PROSES BERPIKIR REFLEKTIF MATEMATIS MAHASISWA CALON GURU MATEMATIKA MELALUI PEMBELAJARAN METAKOGNITIF DALAM SETTING KOLABORATIF

DISERTASI

Diajukan untuk Memenuhi Sebagian Syarat Memperoleh Gelar Doktor Ilmu Pendidikan dalam Bidang Pendidikan Matematika

Promovenda

Muntazhimah

NIM. 1707211

PROGRAM STUDI PENDIDIKAN MATEMATIKA

FAKULTAS PENDIDIKAN MATEMATIKA DAN IPA

UNIVERSITAS PENDIDIKAN INDONESIA

2023

PROSES BERPIKIR REFLEKTIF MATEMATIS MAHASISWA CALON GURU MATEMATIKA MELALUI PEMBELAJARAN METAKOGNITIF DALAM SETTING KOLABORATIF

Oleh
Muntazhimah

Dr. Universitas Pendidikan Indonesia, 2023
M.Pd Universitas Pendidikan Indonesia, 2015

Sebuah Disertasi yang diajukan untuk memenuhi sebagian syarat memperoleh gelar Doktor Pendidikan (Dr.) pada Fakultas Pendidikan Matematika dan IPA

HALAMAN PENGESAHAN

MUNTAZHIMAH

PROSES BERPIKIR REFLEKTIF MATEMATIS MAHASISWA CALON GURU MATEMATIKA MELALUI PEMBELAJARAN METAKOGNITIF DALAM SETTING KOLABORATIF

Disetujui dan Disahkan oleh Tim Penguji Disertasi

Prof. Turmudi, M.Ed., M.Sc., Ph.D
Promotor merangkap Ketua

Dr. H. Sufyani Prabawanto, M.Ed.
Ko-promotor merangkap Sekretaris

Prof. Dr. H. Tatang Herman, M.Ed.
Anggota Penguji

Prof. H. Yaya Sukjaya Kusumah, M.Sc., Ph.D.
Anggota Penguji

Prof. Dr. M. Salman A. N., M.Si.
Anggota Penguji dari Luar Universitas

Mengetahui,
Ketua Departemen Pendidikan Matematika,

Dr. H. Dadang Juandi, M.Si.
NIP. 196401171992021001

PERNYATAAN

Dengan ini saya menyatakan bahwa disertasi dengan judul "Proses Berpikir Reflektif Matematis Mahasiswa Calon Guru Matematika Melalui Pembelajaran Metakognitif dalam Setting Kolaboratif" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 14 November 2022

Yang membuat pernyataan,

Muntazhimah
NIM 1707211

MUNTAZHIMAH (1707211)

PROSES BERPIKIR REFLEKTIF MATEMATIS MAHASISWA CALON GURU MATEMATIKA MELALUI PEMBELAJARAN METAKOGNITIF DALAM SETTING KOLABORATIF

Abstrak

Penelitian ini bertujuan mengkaji secara komprehensif dan mendalam tentang proses berpikir reflektif matematis yang terjadi pada mahasiswa calon guru matematika yang belajar dengan pembelajaran metakognitif dalam *setting* kolaboratif serta proses berpikir reflektif matematis yang terjadi pada mahasiswa calon guru matematika yang belajar dengan pembelajaran metakognitif dalam *setting* kolaboratif ditinjau dari *prior knowledge*. **Penelitian ini menggunakan paradigma interpretif** dengan pendekatan kualitatif. **Metodologi penelitian** yang digunakan adalah fenomenologi, yaitu mahasiswa memaknai pengalaman proses berpikir reflektif matematisnya yang di stimulus melalui pembelajaran metakognitif dalam setting kolaboratif. **metode penelitian** menggunakan *grounded theory*. Partisipan merupakan mahasiswa program studi pendidikan matematika di salah satu Universitas swasta di Sumatera Utara. **Penelitian ini menghasilkan** kesimpulan bahwa proses berpikir reflektif matematis merupakan proses kognitif dan afektif yang dapat dipicu melalui pembelajaran metakognitif dalam *setting* kolaboratif. Proses kognitif yang dimaksud adalah proses mengintegrasikan *prior knowledge* yang dimiliki dengan pemahaman matematis untuk digunakan sebagai dasar pengambilan keputusan atas permasalahan matematis yang sedang dihadapi serta proses afektif berupa resiliensi matematis yang menghantarkan untuk terjadinya proses berpikir reflektif matematis tersebut. Dalam konteks belajar matematika, semakin tinggi *prior knowledge* yang dimiliki seseorang maka akan semakin baik pula proses berpikir reflektif matematisnya.

Kata Kunci : Proses Berpikir Reflektif Matematis, Mahasiswa Calon Guru Matematika, Metakognitif dalam setting kolaboratif

MUNTAZHIMAH (1707211)

MATHEMATICAL REFLECTIVE THINKING PROCESS OF PROSPECTIVE MATHEMATICS TEACHER STUDENTS THROUGH METACOGNITIVE LEARNING IN COLLABORATIVE SETTINGS

Abstract

This study aims to thoroughly examine the mathematical reflective thinking processes in prospective mathematics teacher students who learn by metacognitive learning in a collaborative setting. It also investigates the mathematical reflective thinking processes in prospective mathematics teacher students experiencing metacognitive learning in a collaborative setting based on prior knowledge. This study employed an interpretive paradigm with a qualitative approach. This research applied phenomenology, where students define their mathematical reflective thinking experience stimulated by metacognitive learning in a collaborative setting. This research also applied the grounded theory method. Participants are students of the mathematics education study program at a private university in North Sumatra. This research concludes that mathematical reflective thinking is a cognitive and affective process that can be triggered through metacognitive learning in a collaborative setting. The cognitive process integrates prior knowledge with mathematical understanding as a basis for decision-making for mathematical problems and affective processes is mathematical resilience, leading to the mathematical reflective thinking process. In learning mathematics, the higher a person's prior knowledge, the better the mathematical reflective thinking process will be.

Keywords: Mathematical Reflective Thinking Process, Mathematics Student Teacher, Metacognitive in a collaborative setting

KATA PENGANTAR

Bismillahirrahmanirrahim,

Puji syukur penulis sampaikan pada Allah SWT atas limpahan rahmat dan karuniaNya, sehingga disertasi yang berjudul "PROSES BERPIKIR REFLEKTIF MATEMATIS MAHASISWA CALON GURU MATEMATIKA MELALUI PEMBELAJARAN METAKOGNITIF DALAM SETTING KOLABORATIF" ini dapat diselesaikan.

