DAFTAR PUSTAKA

ABET. (2019). *Criteria for Accrediting Engineering Program*. http://www.abet.org/accreditation/%0Aaccreditation-criteria/criteria-for-accrediting-engineering-programs-2016-2017/.

Adriyawati, Utomo, E., Rahmawati, Y., & Mardiah, A. (2020). Steam-project-based learning integration to improve elementary school students' scientific literacy on alternative energy learning. *Universal Journal of Educational Research*, *8*(5), 1863–1873. https://doi.org/10.13189/ujer.2020.080523

Afriana, J., & Indonesia, U. P. (2016). Project-Based Learning (PjBL). *January*. https://doi.org/10.13140/RG.2.1.3338.2486

Ahmed, B., Dannhauser, T., & Philip, N. (2019). A Lean Design Thinking Methodology (LDTM) for Machine Learning and Modern Data Projects. *2018 10th Computer Science and Electronic Engineering Conference, CEEC 2018 - Proceedings*, *June 2019*, 11–14. https://doi.org/10.1109/CEEC.2018.8674234

Alfiani, S. (2021). *Enhancing Students' Problem-Solving Skills Through Design Thinking Approach In Learning Environmental Pollution*. Universitas Pendidikan Indonesia.

Ann, J., & Schmidt-mccormack, J. A. (2019). *Assessing student process skills and providing feedback to enhance learning in analytical chemistry by.*

Bao, S. qian. (2009). [Design thinking and clinical basic operation rules of the needling instrument for Shu-needle therapy]. In *Zhongguo zhen jiu = Chinese acupuncture & moxibustion* (Vol. 29, Issue 3).

Boss, B. S., & Krauss, J. (2007). Power of the Mashup Combining Essential Learning with New Technology Tools. *Technology*, *5191*(August), 12–17.

Broman, K., Bernholt, S., & Christensson, C. (2020). Relevant or interesting according to upper secondary students? Affective aspects of context-based chemistry problems. *Research in Science and Technological Education*, *00*(00), 1–21. https://doi.org/10.1080/02635143.2020.1824177

Buhl, A., Schmidt-Keilich, M., Muster, V., Blazejewski, S., Schrader, U., Harrach, C., Schäfer, M., & Süßbauer, E. (2019). Design thinking for sustainability: Why and how design thinking can foster sustainability-oriented innovation development. *Journal of Cleaner Production*, *231*, 1248–1257. https://doi.org/10.1016/j.jclepro.2019.05.259

Çakır, R., Korkmaz, Ö., İdil, Ö., & Uğur Erdoğmuş, F. (2021). The effect of robotic coding education on preschoolers' problem solving and

creative thinking skills. *Thinking Skills and Creativity*, *40*(February). https://doi.org/10.1016/j.tsc.2021.100812

Ciesielska, M., & Jemielniak, D. (2017). Qualitative methodologies in organization studies. *Qualitative Methodologies in Organization Studies*, *2*(December), 1–264. https://doi.org/10.1007/978-3-319-65442-3

Dahiya, A., & Kumar, J. (2018). How empathizing with persona helps in design thinking: An experimental study with novice designers. *MCCSIS 2018 - Multi Conference on Computer Science and Information Systems; Proceedings of the International Conferences on Interfaces and Human Computer Interaction 2018, Game and Entertainment Technologies 2018 and Computer Graphics, Visualization, Comp*, *2018-July*(March), 35–42.

Davishahl, E., Singleton, L. W., & Haskell, T. (2020). Engaging STEM learners with hands-on models to build representational competence. *ASEE Annual Conference and Exposition, Conference Proceedings*, *2020-June*. https://doi.org/10.18260/1-2--34541

Deb, E. (2021). *A Strategic Understanding of Information Processing Theory by a Critical A Strategic Understanding of Information Processing Theory by a Critical Analysis . Ekata Deb-1738501 Department of Psychology : Christ University , Bangalore , Karnataka , India September 2020*. https://doi.org/10.13140/RG.2.2.24118.22088

Diego-Mantecon, J.-M., Prodromou, T., Lavicza, Z., Blanco, T. F., & Ortiz-Laso, Z. (2021). An attempt to evaluate STEAM project-based instruction from a school mathematics perspective. *ZDM – Mathematics Education*, *53*(5), 1137–1148. https://doi.org/10.1007/s11858-021-01303-9

Dorst, K. (2010). Pakollinen, The Nature of Design Thinking. *Proceedings of the 8th Design Thinking Research Symposium (DTRS8)*, 131–141.

Driscoll, M. P. (2005). Psychology of learning for instruction. In *Pearson Education*.

