6596/1280/4/042005>
- Lapitan, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An Effective Blended Online Teaching and Learning Strategy During the COVID-19 Pandemic. *Education for Chemical Engineers*, 35, 116–131. <https://doi.org/10.1016/j.ece.2021.01.012>
- Lee, C, & Johnston-Wilder, S. (2017). The Construct of Mathematical Resilience. In *Understanding Emotions in Mathematical Thinking and Learning* (pp. 269–291). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-802218-4.00010-8>
- Lee, Clare, & Johnston-Wilder, S. (2017). The Construct of Mathematical Resilience. In *Understanding Emotions in Mathematical Thinking and Learning* (pp. 269–291). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-802218-4.00010-8>
- Lowenthal, P. R., & Cavey, L. O. (2021). Lessons Learned from Creating Videos for Online Video-Based Instructional Modules in Mathematics Teacher Education. *TechTrends*, 65(2), 225–235. <https://doi.org/10.1007/s11528-021-00581-0>
- Lutfi, M. K., Juandi, D., & Jupri, A. (2021). Student' Ontogenic Obstacle on the Topic of Triangle and Quadrilateral. *Journal of Physics: Conference Series*, 1806(1), 1–7. <https://doi.org/10.1088/1742-6596/1806/1/012108>
- Martinez, M. E. (1998). What Is Pobleem Solving? *Phi Delta Kappa International*, 79(8), 605–609.
- Maulina, V., & Harun, L. (2022). Pengaruh Minat Belajar dan Resiliensi Matematis Terhadap Kemampuan Pemecahan Masalah Matematis Siswa. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 4(4), 347–354.
- Meliana, F. M., Herlina, S., Suripah, S., & Dahlia, A. (2022). Pengembangan Bahan

- Ajar E-Modul Matematika Berbantuan Flip Pdf Professional pada Materi Peluang Kelas VIII SMP. *SJME (Supremum Journal of Mathematics Education)*, 6(1), 43–60. <https://doi.org/10.35706/sjme.v6i1.5712>
- Meng, W., & Dan-Dan, L. (2022). An Effective Blended Online Political Teaching and Learning Strategy During the COVID-19 Pandemic. *Journal of Commercial Biotechnology*, 27(2), 1–12. <https://doi.org/https://doi.org/10.5912/jcb1066>
- Miles, M. B., & A. Huberman, M. (1994). *Qualitative Data Analysis* (2nd ed.). London: SAGE Publications Inc.
- Mota, A. I., Oliveira, H., & Henriques, A. (2016). Developing Mathematical Resilience: Students' Voice About the use of ICT in Classroom. *Electronic Journal of Research in Educational Psychology*, 14(1), 67–88. <https://doi.org/10.14204/ejrep.38.15041>
- Mu'arif, A. N., Andriyansah, R., Nataliasari, D., Rahmin, S., Kurniawati, S., & Darmadi, D. (2021). Kesulitan Pembelajaran Daring Matematika Saat Pandemi COVID-19 Pada Siswa SMP Kelas VIII. *Jurnal Pendidikan Dan Konseling (JPDK)*, 3(2), 67–71. <https://doi.org/10.31004/jpdk.v3i2.1787>
- Muntazhimah, M., & Ulfah, S. (2020). Mathematics Resilience of Pre-Service Mathematics Teacher. *International Journal of Scientific and Technology Research*, 9(1), 1442–1445.
- Murtikusuma, R. P., Hobri, Fatahillah, A., Hussien, S., Prasetyo, R. R., & Alfarisi, M. A. (2019). Development of Blended Learning Based on Google Classroom With Osing Culture Theme in Mathematics Learning. *Journal of Physics: Conference Series*, 1165(1), 1–8. <https://doi.org/10.1088/1742-6596/1165/1/012017>
- Nakakoji, Y., & Wilson, R. (2020). Interdisciplinary Learning in Mathematics and Science: Transfer of Learning for 21st Century Problem Solving at University. *Journal of Intelligence*, 8(3), 1–23. <https://doi.org/10.3390/jintelligence8030032>
- Naqiyah, M., Rosana, D., Sukardiyono, S., & Ernasari, E. (2020). Developing Instruments to Measure Physics Problem Solving Ability and Nationalism of High School Student. *International Journal of Instruction*, 13(4), 921–936.

