

DAFTAR PUSTAKA

- Abdelrahman, R. M. (2020). Metacognitive awareness and academic motivation and their impact on academic achievement of Ajman University students. *Heliyon*, 6(1), e04192. <https://doi.org/10.1016/j.heliyon.2020.e04192>
- Akkus, H., Kadayifci, H., & Atasoy, B. (2011). Development and Application of a Two-tier Diagnostic Test to Assess Secondary Students' Understanding of Chemical Equilibrium Concepts. *Journal of Baltic Science Education*, 10(3), 146–155.
- Alfonso, D. V. (2015). Evidence of Critical Thinking in High School Humanities Classrooms. *GiST Education and Learning Research Journal*, 11, 26–44. <https://doi.org/10.26817/16925777.281>
- Allegretti, C. L., & Frederick, J. N. (1995). A Model for Thinking Critically about Ethical Issues. *Teaching of Psychology*, 22(1), 46–48. https://doi.org/10.1207/s15328023top2201_14
- Anderson, L. W., Krathwohl Peter W Airasian, D. R., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., Raths, J., & Wittrock, M. C. (2001). *A Taxonomy for Learning, Teaching, and Assessing: a Revision of Bloom's Taxonomy of Educational Objectives*. <https://www.uky.edu/~rsand1/china2018/texts/Anderson-Krathwohl - A taxonomy for learning teaching and assessing.pdf>
- Anderson, N. J. (2002). *The Role of Metacognition in Second Language Teaching and Learning*.
- Annisa, L., Oktaviana, C., & Habibi, A. A. (2020). Hubungan Keterampilan Berpikir Kritis Dengan Hasil Belajar Peserta Didik. *Edubiologica Jurnal Penelitian Ilmu Dan Pendidikan Biologi*, 8(1), 35–37. <https://doi.org/10.25134/edubiologica.v8i1.2337>
- Arikunto, S. (2010). *Prosedur Penelitian Suatu Pendekatan Praktik: Menentukan dan Menyusun Instrumen*. Jakarta: Rineka Cipta.
- Aydin, S. Ö., Şahin, S., & Sicaker, A. (2014). The Effect of Protein Synthesis Game in the Class on the Students' Understanding of Protein Synthesis Subject. *Procedia - Social and Behavioral Sciences*, 116(1), 3075–3078. <https://doi.org/10.1016/j.sbspro.2014.01.710>
- Azar, A. (2010). The effect of critical thinking dispositions on students achievement in selection and placement exam for university in Turkey. *Journal of Turkish Science Education*, 7(1), 61–73.
- Bae, H., & Kwon, K. (2019). Developing metacognitive skills through class activities: what makes students use metacognitive skills? *Educational Studies*, 1–16. <https://doi.org/10.1080/03055698.2019.1707068>
- Basith, A., Corebima, A. D., & Zubaidah, S. (2014). Hubungan antara Keterampilan Metakognitif dan Pemahaman Konsep Biologi Siswa Kelas X pada Penerapan Strategi Problem-Based Learning dan Reciprocal Teaching di SMAN 9 Malang. *Prosiding Seminar Nasional XI Pendidikan Biologi*

FKIP UNS, 423–428.