Penyusunan disertasi ini dilakukan dalam rangka memenuhi sebagian syarat untuk memperoleh gelar Doktor Pendidikan Matematika (Dr.) pada Fakultas Pendidikan Matematika dan IPA Universitas Pendidikan Indonesia. Penulisan disertasi dibagi menjadi lima bab. Bab I berisi pendahuluan yang meliputi latar belakang masalah, tujuan penelitian, pertanyaan penelitian dan manfaat penelitian. Bab II berisi kajian literatur mengenai proses berpikir reflektif matematis, *prior knowledge*, pemahaman matematis, resiliensi matematis, pembelajaran metakognitif, pembelajaran kolaboratif, pembelajaran metakognitif dalam *setting* kolaboratif, dan *State of The Art* proses berpikir reflektif matematis. Bab III berisi metodologi penelitian yang mencakup desain penelitian, partisipan, prosedur pengumpulan data, dan teknik analisis data. Bab IV hasil dan pembahasan penelitian, serta Bab V kesimpulan, implikasi serta rekomendasi.

DAFTAR ISI

DAFTAR TABEL

DAFTAR GAMBAR

DAFTAR LAMPIRAN

DAFTAR PUSTAKA

Abdullah, A. halim, Mokhtar, M., Ali, D. F., Tahir, L. M., & Kohar, U. H. A. (2017). Mathematics Teachers' Level of Knowledge and Practice on the Implementation of Higher-Order Thinking Skills (HOTS). *EURASIA Journal of Mathematics Science and Technology Education*, *13*(1), 3–17. https://www.ejmste.com/download/mathematics-teachers-level-of-knowledge-and-practice-on-the-implementation-of-higher-order-thinking-4648.pdf

Adolphs, R., & Damasio, A. R. (2001). The interaction of affect and cognition: A neurobiological perspective. In *In J. P. Forgas (Ed.), Handbook of affect and social cognition* (pp. 27–49). Lawrence Erlbaum Associates Publishers.

Afshar, S. H., & Farahani, M. (2018). Inhibitors to EFL teachers' reflective teaching and EFL learners' reflective thinking and the role of teaching experience and academic degree in reflection perception. *Reflective Practice*, *19*(1), 46–67. https://doi.org/10.1080/14623943.2017.1351353

Agustan, S., Juniati, D., & Siswono, T. Y. E. (2017). Investigating and analyzing prospective teacher's reflective thinking in solving mathematical problem: A case study of female-field dependent (FD) prospective teacher. *Mathematics, Science, and Computer Science Education (MSCEIS 2016)*, *1848*. https://doi.org/10.1063/1.4983956

Agustin, M. (2017). Deskripsi Kemampuan Berpikir Reflektif Siswa SMA berkemampuan Matematika Tinggi pada materi bentuk Aljabar. *Angewandte Chemie International Edition, 6(11), 951–952.*

Agustin, N., Noto, M. S., & Dewi, I. L. K. (2022). Construction of Student Mathematics Resilience Through the Development of Sainsmatika-Based Teaching Materials. *International Electronic Journal of Mathematics Education*, *17*(2), em0683. https://doi.org/10.29333/iejme/11835

Al Ghifari, S. S., Juandi, D., & Usdiyana, D. (2022). Systematic Literature Review: Pengaruh Resiliensi Matematis Terhadap Kemampuan Berpikir Matematis Tingkat Tinggi. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 2025–2039. https://doi.org/10.31004/cendekia.v6i2.1271

Alzahrani, K. S. (2017). Metacognition in the mathematics classroom : an exploration of the perceptions of teachers and students in secondary schools in Saudi Arabia. *International Electronic Journal of Mathematics Education*, *12*(3), 521–537.

Amalia, R., Fadilah, F., & Anwar, A. (2020). Development of Appy Pie Learning Media Based on Metacognitive Approach for Mathematical Reflective Thinking Ability in Geometry. *Proceedings of the SEADRIC 2019 (2020)*, *2019*(July 2019), 38–42. https://doi.org/10.24071/seadr.2019.06

Ambrose, R. (2004). Teachers ' Orientations To Mathematics Teaching By. *Journal of Mathematics Teacher Education*, 91–119.

Ariestyan, Y., Sunardi, S., & Dian, K. (2016). PROSES BERPIKIR REFLEKTIF

SISWA DALAM MENYELESAIKAN SOAL MATEMATIKA MATERI SISTEM PERSAMAAN LINEAR DUA VARIABEL. *Kadikma*, *7*(1).

Ariyanto, L., Herman, T., Sumarmo, U., & Suryadi, D. (2017). Developing Mathematical Resilience of Prospective Math Teachers. *Journal of Physics: Conference Series*, *895*(1). https://doi.org/10.1088/1742-6596/895/1/012062

Atkins, S., & Murphy, K. (1993). Reflection: a review of the literature. *Journal of Advanced Nursing*, *18*(8), 1188–1192. https://doi.org/10.1046/j.1365-2648.1993.18081188.x

Attami, D., Budiyono, B., & Indriati, D. (2020). The mathematical problem-solving ability of junior high school students based on their mathematical resilience. *Journal of Physics: Conference Series*, *1469*(1). https://doi.org/10.1088/1742-6596/1469/1/012152

Azizah, N., Budiyono, B., & Siswanto, S. (2021). Kemampuan Awal : Bagaimana Pemahaman Konsep Siswa Pada Materi Teorema Pythagoras? *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(2), 1151. https://doi.org/10.24127/ajpm.v10i2.3662

Bakar, M. A. A., & Ismail, N. (2019). Metacognitive Learning Strategies in Mathematics Classroom Intervention: A Review of Implementation and Operational Design Aspect. *International Electronic Journal of Mathematics Education*, *15*(1), 1–9. https://doi.org/10.29333/iejme/5937

Bartlett, F. C., & Burt, C. (1933). REMEMBERING : A STUDY IN EXPERIMENTAL AND SOCIAL PS'17CHOLOGY. *British Journal of Educational Psychology*, *3*(2), 187–192.

Başol, G., & Gencel, I. E. (2013). Reflective thinking scale: A validity and reliability study. *Kuram ve Uygulamada Egitim Bilimleri*, *13*(2), 941–946.

Benjamin S. Bloom, Max D. Engelhart, Furst, E. J., Hill, W. H., & David R. Krathwohl. (1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals*. Longmans, Green and Co Ltd. https://doi.org/10.1300/J104v03n01_03

Betne, P. (2009a). Reflection as a learning tool in mathematics. *Transit: The LaGuardia Journal on Teaching and Learning*, 93–101.

