ANALISIS KEMAMPUAN *COMPUTATIONAL THINKING* SISWA DALAM MENYELESAIKAN MASALAH MATEMATIS PADA MATERI SISTEM PERSAMAAN LINEAR DUA VARIABEL DITINJAU DARI *SELF-REGULATED LEARNING*

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UNIVERSITAS PENDIDIKAN INDONESIA
2025

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ABSTRAK

Nisa Novita Ardina Putri (2104896). Analisis Kemampuan *Computational Thinking* Siswa dalam Menyelesaikan Masalah Matematis pada Materi Sistem Persamaan Linear Dua Variabel Ditinjau dari *Self-Regulated Learning.*

Di era globalisasi dan digitalisasi abad ke-21, keterampilan pemecahan masalah menjadi salah satu kompetensi penting yang harus dimiliki siswa untuk menghadapi perkembangan zaman. Namun, hasil survei *Programme for International Student Assessment* (PISA) menunjukkan bahwa kemampuan pemecahan masalah siswa di Indonesia masih tergolong rendah. *Computational thinking* merupakan pendekatan pemecahan masalah yang mencakup berpikir sistematis, analitis, serta penyusunan solusi berbasis algoritma. Salah satu faktor yang dapat memengaruhi kemampuan ini adalah *self-regulated learning* (SRL), yaitu kemampuan siswa dalam mengatur proses belajar secara mandiri. Penelitian ini bertujuan mendeskripsikan kemampuan *computational thinking* siswa SMP dalam menyelesaikan permasalahan matematis pada materi Sistem Persamaan Linear Dua Variabel (SPLDV) ditinjau berdasarkan tingkat SRL yang tinggi, sedang, dan rendah. Metode penelitian yang digunakan adalah kualitatif dengan pendekatan studi kasus. Subjek penelitian adalah siswa kelas VIII di salah satu SMP Negeri di Kota Bandung, dengan instrumen berupa tes kemampuan *computational thinking*, angket SRL, dan pedoman wawancara. Hasil penelitian menunjukkan bahwa siswa dengan SRL tinggi mampu memenuhi seluruh indikator *computational thinking*. Siswa dengan SRL sedang hanya memenuhi indikator dekomposisi, sementara indikator pengenalan pola, berpikir algoritma, dan abstraksi belum terpenuhi sepenuhnya. Adapun siswa dengan SRL rendah hanya mampu memenuhi indikator dekomposisi, sedangkan pada indikator pengenalan pola belum terpenuhi sepenuhnya, dan pada indikator berpikir algoritma serta abstraksi tidak tercapai.
Kata kunci: *Computational Thinking, Self-Regulated Learning*, Sistem Persamaan Linear Dua Variabel.

ABSTRACT

Nisa Novita Ardina Putri (2104896). ***Analysis of Students' Computational Thinking Ability in Solving Mathematical Problems on the Topic of Two Variable Linear Equations Reviewed from Self-Regulated Learning.***

In the era of globalization and digitalization in the 21st century, problem-solving skills have become one of the essential competencies that students must possess to face contemporary challenges. However, the Programme for International Student Assessment (PISA) surveys showed that Indonesian students' problem-solving abilities were relatively low. Computational thinking is a problem-solving approach that involves systematic, analytical, and algorithmic processes in designing solutions, and one of the factors that may influence this ability is self-regulated learning (SRL), which refers to students' capacity to manage their own learning processes independently. This study aimed to describe the computational thinking abilities of junior high school students in solving mathematical problems on the topic of Linear Equations in Two Variables (SPLDV), viewed from high, medium, and low levels of SRL. The research employed a qualitative approach with a case study design. The subjects were eighth-grade students at a public junior high school in Bandung, and the instruments included a computational thinking test, an SRL questionnaire, and interview guidelines. The results reveal that students with high SRL are able to meet all computational thinking indicators, students with medium SRL only fulfill the decomposition indicator while the indicators of pattern recognition, algorithmic thinking, and abstraction are not fully achieved, and students with low SRL only meet the decomposition indicator, with pattern recognition partially achieved, and algorithmic thinking as well as abstraction not achieved at all.

