

DAFTAR PUSTAKA

- Afifah, S., & Yusmaita, E. (2019). Perancangan Assesmen Literasi Kimia pada Materi Termokimia Kelas XI SMA/MA. *EduKimia Journal*, 79-83.
- Anggreini, C. K., & Asngad, A. (2018). Hand Sanitizer dalam Bentuk Gel dari Daun Serai dengan Penambahan Alkohol dan Triklosan. *Seminar Nasional Pendidikan Biologi dan SAINTEK*, 126-130.
- Anisimova, T. I., Sabirova, F. M., & Shatunova, O. V. (2020). Formation of Design and Research Competencies in Future Teachers in the Framework of STEAM Education. *iJET*, 204-217.
- Anjarsari, P. (2014). Literasi Sains dalam Kurikulum dan Pembelajaran IPA SMP. *Prosiding Semnas Pensa VI "Peran Literasi Sains"* (pp. 602-607). Surabaya: Universitas Negeri Surabaya.
- Anwar, R. (2014). Hal-hal yang Mendasari Penerapan Kurikulum 2013. *HUMANIORA*, 97-106.
- Ausrianti, R., & Nurleni. (2019). Hubungan Pola Makan dan Faktor Stress dengan Kejadian Gastritis di Poliklinik Penyakit Dalam RSUP Dr. M Jamil Padang. *Menara Ilmu*, 105-112.
- Bahrum, S., Wahid, N., & Ibrahim, N. (2017). Integration of STEM Education in Malaysia and Why to STEAM. *International Journal of Academic Research in Business and Social Sciences*, 645-654.
- Bligh, A. (2015). *Towards a 10-year plan for science, technology, engineering and mathematics (STEM) education and skills in Queensland*. Queensland: Department of Education, Training and the Arts.
- Brady, J. E. (1999). *Kimia Universitas Asas & Struktur, Jilid I, Edisi Kelima*. Jakarta: Binarupa Aksara.
- Bungin, B. (2012). *Analisis Data Penelitian Kualitatif*. Jakarta: PT Raja Grafindo.
- Burns, E. R. (2010). "Anatomizing" Reversed: Use of Examination Questions that Foster Use of Higher Order Learning Skills by Students. *Anatomical Sciences Education*, 330-334.
- Bybee, R. W. (1997). *Achieving scientific literacy: from purposes to practice*. Heinemann: Portsmouth, NH.
- Chang, B. (2019). Reflection in Learning. *Online Learning*, 95-110.
- Chang, R. (2005). *Kimia Dasar Konsep-Konsep Inti*. Jakarta: Erlangga.
- Chen, S. Y., & Liu, S. Y. (2020). Using Augmented Reality To Experiment With Elements In A Chemistry Course. *Computers in Human Behavior*, 1-12.

- Chung, S. K., & Li, D. (2021). Issues-Based STEAM Education: A Case Study in a Hong Kong Secondary School. *International Journal of Education & the Arts*, 1-23.
- Creswell, J. W. (2016). *Research Design: Pendekatan Metode Kualitatif, Kuantitatif, dan Campuran*. Yogyakarta: Pustaka Pelajar.
- Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative Content Analysis: A Focus on Trustworthiness. *SAGE Open*, 1-14.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, 1-4.
- Ferreira-Gauchía, C., Vilches, A., & Gil-Pérez, D. (2012). Teachers' conceptions about the Nature of Technology and the Science-Technology-Society-Environment relationships. *Enseñanza De Las Cienc*, 197-218.
- Gilbert, J. K., & Treagust, D. (2009). *Multiple Representation in Chemical Education*. Australia: Springer.
- Graber, W., Nentwig, P., Becker, H. J., Sumfleth, E., Pitton, A., Wollweber, K., & Jorde, D. (2001). Scientific literacy: From theory to practice. Dalam H. Behrendt, *Research in Science Education-Past, Present, and Future* (hal. 61-70). Nederland: Kluwer Academic Publisher.
- Gülbetekin, M. (2022). An Analysis on the Assessment of Open Ended Questions from a Teacher's Perspective. *IJOEEC (International Journal of Eurasian Education and Culture)*, 423-473.
- Hamdani, A. S. (2007). Pengembangan Kreativitas Siswa Melalui Pembelajaran Matematika dengan Masalah Terbuka (Open Ended Problem). *Didaktis: Jurnal Pendidikan dan Ilmu Pengetahuan*, 58-67.
- Ihsani, A. Z., Langitasari, I., & Affifah, I. (2020). Penerapan Model Pembelajaran REACT terhadap Keterampilan Berpikir Kritis Siswa pada Konsep Kelarutan dan Hasil Kali Kelarutan. *Jurnal Inovasi Pendidikan Kimia*, 1498-2511.
- Imansari, M., Sudarmin, & Sumarni, W. (2018). Analisis Literasi Kimia Peserta Didik Melalui Pembelajaran Inkuiri Terbimbing Bermuatan Etnosains. *Jurnal Inovasi Pendidikan Kimia*, 2201-2211.
- Jeong, S., & Kim, H. (2014). The effect of a climate change monitoring program on students' knowledge and perceptions of STEAM education in Korea. *Eurasia Journal of Mathematics, Science & Technology Education*, 1321-1338.
- Johnstone, A. H. (2000). Teaching of chemistry – Logical or psycho-logical? *Chem. Educ. Res. Pract*, 9-15.
- Kamza, M., & Husaini, L. A. (2021). Pengaruh Metode Pembelajaran Diskusi dengan Tipe Buzz Group terhadap Keaktifan Belajar Siswa pada Mata

