

**KEMAMPUAN BERPIKIR REFLEKTIF MATEMATIS SISWA KELAS XI  
DALAM MENYELESAIKAN MASALAH MATEMATIS  
DITINJAU DARI PERSPEKTIF GAYA BELAJAR**

TESIS

Diajukan untuk memenuhi salah satu syarat memperoleh gelar  
Magister Pendidikan Matematika



Oleh:

**Fanisa Dina Amalia Dewi Umbara**  
**NIM. 2105131**

**PROGRAM STUDI MAGISTER PENDIDIKAN MATEMATIKA  
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
UNIVERSITAS PENDIDIKAN INDONESIA**

**2023**

**KEMAMPUAN BERPIKIR REFLEKTIF MATEMATIS SISWA KELAS XI  
DALAM MENYELESAIKAN MASALAH MATEMATIS  
DITINJAU DARI PERSPEKTIF GAYA BELAJAR**

Oleh:

Fanisa Dina Amalia Dewi Umbara  
S.Pd. Universitas Pendidikan Indonesia, 2021

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar  
Master Pendidikan pada Program Studi Magister Pendidikan Matematika  
Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

©Fanisa Dina Amalia Dewi Umbara 2023  
Universitas Pendidikan Indonesia  
April 2023

Hak Cipta dilindungi undang-undang.

Tesis ini tidak boleh diperbanyak seluruhnya atau sebagian,  
dengan dicetak ulang difoto kopi, atau cara lainnya tanpa ijin dari penulis.

## LEMBAR PENGESAHAN TESIS

### LEMBAR PENGESAHAN TESIS

FANISA DINA AMALIA DEWI UMBARA  
NIM. 2105131

KEMAMPUAN BERPIKIR REFLEKTIF MATEMATIS SISWA KELAS XI  
DALAM MENYELESAIKAN MASALAH MATEMATIS  
DITINJAU DARI PERSPEKTIF GAYA BELAJAR

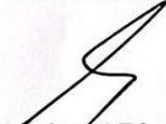
Disetujui dan disahkan oleh pembimbing:

Pembimbing I,



Prof. H. Yaya Sukjaya Kusumah, M.Sc., Ph.D.  
NIP. 195909221983031003

Pembimbing II,



Suhendra, M.Ed., Ph.D.  
NIP. 196509041991011001

Mengetahui,  
Ketua Program Studi Pendidikan Matematika



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

i

Scanned with CamScanner

i

## ABSTRAK

### **Fanisa Dina Amalia Dewi Umbara. (2023). Kemampuan Berpikir Reflektif Matematis Siswa Kelas XI dalam Menyelesaikan Masalah Matematis Ditinjau dari Perspektif Gaya Belajar.**

Kemampuan berpikir reflektif merupakan salah satu kemampuan berpikir tingkat tinggi yang berperan penting dalam proses penyelesaian masalah. Kemampuan ini membantu siswa berpikir tentang apa yang mereka lakukan dan mengapa mereka melakukannya. Setiap siswa memiliki kecenderungan gaya belajar yang berbeda, kecenderungan tersebut berkaitan dengan cara mereka mengasimilasi dan mengolah informasi yang diterima. Penelitian ini bertujuan untuk mendeskripsikan kecenderungan gaya belajar siswa kelas XI, kemampuan berpikir reflektif matematis siswa kelas XI, dan kemampuan berpikir reflektif matematis siswa kelas XI ditinjau dari perspektif gaya belajar. Metode yang digunakan pada penelitian ini adalah studi kasus dengan pendekatan kualitatif. Subjek penelitian yaitu siswa kelas XI di salah satu SMA di Kabupaten Bandung, Provinsi Jawa Barat yang telah mempelajari topik lingkaran. Teknik pengumpulan data yang digunakan yaitu teknik tes berupa tes kemampuan berpikir reflektif matematis dan teknik nontes berupa angket gaya belajar dan pedoman wawancara. Temuan penelitian menunjukkan bahwa kecenderungan gaya belajar mayoritas siswa adalah visual. Kemampuan berpikir reflektif matematis siswa secara keseluruhan termasuk dalam kategori sedang. Berdasarkan ketercapaian indikator kemampuan berpikir reflektif matematis ditinjau dari perspektif gaya belajar, siswa visual dengan kemampuan berpikir reflektif matematis tinggi, sedang, atau rendah memenuhi dua dari lima indikator. Siswa auditorial dengan kemampuan berpikir reflektif matematis tinggi memenuhi empat dari lima indikator, siswa auditorial dengan kemampuan berpikir reflektif matematis sedang memenuhi satu dari lima indikator, sementara siswa auditorial dengan kemampuan berpikir reflektif matematis rendah belum memenuhi semua indikator. Siswa kinestetik dengan kemampuan berpikir reflektif matematis tinggi memenuhi tiga dari lima indikator, sementara siswa kinestetik dengan kemampuan berpikir reflektif matematis sedang dan rendah memenuhi tiga dari lima indikator.