Fensel, D. (2021). Inverse Verification of Problem-Solving Methods 1 Introduction 2 The Problem And its Solution. *IJHS*, 1–31.

Fitriyah, A., & Ramadani, S. D. (2021). Pengaruh Pembelajaran Steam Berbasis Pjbl (Project-Based Learning) Terhadap Keterampilan Berpikir Kreatif Dan Berpikir Kritis. *Jurnal Inspiratif Pendidikan*, *10*(1), 209–226.

Geiger, M. (Peggy). (2010). Implementing POGIL in Allied Health Chemistry Courses: Insights from Process Education. *International Journal of Process Education*, *2*(1), 19–34.

Hjørland, B. (2012). Methods for evaluating information sources: An annotated catalogue. *Journal of Information Science*, *38*(3), 258–268.

https://doi.org/10.1177/0165551512439178

IDF. (2022). *Brainstorming*. International Design Foundation. https://www.interaction-design.org/literature/topics/brainstorming

Ke, Y., Xia, J., & Wang, L. (2017). *Working Memory Centered Interpreting Information Processing Study*. *61*(Isss), 371–373. https://doi.org/10.2991/isss-17.2017.140

Khamhaengpol, A., Sriprom, M., & Chuamchaitrakool, P. (2021). Development of STEAM activity on nanotechnology to determine basic science process skills and engineering design process for high school students. *Thinking Skills and Creativity*, *39*(January), 100796. https://doi.org/10.1016/j.tsc.2021.100796

Kiili, C., Laurinen, L., & Marttunen, M. (2007). How students evaluate credibility and relevance of information on the internet? *IADIS International Conference on Cognition and Exploratory Learning in Digital Age, CELDA 2007*, *May*, 155–162.

Kim, E. J., & Kim, K. M. (2015). Cognitive styles in design problem solving: Insights from network-based cognitive maps. *Design Studies*, *40*, 1–38. https://doi.org/10.1016/j.destud.2015.05.002

Knight, E., Daymond, J., & Paroutis, S. (2020). Design-Led Strategy: How To Bring Design Thinking Into The Art of Strategic Management. In *California Management Review* (Vol. 62, Issue 2). https://doi.org/10.1177/0008125619897594

Larysa, N., & Marta, S. (2019). Design thinking approaches in it projects. *CEUR Workshop Proceedings*, *2856*, 45–47.

Luka, I. (2019). Design thinking in pedagogy: Frameworks and uses. *European Journal of Education*, *54*(4), 499–512. https://doi.org/10.1111/ejed.12367

Lunenburg, F. C. (2010). Communication : The Process , Barriers , And Improving Effectiveness. *Schooling*, *1*, 1–11.

Malik, M. N., Khan, H. H., Chofreh, A. G., Goni, F. A., Klemeš, J. J., & Alotaibi, Y. (2019). Investigating students' sustainability awareness and the curriculum of technology education in Pakistan. *Sustainability (Switzerland)*, *11*(9), 1–18. https://doi.org/10.3390/su11092651

Muntari, M., Idrus, S. W. Al, & Supriadi, S. (2021). Pendampingan Implementasi Pembelajaran Guided Discovery Melalui Lesson Study for Learning Community (LSLC) untuk Peningkatan Kemampuan Berpikir Kritis Kimia Siswa SMA Zonasi Narmada Kabupaten Lombok Barat. *Jurnal Pengabdian Magister Pendidikan IPA*, *4*(1). https://doi.org/10.29303/jpmpi.v4i1.603

Ngoc Tuan, N., Thi Hanh, B., & Trung Ninh, T. (2020). Project Based Learning in General Chemistry to Develop the Problem-Solving and

Creativity. *American Journal of Educational Research*, *8*(7), 475–479. https://doi.org/10.12691/education-8-7-4

Nigel, M. (2006). *Using Interviews in a Research Project*. Radcliffe Medical Press.

Pande, M., & Bharathi, S. V. (2020). Theoretical foundations of design thinking – A constructivism learning approach to design thinking. *Thinking Skills and Creativity*, *36*(October 2019), 100637. https://doi.org/10.1016/j.tsc.2020.100637

Panke, S. (2019). Design Thinking in Education: Perspectives, Opportunities and Challenges. *Open Education Studies*, *1*(1), 281–306. https://doi.org/10.1515/edu-2019-0022

Pratiwi, R., Lenny, P., Yuanita, & Rahayu, Y. S. (2018). The Innovative Problem Solving Strategy As The Model Of Teaching Problem Solving. *UDC*.

Pressman, A. (2019). Design Thinking : A Guide to Creative Problem Solving for Everyone. In *Ebook* (Vol. 86, Issue 6).