- Pelajaran IPS. *Jurnal BASICEDU: Research & Learning in Elementary Education*, 4120-4126.
- Keasta, S., & Marangio, K. (2015). Values and Knowledge Education (VaKE) in Teacher Education: Benefits for Science Pre-service Teachers when Using Dilemma Stories. *Procedia - Social and Behavioral Sciences IOSTE BORNEO 2014* (hal. 198-203). Clayton: Elsevier.
- Kemendikbud. (2019). *Model Pembelajaran STEAM (Science, Technology, Engineering, Art and Mathematics) dengan Pendekatan Saintifik*. Jakarta: Kemendikbud.
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 120-124.
- Lee, Y. (2021). Development and effectiveness analysis of artificial intelligence STEAM education program. *Journal of The Korean Association*, 71-79.
- Liao, C. (2016). From Interdisciplinary to Transdisciplinary: An Arts-Integrated Approach to STEAM Education. *Art Education*, 44-49.
- Liestari, S., & Muhardis. (2020). Kemampuan Literasi Membaca Siswa Indonesia (Berdasarkan Hasil UN dan PISA). *Indonesian Journal of Educational Assessment*, 24-31.
- Long, R. L., & Davis, S. S. (2017). Using STEAM to Increase Engagement and Literacy Across Disciplines. *The STEAM Journal*, 1-11.
- Mckinney, C. (2006). A Balancing act: ethical dilemmas of democratic teaching within critical pedagogy. *Educational Action Research*, 375-392.
- Mehta, R., Keenan, S., Henriksen, D., & Mishra, P. (2019). Chapter 7 - Developing a Rhetoric of Aesthetics: The (Often) Forgotten Link Between Art and STEM. Dalam M. S. Khine, & S. Areepattamannil, *STEAM Education - Theory and Practice* (hal. 117-141). Cham: Springer.
- Miles, M. B., & Huberman. (1992). *Analisis Data Kualitatif: Buku Sumber Tentang Metode-Metode Baru*. Jakarta: UI Press.
- Muhlisin, A., Susilo, H., Amin, M., & Rohman, F. (2015). An Analysis Of University Students' Method Or Learning Model and Critical Thinking Skills On Natural Science Basic Concepts. *Science, Mathematics, Engineering and Technology Education: Cultural Challenges and Opportunities in a Globalising World*, 1-6.
- Nakhleh, M. B. (1992). Why Some Students Don't Learn Chemistry. *Journal of Chemical Education*, 191-196.
- Nasihah, M. (2017). Efek Hujan Asam terhadap Pertumbuhan Tanaman. *Jurnal EnviScience*, 27-30.
- Nelson, P. G. (2003). Basic Chemical Concept. *Chem. Educ. Res. Pract.*, 19-24.