**Kata kunci:** kemampuan berpikir reflektif matematis, masalah matematis, gaya belajar.

## ABSTRACT

**Fanisa Dina Amalia Dewi Umbara. (2023). Mathematical Reflective Thinking Ability of Grade XI Students in Solving Mathematical Problem Viewed from The Perspective of Learning Style.**

Reflective thinking is one of the higher-order thinking skills for students, which has an essential role in the problem-solving process by helping students to think about what they are doing and why they are doing it. Every student's learning style is associated with how they assimilate and process information received. This study aims to describe the tendency of students' learning styles in grade XI, students' mathematical reflective thinking ability in grade XI, and students' mathematical reflective thinking ability in grade XI viewed from the perspective of learning style. The method used in this research is a case study with a qualitative approach. The research subjects were students of grade XI in one of the senior high schools in Kabupaten Bandung, Jawa Barat who has studied the circle topic. The data collection technique used was a test of mathematical reflective thinking ability and a non-test technique in the form of a learning style questionnaire and an interview guide. The results showed that most students learning styles tended to be visual. The ability of students' mathematical reflective thinking is included in the medium category. Based on the attainment of mathematical reflective thinking ability indicators viewed from their learning style, visual students with high, medium, or low mathematical reflective thinking ability can meet two of the five indicators. Auditory student with high mathematical reflective thinking ability can meet four of the five indicators, auditory student with moderate mathematical reflective thinking ability can meet one of the five indicators, while auditory student with low mathematical reflective thinking skill do not meet all indicators. Kinesthetic student with high mathematical reflective thinking ability can meet three of the five indicators, while kinesthetic students with moderate and low mathematical reflective thinking ability can meet three of the five indicators.

**Keywords:** mathematical reflective thinking ability, mathematical problems, learning style.

## DAFTAR ISI

LEMBAR PENGESAHAN TESIS.....	i
PERNYATAAN BEBAS PLAGIARISME.....	ii
KATA PENGANTAR .....	iii
UCAPAN TERIMA KASIH.....	iv
ABSTRAK .....	vi
ABSTRACT.....	vii
DAFTAR ISI.....	viii
DAFTAR TABEL.....	x
DAFTAR GAMBAR .....	xi
DAFTAR LAMPIRAN.....	xiii
BAB I PENDAHULUAN .....	1
1.1 Latar Belakang Masalah.....	1
1.2 Rumusan Masalah .....	10
1.3 Batasan Masalah.....	10
1.4 Tujuan Penelitian .....	11
1.5 Manfaat Penelitian .....	11
BAB II KAJIAN PUSTAKA .....	13
2.1 Berpikir Reflektif Matematis .....	13
2.2 Gaya Belajar.....	20
2.3 Masalah Matematis .....	27
2.4 Penelitian Relevan.....	33
2.5 Definisi Operasional.....	37
BAB III METODE PENELITIAN .....	39
3.1 Desain Penelitian.....	39
3.2 Subjek dan Tempat Penelitian.....	40
3.3 Teknik Pengumpulan Data.....	40
3.4 Instrumen Pengumpulan Data .....	42
3.5 Uji Keabsahan Data.....	44
3.6 Teknik Analisis Data.....	45
3.7 Prosedur Penelitian.....	50