<https://doi.org/10.29333/iji.2020.13456a>

- Nasution, P. N., Herman, T., & Jupri, A. (2019). Problem Solving Analysis in Early Adult Period. *STEMEIF (Science, Technology, Engineering and Mathematics Learning International Forum)*, Purwokerto, April 25th 2019, 540–550.
- Naufal, M. A., Abdullah, A. H., Osman, S., Abu, M. S., & Ihsan, H. (2021). The Effectiveness of Infusion of Metacognition in Van Hiele Model on Secondary School Students' Geometry Thinking Level. *International Journal of Instruction*, 14(3), 535–546. <https://doi.org/10.29333/iji.2021.14331a>
- NCTM. (2000a). *Principles and Standards for School Mathematics*. USA: Reston.
- NCTM. (2000b). *Principles Standards and for School Mathematics*. Reston, NCTM.
- NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. USA: Reston.
- Neumann, I., Jeschke, C., & Heinze, A. (2021). First Year Students' Resilience to Cope with Mathematics Exercises in the University Mathematics Studies. *Journal Fur Mathematik-Didaktik*, 42(2), 307–333. <https://doi.org/10.1007/s13138-020-00177-w>
- Nofriyandi, Herman, T., & Dahlan, J. A. (2017). The Enhancement of Students' Mathematical Problem Solving Ability Through Contextual Approach With Bamboo Dance Technique. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, 1848(ICMSEd 2016), 107–112. <https://doi.org/10.1063/1.4983952>
- Norman, E. (2000). *Resiliency Enhancement: Putting The Strengths Perspective Into Social Work Practice*. New York: Colombia University Press.
- Nurjanah, & Dahlan, J. A. (2018). Improving Self-Regulated Learning Junior High School Students Through Computer-Based Learning. *Journal of Physics: Conference Series*, 1013(1), 1–9. <https://doi.org/10.1088/1742-6596/1013/1/012126>
- Nurjanah, Dahlan, J. A., & Wibisono, Y. (2021). The Effect of Hands-On and Computer-Based Learning Activities on Conceptual Understanding and Mathematical Reasoning. *International Journal of Instruction*, 14(1), 143–160. <https://doi.org/https://doi.org/10.29333/iji.2021.1419a>

- Nurjanah, Latif, B., Yuliardi, R., & Tamur, M. (2020). Computer-assisted Learning Using the Cabri 3D for Improving Spatial Ability and Self-regulated Learning. *Heliyon*, 6(11), 1–7. <https://doi.org/10.1016/j.heliyon.2020.e05536>
- OECD. (2019). *PISA 2018 Results (Volume I): What Students Know and Can Do: Vol. I*. <https://doi.org/10.1787/5f07c754-en>
- Ojaleye, O., & Awofala, A. O. A. (2018). Blended Learning and Problem-Based Learning Instructional Strategies as Determinants of Senior Secondary School Students' Achievement in Algebra. *International Journal of Research in Education and Science*, 4(2), 486–501. <https://doi.org/10.21890/ijres.428286>
- Ozcan, Z. Ç., İmamoğlu, Y., & Bayraklı, V. K. (2017). Analysis of Sixth Grade Students' Think-Aloud Processes While Solving a Non-routine Mathematical Problem. *Educational Sciences: Theory & Practice*, 17(1), 129–144. <https://doi.org/10.12738/estp.2017.1.2680>
- Özreçberoglu, N., & Çağanağa, Ç. K. (2018). Making It Count: Strategies for Improving Problem-Solving Skills in Mathematics for Students and Teachers' Classroom Management. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(4), 1253–1261. <https://doi.org/10.29333/ejmste/82536>
- Ozturk, C, & Kilmen, S. (2022). Middle School Students' Mathematical Resilience and Perceptions of Mathematics: A Cluster Analysis Approach. *Egitim ve Bilim*, 47(209), 155–170. <https://doi.org/10.15390/EB.2022.10258>
- Ozturk, Cagla, & Kilmen, S. (2022). Middle School Students' Mathematical Resilience and Perceptions of Mathematics: A Cluster Analysis Approach. *Egitim ve Bilim*, 47(209), 155–170. <https://doi.org/10.15390/EB.2022.10258>
- Palmér, H., & van Bommel, J. (2020). Young Students Posing Problem-Solving Tasks: What Does Posing a Similar Task Imply to Students? *ZDM - Mathematics Education*, 52(4), 743–752. <https://doi.org/10.1007/s11858-020-01129-x>
- Pertiwi, A., Kariadinata, R., Juariah, J., Sugilar, H., & Ramadhani, M. A. (2019). Edmodo-Based Blended Learning on Mathematical Proving Capability. *Journal of Physics: Conference Series*, 1157(4), 1–7. <https://doi.org/10.1088/1742-6596/1157/4/042001>