- Nengsih, N. R., Yusmaita, E., & Gazali, F. (2019). Evaluasi Validasi Konten dan Ekonstruksi Bahan Ajar Asam Basa Berbasis REACT. *EKJ: EduKimia*, 1-10.
- Nisa, A., Sudarmin, & Samini. (2015). Efektivitas Penggunaan Modul Terintegrasi Etnosains dalam Pembelajaran Berbasis Masalah untuk Meningkatkan Literasi Sains Siswa. *Unnes Science Education Journal*, 1049-1056.
- OECD. (2009). *PISA 2009 Assessment Framework - Key competencies in reading, mathematics and science*. New York: Columbia University.
- Orgill, M. K., York, S., & Mackellar, J. (2019). Introduction to Systems Thinking for the Chemistry Education Community. *Journal of Chemical Education*, 2720-2729.
- Ozkan, G., & Topsakal, U. U. (2017). Examining Students' Opinions about STEAM Activities. *Journal of Education and Training Studies*, 115-123.
- Padmadewi, N. N., & Artini, L. P. (2018). *Literasi di Sekolah, dari Teori ke Praktik*. Bandung: Nilacakra.
- Pandey, K. (2019). Experiencing Transformative Learning: An Autoethnographic Journey through Ethical Dilemma Story Pedagogy (EDSP). *Bodhi: An Interdisciplinary Journal*, 227-244.
- Partnership for 21st Century Skills. (2006). *Are They Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce*. Washington D.C: Battelle for Kids. Diambil kembali dari <https://www.battelleforkids.org/networks/p21/frameworks-resources>
- Prasemmi, S., Rahayu, S., Fajaroh, F., & Almunasherri, S. (2021). Chemical Literacy Skill of High School Students on Solution Chemistry. *JTK: Jurnal Tadris Kimiya*, 1-15.
- Program Studi Kimia Fakultas MIPA UII. (2020, November 1). *Semua tentang Program Studi Kimia Fakultas MIPA Universitas Islam Indonesia - Sejarah Perkembangan Ilmu Kimia*. Retrieved from Undergraduate Program in Chemistry: <https://chemistry.uui.ac.id/profil/>
- Raharja, S., Wibhawa, M. R., & Lukas, S. (2018). Mengukur Rasa Ingin Tahu Siswa. *POLYGLOT: A Journal of Language, Literature, Culture, and Education*, 151-164.
- Rahayu, S. (2017). Mengoptimalkan Aspek Literasi dalam Pembelajaran Kimia Abad 21. *Prosiding Seminar Nasional Kimia UNY 2017* (hal. 1-16). Yogyakarta : UNY.
- Rahmawati, Y., Erdawati, E., & Natalya, E. (2021). Integration dilemmas stories in STEAM project of colloid. *Journal of Physics: Conference Series*, 1-6.