Keywords: *Computational Thinking, Self-Regulated Learning, Linear Equation System of Two Variables*

DAFTAR ISI

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DAFTAR GAMBAR

DAFTAR LAMPIRAN

DAFTAR PUSTAKA

Adeoye, M. A., & Jimoh, H. A. (2023). Problem-Solving Skills Among 21st-Century Learners Toward Creativity and Innovation Ideas. *Thinking Skills and Creativity Journal*, *6*(1), 52–58. https://doi.org/10.23887/tscj.v6i1.62708

Ahmadi, D. L. A., Astuti, & Zulfah. (2025). Analisis Kemampuan Computational Thinking (CT) Peserta Didik Kelas VIII SMP Negeri 1 Bangkinang Kota. *Jurnal PEKA (Pendidikan Matematika)*, *8*(2), 246–255. https://doi.org/10.37150/jp.v8i2.3298

Aini, R. N. (2022). *Kemampuan Pemecahan Masalah Matematis Ditinjau Dari Self Regulated Learning Dan Minat Belajar Siswa SMA (Studi Komparatif Di Dua SMA Kota Bandung)*. Universitas Pendidikan Indonesia.

Akhdiyat, A. M., & Hidayat, W. (2018). Pengaruh Kemandirian Belajar Matematik Siswa Terhadap Kemampuan Berpikir Kreatif Matematis Siswa Sma. *Jurnal Pembelajaran Matematika Inovatif*, *1*(6).

Angeli, C., Voogt, J., Fluck, A., Webb, M., Cox, M., Malyn-Smith, J., & Zagami, J. (2016). A K-6 Computational Thinking Curriculum Framework: Implications for Teacher Knowledge. In *Journal of Educational Technology and Society* (Vol. 19, Issue 3).

Angraini, L. M., & Ilham Muhammad. (2023). Analysis Of Students' Computational Thinking Ability in Prior Mathematical Knowledge. *Indonesian Journal of Teaching and Learning (INTEL)*, *2*(2), 253–264. https://doi.org/10.56855/intel.v2i2.308

Ansori, M. (2020). Pemikiran Komputasi (Computational Thinking) dalam Pemecahan Masalah. *DIRASAH*, *3*(1), 111–126.

Azizah, Maimunah, & Roza, Y. (2019). Kemampuan Pemecahan Masalah Matematis Siswa Pada Materi Peluang Berdasarkan Self-Regulated Learning (S-Rl). *JRPM*, *4*(1), 23–31. https://doi.org/10.15642/jrpm.2019.23-31

Azizah, N. I., Roza, Y., & Maimunah, M. (2022). Computational Thinking Process of High School Students in Solving Sequences and Series Problems. *Jurnal Analisa*, *8*(1), 21–35. https://doi.org/10.15575/ja.v8i1.17917

Barr, V., & Stephenson, C. (2011). Bringing Computational Thinking to K-12. *ACM Inroads*, *2*(1), 48–54. https://doi.org/10.1145/1929887.1929905

Cahdriyana, R. A., & Richardo, R. (2020). Berpikir Komputasi dalam Pembelajaran Matematika. *LITERASI (Jurnal Ilmu Pendidikan)*, *11*(1), 50. https://doi.org/10.21927/literasi.2020.11(1).50-56

Cooper, S., & Dann, W. (2015). Programming: A Key Component of Computational Thinking in CS Courses for Non-Majors. *ACM Inroads*, *6*(1), 50–54. https://doi.org/10.1145/2723169

Csizmadia, A., Standl, B., & Waite, J. (2019). Integrating the constructionist learning theory with computational thinking classroom activities. *Informatics in Education*, *18*(1), 41–67. https://doi.org/10.15388/infedu.2019.03

Dagienė, V., & Sentance, S. (2016). It's Computational Thinking! Bebras Tasks in the Curriculum. In *Lecture Notes in Computer Science: Vol. 9973 LNCS* (pp. 28–39). Springer Verlag. https://doi.org/10.1007/978-3-319-46747-4_3

Denning, P. J. (2009). The profession of It: Beyond Computational Thinking. *Communications of the ACM*, *52*(6), 28–30. https://doi.org/10.1145/1516046.1516054

Doleck, T., Bazelais, P., Lemay, D. J., Saxena, A., & Basnet, R. B. (2017). Algorithmic Thinking, Cooperativity, Creativity, Critical Thinking, and Problem Solving: Exploring the Relationship Between Computational Thinking Skills and Academic Performance. *Journal of Computers in Education*, *4*(4), 355–369. https://doi.org/10.1007/s40692-017-0090-9