- Piaget, J. (1964). Cognitive Development in Children: Piaget Development and Learning. *Journal of Research in Science Teaching*, 2, 176–186.
- Plomp, T., & Nieveen, N. (2010). *An Introduction to Educational Design Research*. Netherlands Institute for Curriculum Development (SLO), Enschede.
- Plomp, T., & Nieveen, N. (2013). *Educational Design Research Part A: An Introduction*. Netherlands Institute for Curriculum Development (SLO), Enschede.
- Polya, G. (1973). *How to Solve It :A New Aspect of Mathematical Method* (2nd ed.). USA: Princeton University Press.
- Polya, G. (1985). *How to solve it. A new aspect of mathematical method* (2nd ed.). USA: Princeton University Press.
- Posamentier, A. S., & Krulik, S. (2009). *Problem Solving in Mathematics Grades 3-6*. America : Corwin A SAGE Company.
- Prayekti, N., Nusantara, T., Sudirman, Susanto, H., & Rofiki, I. (2020). Students' Mental Models in Mathematics Problem-Solving. *Journal of Critical Reviews*, 7(12), 468–470. <https://doi.org/10.31838/jcr.07.12.83>
- Prayito, M., Suryadi, D., & Mulyana, E. (2019). Geometric Thinking Level of the Indonesian Seventh Grade Students of Junior High School. *Journal of Physics: Conference Series*, 1188(1), 012036. <https://doi.org/10.1088/1742-6596/1188/1/012036>
- Pulungan, D. A., Retnawati, H., & Jaedun, A. (2022). Mathematical Resilience : how Students Survived in Learning Mathematics Online During the Covid-19 Pandemic. *Qualitative Research in Education*, 11(2), 151–179. <https://doi.org/10.17583/qre.9805>
- Purwanto. (2016). *Evaluasi Hasil Belajar* (Ketujuh). Yogyakarta: Pustaka Belajar.
- Putra, H. D., Setiawan, W., & Afrilianto, M. (2020). Indonesian High Scholar Difficulties In Learning Mathematics. *International Journal of Scientific & Technology Research*, 9(1), 3466–3471.
- Reivich, K., & Shatte, A. (2002). *The Resilience Factor: 7 Keys to Finding Your Inner Strength and Overcoming Life's Hurdles* (1st ed.). New York:Three Rivers Press.
- Rezeki, S., Andrian, D., & Safitri, Y. (2021). Mathematics and Cultures: A New

