

DAFTAR PUSTAKA

- Abd-El-Khalick, F., Boujaoude, S., Duschl, R., Lederman, N.G., Mamlok-Naaman, R., Hofstein, A... Tuan, H. (2004). Inquiry in science education: International Perspectives. *Science Education*, 88 (3), hlm. 397–419.
- Abrahams, I. & Millar, R. (2008). Does practical work really work? A study of the effectiveness of practical work as a teaching and learning method in school science. *International Journal of Science Education*, 30, hlm. 1945–1969.
- Adeeyinwo, C.E, Okorie, N. N. & Idowu, G. O. (2013). Basic calibration of uv/visible spectrophotometer. *International Journal of Science and Technology*, 2 (3), 247–251.
- Albert, D.R., Todt, M.A. & Davis, H.F. (2012). A low-cost quantitative absorption spectrophotometer. *Journal of Chemical Education*, 89 (11), hlm. 1432–1435.
- Allen, A. P & Thomas, K.E. (2011). A dual process account of creative thinking. *Creativity Research Journal*, 23(2), hlm. 109–118.
- Al-Suleiman, N. (2009). Cross cultural studies and creative thinking abilities. *Journal of Educational and Psychology Science*. 1 (1), hlm. 42–92.
- Ariyoso. (2009). Uji Kolmogorov-Smirnov. [Online]. Diakses dari <https://ariyoso.wordpress.com/2009/11/16/uji-kolmogorov-smirnov/>.
- Baer, J. (1993). *Creativity and divergent thinking*. Hillsdale, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Baer, J. (2003). Evaluative thinking, creativity, and task specificity: separating wheat from chaff is not the same as finding needles in haystacks. In M.A. Runco (Ed.), *Critical creative process*. Cresskill, NJ: Hampton Press.
- Baker, M., Rudd, R. & Pomeroy, C. (2001). Relationships between critical and creative thinking. *Journal of Southern Agricultural Education Research*. 51 (1), hlm. 173–188.
- Bakir, S. & Öztekin, E. (2014). Creative thinking levels of preservice science teacher in terms of different variables. *Journal of Baltic Science Education*, 13(2), hlm. 231–242.
- Barak, M. (2012). From ‘doing’ to ‘doing with learning’: reflection on an effort to promote self-regulated learning in technological projects in high school *European Journal of Engineering Education*, 37 (1), hlm. 105–116.

- Barak, M. & Doppelt, Y. (2000). Using portfolios to enhance creative thinking. *The Journal of Technology Studies*, 26 (2), hlm. 16–24.
- Barak, M., Maymon, T. (1998). Aspects of Teamwork Observed in a Technological Task in Junior High Schools. *Journal of Technology Education*, 9(2), hlm. 3–17.
- Barlex, D. (2002). The relationship between science and design and technology in the secondary school curriculum in England. In I. Mottier & M. J. De Vries (Eds.), *Proceedings of the PATT12 Conference*, hlm. 3–12.
- Barnea, N., Dori, Y.J., & Hofstein, A. (2010). Development and implementation of inquiry-based and computerized-based laboratories: reforming high school chemistry in Israel. *Chemistry Education Research and Practice*, 11, hlm. 218–228.
- Bell, S. (2010). Project-based learning for the 21st century: skills for the future. *The Clearing House*, 83, hlm. 39–43.
- Bergh, V., Mortelmans, D., Spooren, P., Petegem, P., Gijbels, D. & Vanthournout, G. (2006). New assessment modes within project-based education–The Stakeholders. *Studies in Educational Evaluation*, 32, 345–368.
- Bernazzani, P. & Paquin, F. (2001). modular spectrometers in the undergraduate chemistry laboratory. *Journal of Chemical Education*, 78 (6), hlm. 796–798.
- Blonder, R., Mamlok-Naaman, R. & Hofstein, A. (2008). Analyzing Inquiry Questions of High-School Students in a Gas Chromatography Open-Ended Laboratory Experiment. *Chemistry Education Research and Practice*, 9 (3), hlm. 250–258.
- Blosser, B.F. (1983). The role of the laboratory in science teaching. *School Science and Mathematics*, 83, 165–169.
- Blumenfeld, P.C., Krajcik, J.S., Marx, R.W., & Soloway, E. (1994). Lesson learn: How collaboration helped middle school science teachers learn project-based instruction. *Elementary School Journal*, 94, 539–551.
- Bopegedera, A.M.R.P. (2011). A Guided-inquiry lab for the analysis of the balmer series of the hydrogen atomic spectrum. *Journal of Chemical Education*, 88 (1), hlm. 77–81.
- Bowden, J. & Marton, F. (1998). *The university of learning: beyond quality and competence*. London: Kogan Page.
- Brescia, W, Mullins, C. & Miller, M. (2009). Project-based service-learning in