Eck, N. J. van, & Waltman, L. (2010). Software Survey: VOSviewer, a Computer Program for Bibliometric Mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

Elinda, E., Laelasari, L., & Raharjo, J. F. (2023). Analisis Computational Thinking dalam Menyelesaikan Masalah pada Materi Program Linear. *PRISMA*, *12*(1), 115. https://doi.org/10.35194/jp.v12i1.2635

Fauzi, A. M., & Abidin, Z. (2019). Analisis Keterampilan Berpikir Kritis Tipe Kepribadian Thinking-Feeling dalam Menyelesaikan Soal PISA. *Suska Journal of Mathematics Education*, *5*(1), 1. https://doi.org/10.24014/sjme.v5i1.6769

Grover, S., & Pea, R. (2013). Computational Thinking in K–12: A Review of the State of the Field. *Educational Researcher*, *42*(1), 38–43. https://doi.org/10.3102/0013189X12463051

Hardin, J. S., & Horton, N. J. (2017). Ensuring That Mathematics is Relevant in a World of Data Science. *Notices of the American Mathematical Society*, *64*(09), 986–990. https://doi.org/10.1090/noti1572

Haseski, H. I., Ilic, U., & Tugtekin, U. (2018). Defining a New 21st Century Skill-Computational Thinking: Concepts and Trends. *International Education Studies*, *11*(4), 29. https://doi.org/10.5539/ies.v11n4p29

Hong, F. T. (2013). The Role of Pattern Recognition in Creative Problem Solving: a Case Study in Search of New Mathematics for Biology. *Progress in Biophysics and Molecular Biology*, *113*(1), 181–215. https://doi.org/10.1016/j.pbiomolbio.2013.03.017

Indah, N., & Hidayati, N. (2021). Analisis Kesulitan Siswa Berdasarkan Kemampuan Pemahaman Konsep Matematis dalam Menyelesaikan Soal

Materi SPLDV. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *6*(1), 24–34. https://doi.org/10.31004/cendekia.v6i1.981

ISTE, & CSTA. (2011). *Operational Definition of Computational Thinking*. https://id.iste.org/docs/ct-documents/computational-thinkingoperational-definition-flyer.pdf

Jatmiko, D. D. H., Putra, A. M., Kristiana, A. I., Murtikusuma, R. P., & Adawiyah, R. (2025). Kemampuan Berpikir Logis Siswa Dalam Menyelesaikan Masalah Peluang Ditinjau dari Self-Regulated Learning. *Jurnal Ilmiah Matematika (JIMAT)*, *6*(1), 163–172. https://doi.org/10.63976/jimat.v6i1.921

Jeng, H.-L., Liu, L.-W., & Chen, C.-N. (2019). Developing a Procedural Problem-solving-based Framework of Computational Thinking Components. *2019 8th International Congress on Advanced Applied Informatics (IIAI-AAI)*, 272–277. https://doi.org/10.1109/IIAI-AAI.2019.00061

Juniar, N. (2024). Studi literatur: Pengaruh Self-Regulated Learning terhadap Prestasi Belajar Siswa. *Jendela: Jurnal Pendidikan Elaborasi Athirah*, *1*(1), 17–24.

Kamil, M. R., Imami, A. I., & Abadi, A. P. (2021). Analisis Kemampuan Berpikir Komputasional Matematis Siswa Kelas IX SMP Negeri 1 Cikampek pada Materi Pola Bilangan. *AKSIOMA: Jurnal Matematika Dan Pendidikan Matematika*, *12*(2), 259–270. https://doi.org/https://doi.org/10.26877/aks.v12i2.8447

Kramarski, B., & Gutman, M. (2006). How Can Self-Regulated Learning Be Supported in Mathematical E-Learning Environments. *Journal of Computer Assisted Learning*, *22*(1), 24–33. https://doi.org/10.1111/j.1365-2729.2006.00157.x

Kurnia, H. I., Royani, Y., Hendriana, H., & Nurfauziah, P. (2018). Analisis Kemampuan Komunikasi Matematik Siswa SMP Ditinjau dari Resiliensi Matematik. *JPMI: Jurnal Pembelajaran Matematika Inovatif*, *1*(5), 933–939. https://doi.org/https://doi.org/10.22460/jpmi.v1i5.p933-940