BAB IV TEMUAN DAN PEMBAHASAN .....	52
4.1 Temuan.....	52
4.1.1 Temuan Angket Gaya Belajar Siswa .....	52
4.1.2 Temuan Tes Kemampuan Berpikir Reflektif Matematis Siswa dalam Menyelesaikan Masalah Matematis.....	66
4.1.3 Temuan Tes dan Wawancara Siswa Terkait Kemampuan Berpikir Reflektif Matematis dalam Menyelesaikan Masalah Matematis Ditinjau dari Perspektif Gaya Belajar..	73
4.2 Pembahasan.....	124
4.2.1 Deskripsi Kecenderungan Gaya Belajar Siswa.....	124
4.2.2 Deskripsi Kemampuan Berpikir Reflektif Matematis Siswa .....	126
4.2.3 Deskripsi Kemampuan Berpikir Reflektif Matematis Siswa Ditinjau dari Perspektif Gaya Belajar .....	128
BAB V SIMPULAN DAN REKOMENDASI .....	137
5.1 Simpulan .....	137
5.1.1 Kecenderungan Gaya Belajar Siswa Kelas XI.....	137
5.1.2 Kemampuan Berpikir Reflektif Matematis Siswa dalam Menyelesaikan Masalah Matematis .....	138
5.1.3 Kemampuan Berpikir Reflektif Matematis Siswa dalam Menyelesaikan Masalah Matematis Ditinjau dari Perspektif Gaya Belajar.....	139
5.2 Rekomendasi .....	142
5.2.1 Bagi Guru .....	142
5.2.2 Bagi Peneliti Selanjutnya .....	143
DAFTAR PUSTAKA .....	144
LAMPIRAN.....	153

## DAFTAR PUSTAKA

- Adenia, W. O., Angkotasan, N., & Suratno, J. (2019). Berpikir Reflektif Matematis Siswa dalam Menyelesaikan Soal Garis Singgung Lingkaran Berdasarkan Kemampuan Matematika. *Delta-Pi: Jurnal Matematika Dan Pendidikan Matematika*, 8(2), 53–68.
- Adha, S. M., & Rahaju, E. B. (2020). Profil Berpikir Reflektif Siswa SMA dalam Memecahkan Masalah Matematika Ditinjau dari Kecerdasan Logis-Matematis. *Jurnal Penelitian Pendidikan Matematika Dan Sains*, 4(2), 61–71.
- Agustan, S., Juniati, D., & Siswono, T. Y. E. (2017). Profile of Male-Field Dependent (FD) Prospective Teacher's Reflective Thinking in solving Contextual Mathematical Problem. *AIP Conference Proceedings*, 1867(020034), 1–7. <https://doi.org/10.1063/1.4994437>
- Akpur, U. (2020). Critical, Reflective, Creative Thinking and Their Reflections on Academic Achievement. *Thinking Skills and Creativity*, 37(July), 1–8. <https://doi.org/10.1016/j.tsc.2020.100683>
- Alavi, S., & Toozandehjani, H. (2017). The Relationship between Learning Styles and Students' Identity Styles. *Open Journal of Psychiatry*, 7, 90–102. <https://doi.org/10.4236/ojpsych.2017.72009>
- Alzain, M. A., Clark, S., & Jwaid, A. (2018). Adaptive Education Based on Learning Styles: Are Learning Style Instruments Precise Enough? *International Journal of Emerging Technologies in Learning*, 13(9), 41–52. <https://doi.org/10.3991/ijet.v13i09.8554>
- Amaliyah, S., Munawwir, Z., & Puspitasari, Y. (2021). Analisis Kemampuan Berpikir Reflektif dan Disposisi Matematis Siswa Ditinjau dari Gaya Belajar. *Jurnal IKA PGSD (Ikatan Alumni PGSD) UNARS*, 10(2), 305–321. <https://doi.org/10.36841/pgsdunars.v10i2.1429>
- Ambrose, R. (2004). Initiating Change in Prospective Elementary School Teachers' Orientations to Mathematics Teaching by Building on Beliefs. *Journal of Mathematics Teacher Education*, 7, 91–119.
- Apendi, F., & Prabawanto, S. (2019). Analysis of Student's Mathematical Reflective Thinking Ability in Number Pattern. *MSCEIS 2019*. <https://doi.org/10.4108/eai.12-10-2019.2296421>
- Apino, E., & Retnawati, H. (2017). Developing Instructional Design to Improve Mathematical Higher Order Thinking Skills of Students. *Journal of Physics: Conference Series*, 812(012100), 1–7. <https://doi.org/10.1088/1742-6596/755/1/011001>