Priantari, I., Prafitasari, A. N., Kusumawardhani, D. R., & Susanti, S. (2020). Improving Student Critical Thinking trough STEAM-PjBL Learning. *Bioeducation Journal*, *4*(2), 95–103. https://doi.org/10.24036/bioedu.v4i2.283

Pusca, D., & Northwood, D. O. (2018). Design thinking and its application to problem solving. *Global Journal of Engineering Education*, *20*(1), 48–53.

Razzouk, R., & Shute, V. (2012). What Is Design Thinking and Why Is It Important? *Review of Educational Research*, *82*(3), 330–348. https://doi.org/10.3102/0034654312457429

Reynders, G., Lantz, J., Ruder, S. M., Stanford, C. L., & Cole, R. S. (2020). Rubrics to assess critical thinking and information processing in undergraduate STEM courses. *International Journal of STEM Education*, *7*(1). https://doi.org/10.1186/s40594-020-00208-5

Reynders, G., Suh, E., Cole, R. S., & Sansom, R. L. (2019). Developing Student Process Skills in a General Chemistry Laboratory. *Journal of Chemical Education*, *96*(10), 2109–2119. https://doi.org/10.1021/acs.jchemed.9b00441

Sa'ida, N. (2021). Implementasi Model Pembelajaran STEAM pada Pembelajaran Daring. *Jurnal Review Pendidikan Dasar : Jurnal Kajian Pendidikan Dan Hasil Penelitian*, *7*(2), 123–128. https://journal.unesa.ac.id/index.php/PD/article/view/13955

Sándorová, Z., Repáňová, T., Palenčíková, Z., & Beták, N. (2020). Design thinking - A revolutionary new approach in tourism education? *Journal of Hospitality, Leisure, Sport and Tourism Education*, *26*(December

2019), 100238. https://doi.org/10.1016/j.jhlste.2019.100238

Sarathy, V. (2018). Real world problem-solving. *Frontiers in Human Neuroscience*, *12*(June), 1–14. https://doi.org/10.3389/fnhum.2018.00261

School, D. (2009). Design Thinking. *Proceedings - 12th IEEE International Conference on Computational Science and Engineering, CSE 2009*, *4*, 903–908. https://doi.org/10.1109/CSE.2009.207

Shariff, A. (2016). Reflections on a first time experience of problem-based learning. *New Directions in the Teaching of Physical Sciences*, *5*, 48–54. https://doi.org/10.29311/ndtps.v0i5.453

Shively, K., & Palilonis, J. (2018). Curriculum Development: Preservice Teachers' Perceptions of Design Thinking for Understanding Digital Literacy as a Curricular Framework. *Journal of Education*, *198*(3), 202–214. https://doi.org/10.1177/0022057418811128

Shively, K., Stith, K. M., & Rubenstein, L. D. V. (2018). Measuring What Matters: Assessing Creativity, Critical Thinking, and the Design Process. *Gifted Child Today*, *41*(3), 149–158. https://doi.org/10.1177/1076217518768361

Sugiono, A. (2021). Pelatihan Creative Design Thinking Start Up Entrepreneur. *Bernas: Jurnal Pengabdian Kepada Masyarakat*, *2*(1), 317–323. https://doi.org/10.31949/jb.v2i1.510

Tu, J. C., Liu, L. X., & Wu, K. Y. (2018). Study on the learning effectiveness of stanford design thinking in integrated design education. *Sustainability (Switzerland)*, *10*(8), 1–21. https://doi.org/10.3390/su10082649

Veerasinghan, K., Balakrishnan, B., Damanhuri, M. I. M., & Gengatharan, K. (2021). Design Thinking for Creative Teaching of Chemistry. *International Journal of Academic Research in Business and Social Sciences*, *11*(3). https://doi.org/10.6007/ijarbss/v11-i3/8979

Widyaningrum, A., & Agustini, R. (2021). Analisis Keterampilan Proses Sains Peserta Didik Pada Materi Ikatan Kimia Kelas X SMAN 6 Madiun. *Jurnal Inovasi Pembelajaran Kimia*, *3*(1), 1–10.

Yakman, G. (2008). STEAM Education: An Overview of Creating a Model of Intergrative Education. *Tesis*, *53*(9), 1689–1699.

Zhou, M., & Brown, D. (2015). Educational Learning Theories: 2nd Edition. In *Galileo* (Vol. 51, Issue 4). Galileo. https://doi.org/10.1080/10971475.2018.1457318

Zowada, C., Frerichs, N., Zuin, V. G., & Eilks, I. (2020). Developing a lesson plan on conventional and green pesticides in chemistry education-a project of participatory action research. *Chemistry Education Research and Practice*, *21*(1), 141–153.