Lee, I., Martin, F., Denner, J., Coulter, B., Allan, W., Erickson, J., Malyn-Smith, J., & Werner, L. (2011). Computational Thinking for Youth in Practice. *ACM Inroads*, *2*(1), 32–37. https://doi.org/10.1145/1929887.1929902

Lee, T. Y., Mauriello, M. L., Ahn, J., & Bederson, B. B. (2014). CTArcade: Computational Thinking with Games in School Age Children. *International Journal of Child-Computer Interaction*, *2*(1), 26–33. https://doi.org/10.1016/j.ijcci.2014.06.003

Lee, T. Y., Mauriello, M. L., Ingraham, J., Sopan, A., Ahn, J., & Bederson, B. B. (2012). CTArcade: Learning Computational Thinking While Training Virtual Characters Through Game Play. *CHI '12 Extended Abstracts on Human*

Factors in Computing Systems, 2309–2314. https://doi.org/10.1145/2212776.2223794

Lensi Hariyani, Yurniwati Yurniwati, & Ade Dwi Utami. (2024). The Effect of Discovery Learning in Mathematics Learning on Computational Thinking in Terms of Self-Regulated Learning (SRL) in Student. *Jurnal Elementaria Edukasia*, *7*(2), 2801–2814. https://doi.org/10.31949/jee.v7i2.9551

Lestari, S., & Roesdiana, L. (2023). Analisis Kemampuan Berpikir Komputasional Matematis Siswa Pada Materi Program Linear. *Range: Jurnal Pendidikan Matematika*, *4*(2), 178–188.

Lu, J. J., & Fletcher, G. H. L. (2009). Thinking About Computational Thinking. *ACM SIGCSE Bulletin*, *41*(1), 260–264. https://doi.org/10.1145/1539024.1508959

Mukhid, A. (2008). Strategi Self-Regulated Learning (Perspektif Teoritik). *TADRIS: Jurnal Pendidikan Islam*, *3*. https://doi.org/https://doi.org/10.19105/tjpi.v3i2.239

Mustaqimah, U. P. S., & Ni'mah, K. (2024). Profil Kemampuan Berpikir Komputasi Siswa SMP Pada Soal Tantangan Bebras. *JPMI (Jurnal Pembelajaran Matematika Inovatif)*, *7*(2), 297–308. https://doi.org/10.22460/jpmi.v7i2.21590

NCTM. (2000). *Principles Standards and for School Mathematics: Vol. Reston* (Reston). NCTM.

Noviyanti, N., Yuniarti, Y., & Lestari, T. (2023). Pengaruh Pembelajaran Berdiferensiasi Terhadap Kemampuan Computational Thinking Siswa Sekolah Dasar. *Prima Magistra: Jurnal Ilmiah Kependidikan*, *4*(3), 283–293. https://doi.org/10.37478/jpm.v4i3.2806

Nuraini, F., Agustiani, N., & Mulyanti, Y. (2023). Analisis Kemampuan Berpikir Komputasi Ditinjau dari Kemandirian Belajar Siswa Kelas X SMK. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *7*(3), 3067–3082. https://doi.org/10.31004/cendekia.v7i3.2672

Nuraisa, D., Azizah, A. N., Nopitasari, D., & Maharani, S. (2019). Exploring Students Computational Thinking based on Self-Regulated Learning in the Solution of Linear Program Problem. *JIPM (Jurnal Ilmiah Pendidikan Matematika)*, *8*(1), 30. https://doi.org/10.25273/jipm.v8i1.4871

Nurcahyono, S. (2018). *Matematika, Cara Praktis Menyelesaikan SPLDV (Sistem Persamaan Linear Dua Variabel)*. CV. Cipta Media Edukasi.

Nurhayati, A. S., & Aripin, U. (2020). Students Thinking Process in Solving the Problems of Social Arithmetic Stories Test Based on Gender. *MaPan*, *8*(1), 103. https://doi.org/10.24252/mapan.2020v8n1a8

Oktaviani, S. S., & Hidayati, N. (2023). Analisis Self-Regulated Learning Siswa SMP Pada Materi Persamaan Linear Dua Variabel (SPLDV). *Prosiding Sesiomadika*, *4*.