- Concept in Maintaining Cultures Through the Development of Learning Devices. *International Journal of Instruction*, 14(3), 375–392. <https://doi.org/10.29333/iji.2021.14322a>
- Rini, D. E. P., Prabawanto, S., & Fakhrunisa, F. (2020). How Are the Students' Steps in Solving Mathematical Problems? *Proceedings of the 2020 The 6th International Conference on Frontiers of Educational Technologies*, 229, 56–60. <https://doi.org/10.1145/3404709.3404715>
- Rohmah, S., Kusmayadi, T. A., & Fitriana, L. (2020). The Effect of the Treffinger Learning Model on Mathematical Connection Ability Students Viewed from Mathematical Resilience. *International Journal of Multicultural and Multireligious Understanding*, 7(5), 275–284. <https://doi.org/http://dx.doi.org/10.18415/ijmmu.v7i5.1621>
- Safura, N. A., Aisyah, N., Cecil, H., & Indaryanti. (2018). Student's Mathematical Value in Mathematics Learning Using Non-Routine Problem. *Cakrawala Pendidikan*, 37(3), 400–412.
- Sani, R. A., Arafah, K., Aziz, I., Tanjung, R., & Suswanto, H. (2020). *Evaluasi Proses dan Penilaian Hasil Belajar*. Bandung: Remaja Rosdakarya.
- Santos-Trigo, M., Barrera-Mora, F., & Camacho-Machín, M. (2021). Teachers' Use of Technology Affordances to Contextualize and Dynamically Enrich and Extend Mathematical Problem-Solving Strategies. *Mathematics*, 9(8), 1–21. <https://doi.org/10.3390/math9080793>
- Sarfina, K., Ikhsan, M., & Ahmad, A. (2014). Peningkatan Kemampuan Pemecahan Masalah Geometri Melalui Pembelajaran Kooperatif Berbasis Teori Van Hiele. *Jurnal Didaktik Matematika*, 1(1), 9–20. <https://doi.org/10.24815/jdm.v1i1.1238>
- Setiawan, A. A., Muhtadi, A., & Hukom, J. (2022). Blended Learning and Student Mathematics Ability in Indonesia : A Meta- Analysis Study. *International Journal of Instruction*, 15(2), 905–916. <https://doi.org/https://doi.org/10.29333/iji.2022.15249a>
- Sholihah, S. Z., & Afriansyah, E. A. (2018). Analisis Kesulitan Siswa dalam Proses Pemecahan Masalah Geometri Berdasarkan Tahapan Berpikir Van Hiele. *Mosharafa: Jurnal Pendidikan Matematika*, 6(2), 287–298.

<https://doi.org/10.31980/mosharafa.v6i2.317>

- Siebert, A. (2005). *The Resiliency Advantage: Master Change, Thrive Under Pressure, And Bounce Back From Setbacks* (1st ed.). San Francisco: Berrett-Koehler Publishers, Inc.
- Siregar, N. R. (2017). Persepsi Siswa Pada Pelajaran Matematika: Studi Pendahuluan Pada Siswa yang Menyenangi Game. *Prosiding Temu Ilmiah X Ikatan Psikologi Perkembangan Indonesia*, 224–232.
- Siskawati, E., Zaenuri, Waluya, S. B., & Junaedi, I. (2022). Mathematical Error Patterns to Facilitate Solving Math Problems for Junior High School Students. *Journal of Higher Education Theory and Practice*, 22(9), 112–117. <https://doi.org/10.33423/jhetp.v22i9.5368>
- Son, A. L., Darhim, D., & Fatimah, S. (2020). Student's Mathematical Problem Solving Ability Based on Teaching Models Intervention and Cognitive Style. *Journal on Mathematics Education*, 11(2), 209–222. <https://doi.org/10.22342/jme.11.2.10744.209-222>
- Stake, H., & Horn, M. B. (2012). Classifying K – 12 Blended Learning. In *Innosight Institute* (Issue May).
- Sugiyono. (2016). *Metode Penelitian Kombinasi* (8th ed.). Bandung: Alfabeta.
- Sulistiowati, D. L., Herman, T., & Jupri, A. (2019). Student difficulties in solving geometry problem based on Van Hiele thinking level. *Journal of Physics: Conference Series*, 1157(4), 1–8. <https://doi.org/10.1088/1742-6596/1157/4/042118>
- Sulistyaningsih, A., Suparman, & Rakhmawati, E. (2019). Mathematics Module Development Design Based on PBL to Improve Mathematics Problem-Solving Ability. *International Journal of Scientific and Technology Research*, 8(11), 2508–2516.
- Sulistyaningsih, A., Suparman, S., Rakhmawati, E., & Surasmanto, S. (2019). Analisis Kebutuhan Modul Matematika untuk Meningkatkan Kemampuan Pemecahan Masalah Siswa SMP Kelas VII. *AKSIOMA : Jurnal Matematika Dan Pendidikan Matematika*, 10(2), 143–154. <https://doi.org/10.26877/aks.v10i2.4252>
- Sulistyaningsih, D., Purnomo, E. A., & Purnomo, P. (2021). Polya's Problem