- Boso, C. M., van der Merwe, A. S., & Gross, J. (2021). Students' and educators' experiences with instructional activities towards critical thinking skills acquisition in a nursing school. *International Journal of Africa Nursing Sciences*, *14*, 100293. <https://doi.org/10.1016/j.ijans.2021.100293>
- Bruckermann, T., Aschermann, E., Bresges, A., & Schlüter, K. (2017). Metacognitive and Multimedia Support of Experiments in Inquiry Learning for Science Teacher Preparation. *International Journal of Science Education*, 1–22. <https://doi.org/10.1080/09500693.2017.1301691>
- Carvalho, C., Fiuza, E., Conboy, J., Fonseca, J., Santos, J., Gama, A. P., & Salema, M. H. (2015). Critical thinking, real life problems and feedback in the sciences classroom. *Journal of Turkish Science Education*, *12*(2), 21–31. <https://doi.org/10.12973/tused.10138a>
- Çepni, S., Ülger, B. B., & Ormanci, Ü. (2017). Pre-Service Science Teachers' Views towards the Process of Associating Science Concepts with Everyday Life. *Journal of Turkish Science Education*, *14*(4), 1–15. <https://doi.org/10.12973/tused.10208>
- Chukwuyenum, A. N. (2013). Impact of Critical thinking on Performance in Mathematics among Senior Secondary School Students in Lagos State. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *3*(5), 18–25. <https://doi.org/10.9790/7388-0351825>
- Cleveland, L. M., McCabe, T. M., & Olimpo, J. T. (2018). A Call for Programmatic Assessment of Undergraduate Students' Conceptual Understanding and Higher-Order Cognitive Skills †. *Journal of Microbiology & Biology Education*, *19*(1), 1–6. <https://doi.org/10.1128/jmbe.v19i1.1368>
- Corebima, A. D. (2009). Metacognitive skill measurement integrated in achievement test. In Third International Conference on Science and Mathematics Education (CoSMEd). Penang: SEAMEO Regional Centre for Education in Science and Mathematics. Retrieved from <http://ftp.recsam.edu.my/cosmed/cosmed09/AbstractsFullPapers2009/Abstract/ScienceParallel PDF/Full Paper/01.pdf>
- Crealock-Ashurst, B., Williams, L., & Moffat, K. (2017). A Critical Reflection on the 28th International Biology Olympiad. *Exchanges: The Interdisciplinary Research Journal*, *5*(1), 127–136. <https://doi.org/10.31273/eirj.v5i1.221>
- de Bruin, A. B. H., Dunlosky, J., & Cavalcanti, R. B. (2017). Monitoring and regulation of learning in medical education: the need for predictive cues. *Medical Education*, *51*(6), 575–584. <https://doi.org/10.1111/medu.13267>
- Dekker, T. J. (2020). Teaching critical thinking through engagement with multiplicity. *Thinking Skills and Creativity*, *37*(1), 100701. <https://doi.org/10.1016/j.tsc.2020.100701>
- Depaepe, F., de Corte, E., & Verschaffel, L. (2010). Teachers' metacognitive and heuristic approaches to word problem solving: Analysis and impact on students' beliefs and performance. *ZDM Mathematics Education*, *42*(1), 205–218. <https://doi.org/10.1007/s11858-009-0221-5>