Betne, P. (2009b). Reflection as a Learning Tool in Mathematics. *In Transit: The LaGuardia Journal on Teaching and Learning*, *4*, 93–101.

Biemans, H. J. A., Deel, O. R., & Simons, P. R. J. (2001). Differences between successful and less successful students while working with the CONTACT-2 strategy. *Learning and Instruction*, *11*(4–5), 265–282. https://doi.org/10.1016/S0959-4752(00)00033-5

Blakey, E., & Spence, S. (1990). ED Developing Metacognition. *ERIC Digest.*, 1–5. http://www.nagc.org/index.aspx?id=205

Bringula, R. P., Basa, R. S., Dela Cruz, C., & Rodrigo, M. M. T. (2016). Effects of Prior Knowledge in Mathematics on Learner-Interface Interactions in a Learning-by-Teaching Intelligent Tutoring System. *Journal of Educational Computing Research*, *54*(4), 462–482.

https://doi.org/10.1177/0735633115622213

Brod, G. (2021). Toward an understanding of when prior knowledge helps or hinders learning. *Npj Science of Learning*, *6*(1), 2–4. https://doi.org/10.1038/s41539-021-00103-w

Bruner, J. S. (1961). the Act of Discovery. In *In Search of Pedagogy Volume I* (pp. 67–76). https://doi.org/10.4324/9780203088609-13

Cai, J., & Ding, M. (2017). On mathematical understanding: perspectives of experienced Chinese mathematics teachers. *Journal of Mathematics Teacher Education*, *20*(1), 5–29. https://doi.org/10.1007/s10857-015-9325-8

Campbell, L., & Campbell, B. (2010). Mindful Learning: 101 Proven Strategies for Student and Teacher Success. *Canadian Journal of University Continuing Education*, *36*(10), 95. https://doi.org/10.5195/jffp.1996.115

CAO, H. T. (2018). Teachers' Capacity of Instruction for Developing Higher – Order Thinking Skills for Upper Secondary Students – A Case Study in Teaching Mathematics in Vietnam. *Revista Romaneasca Pentru Educatie Multidimensionala*, *10*(1.SP), 8. https://doi.org/10.18662/rrem/33

Casinillo, L. F., Casinillo, E. L., Lagumbay, C. T., Abad, H. R. F., & Dagongdong, M. L. (2022). Revisiting Mathematical Resilience and Anxiety among Senior High Students. *International Journal of Indonesian Education and Teaching*, *6*(2), 193–203.

Choy, S. C., Yim, J. S. C., & Tan, P. L. (2017). Reflective thinking among preservice teachers: A Malaysian perspective. *Issues in Educational Research*, *27*(2), 234–251.

Christen, A., Murphy, W. L., Thomas, J., & Digest, K. E. (1991). Increasing Comprehension by Activating Prior Knowledge. *ERIC Digest*, *3*, 1–6.

Corbin, J., & Strauss, A. (1990). Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. *Qualitative Sociology*, *13*(1), 1633–1636.

Corbin, J., & Strauss, A. (2008). Basics of Qualitative Research : Techniques and Procedures for Developing Grounded Theory. In *sage publication, Inc* (Vol. 31, Issue 4). SAGE Publications Inc. https://doi.org/10.1177/1350507600314007

Creswell, J. W. (2015). *Educational Research : Planning, Conducting, and Evaluating Quantitative and Qualitative Research*.

Damastuti, A. S., Triyanto, & Nurhasanah, F. (2021). Students' Reflective Thinking Ability Based on Their Prior Knowledge in Solving Geometry Problems. *Proceedings of the International Conference of Mathematics and Mathematics Education (I-CMME 2021)*, *597*, 42–48. https://doi.org/10.2991/assehr.k.211122.006

Davis, R. . (1992). Understanding "Understanding." *Journal of Mathematical Behavior*, *11*(3), 225–241. https://doi.org/10.1007/s10780-011-9147-2

Dewey, J. (1993). *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*. D.C. Heath & Co Publishers.

Djasuli, M., Sa'dijah, C., Parta, I. N., & Chandra, T. D. (2021). Students' Reflective Abstraction in Solving Number Sequence Problems. *International Electronic Journal of Mathematics Education*, *12*(3), 621–632. https://doi.org/10.29333/iejme/638

Dochy, F., Segers, M., & Buehl, M. M. (1999). The relation between assessment practices and outcomes of studies: The case of research on prior knowledge. *Review of Educational Research*, *69*(2), 145–186. https://doi.org/10.3102/00346543069002145

Dong, A., Jong, M. S. Y., & King, R. B. (2020). How Does Prior Knowledge Influence Learning Engagement? The Mediating Roles of Cognitive Load and Help-Seeking. *Frontiers in Psychology*, *11*(October), 1–10. https://doi.org/10.3389/fpsyg.2020.591203

Donna, P., Simacon, P., & Veloria, E. V. (2022). Reflective Thinking Skills and Attitude towards Problem-solving as Mediated by Mathematical Resilience of the Students. *Asian Journal of Education and Social Studies*, *35*(4), 39–51. https://doi.org/10.9734/AJESS/2022/v35i4765

Dorko, A. (2019). Generalization , Assimilation , and Accommodation. *The Mathematics Educator*, *28*(2), 33–51.

dweck, carol s. (2000). *Self Theories: Their Role in Motivation, Personality and Development* (1st ed.). Psychology Press, Taylor & Francis.

Education, G. P. for. (2020). *21st Century Skills: What potential role for the Global Partnership for Education?* https://www.globalpartnership.org/sites/default/files/document/file/2020-01-GPE-21st-century-skills.pdf

Effendi, A. (2016). Implementasi Model Creative Problem Solving Untuk Meningkatkan Kemampuan Metakognitif Berdasarkan Kemampuan Awal Matematis Siswa. *JPPM Jurnal Penelitian Dan Pembelajaran Matematika*, *9*(2), 165–176.

Falk, J. H., & Adelman, L. M. (2003). Investigating the impact of prior knowledge and interest on aquarium visitor learning. *Journal of Research in Science Teaching*, *40*(2), 163–176. https://doi.org/10.1002/tea.10070

Fitriati, F., Novita, R., & Johar, R. (2020). Exploring the usefulness of rich mathematical tasks to enhance students' reflective thinking. *Cakrawala Pendidikan*, *39*(2), 346–358. https://doi.org/10.21831/cp.v39i2.24047

Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist*, *18*(1), 12–23. https://doi.org/10.1027/1016-9040/a000124

Gall, M. ., & Borg, W. R. (2003). Educational research: An introduction 7th Edition. In *British Journal of Educational Studies* (Vol. 14, Issue 1). Longman Publishing. https://doi.org/10.2307/3119062

Gelter, H. (2003). Why is reflective thinking uncommon. *Reflective Practice*, *4*(3), 337–344. https://doi.org/10.1080/1462394032000112237

Gokhale, A. A. (1995). Collaborative Learning Enhances Critical Thinking.