- Ardani, D. A. P. (2021). Profile of High School Students Reflective Thinking in Solving Algebra Problems Viewed From Mathematical Ability. *MATHEdunesa*, 10(1), 59–68. <https://doi.org/10.26740/mathedunesa.v10n1.p59-68>
- As'ari, A. R., Mahmudi, A., & Nuerlaelah, E. (2017). Our Prospective Mathematic Teachers Are Not Critical Thinkers Yet. *Journal on Mathematics Education*, 8(2), 145–156.
- Baron, J. (1981). Reflective Thinking as a Goal of Education. *Intelligence*, 5(4), 291–309. [https://doi.org/10.1016/0160-2896\(81\)90021-0](https://doi.org/10.1016/0160-2896(81)90021-0)
- Baxter, P., & Jack, S. (2008). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The qualitative report*, 13(4), 544-559.
- Blum, W., & Niss, M. (1991). Applied Mathematical Problem Solving, Modelling, Applications, and Links to Other Subjects-State, Trends and Issues in Mathematics Instruction. *Educational Studies in Mathematics*, 22, 37–68.
- Chairunnisa, S. (2021). Analisis Kemampuan Berpikir Reflektif Matematis Siswa SMA Menyelesaikan Soal Program Linear Ditinjau dari Disposisi Matematis Kriteria Polking. *Prosiding Seminar Nasional Integrasi Matematika Dan Nilai Islami*, 4(1), 66–77. <http://digilib.uinsgd.ac.id/43448/>
- Brousseau, G. (2002). *Theory of Didactical Situation in Mathematics*. Academic Publisher.
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research Methods in Education*. Routledge.
- Costa, R. D., Souza, G. F., Valentim, R. A. M., & Castro, T. B. (2020). The Theory of Learning Styles Applied to Distance Learning. *Cognitive Systems Research*, 64, 134–145. <https://doi.org/10.1016/j.cogsys.2020.08.004>
- Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Third Edit). London: SAGE Publications, Inc.
- Cuevas, J., & Dawson, B. L. (2018). A Test of Two Alternative Cognitive Processing Models: Learning Styles and Dual Coding. *Theory and Research in Education*, 1–21. <https://doi.org/10.1177/1477878517731450>
- Depdiknas, R. I. (2003). UU No. 20 Tahun 2003 tentang Sistem Pendidikan Nasional. *Departemen Pendidikan Nasional Republik Indonesia Jakarta*.
- DePorter, B., & Hernacki, M. (2008). *Quantum Learning: Membiasakan Belajar Nyaman dan Menyenangkan*. Bandung: Kaifa.
- Dewey, J. (1933). *How We Think: A Restatement of The Relation of Reflective*

*Thinking to The Educative Process*. Boston: D.C. Heath and Company.

- Dian, C. K., Kriswandani, & Ratu, N. (2018). Analisis Kemampuan Berpikir Reflektif dalam Menyelesaikan Soal Cerita Materi Persegi bagi Siswa Kelas VIII SMP Kristen 02 Salatiga Tahun Ajaran 2017/2018. *Paedagogia*, 9(1), 1–4. <https://doi.org/10.31764/paedagogia.v9i1.245>
- Ekawati, M., & Asih, E. C. M. (2019). Mathematical Reflective Thinking Process Based on Cognitive Style. *Journal of Physics: Conference Series*, 1211(012069), 1–8. <https://doi.org/10.1088/1742-6596/1211/1/012069>
- Fauziyah, N., Lant, C. Le, Budayasa, I. K., & Juniati, D. (2019). Cognition Processes of Students with High Functioning Autism Spectrum Disorder in Solving Mathematical Problems. *International Journal of Instruction*, 12(1), 457–478. <https://doi.org/10.29333/iji.2019.12130a>
- Fleming, N. D., & Mills, C. (1992). Helping Students Understand How They Learn. *Teach Proffesor*, 7(4), 44–63.
- Flick, U. (2009). An Introduction To Qualitative Research Fourth Edition. New Delhi: *SAGE Publications*.
- Foshay, R., & Kirkley, J. (1998). *Principles for Teaching Problem Solving*. Plato Learning, Inc.
- Fuady, A. (2017). Berfikir Reflektif dalam Pembelajaran Matematika. *Jurnal Ilmiah Pendidikan Matematika*, 1(2), 104–112. <https://doi.org/10.26877/jipmat.v1i2.1236>
- Funny, R. A., Ghofur, M. A., Oktiningrum, W., & Nuraini, N. L. S. (2019). Reflective Thinking Skills of Engineering Students in Learning Statistics. *Journal on Mathematics Education*, 10(3), 445–458. <https://doi.org/10.22342/jme.10.3.9446.445-458>
- Gelter, H. (2003). Why is Reflective Thinking Uncommon. *Reflective Practice*, 4(3), 337–344. <https://doi.org/10.1080/1462394032000112237>
- Gunawan, A. W. (2007). *Genius Learning Strategy: Petunjuk Praktis untuk Menerapkan Accelerated Learning*. PT. Gramedia Pustaka Utama
- Gürol, 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).
- Halean, S., Kandowanko, N., & Goni, S. Y. V. I. (2021). Peranan Pendidikan dalam Meningkatkan Sumber Daya Manusia di SMA Negeri 1 Tampan Amma di Talaud. *Jurnal Holistik*, 14(2), 1–15.
- Haryati, T., Nindiasari, H., & Sudiana, R. (2017). Analisis Kemampuan dan