- Duit, R., & Treagust, D. F. (2003). Conceptual change: A powerful framework for improving science teaching and learning. *International Journal of Science Education*, 25(6), 671–688. <https://doi.org/10.1080/0950069032000076652>
- Dumais, N., & Hasni, A. (2009). High School Intervention for Influenza Biology and Epidemics/Pandemics: Impact on Conceptual Understanding among Adolescents. *Cbe-Life Sciences Education*, 8(1), 62–71. <https://doi.org/10.1187/cbe.08>
- Dwyer, C. P., Hogan, M. J., & Stewart, I. (2014). An integrated critical thinking framework for the 21st century. *Thinking Skills and Creativity*, 12(1), 43–52. <https://doi.org/10.1016/j.tsc.2013.12.004>
- Facione, P. A. (2011). Critical Thinking : What It Is and Why It Counts. In *Insight assessment*. Insight Assessment. <https://www.insightassessment.com/CT-Resources/Teaching-For-and-About-Critical-Thinking/Critical-Thinking-What-It-Is-and-Why-It-Counts/Critical-Thinking-What-It-Is-and-Why-It-Counts-PDF>
- Fauzi, A. (2019). Profile of Junior High School Students' Critical Thinking Skills in Answering Questions Related to Biological Concepts. *Scientiae Educatia: Jurnal Pendidikan Sains*, 8(1), 51–63. <https://doi.org/10.24235/sc.educatia.v8i1.4081>
- Finken, M., & Ennis, R. H. (1993). *Illinois Critical Thinking Essay Test* (pp. 1–17).
- Flavell, J. H. (1979). Metacognition and Cognitive Monitoring. In *American Psychologist* (Vol. 34, Issue 10, pp. 906–911). <https://doi.org/10.1093/nq/CLVII.dec14.424-a>
- Fouché, J. (2011). Do Metacognitive Strategies Improve Student Achievement in Secondary Science Classrooms? *Christian Perspectives in Education*, 4(2), 1–25.
- Foy, P. (2017). *TIMSS 2015 User Guide For The Internatinal DataBase*.
- Hadi, S., Retnawati, H., Munadi, S., Apino, E., & Wulandari, N. F. (2018). The Difficulties of High School Students in Solving Higher-Order Thinking Skills Problems. *Problems of Education in the 21st Century*, 76(4), 520–532. <https://doi.org/10.33225/pec/18.76.520>
- Halpern, D. F. (2013). Critical Thinking Workshop for Helping our Students Become Better Thinkers. In *Ideas to Action*. <http://louisville.edu/ideastoaction/-/files/featured/halpern/critical-thinking.pdf>
- Hardianti, Y., Sartono, N., & Dewahrani, Y. R. (2014). Pengaruh Penggunaan Lembar Kerja Siswa (LKS) Bilingual terhadap Hasil Belajar Siswa pada Materi Sistem Reproduksi Manusia. *Biosfer*, 7(1), 30–36. <https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Yayinlar/kitaplar/diger-kitaplar/TBSA-Beslenme-Yayini.pdf>
- Hasan, R., Lukitasari, M., Utami, S., & Anizar, A. (2019). The activeness, critical, and creative thinking skills of students in the Lesson Study-based inquiry and cooperative learning. *Jurnal Pendidikan Biologi Indonesia*, 5(1), 77–84. <https://doi.org/10.22219/jpbi.v5i1.7328>
- Hmelo-Silver, C. E., Marathe, S., & Liu, L. (2007). Fish swim, rocks sit, and lungs breathe: Expert-novice understanding of complex systems. *Journal of the Learning Sciences*, 16(3), 307–331. <https://doi.org/10.1080/10508400701413401>

- Ichsan, I. Z., Sigit, D. V., Miarsyah, M., Ali, A., Arif, W. P., & Prayitno, T. A. (2019). HOTS-AEP: Higher order thinking skills from elementary to master students in environmental learning. *European Journal of Educational Research*, 8(4), 935–942. <https://doi.org/10.12973/eu-jer.8.4.935>
- Jacobs, J. E., & Paris, S. G. (1987). Children's Metacognition About Reading: Issues in Definition, Measurement, and Instruction. *Educational Psychologist*, 22(3–4), 255–278. <https://doi.org/10.1080/00461520.1987.9653052>
- Jatmiko, B., Prahani, B. K., Munasir, Supardi, Z. A. I., Wicaksono, I., Erlina, N., Pandiangan, P., Althaf, R., & Zainuddin. (2018). The comparison of oripa teaching model and problem based learning model effectiveness to improve critical thinking skills of pre-service physics teachers. *Journal of Baltic Science Education*, 17(2), 300–319.
- Kozikoğlu, İ. (2019). Investigating critical thinking in prospective teachers: Metacognitive skills, problem solving skills and academic self-efficacy. *Journal of Social Studies Education Research*, 10(2), 111–130.
- Krathwohl, D. R. (2002). A Revision of Bloom's Taxonomy: An Overview. *American Journal of Psychology*, 41(4), 219–225. <https://doi.org/10.1207/s15430421tip4104>
- Kristiani, N. (2015). Hubungan Keterampilan Metakognitif dan Hasil Belajar Kognitif Siswa pada Pembelajaran Saintifik dalam Mata Pelajaran Biologi SMA Kurikulum 2013. *Jurnal Biologi, Sains, Lingkungan, Dan Pembelajarannya*, 10(6), 513–518.
- Ku, K. Y. L. (2009). Assessing students' critical thinking performance: Urging for measurements using multi-response format. *Thinking Skills and Creativity*, 4(1), 70–76. <https://doi.org/10.1016/j.tsc.2009.02.001>
- Kuhn, D. (1999). A developmental model of critical thinking. *American Educational Researcher Association*, 28(2), 16–46. <https://doi.org/10.3102/0013189X028002016>
- Kyriakides, L., Anthimou, M., & Panayiotou, A. (2020). Searching for the impact of teacher behavior on promoting students' cognitive and metacognitive skills. *Studies in Educational Evaluation*, 64(1), 100810. <https://doi.org/10.1016/j.stueduc.2019.100810>
- Lestari, D., Handayani, D., Darussyamsu, R., & Armen, A. (2019). Identifikasi Miskonsepsi Peserta Didik Kelas VIII SMPN 21 Padang pada Materi Sistem Gerak MakhluK Hidup Menggunakan Teknik CRI. *Atrium Pendidikan Biologi*, 135–142.
- Lestari, P., Ristanto, R. H., & Miarsyah, M. (2019). Metacognitive and Conceptual Understanding of Pteridophytes: Development and Validity Testing of an integrated Assessment Tool. *Indonesian Journal of Biology Education*, 2(1), 15–24. <https://doi.org/10.31002/ijobe.v2i1.1225>
- Lucenario, J. L. S., Yangco, R. T., Punzalan, A. E., & Espinosa, A. A. (2016). Pedagogical Content Knowledge-Guided Lesson Study: Effects on Teacher Competence and Students' Achievement in Chemistry. *Education Research International*, 2016(1), 1–9. <https://doi.org/10.1155/2016/6068930>