Journal of Technology Education, *1*(7), 22–30. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.78.6419&rep=rep1&type=pdf#page=49

Goos, M., & Galbraith, P. (1996). Do it this way! metacognitive strategies in collaborative mathematical problem solving. *Educational Studies in Mathematics*, *30*(3), 229–260. https://doi.org/10.1007/BF00304567

Gurol, A. (2011). Determining the reflective thinking skills of pre-service teachers in learning and teaching process. *Energy Education Science and Technology Part B: Social and Educational Studies*, *3*(3), 387–402.

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). https://doi.org/10.1088/1742-6596/895/1/012098

Hanfstingl, B., Arzenšek, A., Apschner, J., & Gölly, K. I. (2021). Assimilation and Accommodation: A Systematic Review of the Last Two Decades. *European Psychologist*, *November*. https://doi.org/10.1027/1016-9040/a000463

Harsela, K., & Asih, E. C. M. (2020). The level of mathematical resilience and mathematical problem-solving abilities of 11th grade sciences students in a senior high school. *Journal of Physics: Conference Series*, *1521*(3), 0–6. https://doi.org/10.1088/1742-6596/1521/3/032053

Hartini, P., Setiadi, H., & Ernawati, E. (2021). Cognitive domain analysis (LOTS and HOTS) assessment instruments made by primary school teachers. *Jurnal Penelitian Dan Evaluasi Pendidikan*, *25*(1), 16–24. https://doi.org/10.21831/pep.v25i1.34411

Herman Tatang. (2007). Pembelajaran Berbasis Masalah untuk Meningkatkan Kemampuan Berpikir Matematis Tingkat Tinggi Siswa Sekolah Menengah Pertama. *Educationist*, *1*(1), 3. http://ejournal.sps.upi.edu/index.php/educationist/article/view/28/22

Hewitt, D. (2008). Understanding effective learning strategies for the classroom. In *British Journal of Educational Technology* (Vol. 39, Issue 6). https://doi.org/10.1111/j.1467-8535.2008.00908_20.x

Hidajat, F. A., Sa'dijah, C., Sudirma, & Susisw. (2019). Exploration of students' arguments to identify perplexity from reflective process on mathematical problems. *International Journal of Instruction*, *12*(2), 573–586. https://doi.org/10.29333/iji.2019.12236a

Howlett, C., Ferreira, J. A., & Blomfield, J. (2016). Teaching sustainable development in higher education: Building critical, reflective thinkers through an interdisciplinary approach. *International Journal of Sustainability in Higher Education*, *17*(3), 305–321. https://doi.org/10.1108/IJSHE-07-2014-0102

Hsieh, P. H., & Chen, N. S. (2012). Effects of reflective thinking in the process of designing software on students' learning performances. *Turkish Online*

Journal of Educational Technology, *11*(2), 88–99.

Hudojo, H. (2005). *Pengembangan Kurikulum dan Pembelajaran Matematika*. UM Press.

Hugerat, M., & Kortam, N. (2014). Improving higher order thinking skills among freshmen by teaching science through inquiry. *Eurasia Journal of Mathematics, Science and Technology Education*, *10*(5), 447–454. https://doi.org/10.12973/eurasia.2014.1107a

Hutauruk, A. J. B., Darmayasa, J. B., & Priatna, N. (2019). Achievement of students mathematical resilience through problem based learning model with metacognitive approach. *Journal of Physics: Conference Series*, *1315*(1). https://doi.org/10.1088/1742-6596/1315/1/012051

Hutauruk, A. J. B., & Naibaho Tutiarny. (2020). Indikator Pembentuk Resiliensi Matematis Mahasiswa Prodi Pendidikan Matematika FKIP. *Sepren : Journal of Mathematics Education and Applied*, *1*(02), 78–91. https://doi.org/10.36655/sepren.v1i02.227

Jha, N., & Shah, M. (2018). Reflective thinking: An insight. *International Journal of Research and Analytical Reviews*, *5*(2), 2348–2350.

Johnston-Wilder, S. (2013). Measuring mathematical resilience : an application of the construct of resilience to the study of mathematics. *In: AERA 2013, San Ffancisco California, University of Warwick*, *2013*(May), 1–15. http://wrap.warwick.ac.uk/51559

Johnston-Wilder, S., & Lee, C. (2008). Does articulation matter when learning mathematics? *British Society for Research into Learning Mathematics*, *28*(November), 54–59. http://www.bsrlm.org.uk/IPs/ip28-3/index.html

Johnston-Wilder, S., & Lee, C. (2010). Developing mathematical resilience. *BERA Annual Conference Conference*.

Johnston-Wilder, S., & Lee, C. (2015). Developing Mathematical Resilience by CREET. *The Open University*.

Johnston-Wilder, S., Lee, C., Brindley, J., & Garton, E. (2015). Developing Mathematical Resilience in School-Students Who Have Experienced Repeated Failure. *Iceri2015: 8Th International Conference of Education, Research and Innovation*, *April 2017*.

Juniawan, E. A. (2020). Pengaruh Strategi Metakognitif Dan Kemampuan Awal Terhadap Kemampuan Penalaran Matematis Siswa. *Pasundan Journal of Mathematics Education : Jurnal Pendidikan Matematika*, *10*(Vol 10 No 1), 51–65. https://doi.org/10.23969/pjme.v10i1.2423

Junsay, M. (2016). Reflective learning and prospective teachers' conceptual understanding, critical thinking, problem solving, and mathematical communication skills. *Research in Pedagogy*, *6*(2), 43–58. https://doi.org/10.17810/2015.34

Kapranos, P. (2007). 21 St Century Teaching & Learning Kolb Cycle & Reflective Thinking As Part of Teaching , Creativity , Innovation , Enterprise and Ethics To Engineers. *International Symposium for Engineering*

Education.