Disposisi Berpikir Reflektif Matematis Siswa Ditinjau dari Gaya Belajar. *JPPM*, 10(2), 146–158.

Hendriana, H., Putra, H. D., & Hidayat, W. (2019). How to design teaching materials to improve the ability of mathematical reflective thinking of senior high school students in Indonesia? *Eurasia Journal of Mathematics, Science and Technology Education*, 15(12), 1–20.  
<https://doi.org/10.29333/ejmste/112033>

Hidayat, N., Usodo, B., & Saputro, D. R. S. (2020). Reflective Thinking Ability of Junior High School Students of 2 Pleret Viewed from Self-Confidence. *International Journal of Multicultural and Multireligious Understanding*, 7(8), 117. <https://doi.org/10.18415/ijmmu.v7i8.1818>

Hocking, I., & Vernon, D. (2017). The Right Tool for The Right Task: Structured Techniques Prove Less Effective on An Ill-Defined Problem Finding Task. *Thinking Skills and Creativity*, 26, 84–91.

Honey, P., & Mumford, A. (2006). *Learning Styles Questionnaire: 80 Item Version*. London: Peter Honey Publications.

Hoogland, K., de Koning, J., Bakker, A., Pepin, B. E. U., & Gravemeijer, K. (2018). Changing representation in contextual mathematical problems from descriptive to depictive: The effect on students' performance. *Studies in Educational Evaluation*, 58(April), 122–131.  
<https://doi.org/10.1016/j.stueduc.2018.06.004>

Jaenudin, J., Nindiasari, H., & Pamungkas, A. S. (2017). Analisis Kemampuan Berpikir Reflektif Matematis Siswa Ditinjau Dari Gaya Belajar. *Prima: Jurnal Pendidikan Matematika*, 1(1), 69–82.  
<https://doi.org/10.31000/prima.v1i1.256>

Jr., G. C. M. (2019). Learning Styles, Study Habits and Academic Performance of Filipino University Students in Applied Science Courses: Implications for Instruction. *Journal of Technology and Science Education*, 9(2), 184–198.  
<https://doi.org/10.3926/jotse.504>

Juhaevah, F. (2017). Profil Kemampuan Berpikir Reflektif Siswa SMP dalam Memecahkan Masalah Matematika Standar PISA Ditinjau dari Perbedaan Gender. *Jurnal Matematika dan Pembelajaran*, 5(2), 221–236.  
<https://doi.org/10.33477/mp.v5i2.770>

Kartono, A., Mariani, P. D., & Mariani, S. (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>

Keefe, J. W. (1987). *Learning Style Theory and Practice*. Virginia: National Association of Secondary School Principals.