- Lukitasari, M., Hasan, R., & Murtafiah, W. (2019). Using critical analysis to develop metacognitive ability and critical thinking skills in biology. *Jurnal Pendidikan Biologi Indonesia*, 5(1), 151–158. <https://doi.org/10.22219/jpbi.v5i1.7262>
- Malahayati, E. N., Duran Corebima, A., & Zubaidah, S. (2015). Hubungan Keterampilan Metakognitif dan Kemampuan Berpikir Kritis dengan Hasil Belajar Biologi Siswa SMA dalam Pembelajaran Problem Based Learning (PBL). *Jurnal Pendidikan Sains*, 3(4), 178–185.
- Mathai, S., & Ramadas, J. (2009). Visuals and Visualisation of Human Body Systems. *International Journal of Science Education*, 31(3), 439–458. <https://doi.org/10.1080/09500690802595821>
- Meilina, D. F., Widiyaningrum, P., & Supriyanto, S. (2016). Efektivitas Pembelajaran Learning Cycle 5E dipadu dengan Media Puzzle Education pada Materi Sistem Gerak Manusia di SMA. *Unnes Journal of Biology Education*, 5(1), 44–49.
- Mi, S., Lu, S., & Bi, H. (2020). Trends and foundations in research on students' conceptual understanding in science education: A method based on the structural topic model. *Journal of Baltic Science Education*, 19(4), 551–568. <https://doi.org/10.33225/jbse/20.19.551>
- Miharja, F. J., Hindun, I., & Fauzi, A. (2019). Critical thinking, metacognitive skills, and cognitive learning outcomes: a correlation study in genetic studies. *Biosfer*, 12(2), 135–143. <https://doi.org/10.21009/biosferjpb.v12n2.135-143>
- Miller, T. M. (2017). Measurement, Theory, and Current Issues in Metacognition: An Overview Tyler. In *ACS Symposium Series* (pp. 1–15). <https://doi.org/10.1021/bk-2017-1269.ch001>
- Mills, S. (2016). Conceptual understanding: A concept analysis. *The Qualitative Report*, 21(3), 546–557.
- Mite, Y., & Corebima, D. A. (2017). The Correlation Between Critical Thinking and The Learning Results of The Senior High School Students in Biology Learning Implementing Group Investigation (GI) Learning in Malang, Indonesia. *Journal of Applied and Advanced Research*, 2(2), 56–62. <https://doi.org/10.21839/jaar.2017.v2i2.57>
- Molin, F., Haelermans, C., Cabus, S., & Groot, W. (2020). The effect of feedback on metacognition - A randomized experiment using polling technology. *Computers and Education*, 152(1), 103885. <https://doi.org/10.1016/j.compedu.2020.103885>
- Morgenroth, O., Keck, M., & Gensicke, M. (2021). Time will tell: Time perspective as a source for metacognitive emotion-focused coping and its measurement. *Personality and Individual Differences*, 168(1), 110367. <https://doi.org/10.1016/j.paid.2020.110367>
- Murawski, L. M. (2014). Critical Thinking in the Classroom... and Beyond. *Journal of Learning in Higher Education*, 10(1), 25–30. <https://doi.org/10.1021/acs.jchemed.6b00406>
- Netri, N., Holiwarni, B., & Abdullah, A. (2018). Development of test instruments based higher order thinking skill (HOTS) on chemical equilibrium at second grade in senior high school. *Jom*, 5(2), 1–11.