Kartono, A., & Mariani, P. D. (2019). Analysis of students' mathematical reflective thinking on problem based learning (PBL) based from learning styles. *Unnes Journal of Mathematics Education*, *8*(1), 34–41. https://doi.org/10.15294/ujme.v8i1.24239

Kember, D., Mckay, J., Sinclair, K., & Kam Yuet Wong, F. (2008). A four-category scheme for coding and assessing the level of reflection in written work. *Assessment and Evaluation in Higher Education*, *33*(4), 369–379. https://doi.org/10.1080/02602930701293355

Panduan Penyusunan Kurikulum Pendidikan Tinggi, (2020). https://dikti.kemdikbud.go.id/pengumuman/buku-panduan-penyusunan-kurikulum-pendidikan-tinggi-di-era-industri-4-0-untuk-mendukung-merdeka-belajar-kampus-merdeka/

Kholid, M. N., Sadijah, C., Hidayanto, E., Permadi, H., & Firdareza, R. M. F. (2020). Pupils' Reflective Thinking in Solving Linear Equation System Problem. *Journal for the Mathematics Education and Teaching Practices*, *1*(1), 19–27.

Kholid, M. N., Telasih, S., Pradana, L. N., & Maharani, S. (2021). Reflective Thinking of Mathematics Prospective Teachers' for Problem Solving. *Annual Conference on Science and Technology Research (ACOSTER) 2020. Journal of Physics: Conference Series*, *1783*(1), 012102. https://doi.org/10.1088/1742-6596/1783/1/012102

King, F., Goodson, L., Faranak Rohani, M., Caladine, R., & Lee, L. (2003). Higher Order Thinking Skills • Definition • Teaching Strategies • Assessment A publication of the Educational Services Program, now known as the Center for Advancement of Learning and Assessment. *Voices from the Middle*, *88*(18), 495–496. http://llt.msu.edu/issues/june2016/lee.pdfhttp://llt.msu.edu/issues/june2016/lee.pdf%0Awww.cala.fsu.edu%0Awww.ascd.org/memberbooks%0Awww.21stcenturyskills.org%0Ahttp://www.

King, P. M., & Kitchener, K. S. (2004). Reflective Judgment: Theory and Research on the Development of Epistemic Assumptions Through Adulthood. *Educational Psychologist*, *39*(1), 5–18. https://doi.org/10.1207/s15326985ep3901_2

Klimova, B. F. (2014). Self-reflection in the Course Evaluation. *Procedia - Social and Behavioral Sciences*, *141*, 119–123. https://doi.org/10.1016/j.sbspro.2014.05.022

Koszalka, T. A., Song, H.-D., & Grabowski, B. (2002). Examining learning environmental design issues for prompting reflective thinking in web-enhanced PBL. *American Educational Research Association*, 1–7.

Kurniah, N., Basir, F., & Ikram, M. (2018). Pola Interaksi Dalam Belajar Matematika Berdasarkan Kemampuan Awal Melalui Pembelajaran Kooperatif. *Penelitian Matematika Dan Pendidikan Matematika*, *1*(1), 65–74. https://www.e-journal.my.id/proximal/article/view/188, diakses Jumat 4

Juni 2021

Kusuma, M. D., Rosidin, U., Abdurrahman, A., & Suyatna, A. (2017). The Development of Higher Order Thinking Skill (Hots) Instrument Assessment In Physics Study. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *07*(01), 26–32. https://doi.org/10.9790/7388-0701052632

Laal, M., & Ghodsi, S. M. (2013). Benefits of collaborative learning. *Procedia - Social and Behavioral Sciences*, *31*, 486–490. https://reader.elsevier.com/reader/sd/pii/S1877042811030205?token=69C74A281181414B308F858B510685039334FA9E8D93A0D68851F3F6EB17ED6D8EE869B9A45AA54D43A1ECBC51122970

Laal, M., & Laal, M. (2012). Collaborative learning: What is it? *Procedia - Social and Behavioral Sciences*, *31*(December 2012), 491–495. https://doi.org/10.1016/j.sbspro.2011.12.092

Lee, C., & Johnston-Wilder, S. (2017). The Construct of Mathematical Resilience. In *Understanding Emotions in Mathematical Thinking and Learning*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-802218-4.00010-8

Lee, H. J. (2005). Understanding and assessing preservice teachers' reflective thinking. *Teaching and Teacher Education*, *21*(6), 699–715. https://doi.org/10.1016/j.tate.2005.05.007

Lefa, B. (2014). The Piaget theory of cognitive development: An educational implications. *Research Gate*, *1*(9), 1–9. https://www.researchgate.net/publication/252532772_Constructing_a_theory_of_learner_autonomy_Some_steps_along_the_way

Lipman, M. (2003). Thinking in education, Second edition. In *Thinking in Education, Second Edition*. Cambridge University Press. https://doi.org/10.1017/CBO9780511840272

Luthfiananda, I. M. A., Mardiyana, & Saputro. (2016). Analisis proses berpikir reflektif siswa dalam memecahkan masalah matematika non-rutin di kelas VIII SMP IIS PSM Magetan ditinjau dari kemampuan awal. *Jurnal Elektronik Pembelajaran Matematika*, *4*(9), 812–823.

Maharani, S., & Bernard, M. (2018). Analisis Hubungan Resiliensi Matematik Terhadap Kemampuan Pemecahan Masalah Siswa Pada Materi Lingkaran. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, *1*(5), 819. https://doi.org/10.22460/jpmi.v1i5.p819-826

Maulidya, S. R., & Saputri, N. I. (2016). Mengapa Siswa Menghadapi Kesulitan dalam Belajar Matematika? *Seminar Nasional Matematika Dan Pendidikan Matematika UNY 2016*, 475–480.

Maya Nurjanah. (2021). Implementasi Lots Dan Hots Pada Soal Tema 3 Kelas 1 Mi/Sd. *Jurnal Evaluasi Dan Pembelajaran*, *3*(2), 70–79. https://doi.org/10.52647/jep.v3i2.36

McInnis-Bowers, C., Chew, E. B., & Bowers, M. R. (2010). Using Reflective Thinking to Enhance Decision Skills, Cultural Sensitivity, and Teamwork. *Marketing Education Review*, *20*(1), 17–20.

https://doi.org/10.2753/mer1052-8008200103

Melis, E., & Ullrich, C. (2001). How to Teach it -- Polya-Inspired Scenarios in ActiveMath. *AI in Education (AIED-2003), IOS Press*, 141–147. http://www.activemath.org

Mezirow, J. (1998). On critical reflection. *Adult Education Quarterly*, *48*(3), 185–198. https://doi.org/10.1177/074171369804800305

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis : a methods sourcebook*. SAGE Publications Inc.