- Solving Strategy in Trigonometry: An Analysis of Students' Difficulties in Problem Solving. *Mathematics and Statistics*, 9(2), 127–134. <https://doi.org/10.13189/ms.2021.090206>
- Suprpto, N., Tafauliyati, T., & Khoiri Yanti, V. (2022). Development of e-Book with Flip PDF Professional Based on Scientific Literacy. *TEM Journal*, 11(2), 851–855. <https://doi.org/10.18421/tem112-44>
- Supriadi, N., Kusumah, Y. S., Sabandar, J., & Afgani, J. D. (2014). Developing High-Order Mathematical Thinking Competency on High School Students ' Through Geo Gebra-Assisted Blended Learning. *Mathematical Theory and Modelling*, 4(6), 57–66.
- Susiana, & Suparman. (2019). Design of Mathematics Module for Mental Retardation Students in Mathematical Problem-Solving. *International Journal of Scientific and Technology Research*, 8(11), 3900–3905.
- Sutarto, Muzaki, A., Hastuti, I. D., Fujiaturrahman, S., & Untu, Z. (2022). Development of an Ethnomathematics-Based e-Module to Improve Students' Metacognitive Ability in 3D Geometry Topic. *International Journal of Interactive Mobile Technologies*, 16(3), 32–46. <https://doi.org/https://doi.org/10.3991/ijim.v16i03.24949> Sutarto1(*)
- Syamsuddin, A., Juniati, D., & Siswono, T. Y. E. (2020). Understanding the Problem Solving Strategy Based on Cognitive Style as a Tool to Investigate Reflective Thinking Process of Prospective Teacher. *Universal Journal of Educational Research*, 8(6), 2614–2620. <https://doi.org/10.13189/ujer.2020.080644>
- Szabo, Z. K., Körtesi, P., Guncaga, J., Szabo, D., & Neag, R. (2020). Examples of Problem-Solving Strategies in Mathematics Education Supporting the Sustainability of 21st-Century Skills. *Sustainability (Switzerland)*, 12(23), 1–28. <https://doi.org/10.3390/su122310113>
- Szczygiel, M. (2020). When Does Math Anxiety in Parents and Teachers Predict Math Anxiety and Math Achievement in Elementary School Children? The Role of Gender and Grade Year. *Social Psychology of Education*, 23, 1023–1054. <https://doi.org/https://doi.org/10.1007/s11218-020-09570-2>
- Tambunan, L. O., & Tambunan, J. (2022). Pengembangan Modul Pembelajaran