<https://jom.unri.ac.id/index.php/JOMFKIP/article/download/20515/19843>

- Nisa, A., Djamahar, R., & Evriyani, D. (2015). Pengaruh Penggunaan Media Permainan Ular Tangga Terhadap Hasil Belajar Kognitif pada Materi Sistem Reproduksi Manusia. *Jurnal Biosfer*, 8(2), 20–26.
- Nolan, J. (2005). Interpretation: techniques and exercises. In *Multilingual Matters*. <https://doi.org/10.1080/1750399x.2014.972030>
- Nurhayati, N., Hartoyo, A., & Hamdani, H. (2017). Kemampuan Metakognisi Siswa dalam Pemecahan Masalah pada Materi Bangun Datar Di Kelas VII SMP. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa*, 6(1), 1–13.
- Nuri, A. R. U., Sajidan, S., Oetomo, D., Prasetyanti, N. M., & Parmin, P. (2019). Improving Indonesian Senior High School Students' Critical Thinking Skill through Science Integrated Learning (SIL) Model. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, 4(2), 145–158. <https://doi.org/10.24042/tadris.v4i2.3144>
- OECD. (2014). *PISA 2012 Result: What Students Know and Can Do: Vol. I*. <https://doi.org/10.1787/9789264208780-5-en>
- Omar, N., Haris, S. S., Hassan, R., Arshad, H., Rahmat, M., Zainal, N. F. A., & Zulkifli, R. (2012). Automated Analysis of Exam Questions According to Bloom's Taxonomy. *Procedia - Social and Behavioral Sciences*, 59, 297–303. <https://doi.org/10.1016/j.sbspro.2012.09.278>
- Ongardwanich, N., Kanjanawasee, S., & Tuipae, C. (2015). Development of 21st Century Skill Scales as Perceived by Students. *Procedia - Social and Behavioral Sciences*, 191(1), 737–741. <https://doi.org/10.1016/j.sbspro.2015.04.716>
- Papleontiou-Louca, E. (2003). The concept and instruction of metacognition. *Teacher Development*, 7(1), 9–30. <https://doi.org/10.1080/13664530300200184>
- Papp, K. K., Huang, G. C., Lauzon Clabo, L. M., Delva, D., Fischer, M., Konopasek, L., Schwartzstein, R. M., & Gusic, M. (2014). Milestones of critical thinking: A developmental model for medicine and nursing. *Academic Medicine*, 89(5), 715–720. <https://doi.org/10.1097/ACM.0000000000000220>
- Permana, T. I., Hindun, I., Rofi'ah, N. L., & Azizah, A. S. N. (2019). Critical thinking skills: The academic ability, mastering concepts and analytical skill of undergraduate students. *Jurnal Pendidikan Biologi Indonesia*, 5(1), 1–8. <https://doi.org/10.22219/jpbi.v5i1.7626>
- Pheeraphan, N. (2013). Enhancement of the 21st Century Skills for Thai Higher Education by Integration of ICT in Classroom. *Procedia - Social and Behavioral Sciences*, 103(1), 365–373. <https://doi.org/10.1016/j.sbspro.2013.10.346>
- Piatek-Jimenez, K. (2010). Students' interpretations of mathematical statements involving quantification. *Mathematics Education Research Journal*, 22(3), 41–56. <https://doi.org/10.1007/BF03219777>
- Piliang, I. W., Rusdi, R., & Miarsyah, M. (2019). Correlation between Learning Motivation and Learning Outcomes in Circulation System Learning Materials in Grade XI. *Indonesian Journal of Science and Education*, 3(1), 15–20. <https://doi.org/10.31002/ijose.v3i1.861>