- Rahmawati, Y., Istianah, & Kurniadewi, F. (2019). Empowering students' engagement in organic chemistry learning through integration of dilemma stories with number head together. *Journal of Physics: Conference Series*, 1-7.
- Rahmawati, Y., Nurbaity, & Marheni. (2014). Engaging Students in Social Emotional Learning : The Role of Dilemma Stories In Chemistry Learning. *Proceeding of International Conference On Research, Implementation And Education Of Mathematics And Sciences 2014* (pp. 123-134). Yogyakarta: UNY.
- Rahmawati, Y., Ridwan, A., Mardiah, A., & Afrizal. (2020). Students' chemical literacy development through STEAM integrated with dilemmas stories on acid and base topics. *Journal of Physics: Conference Series*, 1-7.
- Rahmawati, Y., Taylor, E., Taylor, P. C., Ridwan, A., & Mardiah, A. (2022). Students' Engagement in Education as Sustainability: Implementing an Ethical Dilemma-STEAM Teaching Model in Chemistry Learning. *Sustainability*, 1-15.
- Ridwan, A., Rahmawati, Y., & Hadinugrahaningsih, T. (2017). STEAM Integration In Chemistry Learning For Developing 21st Century Skills. *MIER Journal of Educational Studies, Trends & Practices*, 184-194.
- Rikawati, K., & Sitinjak, D. (2020). Peningkatan Keaktifan Belajar Siswa dengan Menggunakan Metode Ceramah Interaktif. *JEC: Journal of Educational Chemistry*, 40-48.
- Rizkiana, F., Dasna, I. W., & Marfu'ah, S. (2016). Pengaruh Praktikum dan Demonstrasi dalam Pembelajaran Inkuiri Terbimbing terhadap Motivasi Belajar Siswa pada Materi Asam Basa Ditinjau Dari Kemampuan Awal. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 354-362.
- Rohman, A. A., & Karimah, S. (2018). Faktor-faktor yang Mempengaruhi Rendahnya Motivasi Belajar Siswa Kelas XI. *Jurnal At-Taqaddum*, 95-108.
- Sabnis, R. W. (2007). *Handbook of Acid-Base Indicators*. Boca Raton: CRC Press.
- Samon, S., & Levy, S. T. (2019). Interactions between reasoning about complex systems and conceptual understanding in learning chemistry. *J. Res. Sci. Teach.*, 1-29.
- Sernita, & Firdayani. (2016). Variasi Konsentrasi Cuka Dapur sebagai Alternatif Pengganti Asam Asetat Glasial 6% pada Pemeriksaan Proteinuria pada Ibu Hamil di Puskesmas Lepo-Lepo Kota Kendari. *Jurnal Analisis Kesehatan Kendari*, 23-31.
- Setiawati, I., & Ariani, A. (2020). Kajian pH dan Kadar Air dalam SNI Sabun Mandi Padat di Jabedebog. *Prosiding PPIS 2020*, 293-300.

- Setiawati, I., & Ariani, A. (2020). Kajian pH dan Kadar Air dalam SNI Sabun Mandi Padat di Jabedebog. *PPIS*, 293-300.
- Settelmaier, E. (2003). *Dilemmas with Dilemmas: Exploring the Suitability of Dilemma Stories as a Way of Addressing Ethical Issues in Science Education*. Philadelphia: ERIC.
- Settelmaier, E. (2003). *Transforming the culture of teaching and learning in science: the promise of moral dilemma stories*. Perth: Curtin University of Technology.
- Settelmaier, E. (2009). *Adding zest' to science education: Transforming the culture of science classrooms through ethical dilemma story pedagogy*. Saarbrücken: VDM.
- Sheppard, K. (2006). High School Students' Understanding of Titrations and Related Acid-Base Phenomena. *Chemistry Education Research and Practice*, 32-45.
- Shui-Te, L., Kusuma, I. W., Wardani, S., & Harjito. (2018). Hasil identifikasi miskonsepsi siswa ditinjau dari aspek makroskopis, mikroskopis, dan simbolik (MMS) pada pokok bahasan partikulat sifat materi di Taiwan. *Jurnal Inovasi Pendidikan Kimia*, 2019-2030.
- Shukshina, L. V., Gegel, L. A., Erofeeva, M. A., Levina, I. D., Chugaeva, U. Y., & Nikitin, O. D. (2021). STEM and STEAM Education in Russian Education: Conceptual Framework. *EURASIA Journal of Mathematics, Science and Technology Education*, 1-14.
- Shwartz, Y., Ben-Zvi, R., & Hofstein, A. (2006). Chemical literacy: what it means to scientists and school teachers? *Journal of Chemical Education*, 1557-1561.
- Sirhan, G. (2007). Learning difficulties in Chemistry: an overview. *Journal of Turkish Science Education*, 2-20.
- Skillton, C. J. (2011). Involving Experts by Experience in Assessing Students' Readiness to Practise: The Value of Experiential Learning in Student Reflection and Preparation for Practice. *Social Work Education*, 299-311.
- Stojanovska, M., Petruševski, V. M., & Šoptrajanov, B. (2014). Study of the use of the three of thinking and representation. *CONTRIBUTIONS, Section of Natural, Mathematical and Biotechnical Sciences, MASA*, 37-46.
- Sudiarti. (2021). Peningkatan Prestasi Belajar Kimia Melalui Penerapan Kombinasi Metode Diskusi Kelompok dan Penugasan Terstruktur. *ACADEMIA: Jurnal Inovasi Riset Akademik*, 11-19.
- Sujana, A., Permanasari, A., Sopandi, W., & Mudzakir, A. (2014). Literasi Kimia Mahasiswa PGSD dan Guru IPA Sekolah Dasar. *Jurnal Pendidikan IPA Indonesia*, 5-11.
- Sukaesah, I., Rusdi, & Indrayanti, R. (2015). The Use of Learning Models and Learning Media Regarding Reproductive Health Attitudes and

Reproductive System Learning Outcomes In Senior High Schools. *Science, Mathematics, Engineering and Technology Education: Cultural Challenges and Opportunities in a Globalising World*, 180-192.

