

DAFTAR PUSTAKA

- Akubue, A. (2000). *Appropriate technology for socioeconomic development in third world countries*. Cloud State University. Minnesota.
- Aleman, M. P. (1992). Redefining teacher. *Educational Leadership*, 50(3), 97-97.
- Anderson, L. W., & Krathwohl, D. R. (2010). Kerangka Landasan untuk Pembelajaran, Pengajaran, dan Asesmen. [The Foundation Framework for Learning, Teaching, and Assessment]. *Yogyakarta: Pustaka Pelajar*, 300(300), 00.
- Angier, N. (2010, October 04). Stem education has little to do with flowers. *New York Times*. Retrieved from <http://www.nytimes.com/2010/10/05/science/05angier.html?pagewanted=all>
- Apedoe, X. S., Reynolds, B., Ellefson, M. R., & Schunn, C. D. (2008). Bringing engineering design into high school science classrooms: The heating/cooling unit. *Journal of Science Education and Technology*, 17(5), 454-465.
- Basalyga, S. (2003). *Student interest in engineering is on decline*. *Daily Journal of Commerce*, Retrieved Feb 24, 2017 from http://findarticles.com/p/articles/mi_qn4184/is_20030611/ai_n1004581/
- Becker, K., Park, K. (2011). Effects of integrative approaches among science, technology, engineering, and mathematics (STEM) subjects on students' learning: A preliminary meta-analysis. *Journal of STEM Education*, 12, 5-6.
- Berlin, D. F., & Lee, H. (2005). Integrating science and mathematics education: Historical analysis. *School Science and Mathematics*, 105(1), 15-24.
- Burchfield, C.M., & Sappington, J. (1999). Participation in Classroom Discussion. *Teaching of Psychology*.
- Breiner, J. M., Harkness, S. S., Johnson, C. C., & Koehler, C. M. (2012). What is STEM? A discussion about conceptions of STEM in education and partnerships. *School Science and Mathematics*, 112(1), 3-11.
- Bryan, L. A., Moore, T. J., Johnson, C. C., & Roehrig, G. H. (2015). Integrated STEM education. In C. C. Johnson, E. E. Peters-Burton, & T. J. Moore (Eds.), *STEM roadmap: A framework for integration* (pp. 23-37). London: Taylor & Francis.

- Bybee, R. W. (2010). What is STEM education?.
- Bybee, R. W. (2013). *The Case for STEM Education Challenges and Opportunities*. Virginia: National Science Teacher Association.
- Cafarella, Julie. 2015. Research Brief: Designing an Assessment System that Measures Three-Dimensional Science Learning. Accessed Online: http://www.oregon.gov/ode/educatorresources/assessment/Documents/stem_teaching_tool_34_asmt_system_3d.pdf.
- Council, T. A., & National Research Council. (2014). *STEM learning is everywhere: Summary of a convocation on building learning systems*. Washington, DC: National Academies Press.
- Creswell, J. W. (2010). Research design: pendekatan kualitatif, kuantitatif, dan mixed. Yogyakarta: PT Pustaka Pelajar.
- Czekanski, Kathleen. (2013). Encouraging and Evaluating Class Participation. *Journal of University Teaching and Learning Practices*, Vol – 10. [Online]. Retrieved from <http://ro.uow.edu.au/jutlp/vol10/iss1/7>. [Accessed on October 30th, 2014].
- Dancer, D., and Kamvounias, P. (2005). Student involvement in assessment: A project designed to assess class participation fairly and reliably. *Assessment & Evaluation in Higher Education*. 30 --,445-454. [Online]. Retrieved from <http://eric.ed.gov/>. [Accessed on October 30th, 2014].
- Davies, Trevor. (2000). Confidence! Its Role in the Creative Teaching and Learning of Design and Technology. *Journal of Technology Education*, Vol. 12, 29. Retrieved from: <https://scholar.lib.vt.edu/ejournals/JTE/v12n1/pdf/davies.pdf>
- English, L. D & King, D. T. (2015). STEM learning through engineering design: fourth-grade students' investigations in aerospace. *International Journal of STEM Education*, 2(14), 1-18.
- English, L. D., Dawes, L., Hudson, P., & Byers, T. (2009). Introducing engineering education in the middle school. In L. Mann & R. Hadgraft(Eds.), *Proceedings of the Third International Symposium on Research on Engineering Education*, July 20–23, Palm Cove.