- 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>
- Puente-Díaz, R., Cavazos-Arroyo, J., & Vargas-Barrera, F. (2021). Metacognitive feelings as a source of information in the evaluation and selection of creative ideas. *Thinking Skills and Creativity*, 39(1), 100767. <https://doi.org/10.1016/j.tsc.2020.100767>
- Putri, N. R., Miarsyah, M., & Vivanti, D. (2018). Hubungan kecerdasan naturalis dan motivasi belajar dengan kemampuan berpikir kritis peserta didik pada materi pencemaran lingkungan. *Florea : Jurnal Biologi Dan Pembelajarannya*, 5(2), 100–109. <https://doi.org/10.25273/florea.v5i2.3124>
- Raida, S. A. (2018). Identifikasi Materi Biologi SMA Sulit Menurut Pandangan Siswa dan Guru SMA se-Kota Salatiga. *Journal of Biology Education*, 1(2), 209–222. <http://journal.stainkudus.ac.id/index.php/jbe%0AIdentifikasi>
- Ramadhani, D. P., Juanengsih, N., & Mardiaty, Y. (2017). Analisis Kemampuan Berpikir Kritis Siswa pada Konsep Sistem Gerak Manusia dengan Menggunakan Peta Konsep. *Edusains*, 9(2), 193–200.
- Reif, F. (1995). Understanding and teaching important scientific thought processes. *Journal of Science Education and Technology*, 4(4), 261–282. <https://doi.org/10.1007/BF02211259>
- Ren, X., Tong, Y., Peng, P., & Wang, T. (2020). Critical thinking predicts academic performance beyond general cognitive ability: Evidence from adults and children. *Intelligence*, 82(1), 101487. <https://doi.org/10.1016/j.intell.2020.101487>
- Riduwan. (2010). *Pengantar Statistika Untuk Penelitian Pendidikan, Sosial, ekonomi, Komunikasi, dan Bisnis*. Bandung: Alfabeta.
- Rini, D. S., Adisyahputra, A., & Sigit, D. V. (2020). Boosting student critical thinking ability through project based learning, motivation and visual, auditory, kinesthetic learning style: A study on Ecosystem Topic. *Universal Journal of Educational Research*, 8(4A), 37–44. <https://doi.org/10.13189/ujer.2020.081806>
- Rizky, H., Sukmawati, D., & Rusdi, R. (2020). Excretory system learning: What is the relationship between critical thinking skills and biology learning motivation? *Biosfer*, 13(2), 320–332. <https://doi.org/10.21009/biosferjpb.v13n2.320-332>
- Rodiah, S., Komala, R., & Rusdi, R. (2020). The Correlation Between Biology Learning Outcomes and Senior High School Students' Self Concept. *Jurnal Penelitian Dan Pembelajaran IPA*, 6(1), 141–151. <https://doi.org/10.30870/jppi.v6i1.4594>
- Rødnes, K. A., Rasmussen, I., Omland, M., & Cook, V. (2021). Who has power? An investigation of how one teacher led her class towards understanding an academic concept through talking and microblogging. *Teaching and Teacher Education*, 98(1), 103229. <https://doi.org/10.1016/j.tate.2020.103229>
- Sadeghi, B., Hassani, M. T., & Rahmatkhan, M. (2014). The Relationship between EFL Learners' Metacognitive Strategies, and Their Critical Thinking. *Journal of Language Teaching and Research*, 5(5), 1167–1175.