Miri, B., David, B. C., & Uri, Z. (2007). Purposely teaching for the promotion of higher-order thinking skills: A case of critical thinking. *Research in Science Education*, *37*(4), 353–369. https://doi.org/10.1007/s11165-006-9029-2

Moala, J. G., & Hunter, R. (2019). Developing Mathematical Resilience Among Diverse Learners: Preliminary Progress and Problematics. *Mathematics Education Research: Impacting Practice (Proceedings of the 42nd Annual Conference of the Mathematics Education Research Group of Australasia)*, 500–507.

Mousley, J. (2004). An aspect of mathematical understanding: The notion of "connected knowing." *Proceedings of the 28th International Conference of the International Group for the Psychology of Mathematics Education*, *3*, 377–384.

Muin, A. (2011). The Situations That Can Bring Reflective Thinking Process. *International Seminar and the Fourth National Conference on Mathematics Education 2011*, 978–979.

Muin, A., Novianti, L., & Musyrifah, E. (2018a). Analysis of Mathematical Reflective Thinking Skills Based on Learning Model And Mathematical Prior Knowledge. *Advances in Social Science, Education and Humanities Research*, *115*(Icems 2017), 21–27. https://doi.org/10.2991/icems-17.2018.5

Muin, A., Novianti, L., & Musyrifah, E. (2018b). Analysis of Mathematical Reflective Thinking Skills Based on Learning Model And Mathematical Prior Knowledge. *3rd International Conferences on Education in Muslim Society (ICEMS 2017)*. https://doi.org/10.2991/icems-17.2018.5

Muntazhimah, M., Turmudi, T., & Prabawanto, S. (2021a). The relation between prior knowledge and students' mathematics reflective thinking ability. *Journal of Physics: Conference Series*, *1731*(1), 0–6. https://doi.org/10.1088/1742-6596/1731/1/012043

Muntazhimah, M., Turmudi, T., & Prabawanto, S. (2021b). The relation between prior knowledge and students' mathematics reflective thinking ability. *Journal of Physics: Conference Series*, *1731*(1). https://doi.org/10.1088/1742-6596/1731/1/012043

Muntazhimah, Turmudi, & Prabawanto, S. (2020). How to Apply Metacognitive Strategies in Collaborative Learning Setting? *Proceedings of the 7th Mathematics, Science, and Computer Science Education International Seminar, MSCEIS 2019*. https://doi.org/10.4108/eai.12-10-2019.2296285

Mutekwe, E. (2014). Unpacking Student Feedback as a Basis for Metacognition and Mediated Learning Experiences: A Socio-cultural perspective. *Journal of Education and Learning (EduLearn)*, *8*(4), 338. https://doi.org/10.11591/edulearn.v8i4.381

Myhill, D., & Brackley, M. (2004). Making Connections : Teachers ' Use of Children ' S Prior Knowledge in Whole. *British Journal of Educational Studies*, *52*(3), 263–275.

Nahdi, D. S. (2020). Mathematical Resilience Dalam Memecahkan Masalah Matematika Di Sekolah Dasar. *Seminar Nasional Pendidikan, FKIP UNMA 2020*, *1*(1), 1000–1009.

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics* (Vol. 29, Issue 5). https://doi.org/10.5951/at.29.5.0059

Ngang, T. K., Nair, S., & Prachak, B. (2014). Developing Instruments to Measure Thinking Skills and Problem Solving Skills among Malaysian Primary School Pupils. *Procedia - Social and Behavioral Sciences*, *116*, 3760–3764. https://doi.org/10.1016/j.sbspro.2014.01.837

Nickerson, R. (1985). Understanding Understanding. *American Journal of Education*, *93*(2), 201–239. https://doi.org/10.1086/443791

Nindiasari, H., Kusumah, Y., Sumarmo, U., & Sabandar, J. (2014). A metacognitive approach to improve high school students' mathematical reflective thinking skills. *Edusentris*, *1*(1). https://doi.org/https://doi.org/10.17509/edusentris.v1i1.136

Ningsih, E. F., & Retnowati, E. (2020). Prior Knowledge in Mathematics Learning. *Advances in Social Science, Education and Humanities Research*, *467*(Semantik 2019), 61–66. https://doi.org/10.2991/assehr.k.200827.118

Nuraeni, T. H., & Kusuma, A. B. (2022). Resiliensi Matematis Ditinjau Dari Self – Efficacy Siswa. *Paradikma: Jurnal Pendidikan Matematika*, *15*(1), 14–19. https://doi.org/10.24114/paradikma.v15i1.35104

Nurfitri, R. A., & Jusra, H. (2021). Analisis Kemampuan Pemecahan Masalah Matematis Peserta Didik Ditinjau dari Resiliensi Matematis dan Gender. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(2), 1943–1954. https://doi.org/10.31004/cendekia.v5i2.723

Nurhidayah, D. (2017). *Psikologi Pendidikan*. UM Penerbit & Percetakan.

Nurkaeti, N., Turmudi, T., & Karso, K. (2019). How to use metacognitive strategy in the open-ended approach? *International Conference on Mathematics and Science Education (ICMScE 2018) Journal of Physics: Conference Series*, *1157*(2). https://doi.org/10.1088/1742-6596/1157/2/022119

OECD. (2005). *the definition and selection of key Competencies.París. OCEDE*. 1–20.

Ormrod, J. E. (2009). Psikologi Pendidikan. Membantu siswa tumbuh dan berkembang. In *Psikologi Pendidikan* (p. 432). https://opac.perpusnas.go.id/DetailOpac.aspx?id=671719%0Ahttps://reposito

ry.ugm.ac.id/35964/1/Psi_Pendidikan_Membantu_SIswa.pdf

Papadopoulos, I. (2009). of the Area of Irregular Plane Figures : *International Journal of Science and Mathematics Education*, *8*(5), 869–890.

Prabawanto, S. (2018a). The enhancement of students' mathematical self-efficacy through teaching with metacognitive scaffolding approach. *4th International Seminar of Mathematics, Science and Computer Science Education Journal of Physics: Conference Series*, *1013*(1). https://doi.org/10.1088/1742-6596/1013/1/012135

Prabawanto, S. (2018b). The enhancement of students' mathematical self-efficacy through teaching with metacognitive scaffolding approach. *Journal of Physics: Conference Series*, *1013*(1). https://doi.org/10.1088/1742-6596/1013/1/012135

Presseisen, B. Z. (1984). Thinking Skills: Meanings, Models, and Materials. *Eric*.

Pugoy, B., Sagayno, R., Ares, C., Ababon, J., & Razonable, S. (2020). Instrumental and Relational Understanding in Math Problem Solving Among Grade V Pupils. *The Asian Society of Teachers for Research*, *Volume 4*(November), 24–43.