- Firman, H. (2015). Pendidikan sains berbasis STEM: Konsep, pengembangan, dan peranan riset pascasarjana. [STEM-based science education: The concept, development, and role of postgraduate research] *Disampaikan pada Seminar Nasional Pendidikan IPA dan PLKH Universitas Pakuan, Agustus*. Published on August, 22th, 2015.
- Feinstein, N. (2011). Salvaging science literacy. *Science Education*, 95(1), 168–185. doi:10.1002/sce.20414.
- Friedman, T.L. (2005). *The world is flat: A brief history of twenty-first century*. New York: Farrar, Straus, and Giroux.
- Smith, D. G. (1977). College classroom interactions and critical thinking. *Journal of Educational Psychology*. 69 --, 180-190 [Online]. Retrived from <http://books.google.co.id/books>. [Accessed on October 30th, 2017].
- Fletcher, Adam. (2004). *Defining Student Engagement: A literature review*. [Online]. Retrieved from www.soundout.org. [Accessed on Oct 30, 2017].
- Giancoli, D. C. (2005). *PHYSICS Principles with Applications, sixth edition*. Upper Saddle River, New Jersey: Pearson education, Inc.
- Harlen, W., Elstgeest, J. (1992). UNESCO Source Book for Science in the Primary School - A workshop approach to teacher education. Paris, UNESCO.
- Harlen, W. (1999). Purposes and procedures for assessing science process skills. *Assessment in Education*, 6, 1, 129-135.
- Harlen, W. (2000). *Teaching, learning and assessing science*, (3rd ed) London: Paul Chapman publishing, 5-12.
- Hom, E.J. (2014). What is STEM education?. *Livescience*, Retrieve from <http://www.livescience.com/43296-what-is-stem-education.html> on June 7, 2018.
- Howard, J. R., & Henney, A. L. (1998). Student participation and instructor gender in the mixedage college classroom. *The Journal of Higher Education*, 69--, 384-405 [Online]. Retrived from. <http://books.google.co.id/books?id=TiBxjMnh5e4C&p>. [Accessed on October 30th, 2017].

- Indonesia Ministry of Education and Culture. (2013). *Peraturan Menteri Pendidikan dan Kebudayaan Nomor 68 Tahun 2013*. [Regulation of the Minister of Education and Culture Nomor 68, 2013].
- Indonesia Ministry of Education and Culture. (2013). Kurikulum 2013, Kompetensi Dasar Sekolah Menengah Pertama (SMP)/Madrasah Tsanawiyah (MTs). [Curriculum 2013, Basic Competence of Junior High School (SMP) / Madrasah Tsanawiyah (MTs)]. *Jakarta, Indonesia: Kementerian Pendidikan dan Kebudayaan*.
- Indonesia Ministry of Education and Culture. (2013). *Peraturan Menteri Pendidikan dan Kebudayaan*. [Regulation of the Minister of Education and Culture]. *Nomor 68 Tahun 2013*.
- Inovasi pendidikan tingkatkan daya saing.[Educational innovation improves competitiveness]. (2015, July 15). *Kompas*, p.12.
- Kong, yuan. (2009). A Brief Discussion on Motivation and Ways to Motivate Students in English Language Learning. *International Education Studies, Vol. 1, No.2, 149*. Retrieved from: <https://files.eric.ed.gov/fulltext/EJ1065695.pdf>.
- Kuenzi, J. J. (2008). *Science, Technology, Engineering, and Mathematics (STEM) Education: Background, federal policy, and legislative action*. Congressional Research Service Report for Congress (RL33434).
- Krajcik, J. & Delen, I. (2016). *How to support learners in developing usable and lasting knowledge of STEM*. *International Journal of Education in Mathematics, Science and Technology*, 5(1), 21-28. DOI:10.18404/ijemst.16863.
- Lam, P., Doverspike, D., Zhao, J., Zhe, J., & Menzemer, C. (2008). *An evaluation of a STEM program for middle school students on learning disability related IEPs*. *Journal of STEM education*, 9(1&2), 21–29.
- Leedy, P. D. (1993). *Practical research: planning and design*. New Jersey: Prentice-Hall.
- Marick group. 2016. A Look At The History Of STEM (And Why We Love It). Accessed on: <http://marickgroup.com/news/2016/a-look-at-the-history-of-stem-and-why-we-love-it#>.