<https://doi.org/10.4304/jltr.5.5.1167-1175>

- Sandi-Urena, S., Cooper, M. M., & Stevens, R. H. (2011). Enhancement of metacognition use and awareness by means of a collaborative intervention. *International Journal of Science Education*, 33(3), 323–340. <https://doi.org/10.1080/09500690903452922>
- Saputri, Y. D., Indrowati, M., & Ariyanto, J. (2019). Hubungan Keterampilan Metakognisi Dengan Pemahaman Konsep Biologi Melalui Model Pembelajaran SSCS. *Proceeding Biology Education Conference*, 16(1), 133–138.
- Saracaloglu, A. S., Aktamis, H., & Delioglu, Y. (2011). The impact of the development of prospective teachers' critical thinking skills on scientific argumentation training and on their ability to construct an argument. *Journal of Baltic Science Education*, 10(4), 243–260.
- Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science*, 26(1), 113–125. <https://doi.org/10.2307/23371268>
- Semilarski, H., Laius, A., & Rannikmäe, M. (2019). Development of estonian upper secondary school students' biological conceptual understanding and competences. *Journal of Baltic Science Education*, 18(6), 955–970. <https://doi.org/10.33225/jbse/19.18.955>
- Shabani, M. B., & Mohammadian, M. (2014). Relationship Between Goal Orientation, Critical Thinking, Meta-Cognitive Awareness and Self-Regulated Learning of Iranian Students. *International Journal of Language Learning and Applied Linguistics World (IJLLALW)*, 5(1), 403–418.
- Shobirin, M., Corebima, A. D., & Lukiaty, B. (2019). Critical Thinking Skills and Students' Achievement on Biology Lesson Using Genetic Instructional Material Based on Learning Cycle 5E: A Correlation Study. *Jurnal Pendidikan Sains*, 7(1), 15–19.
- Shulman, L. S. (2010). Making Differences : A Table of Learning. In *Change* (Vol. 34, Issue 6, pp. 36–44). Taylor & Francis, Ltd.
- Siswati, B. H., Hariyadi, S., & Corebima, A. D. (2020). Hubungan Antara Berpikir Kritis Dan Metakognitif Terhadap Hasil Belajar Mahasiswa Biologi Dengan Penerapan Model Pembelajaran Rwr. *LENSA (Lentera Sains): Jurnal Pendidikan IPA*, 10(2), 74–82. <https://doi.org/10.24929/lensa.v10i2.110>
- Snapir, Z., Eberbach, C., Ben-Zvi-Assaraf, O., Hmelo-Silver, C., & Tripto, J. (2017). Characterising the development of the understanding of human body systems in high-school biology students – A longitudinal study. *International Journal of Science Education*, 1–36. <https://doi.org/10.1080/09500693.2017.1364445>
- Stanton, J. D., Dye, K. M., & Johnson, M. (2019). Knowledge of learning makes a difference: a comparison of metacognition in introductory and senior-level biology students. *CBE Life Sciences Education*, 18(2), 1–13. <https://doi.org/10.1187/cbe.18-12-0239>
- Stanton, N. A., Wong, W., Gore, J., Sevdalis, N., & Strub, M. (2011). Critical Thinking, Theoretical Issues in Ergonomics Science. *Theoretical Issues in Ergonomics Science*, 12(3), 204–209.