- Kember, D., McKay, J., Sinclair, K., & Wong, F. K. Y. (2008). A Four-Category Scheme for Coding and Assessing The Level of Reflection in Written Work. *Assessment & Evaluation in Higher Education*, 33(4), 369–379. <https://doi.org/10.1080/02602930701293355>
- Khamparia, A., & Pandey, B. (2020). Association of Learning Styles with Different E-Learning Problems : A Systematic Review and Classification. *Education and Information Technologies*, 25, 1303–1331. <https://doi.org/https://doi.org/10.1007/s10639-019-10028-y>
- Kholid, M. N., Sa'dijah, C., Hidayanto, E., & Permadi, H. (2020). How are students' reflective thinking for problem solving? *Journal for the Education of Gifted Young Scientists*, 8(3), 1135–1146. <https://doi.org/10.17478/JEGYS.688210>
- King, F., Goodson, L., & Rohani, F. (1997). *Higher Order Thinking Skills*. Educational Services Program.
- Kitchener, K. S. (1984). Educational Goals and Reflective Thinking. *Educational Forum*, 48(1), 74–95. <https://doi.org/10.1080/00131728309335882>
- Kolb, D. A. (1984). *Experiential Learning: Experience as The Source of Learning and Development*. Englewood Cliffs, N.J: Prentice Hall.
- Leasa, M., Corebima, A. D., Ibrohim, & Suwono, H. (2017). Emotional Intelligence among Auditory , Reading , and Kinesthetic Learning Styles of Elementary School Students in Ambon-Indonesia. *International Electronic Journal of Elementary Education*, 10(1), 83–91. <https://doi.org/10.26822/iejee.2017131889>
- Mahasneh, A. M. (2013). The Relationship between Reflective Thinking and Learning Styles among Sample of Jordanian University Students. *Journal of Education and Practice*, 4(21), 50–55.
- Mašić, A., Polz, E., & Bećirović, S. (2020). The Relationship between Learning Styles, GPA, School Level and Gender. *European Researcher*, 11(1), 51–60. <https://doi.org/10.13187/er.2020.1.51>
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis*. London: SAGE Publications.
- Moleong, L. J. (2009). *Metodologi Penelitian Kualitatif*. Bandung: PT. Remaja Rosdakarya.
- Muin, A., Novianti, L., & Musyrifah, E. (2017). Analysis of Mathematical Reflective Thinking Skills Based on Learning Model And Mathematical Prior Knowledge. *ICEMS 2017*, 115. <https://doi.org/10.2991/icems-17.2018.5>
- Mulbar, U., Rahman, A., & Ahmar, A. S. (2017). Analysis of The Ability in

Mathematical Problem-Solving Based on SOLO Taxonomy and Cognitive Style. *World Transactions on Engineering and Technology Education*, 15(1), 68–73. <https://doi.org/10.26858/wtetev15i1y2017p6873>

Muntazhimah, M., Turmudi, T., & Prabawanto, S. (2021). The Relation Between Prior Knowledge and Students' Mathematics Reflective Thinking Ability. *Journal of Physics: Conference Series*, 1731(012043), 1–6. <https://doi.org/10.1088/1742-6596/1731/1/012043>

Nabilah, Amrullah, Lu'luilmaknun, U., & Sripatmi. (2022). Analisis Kemampuan Berpikir Reflektif Matematis Siswa Ditinjau dari Gaya Belajar. *Journal of Classroom Action Research*, 5(1), 185–191. <https://doi.org/10.31000/prima.v1i1.256>

NCTM. (2000). *Principles and Standards for School Mathematics*. The National Council of Teachers of Mathematics, Inc.

Nindiasari, H. (2013). *Meningkatkan kemampuan dan disposisi berpikir reflektif matematis serta kemandirian belajar siswa SMA melalui pembelajaran dengan pendekatan metakognitif* (Doctoral dissertation, Universitas Pendidikan Indonesia).

Nissa, I., C. (2015). *Pemecahan Masalah Matematika*. Mataram: Duta Pustaka Ilmu.

Noor, K. B. M. (2008). Case study: A strategic research methodology. *American journal of applied sciences*, 5(11), 1602-1604

Nuankaew, P., Nuankaew, W., Phanniphong, K., Imwut, S., & Bussaman, S. (2019). Students Model in Different Learning Styles of Academic Achievement at the University of Phayao, Thailand. *International Journal of Emerging Technologies in Learning*, 14(12), 133–157.

Nurdalilah. (2021). Analisis Kemampuan Berpikir Reflektif Matematika dengan Gaya Belajar Visual, Auditorial dan Kinestetik Siswa. *MathEdu(Mathematics Education Journal)*, 4(3), 64–71.

Nurlita, M. (2015). Pengembangan Soal Terbuka (Open-Ended Problem) pada Mata Pelajaran Matematika SMP Kelas VIII. *Pythagoras: Jurnal Pendidikan Matematika*, 10(1), 38–49.