- Martyn, Shuttleworth. (2009). Pretest-Posttest Designs. Retrieved from <https://explorable.com/pretest-posttest-designs>. Accessed on Apr 01, 2018
- McNeil, J. D. (1984). Curriculum: A comprehensive introduction. Los Angeles: University of California.
- Meyer, Helen. (2018). Teachers' Thoughts on Student Decision Making During Engineering Design Lessons. *Education Sciences*. Retrieve from: www.mdpi.com/journal/education.
- Moore, T. J., & Smith, K. A. (2014). Advancing the state of the art of STEM integration. *Journal of STEM Education*, 15(1), 5–10.
- Morrison J. (2006). *TIES STEM education monograph series: Attributes of STEM education*. Baltimore, MD: TIES
- National Research Council. (2014). *Developing Assessments for the Next Generation Science Standards*. Washington, DC: National Academies Press.
- National Academy of Sciences. 2014. Developing Assessment for Next Generation Science Standard, Chapter: 2 Assessments to Meet the Goals of the Framework. Washington, DC: The National Academies Press.
- N. Nurlaely et al. (2017). Students' STEM Literacy in Biotechnology Learning at Junior High School. *Journal of physics: conference series* 895 012155.
- National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. National Academies Press.
- National Education Association. (2012). *Preparing 21st Century Students for a Global Society*. Retrieved June 18, 2017, from National Education Association Great Public Schools for Every Student: www.nea.org/assets/docs/A-Guide-to-Four-Cs.pdf
- National Governors Association. (2010). Common core state standards. *Light, J*, 19, 19.
- OECD. (2015). Report PISA Result. Retrieved from <http://www.oecd.org/education/education-at-a-glance-2015.htm>.
- Ozgelen. (2012). Scientist' Science Process Skills Within A Cognitive Domain Framework. *Eurasia Journal of Mathematics, science & Technology Education* , 8, 283-292.

- Ohio, Dayton. (2016). STEM Learning Network. Accessed on June, 27, 2017. Retrieved from <http://www.osln.org>.
- Ozgelen. (2012). Scientist' Science Process Skills Within A Cognitive Domain Framework. *Eurasia Journal of Mathematics, science & Technology Education* , 8, 283-292.
- Ogonor, B. O., & Badmus, M. M. (2006). Reflective Teaching Practice among Student Teachers: The Case in a Tertiary Institution in Nigeria. *Australian Journal of Teacher Education*, 31(2). <http://dx.doi.org/10.14221/ajte.2006v31n2>.
- Peterson, R. M., (2001). Course participation: An active learning approach employing student documentation. *Journal of Marketing Education*, 23 vol (3).
- Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light. Accessed online: https://www.teachengineering.org/view_activity.php?url=collection/van_/activities/van_troll/van_troll_lesson02_activity1.xml.
- Putra, P. D. A. (2017). Education Game for STEM Education in Indonesia Local Wisdom. *The Japan Society for Science Education*, 31 (2017), 97-100.
- Partnership for 21st century skills. (2018). *21st century skills: how can you prepare students for new global economy*. Paris: Cisco system, Inc. Retrieve from <http://www.oecd.org/educeri21st/40756908.pdf>
- Riding, P, Fowell, S. and Levy, P. (1995). An action research approach to curriculum development, *Information Research* , 1(1) [http:// Information R.net/ir/1-1/paper2.html](http://Information R.net/ir/1-1/paper2.html).
- Rocca, K.A. (2010). Student Participation in the College Classroom: An Extended Multidisciplinary Literature Review. *Communication Education*. 59 (2), 185-213. [Online]. Retrieved from <http://www.csus.edu/>. [Accessed on October 30th , 2017].
- Rosser, S.V. (2001). Will EC 2000 Make Engineering More Female Friendly?. *Women's Studies Quarterly* Vol. 29, No. 3/4, Women Confronting the New Technologies (Fall - Winter, 2001), pp. 164-186.