<https://doi.org/http://dx.doi.org/10.1080/1464536X.2011.564479>

- Stupnisky, R. H., Renaud, R. D., Daniels, L. M., Haynes, T. L., & Perry, R. P. (2008). The interrelation of first-year college students' critical thinking disposition, perceived academic control, and academic achievement. *Research in Higher Education*, 49(1), 513–530. <https://doi.org/10.1007/s11162-008-9093-8>
- Sugiyono. (2010). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.
- Taber, K. (2015). Alternative conceptions/frameworks/misconceptions. In *Encyclopedia of Science Education*. Springer. <https://doi.org/10.1007/978-94-007-2150-0>
- Tasyari, S., Putri, F. N., Aurora, A. A., Nabilah, S., Syahrani, Y., & Suryanda, A. (2021). Identifikasi Media Pembelajaran Pada Materi Biologi Dalam Meningkatkan Pemahaman Konsep Peserta Didik di Masa Pandemi Covid-19. *BIO-EDU: Jurnal Pendidikan Biologi*, 6(1), 1–8.
- Tofade, T., Elsner, J., & Haines, S. T. (2013). Best practice strategies for effective use of questions as a teaching tool. *American Journal of Pharmaceutical Education*, 77(7), 1–9. <https://doi.org/10.5688/ajpe777155>
- Ulger, K. (2018). The effect of problem-based learning on the creative thinking and critical thinking disposition of students in visual arts education. *Interdisciplinary Journal of Problem-Based Learning*, 12(1), 3–6. <https://doi.org/10.7771/1541-5015.1649>
- Utami, B., Probosari, R. M., Saputro, S., Ashadi, A., Masykuri, M., & Sutanto, A. (2018). Students' critical thinking skills profile: constructing best strategy in teaching chemistry. *IJPTE: International Journal of Pedagogy and Teacher Education*, 2, 63. <https://doi.org/10.20961/ijpte.v2i0.19768>
- Vosniadou, S., & Ioannides, C. (1998). From conceptual development to science education: A psychological point of view. *International Journal of Science Education*, 20(10), 1213–1230. <https://doi.org/10.1080/0950069980201004>
- Wicaksono, A. G. C. (2014). Hubungan Keterampilan Metakognitif dan Berpikir Kritis terhadap Hasil Belajar Kognitif Siswa SMA pada Pembelajaran Biologi dengan Strategi Reciprocal Teaching. *Jurnal Pendidikan Sains*, 2(2), 85–92. <http://journal.um.ac.id/index.php/jps/>
- Wulandari, A. Y. R. (2018). Correlation Between Critical Thinking and Conceptual Understanding of Student's Learning Outcome in Mechanics Concept. *AIP Conference Proceedings*, 1–8. <https://doi.org/10.1063/1.5054432>
- Yang, W., Liu, E., Li, X., & Liu, C. (2019). Preparing a Concept-Based Lesson from a Design Perspective: Facilitating Students' Understanding through Metacognitive Strategies. *American Biology Teacher*, 81(9), 610–617. <https://doi.org/10.1525/abt.2019.81.9.610>
- Yee, M. H., Yunos, J. M., Othman, W., Hassan, R., Tee, T. K., & Mohamad, M. M. (2015). Disparity of Learning Styles and Higher Order Thinking Skills among Technical Students. *Procedia - Social and Behavioral Sciences*, 204(November 2014), 143–152. <https://doi.org/10.1016/j.sbspro.2015.08.127>

- Yuan, R., Yang, M., & Stapleton, P. (2020). Enhancing undergraduates' critical thinking through research engagement: A practitioner research approach. *Thinking Skills and Creativity*, 38(1), 100737. <https://doi.org/10.1016/j.tsc.2020.100737>
- Yuriza, P. E., Adisyahputra, A., & Sigit, D. V. (2018). Hubungan antara Kemampuan Berpikir Tingkat Tinggi dan Tingkat Kecerdasan dengan Kemampuan Literasi Sains pada Siswa SMP. *BIOSFER Jurnal Pendidikan Biologi*, 11(1), 13–20.
- Yusnaeni, Corebima, A. D., Susilo, H., & Zubaidah, S. (2020). The Contribution of Metacognitive Skills and Creative Thinking Skills in 21st Century Learning. *Universal Journal of Educational Research*, 8(4A), 31–36. <https://doi.org/10.13189/ujer.2020.081805>
- Živković, S. (2016). A Model of Critical Thinking as an Important Attribute for Success in the 21st Century. *Procedia - Social and Behavioral Sciences*, 232(April), 102–108. <https://doi.org/10.1016/j.sbspro.2016.10.034>