Nurrohmah, S., & Pujiastuti, H. (2020). Analisis Kemampuan Berpikir Reflektif Siswa dalam Menyelesaikan Soal Matematika Materi Lingkaran. *PRISMA*, 9(2), 118–127. <https://doi.org/10.35194/jp.v9i2.955>

Orakçı, Ş. (2021). Exploring the relationships between cognitive flexibility, learner autonomy, and reflective thinking. *Thinking Skills and Creativity*, 41(100838), 1–13. <https://doi.org/10.1016/j.tsc.2021.100838>

- Pamungkas, A. S., Mentari, N., & Nindiasari, H. (2018). Analisis Kemampuan Berpikir Reflektif Siswa SMP Berdasarkan Gaya Belajar. *NUMERICAL: Jurnal Matematika Dan Pendidikan Matematika*, 2(1), 69. <https://doi.org/10.25217/numerical.v2i1.209>
- Payadnya, I. P. A. A., & Jayantika, I. G. A. N. T. (2019). Analisis Kesulitan Siswa dalam Menangani Permasalahan Matematika Terbuka (Mathematic Open-Ended Problems). *Jurnal Santiaji Pendidikan (JSP)*, 8(2), 90–99. <https://doi.org/10.36733/jsp.v8i2.167>
- Polya, G. (1957). *How to Solve It: A New Aspect of Mathematical Method*. New Jersey: Princeton University Press.
- Prabawanto, S. (2013). *Peningkatan kemampuan pemecahan masalah, komunikasi, dan self-efficacy matematis mahasiswa melalui pembelajaran dengan pendekatan metacognitive scaffolding* (Doctoral dissertation, Universitas Pendidikan Indonesia).
- Priyaadharshini, M., & Sundaram, B. V. (2018). Evaluation of Higher-Order Thinking Skills Using Learning Style in An Undergraduate Engineering in Flipped Classroom. *Computer Applications in Engineering Education*, 1–18. <https://doi.org/10.1002/cae.22035>
- Rahman, A., & Ahmar, A. S. (2017). Relationship between Learning Styles and Learning Achievement in Mathematics Based on Genders. *World Transactions on Engineering and Technology Education*, 15(1), 74–77. <https://doi.org/10.26858/wtetev15i1y2017p7477>
- Ramadhani, R., & Juandi, D. (2020). An Analysis of Mathematical Reflective Thinking Skills of Senior High School Students. *Journal of Physics: Conference Series*, 1521(032059), 1–5. <https://doi.org/10.1088/1742-6596/1521/3/032059>
- Ramdani, R., Syamsuddin, A., & Sirajuddin, S. (2019). Development of Mathematical Module-Problem Solving Approach to Train Student's Reflective Thinking. *Pedagogical Research*, 4(4). <https://doi.org/10.29333/pr/5861>
- Ramdhani, M. R., Usodo, B., & Subanti, S. (2017). Student ' s Mathematical Understanding Ability Based on Self-Efficacy. *International Conference on Science and Applied Science*, 909(012065), 1–7. <https://doi.org/https://doi.org/10.1088/1742-6596/909/1/012065>
- Ratnaningsih, N., & Hidayat, E. (2020). Reflective mathematical thinking process and student errors: An analysis in learning style. *Journal of Physics: Conference Series*, 1613(1).
- Resnick, L. B. (1987). *Education and Learning to Think*. Washington, D.C: National Academy Press.