- Matematika Berbasis Model Pembelajaran Problem Solving. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(2), 1636–1647. <https://doi.org/10.31004/cendekia.v6i2.1111>
- Tangsa-nguantham, A., Thipkong, S., Chuntra, C., & Lertamornpong, C. (2018). Using Van Hiele Model to Develop Instruction in Geometri Proof for Mathayomsuksa Three Students. *Kasetsart Journal of Social Sciences*, 9(1), 634–644.
- Tessmer, M. (1993). *Planning and Conducting Formative Evaluations: Improving the Quality of Education and Training*. London: Kogan Page.
- Ukobizaba, F., Nizeyimana, G., & Mukuka, A. (2021). Assessment Strategies for Enhancing Students' Mathematical Problem-solving Skills: A Review of Literature. *Eurasia Journal of Mathematics, Science and Technology Education*, 17(3), 1–10. <https://doi.org/10.29333/ejmste/9728>
- Umoh, J. B., & Akpan, E. T. (2014). Challenges of Blended E-Learning Tools in Mathematics: Students' Perspectives University of Uyo. *Journal of Education and Learning*, 3(4), 60–70. <https://doi.org/10.5539/jel.v3n4p60>
- Urbina, S. (2004). *Essentials of Psychological Testing*. Canada: John Wiley & Sons, Inc.
- Utami, C. T. P., Mardiyana, & Triyanto. (2019). Profile of Students' Mathematical Representation Ability in Solving Geometry Problems. *IOP Conference Series: Earth and Environmental Science*, 243(1), 1–9. <https://doi.org/10.1088/1755-1315/243/1/012123>
- Waluya, S. B., Sukestiyarno, Y. L., & Cahyono, A. N. (2022). E-Module Design Using Kvisoft Flipbook Application Based on Mathematics Creative Thinking Ability for Junior High Schools. *International Journal of Interactive Mobile Technologies*, 16(4), 116–136. <https://doi.org/https://doi.org/10.3991/ijim.v16i04.25329>
- Wickelgren, W. A. (1974). *How to Solve Mathematical Problems*. New York: Dover publications, Inc.
- Widiawati, M., Surya, A., Istiyati, S., & Sukarno, S. (2020). Error Analysis of Fifth-Grade Students of Elementary School in Geometry Problem Solving Based on Newman's Procedure. *Universal Journal of Educational Research*, 8(5),

1676–1682. <https://doi.org/10.13189/ujer.2020.080503>

- Widoyoko, E. P. (2017). *Evaluasi Program Pembelajaran*. Yogyakarta: Pustaka Belajar.
- Wijah, R. B., & Nurjanah. (2021). Error Analysis in Solving the Linear Equation System of Three Variables Using Polya's Problem-Solving Steps. *Journal of Physics: Conference Series*, 1882(1), 1–7. <https://doi.org/10.1088/1742-6596/1882/1/012084>
- Wulandari, F., Yogica, R., & Darussyamsu, R. (2021). Analisis Manfaat Penggunaan E-Modul Interaktif Sebagai Media Pembelajaran Jarak Jauh Di Masa Pandemi Covid-19. *Khazanah Pendidikan*, 15(2), 139. <https://doi.org/10.30595/jkp.v15i2.10809>
- Yaghmour, K. S. (2016). Effectiveness of Blended Teaching Strategy on the Achievement of Third Grade Students in Mathematics. *Journal of Education and Practice*, 7(5), 65–73.
- Yeni, E. M., Wahyudin, & Herman, T. (2020). Difficulty Analysis of Elementary School Students in Mathematical Problem Solving in Solutions. *International Journal of Scientific and Technology Research*, 9(3), 44–47.
- Yuliawati, L., Aribowo, D., & Abi Hamid, M. (2020). Analisis Kebutuhan Pengembangan Media Pembelajaran E-Modul Berbasis Adobe Flash pada Mata Pelajaran Pekerjaan Dasar Elektromekanik. *Jurnal Pendidikan Teknik Elektro*, 05(01), 35–42. <https://doi.org/http://doi.org/10.25273/jupiter.v5i1.6197>
- Yuniar, S., Nafiah, M., & Siregar, R. (2022). Hubungan antara Resiliensi Matematis dan Kemampuan Pemecahan Masalah Matematika Siswa di Sekolah Dasar. *Edukatif: Jurnal Ilmu Pendidikan*, 4(3), 4124–4131. <https://doi.org/10.31004/edukatif.v4i3.2666>