- Sukaria, M. I. (2020). Pengembangan Perangkat Penilaian Afektif Pada Pembelajaran Kimia Untuk Sekolah Menengah Atas. *Biomatika : Jurnal ilmiah fakultas keguruan dan ilmu pendidikan*, 126-131.
- Suswandari. (2010). Sains, Teknologi, dan Pendidikan. *Jurnal Teknodik*, 111-117.
- Syazali, M. (2015). Pengaruh Model Pembelajaran Creative Problem Solving Berbantuan Maple II Terhadap Kemampuan Pemecahan Masalah Matematis. *Al-Jabar: Jurnal Pendidikan Matematika*, 91-98.
- Taylor, E., Taylor, P. C., & Chow, M. (2013). Diverse, disengaged and reactive: A teacher's adaptation of ethical dilemma story pedagogy as a strategy to re-engage learners in education for sustainability. Dalam N. Mansour, & R. Wegerif, *Science education for diversity: Theory and practice* (hal. 97-117). Rotterdam: Sense Publishers.
- Taylor, E., Taylor, P. C., & Hill, J. (2019). Ethical Dilemma Story Pedagogy: A Constructivist Approach to Values Learning and Ethical Understanding. Dalam Y. Rahmawati, & P. C. Taylor, *Empowering science and mathematics for global competitiveness* (hal. 118-124). London: Taylor and Francis.
- Telaumbanua, R. N. (2020). Perbedaan Hasil Belajar Siswa Menggunakan Problem Based Learning dan Student Teams Achievement dengan Power Point pada Materi Ikatan Kimia. *CHEDS: Journal of Chemistry, Education, and Science*, 31-39.
- Werth, J. C. (2017). *Teaching a Dilemma Story in My Science Classroom: Enabling Students to Make Ethically Aware Decisions*. Perth: Curtin University.
- Widarti, H. R., Sutrisno, Sulistina, O., & Muchson, M. (2018). Ujicoba Implementasi Strategi OE3R (Orientasi-Eksplorasi-Eksplanasi-Elaborasi-Refleksi) untuk Pembelajaran Dasar-dasar Kimia Analitik di Jurusan Kimia FMIPA UM. *Prosiding: Seminar Nasional Kimia dan Pembelajarannya (SNKP) 2018*, 61-68.
- Widiatmika, I., Suharta, I., & Suryawan, I. (2019). Meningkatkan Kemampuan Komunikasi Matematis Siswa Melalui Penerapan Creative Problem Solving. *Jurnal Pendidikan Matematika Undiksha*, 1-8.
- William, L., & Wilkins. (2010). *Atlas of Pathophysiology Third Edition*. Philadelphia: Anataomical Chart Company.
- Yacoubian, H. A. (2018). Scientific literacy for democratic decision-making. *Int. J. Sci. Educ.*, 308-327.

- Yakman, G. (2008). STEAM Education: an overview of creating a model of integrative education. *STEAM Education Theory*, 1-28.
- Yakman, G., & Lee, H. (2012). Exploring the exemplary STEAM education in the US as a practical educational framework for Korea. *J. Korean Assoc. Sci. Edu*, 1072-1086.
- Yulianti, Y. (2017). Literasi Sains dalam Pembelajaran IPA. *Jurnal Cakrawala Pendas*, 21-28.
- Zinki, N. M., Utami, B., & Ashadi. (2021). Penggunaan Problem Solving Dilengkapi Media LKS untuk Meningkatkan Kemampuan Berpikir Kritis dan Prestasi Belajar Siswa pada Kesetimbangan Kimia di Kelas XI MIPA 1 SMAN 1 Banyudono Tahun Ajaran 2019/2020. *Jurnal Pendidikan Kimia*, 144-151.