- an instructional technology graduate program. *International Journal for Scholar of Teaching & Learning*, 3 (2), hlm. 1–12.
- Brophy, D.R. (2006). A comparison of individual and group efforts to creatively solve contrasting types of problems. *Creativity Research Journal*, 18(3), hlm. 293–315.
- Burgin, S.R. & Sadler, T.D. (2013). Consistency of practical and formal epistemologies of science held by participants of a research apprenticeship. *Res Sci Educ*, 43, hlm. 2179–2206.
- Busse, T.V. & Mansfield, R.S. (1980). Theories of the creative process: A review and a perspective. *The Journal of Creative Behavior*, 14, hlm. 91–132.
- Bybee R. W., (2000), in J. Minstrel and E. H. Van-Zee, eds, *Inquiring into inquiry learning and teaching in science*, Washington DC; AAAS.
- Cartrette, D.P. & Melroe-Lehrman, B.M. (2012). Describing changes in undergraduate students' preconceptions of research activities. *Res Sci Educ*. 42, hlm. 1073–1100.
- Chandrasekaran, S., Stojcevski, A., Littlefair, G. & Joordens, M. (2012). Learning through projects in engineering education . *Paper presented at the SEFI 40th Annual Conference*. Thessaloniki, Greece.
- Cheng, V.M.Y. (2010). Teaching creative thinking in regular science lessons: Potentials and obstacles of three different approaches in an Asian context. *Asia-Pacific Forum on Science Learning and Teaching*, 11, 1.
- Chin, C. & Chia, L. (2006). Problem-based learning: using ill-structured problems in biology project work. *Science Education*, 90(1), hlm. 44–67.
- Chua, K.J., Yang, W.M. & Leo, H.L. (2014). Enhanced and conventional project-based learning in an engineering design module. *Int J Technol Des Educ*, 24 (4), hlm. 437–458.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences 2nd ed.* USA: Lawrence Erlbaum Associates.
- Colley, K. (2008). Project-based Science Instruction: A Primer. *The Science Teacher*, hlm. 23–28.
- Costa, A L., & Pressceisen. (1985). *Developing minds: a resource book for teaching thinking*. Virginia ASCD: Alexandria.
- Creswell, J.W. & Clark, V.L.P. (2007). *Designing and conducting mixed methods research*. USA: Sage Publication, Inc.

- Csikszentmihalyi, M. (1996). *Creativity: flow and the psychology of discovery and invention*. New York NY: Harpercollins.
- Danish, J.A., Pepler, K., & Phelps, D. (2011). Life in the hive: supporting inquiry into complexity within the zone of proximal development. *Journal of Science Education and Technology*, 20, 454–467.
- Davis, G.A. (1992). *Creativity is forever*. Dubuque 3rd ed., Iowa. Kendall/Hunt Publishing Company.
- De Bono, E. (2007). *Revolusi berpikir*. Bandung. Mizan Media Utama.
- DeHaan, R. L. (2009). Teaching creativity and inventive problem solving in science. *CBE–Life Sciences Education*, 8, 172–181.
- Departemen Pendidikan Nasional. (2008). *Pengembangan pembelajaran yang efektif*. Jakarta: Ditjen Dikti.
- Diawati, C. (2016). Students' conceptions and problem-solving ability on topic chemical thermodynamics. Dalam T. Hidayat dkk. (Penyunting), *International Seminar on Mathematics, Science, an Computer Science Education-2015, AIP Conference Proceedings 1708* (hlm. 040002). American Institute of Physics, Melville, NY: AIP Publishing.
- Dkeidek, I., Mamlok-Naaman, R. & Hofstein, A. (2011). Effect of culture on high-school students' question-asking ability resulting from an inquiry-oriented chemistry laboratory. *International Journal of Science and Mathematics Education*, 9, hlm. 1305–1331.
- Domin, D.S. (2007). Students' perceptions of when conceptual development occurs during laboratory instruction. *Chemistry Education Research and Practice*, 8 (2), hlm. 140–152.
- Domin, D. S. (1999). A review of laboratory instruction styles. *Journal of Chemical Education*, 76 (4), hlm. 543–547.
- Doppelt, Y. (2009). Assessing creative thinking in design-based learning . *Int J Technol Des Educ*, 19, hlm. 55–65.
- Dori Y. J., Sasson, I., Kaberman, Z. & Herscovitz, O. (2004). Integrating case-based computerized laboratories into high school chemistry. *The Chemical Educator*, 9 (1), hlm. 4–8.
- Dori, Y.J. (2003). A framework for project-based assessment in science education. In M. Segers, F. Dochy, E. Cascallar (Eds.), *Optimising new modes of assessment: In search of qualities and standards* (pp. 89-118). Dordrecht: Kluwer.