Pintrich, P. R. (2000). The Role of Goal Orientation in Self-Regulated Learning. In *Handbook of Self-Regulation* (pp. 451–502). Elsevier. https://doi.org/10.1016/B978-012109890-2/50043-3

Pintrich, P. R. (2002). The Role of Metacognitive Knowledge in Learning, Teaching, and Assessing. *Theory Into Practice*, *41*(4), 219–225. https://doi.org/10.1207/s15430421tip4104_3

Pintrich, P. R. (2004). A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students. *Educational Psychology Review*, *16*(4), 385–407. https://doi.org/10.1007/s10648-004-0006-x

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology*, *82*(1), 33–40. https://doi.org/10.1037/0022-0663.82.1.33

Puustinen, M., & Pulkkinen, L. (2001). Models of Self-regulated Learning: A review. *Scandinavian Journal of Educational Research*, *45*(3), 269–286. https://doi.org/10.1080/00313830120074206

Rahma P, F. L., Putri, I. A., Tanjung, M. S., & Siregar, R. (2024). Studi Literatur: Pentingnya Berpikir Komputasional dalam Meningkatkan Kemampuan Pemecahan Masalah Matematis Peserta Didik. *Bilangan: Jurnal Ilmiah Matematika, Kebumian Dan Angkasa*, *2*(2), 23–33. https://doi.org/10.62383/bilangan.v2i2.36

Rahman, M. M. (2019). 21st Century Skill "Problem Solving": Defining the Concept. *Asian Journal of Interdisciplinary Research*, *2*(1), 64–74. https://doi.org/10.34256/ajir1917

Rahmawati, E. Z., & Setyaningsih, N. (2022). Metacognitive Skills of Student in Solving Problems of Two-Variable Linear Equation Systems in Terms of Self-Regulated Learning. *Jurnal Riset Pendidikan Matematika*, *9*(1). https://doi.org/10.21831/jrpm.v9i1.49163

Rohmayanti, & Astuti, R. T. (2023). Analisis Bibliometrik Promosi Kesehatan Selama Masa Pandemi COVID-19 Menggunakan VOSviewer. *BACA: Jurnal Dokumentasi Dan Informasi*, *44*(1), 1–15. https://doi.org/10.55981/j.baca.2023.308

Rosali, D. F., & Suryadi, D. (2021). An Analysis of Students' Computational Thinking Skills on The Number Patterns Lesson during The Covid-19 Pandemic. *Formatif: Jurnal Ilmiah Pendidikan MIPA*, *11*(2). https://doi.org/10.30998/formatif.v11i2.9905

Schunk, D. H., & Ertmer, P. A. (2000). Self-Regulation and Academic Learning. In *Handbook of Self-Regulation* (pp. 631–649). Elsevier. https://doi.org/10.1016/B978-012109890-2/50048-2

Selby, C. C., & Woollard, J. (2010). *Computational Thinking: The Developing Definition*.

Shute, V. J., Sun, C., & Asbell-Clarke, J. (2017). Demystifying Computational Thinking. *Educational Research Review*, *22*, 142–158. https://doi.org/10.1016/j.edurev.2017.09.003

Sidabutar, C. E. R., & Simanjuntak, R. M. (2023). Analisis Kemampuan Literasi Matematika Siswa dalam Menyelesaikan Soal Hots dan Self-Regulated Learning Pada Materi SPLTV di SMA Swasta Pamasta Tanjung Morawa. *INNOVATIVE: Journal of Social Science Research*, *3*, 5926–5939.

Solehudin, S., Darhim, D., & Herman, T. (2024). Analisis Kemampuan Dekomposisi Computational Thinking Siswa Pada Materi Sistem Persamaan Linear Dua Variabel. *Jurnal Perspektif*, *8*(2), 218. https://doi.org/10.15575/jp.v8i2.304

Sriwahyuni, K., & Maryati, I. (2022). Kemampuan Pemecahan Masalah Matematis Siswa pada Materi Statistika. *Plusminus: Jurnal Pendidikan Matematika*, *2*(2), 335–344.