- Rustaman, Septiani. 2016. Implementation of Performance Assessment in STEM (Science, Technology, Engineering, Mathematics) Education to Detect Science Process Skill. *Journal of Physics: Conf Series* 812(2017)012052. IOPscience.iop.org.
- Santrock, J. W. (2009). In *Educational Psychology, Fourth Edition* (p. 405). New York: McGraw-Hill Companies, Inc.
- Schwartz, R. S., & Lederman, N. G. (2002). "It's the nature of the beast": The influence of knowledge and intentions on learning and teaching nature of science. *Journal of Research in Science Teaching*, 39(3), 205-236.
- Shaughnessy, M. (2013). By way of introduction: mathematics in a STEM context. *Mathematics Teaching in the Middle school*, 18(6), 324.
- Subekti, Niken. 2017. *Science Education in Indonesia*. The 351st IDEC Seminar. Hiroshima – Japan.
- Sudjana. (1983). *Metoda dan Teknik Kegiatan Belajar Partisipatif*. Bandung: Theme
- Susilowati, (2010). Pembelajaran IPA Terintegrasi di SMP. [Integrated Science Learning in Secondary School]. Universitas Negeri Yogyakarta.
- Syaodih, N. (2007). Pengembangan kurikulum teori dan praktik. [Curriculum development theory and practice]. New York: Rosdakarya.
- Taba, H. (1962). Curriculum development theory and practice. New York: Harcourt, Brace & World, INC.
- The attachment of regulation Indonesia Ministry of education nomor 68 in 2013 about *basic framework and curriculum structure* in secondary school.
- The attachment of regulation Indonesia Ministry of education nomor 68 in 2016 about *basic framework and curriculum structure* in secondary school.
- Tohir, Mohammad. 2016. *Hasil PISA Indonesia Tahun 2015 Mengalami Peningkatan*. [PISA Result Indonesia 2015 Increased]. Available online: <https://matematohir.wordpress.com/2016/12/08/hasil-pisa-indonesiatahun-2015-mengalami-peningkatan/> [08 Desember 2016].

- Thomas, B and Watters, J. (2015). Perspectives on Australian, Indian, and Malaysian approaches to STEM education. *International Journal of Educational Development*, 45(November 2015), 42-53.
- United Nations Environment Programme. (2012). 21 issues for the 21st century: Result of the UNEP foresight process on emerging environmental issues. Nairobi, Kenya: Author.
- UNESCO. (2015). Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM). France: United Nations Educational, Scientific and Cultural Organization. Retrieved from <http://unesdoc.unesco.org/images/0025/002534/253479e.pdf>.
- Willms, J.D. (2003). *Student Engagement at School: a sense of belonging and participation: Results from PISA 2000*. [Online]. Retrieved from <http://www.oecd.org/edu/school/>. [Accessed on October 30th, 2014].
- Zollman, Allan. 2012. Learning for STEM Literacy: STEM Literacy for Learning. *Journal of School Science and Mathematics Association*. DOI: 10.1111/j.1949-8594.2012.00101.x.
- <http://www.designtechsys.com/contact-us>.
- <https://www.quora.com/>
- <https://www.metroasahan.com>