Putrawangsa, S., & Hasanah, U. (2015). STUDENTS' PRIOR UNDERSTANDING OF AREA. *Beta Jurnal Tadris Matematika*, *8*(2), 100–114.

Rach, S., & Ufer, S. (2020). Which Prior Mathematical Knowledge Is Necessary for Study Success in the University Study Entrance Phase? Results on a New Model of Knowledge Levels Based on a Reanalysis of Data from Existing Studies. *International Journal of Research in Undergraduate Mathematics Education*, *6*(3), 375–403. https://doi.org/10.1007/s40753-020-00112-x

Rahmatiya, R., & Miatun, A. (2020). ANALISIS KEMAMPUAN PEMECAHAN MASALAH MATEMATIS DITINJAU DARI RESILIENSI MATEMATIS SISWA SMP. *Teorema: Teori Dan Riset Matematika*, *5*(2), 187–202. https://doi.org/10.31851/wahanadidaktika.v18i2.4387

Ratumanan, T. G., & Tetelepta, Y. (2019). Analisis Pembelajaran Matematika Berdasarkan Kurikulum 2013 Pada Sma Negeri 1 Masohi. *JUMADIKA : Jurnal Magister Pendidikan Matematika*, *1*(1), 25–34. https://doi.org/10.30598/jumadikavol1iss1year2019page25-34

Reid, J., Forrestal, P., & Cook, J. (1998). Enhancing Student Thinking through Collaborative Learning. In *Heinemann*.

Rodgers C. (2002). Defining reflection: Another look at John Dewey and reflective thinking [Electronic version]. *Teachers College Record*, *104*(4), 842.

Rohmah, S., Kusmayadi, T. A., & Fitriana, L. (2020). Problem solving ability of junior high school students viewed by mathematical resilience. *Universal Journal of Educational Research*, *8*(7), 3026–3033. https://doi.org/10.13189/ujer.2020.080731

Roschelle, J. (1995). Learning in Interactive Environments : Prior Knowledge and

New Experience Jeremy Roschelle University of Massachusetts , Dartmouth. *Public Institutions for Personal Learning: Establishing a Research Agenda*, *August*, 37–51.

Ruggiero, V. ryan. (2012). *The art of thinking: A guide to critical and creative thought (cet. 9)*. Pearson education Inc.

Sa'dijah, C., Kholid, M. N., Hidayanto, E., & Permadi, H. (2020). Reflective Thinking Characteristics: a Study in the Proficient Mathematics Prospective Teachers. *Infinity Journal*, *9*(2), 159–172. https://doi.org/10.22460/infinity.v9i2.p159-172

Sabandar, J. (2017). Berfikir Reflektif Dalam Pembelajaran Matematika. *JIPMat*, *1*(2), 1–17. https://doi.org/10.26877/jipmat.v1i2.1236

Sahin, Z., Yenmez, A. A., & Erbas, A. K. (2015). Relational understanding of the derivative concept through mathematical modeling: A case study. *Eurasia Journal of Mathematics, Science and Technology Education*, *11*(1), 177–188. https://doi.org/10.12973/eurasia.2015.1149a

Santagata, R., König, J., Scheiner, T., Nguyen, H., Adleff, A. K., Yang, X., & Kaiser, G. (2021). Mathematics teacher learning to notice: a systematic review of studies of video-based programs. *ZDM - Mathematics Education*, *53*(1), 119–134. https://doi.org/10.1007/s11858-020-01216-z

Saputra, E., & Zulmaulida, R. (2021). Implementation of Reflective Thinking Process Approach to Students' Mathematical Critical Thinking. *Journal of Physics: Conference Series*, *2123*(1). https://doi.org/10.1088/1742-6596/2123/1/012033

Schoenfeld, A. H. (2016). Learning to Think Mathematically: Problem Solving, Metacognition, and Sense Making in Mathematics (Reprint). *Journal of Education*, *196*(2), 1–38. https://doi.org/10.1177/002205741619600202

Schön, D. A. (1992). The Reflective Practitioner : How Professionals Think In Action. In *Journal of Social Work Education* (Vol. 28, Issue 1). https://doi.org/10.1080/10437797.1992.10778754

Schülke, C., & Steinbring, H. (2010). MATHEMATICAL REFLECTION IN PRIMARY Theoretical Foundation and Empirical Analysis of a Case Study. *Proceedings of CERME 6*, *2010*, 862–872. http://ife.ens-lyon.fr/publications/edition-electronique/cerme6/wg6-04-schuelke-steinbring

Setiyani, Waluya, S. B., Sukestiyarno, Y. L., & Cahyono, A. N. (2022). Mathematical Reflective Thinking Process of Prospective Elementary Teachers Review from the Disposition in Numerical Literacy Problems. *International Journal of Educational Methodology*, *8*(3), 405–420. https://doi.org/10.12973/IJEM.8.3.405

Sierpinska, A. (1994). *Understanding in Mathematics. Studies in Mathematics Education Series: 2.* The Falmer Press.

Simon, M. A. (2006). Key Developmental Understandings in Mathematics: A Direction for Investigating and Establishing Learning Goals. *Mathematical Thinking and Learning*, *8*(4), 359–371.

https://doi.org/10.1207/s15327833mtl0804_1

Siswono, T. Y. E. (2018). *pembelajaran matematika berbasis pengaajuan dan pemecahan masalah* (Vol. 3, Issue April). PT. Remaja Rosda Karya.

Skemp, R. R. (1976). Relational Understanding and Instrumental Understanding. *Mathematics Teaching*, *77*, 20–26. https://doi.org/10.5951/at.26.3.0009

Skemp, R. R. (1987). *The Psychology of Learning Mathematics: Expanded American Edition (1st ed.)*. Routledge. https://doi.org/https://doi.org/10.4324/9780203396391

Skoumpourdi, C., & Mpakopoulou, I. (2011). The Prints: A Picture Book for Pre-Formal Geometry. *Early Childhood Education Journal*, *39*(3), 197–206. https://doi.org/10.1007/s10643-011-0454-0

Smith, B. L., & MacGregor, J. T. (1992). Collaboration Learning: A Sourcebook for Higher Education. *University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment (NCTLA)*, 159–189.

Smith, B. L., MacGregor, J. T., Maher, M., Tinto, V., & Goodshell, A. (1992). *What is Collaborative Learning? **. Pennsylvania State University. https://www.evergreen.edu/sites/default/files/facultydevelopment/docs/WhatisCollaborativeLearning.pdf

Sobur, A. (2016). *Psikologi Umum* (p. 560). CV. Pustaka Setia.