Sugiyono. (2023). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (5th ed.). ALFABETA. www.cvalfabeta.com

Supiarmo, M. G. S., Turmudi, & Susanti, E. (2021). Proses Berpikir Komputasional Siswa dalam Menyelesaikan Soal Pisa Konten Change and Relationship Berdasarkan Self-Regulated Learning. *Numeracy*, *8*(1), 58–72. https://doi.org/10.46244/numeracy.v8i1.1378

Supriani, Y. (2017). Menumbuhkan Kemandirian Belajar Matematika Siswa Berbantuan Quipper School. *JIPMat*, *1*(2). https://doi.org/10.26877/jipmat.v1i2.1248

Syarifah, R., Permadi, H., Qohar, A., & Anwar, L. (2023). Kemampuan Pemecahan Masalah Geometri Siswa berdasarkan Self-Regulated Learning. *Edumatica: Jurnal Pendidikan Matematika*, *13*(03), 258–272. https://doi.org/10.22437/edumatica.v13i03.22185

Thalib, F., & Te'dang, L. (2024). Analisis Kemampuan Menyelesaikan Soal Cerita Pokok Bahasan SPLDV Siswa Kelas VIII SMP. *Journal of Mathematics Education Research (JoMER)*, *1*(3), 70–79.

Thomas, E., & Magilvy, J. K. (2011). Qualitative Rigor or Research Validity in Qualitative Research. *Journal for Specialists in Pediatric Nursing*, *16*(2), 151–155. https://doi.org/10.1111/j.1744-6155.2011.00283.x

Trisnowati, E., Juliyanto, E., Dewantari, N., & Siswanto. (2021). Pengenalan Computational Thinking dan Aplikasinya dalam Pembelajaran IPA SMP. *ABDIPRAJA (Jurnal Pengabdian Kepada Masyarakat)*, *2*(2), 117–182. https://doi.org/10.31002/abdipraja.v2i2.4514

Tsuchiya, M. (2019). Developing a Self-regulated Learning Scale for Learning English as a Foreign Language. *International Journal of Curriculum Development and Practice*, *21*(1), 39–51. https://doi.org/10.18993/jcrdaen.21.1_39

Wahyuningsih, S. (2013). *Metode Penelitian Studi Kasus (Konsep, Teori Pendekatan Psikologi Komunikasi, dan Contoh Penelitiannya)*. UTM Press.

Wing, J. M. (2006). Computational Thinking. *ACM*, *49*(3), 33–35.

Wing, J. M. (2008). Computational Thinking and Thinking About Computing. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *366*(1881), 3717–3725. https://doi.org/10.1098/rsta.2008.0118

Wing, J. M. (2010). *Computational Thinking: What and Why?*

Wing, J. M. (2017). Computational thinking's Influence on Research and Education for All. *Italian Journal of Educational Technology*, *25*(2), 7–14. https://doi.org/https://doi.org/10.17471/2499-4324/922

Winne, P. H., & Hadwin, A. F. (1998). Studying as Self-Regulated Learning. *Metacognition in Educational Theory and Practice*, 277–304. https://www.researchgate.net/publication/247664651

Yadav, A., Gretter, S., Good, J., & McLean, T. (2017). Computational Thinking in Teacher Education. In *Emerging Research, Practice, and Policy on Computational Thinking* (pp. 205–220). Springer International Publishing. https://doi.org/10.1007/978-3-319-52691-1_13

Yuda, E. K., & Rosmilawati, I. (2024). Literasi Numerasi di Sekolah Dasar Berdasarkan Indikator PISA 2023; Systematic Literatur Review. *Journal of Instructional and Development Researches*, *4*(3), 172–191. https://doi.org/10.53621/jider.v4i3.326

Zamnah, L. N. (2017). Hubungan Antara Self-Regulated Learning dengan Kemampuan Pemecahan Masalah Matematis Pada Mata Pelajaran Matematika Kelas VIII SMP Negeri 3 Cipaku. *TEOREMA: Teori Dan Riset Matematika*, *1*(2), 31. https://doi.org/10.25157/teorema.v1i2.549

Zeidner, M., Boekaerts, M., & Pintrich, P. R. (2000). Self-Regulation. In *Handbook of Self-Regulation* (pp. 749–768). Elsevier. https://doi.org/10.1016/B978-012109890-2/50052-4

Zimmerman, B. J. (1989). A Social Cognitive View of Self-Regulated Academic Learning. *Journal of Educational Psychology*, *81*(3), 329–339. https://doi.org/10.1037/0022-0663.81.3.329

Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory Into Practice*, *41*(2), 64–70. https://doi.org/10.1207/s15430421tip4102_2