- Sabandar, J. (2013). *Berpikir Reflektif dalam Pembelajaran Matematika*. Prodi Pendidikan Matematika Sekolah Pascasarjana UPI.
- Saleh, S. (2017). *Analisis Data Kualitatif*. Bandung: Pustaka Ramadhan.
- Salido, A., & Dasari, D. (2019). The Analysis of Students' Reflective Thinking Ability Viewed by Students' Mathematical Ability at Senior High School. *Journal of Physics: Conference Series*, 1157(022121).  
<https://doi.org/10.1088/1742-6596/1157/2/022121>
- Schön, D. A. (1987). *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions*. Jossey Bass.
- Shadiq, F. (2004). Pemecahan Masalah, Penalaran dan Komunikasi. *Widyaiswara PPPG Matematika Yogyakarta*.
- Sholikhin, R., Nur Afifah, D. S., & Maryono, M. (2021). Students' Reflective Thinking in Mathematical Problem Solving. *MaPan*, 9(1), 153–166.  
<https://doi.org/10.24252/mapan.2021v9n1a10>
- Siyoto, S., & Sodik, M. A. (2015). *Dasar Metodologi Penelitian*. Yogyakarta: Literasi Media Publishing.
- Skemp, R.R., (1987). *The Psychology of Learning Mathematics*. Psychology Press.
- Sudria, I. B. N., Redhana, I. W., Kirna, I. M., & Aini, D. (2018). Effect of Kolb ' s Learning Styles under Inductive Guided-Inquiry Learning on Learning Outcomes. *International Journal of Instruction*, 11(1), 89–102.
- Sugiyono. (2015). *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: CV. Alfabeta.
- Suharna, H. (2018). *Teori Berpikir Reflektif dalam Menyelesaikan Masalah Matematika*. Yogyakarta: Deepublish.
- Sumarmo, U. (2016). *Pedoman Pemberian Skor pada Beragam Tes Kemampuan Matematik*.
- Suprianto, T., Noer, S. H., & Rosidin, U. (2020). Pengembangan Model Pembelajaran Group Investigation Berbantuan Soal Open Ended Untuk Meningkatkan Kemampuan Berpikir Reflektif Matematis. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 9(1), 72–85.
- Surbeck, E., Han, E. P., & Moyer, J. E. (1991). Assessing Reflective Responses in Journals. *Educational Leadership*, 25–27.
- Thahir, A., Komarudin, Hasanah, U. N., & Rahmahwaty. (2019). MURDER Learning Models and Self Efficacy: Impact on Mathematical Reflective Thinking Ability. *Journal for the Education of Gifted Young Scientists*, 7(4),

1120–1133. <https://doi.org/10.17478/jegys.594709>

- Tilaar, H. A. R. (2002). *Membenahi Pendidikan Nasional*. Jakarta: PT. Rineka Cipta
- University of Texas Learning Center (2006). *Learning Style Questionnaire*. Student Advising and Learning Center.
- Wahyuni, Y. (2017). Identifikasi Gaya Belajar (Visual, Auditorial, Kinestetik) Mahasiswa Pendidikan Matematika Universitas Bung Hatta. *JPPM*, 10(2), 128–132.
- Weast, D. (1996). Alternative teaching strategies: The case for critical thinking. *Teaching Sociology*, 24(2), 189-194.
- Wijaya, A. (2018). How Do Open-Ended Problems Promote Mathematical Creativity? A reflection of Bare Mathematics Problem and Contextual Problem. *Journal of Physics: Conference Series*, 983(1). <https://doi.org/10.1088/1742-6596/983/1/012114>
- Wulansari, M. D., Purnomo, D., & Utami, R. E. (2019). Analisis Kemampuan Berpikir Reflektif Siswa Kelas VIII dalam Memecahkan Masalah Matematika Ditinjau dari Gaya Belajar Visual dan Auditorial. *Imajiner: Jurnal Matematika Dan Pendidikan Matematika*, 1(6), 393–402. <https://doi.org/10.26877/imajiner.v2i2.5776>
- Yee, F. P. (2002). The Role of Problems to Enhance Pedagogical Practices in the Singapore Mathematics Classroom . *The Mathematics Educator*, 6(2), 15–31.
- Yeo, J. B. (2015). Development of a framework to characterise the openness of mathematical tasks. *International Journal of Science and Mathematics Education*, 15, 175-191.
- Yildirim, T. (2017). An Examination of Geography Teachers' Reflective Thinking Tendencies. *International Journal of Higher Education*, 6(6), 78–90. <https://doi.org/10.5430/ijhe.v6n6p78>
- Yin, R. K. (2016). *Qualitative Research from Start to Finish*. New York: The Guilford Press.
- Zhang, H., Huang, T., Liu, S., Yin, H., Li, J., Yang, H., & Xia, Y. (2020). A Learning Style Classification Approach Based on Deep Belief Network for Large-Scale Online Education. *Journal of Cloud Computing: Advances, Systems and Applications*, 9(26), 1–17. <https://doi.org/10.1186/s13677-020-00165-y>
- Zhang, J., & Dempsey, P. (2019). Exploration and confirmation of a reflective-thinking scale to measure transformative learning in online courses. *Assessment and Evaluation in Higher Education*, 44(3), 463–475.