Solso, R. L., MacLin, O., & Maclin, K. (2010). *Cognitive Psychology (8th Edition)*. Erlangga.

Star, J. R., Rittle-Johnson, B., Lynch, K., & Perova, N. (2009). The role of prior knowledge in the development of strategy flexibility: The case of computational estimation. *ZDM - International Journal on Mathematics Education*, *41*(5), 569–579. https://doi.org/10.1007/s11858-009-0181-9

Stevens, K. C. (1980). The effect of background knowledge on the reading comprehension of ninth graders. *Journal of Literacy Research*, *12*(2), 151–154. https://doi.org/10.1080/10862968009547365

Strangman, N., Hall, T. E., & Meyer, A. (2004). Background Knowledge Instruction and the Implications for UDL Implementation. *Wakefield, MA: National Center on Accessing the General Curriculum*, 1–33. http://aem.cast.org/about/publications/2004/ncac-background-knowledge-udl.html

Subhan, M., & Nandari, F. (2020). ANALISIS HOTS DAN LOTS SOAL PENILAIAN AKHIR SEMESTER MUATAN MATEMATIKA KELAS V SEKOLAH DASAR. *ESJ (Elementary School Journal)*, *10*(3), 137–146. http://clik.dva.gov.au/rehabilitation-library/1-introduction-rehabilitation%0Ahttp://www.scirp.org/journal/doi.aspx?DOI=10.4236/as.2017.81005%0Ahttp://www.scirp.org/journal/PaperDownload.aspx?DOI=10.4236/as.2012.34066%0Ahttp://dx.doi.org/10.1016/j.pbi.201

Sulaiman, T., Vickneswary Muniyan, Diwiyah Madhvan, Raidah Hasan, & Suzieleez Syrene Abdul Rahim. (2017). Implementation of higher order thinking skills in teaching of Science. *International Research Journal of*

Education and Sciences, *1*(1), 1–3.

Syamsuddin, A. (2019). Analysis of prospective teacher's mathematical problem solving based on taxonomy of reflective thinking. *International Conference on Mathematics and Science Education (ICMScE 2018)*, *1157*(3). https://doi.org/10.1088/1742-6596/1157/3/032078

Tachie, S. A. (2019). Meta-cognitive skills and strategies application: How this helps learners in mathematics problem-solving. *Eurasia Journal of Mathematics, Science and Technology Education*, *15*(5). https://doi.org/10.29333/ejmste/105364

The National Council Of Teachers Of Mathematics. (1998). *Qualitative research methods in mathematics education* (Issue 9).

Tomasello, M. (2016). Precís of a natural history of human thinking. *Journal of Social Ontology*, *2*(1), 59–64. https://doi.org/10.1515/jso-2015-0041

Tri Wahyuni, F. (2018). Berpikir Reflektif Dalam Pemecahan Masalah Pecahan Ditinjau Dari Kemampuan Awal Tinggi Dan Gender. *Jurnal Pendidikan Matematika (Kudus)*, *1*(1). https://doi.org/10.21043/jpm.v1i1.4455

Ulfa Masamah. (2017). Peningkatan Kemampuan Berpikir Reflektif Matematis Siswa Sma Melalui Pembelajaran Berbasis Masalah Ditinjau Dari Kemampuanawal Matematika. *Jurnal Penelitian Pendidikan Matematika, 1(1)*, 1–18.

Utomo, D. P. (2019). Instrumental and Relational Understanding Analysis of 5th Grade Elementary School Students on Integers Addition. *Advances in Social Science, Education and Humanities Research*, *349*.

van Riesen, S. A. N., Gijlers, H., Anjewierden, A. A., & de Jong, T. (2022). The influence of prior knowledge on the effectiveness of guided experiment design. *Interactive Learning Environments*, *30*(1), 17–33. https://doi.org/10.1080/10494820.2019.1631193

Waskitoningtyas, R. S. (2015). Pembelajaran Matematika dengan Kemampuan Metakognitif Berbasis Pemecahan Masalah Kontektual Mahasiswa Pendidikan Matematika Universitas Balikpapan. *Math Didactic: Jurnal Pendidikan Matematika*, *1*(3), 211–219. https://doi.org/10.33654/math.v1i3.21

Widiyasari, R., Kusumah, Y. S., & Nurlaelah, E. (2020). Analisis Kemampuan Berpikir Reflektif Mahasiswa Calon Guru Matematika pada Mata Kuliah Program Linier. *Fibonacci*, *6*(1), 67–76.

Wiersema, N. (2002). How does Collaborative Learning actually work in a classroom and how do students react to it ? A Brief Reflection. *Educational Resources Information Centre (ERIC)*, 1–8. https://eric.ed.gov/?id=ED464510

Winkel, W. . (2007). *Psikologi Pengajaran*. Gramedia.

Xenofontos, C., & Mouroutsou, S. (2022). Resilience in mathematics education research: a systematic review of empirical studies. *Scandinavian Journal of Educational Research*, 1–15.

https://doi.org/10.1080/00313831.2022.2115132

Yang, Z., Yang, X., Wang, K., Zhang, Y., Pei, G., & Xu, B. (2021). The Emergence of Mathematical Understanding: Connecting to the Closest Superordinate and Convertible Concepts. *Frontiers in Psychology*, *12*(November), 1–13. https://doi.org/10.3389/fpsyg.2021.525493

Yanik, H. B. (2014). Middle-school students' concept images of geometric translations. *Journal of Mathematical Behavior*, *36*, 33–50. https://doi.org/10.1016/j.jmathb.2014.08.001

Zanthy, L. S. (2018). Kontribusi Resiliensi Matematis Terhadap Kemampuan Akademik Mahasiswa Pada Mata Kuliah Statistika Matematika. *Mosharafa: Jurnal Pendidikan Matematika*, *7*(1), 85–94. https://doi.org/10.31980/mosharafa.v7i1.344

Zehavi, N., & Mann, G. (2005). "Instrumented Techniques and Reflective Thinking in Analytic Geometry. *The Mathematics Enthusiast*, *2*(2), 83–92. https://doi.org/https://doi.org/10.54870/1551-3440.1025

Zheng, Y. . (2001). *Mathematics Education: From Theory to Practice*. Shanghai Education Press. https://scholar.google.com/scholar?scilib=1&hl=en&as_sdt=0,5

Sezer, Renan. "Integration of critical thinking skills into elementary school teacher education courses in mathematics." *Education*, vol. 128, no. 3, spring 2008, pp. 349+. *Gale Academic OneFile*, link.gale.com/apps/doc/A177721139/AONE?u=anon~8f34e66d&sid=googleScholar&xid=becdd669.