- Dyer, J.H., Gregersen, H.B & Christensen, C.M. (2009). The innovator's DNA: Mastering the five skills of disruptive innovators. *Harvard Business Review*, 87(12), 304. [Online]. Diakses dari: www.hbr.org
- Dykstra, D.I. (1992). Studying conceptual change in learning physics. *Science Education*, 76 (6), 615–652.
- Eris, O. (2003). Manifestation of divergent-convergent thinking in question asking and decision making process of design teams: A performance dimension. In U. Lindemann (Ed.), *Human behavior in design: Individuals, teams, tools*. Berlin: Springer.
- Ellwood, S., Pallier, G., Snyder, A. & Jason Gallate, J. (2009). The incubation effect: hatching a solution? *Creativity Research Journal*, 21(1), 6–14.
- Fani, T & Ghaemi, F. (2011). Implications of Vygotsky's zone of proximal development (ZPD) in teacher education: ZPTD and self-scaffolding. *Procedia-Social and Behavioral Sciences*, 29, 1549–1554.
- Frank, M. & Barzilai, A. (2004). Integrating alternative assessment in a project-based learning course for pre-service science and technology teachers. *Assessment & Evaluation in Higher Education*, 29, 41–61.
- Frank, M., Lavy, I., & Elata, D. (2003). Implementing the project-based learning approach in an academic engineering course. *International Journal of Technology and Design Education*, 13, hlm. 273–288.
- Gallagher, S. A., Stepien, W. J., Sher, B. T., & Workman, D. (1995). Implementing problem-based learning in science classroom. *School Science and Mathematics*, 95(3), 136–146.
- Gibson, I. S. (2003). From solo-run to mainstream thinking: project-based learning in engineering design. *European Journal of Engineering Education*, 28 (3), hlm. 331–337.
- Gliem, J.A. & Gliem, R.R. (2003). Calculating, interpreting, and reporting cronbach's alpha reliability coefficient for likert-type scales. *Midwest Research to Practice Conference in Adult, Continuing, and Community Education* (hlm. 82–88).
- Gredler, M.E. (2012). Understanding Vygotsky for the classroom: is it too late? *Education Psychology Review*, 24, hlm.113–131.
- Gregory, E., Hardiman, M., Yarmolinskaya, J., Rinne, L., & Limb, C. (2013). Building creative thinking in the classroom: from research to practice. *Int. J. Educ. Res.*, 62, 43–50.

- Guilford, J.P. (1956). The structure of intellect. *Psychological Bulletin*, 53(4), hlm. 267–293.
- Guilford, J.P. (1979). Some incubated thoughts. *Journal of Creative Behavior*, 13, 1–8.
- Hake, R.R. (1999). *Analyzing change/gain scores*. [Online]. Diakses dari <http://www.physics.indiana.edu/~sdi/AnalyzingChange-Gain.pdf>.
- Hake, R.R. (1998). Interactive-engagement versus traditional methods: a six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, 66(64), hlm. 64–74.
- Harland, T. (2003). Vygotsky's zone of proximal development and problem-based learning: linking a theoretical concept with practice through action research. *Teaching in Higher Education*, 8(2), hlm. 263–272.
- Herrington, D.G., Yeziarski, E.J., Luxford, K.M. & Luxford, C.J. (2011). Target inquiry: changing chemistry high school teachers' classroom practices and knowledge and beliefs about inquiry instruction. *Chemistry Education Research and Practice*, 12 (1), hlm. 74–84.
- Hofstein, A. & Lunetta, V. N. (1982). The role of laboratory in science teaching: neglected aspects of research. *Review of Educational Research*, 52, hlm. 201–217.
- Hofstein, A. & Lunetta, V. N. (2004). The laboratory in science education: foundations for the twenty-first century. *Science Education*, 88, hlm. 28–54.
- Hofstein, A., Navon, O., Kipnis, M., & Mamlok-Naaman, R. (2005). Developing students' ability to ask more and better questions resulting from inquiry-type chemistry laboratories. *Journal of Research in Science Teaching*, 42 (7), hlm. 791–806.
- Hooi, Y.K., Nakano, M. & Koga, N. (2014). A simple oxygen detector using zinc-air battery. *Journal of Chemical Education*, 91 (2), hlm. 297–299.
- Hong, J., Chen, M., Wong, A., Hsu, T. & Peng, C. (2012). Developing physics concepts through hands-on problem solving: a perspective on a technological project design. *Int J Technol Des Educ*, 22, hlm. 473–487
- Hosseini, A.S., & Watt, A.P. (2010). The effect of a teacher professional development in facilitating students' creativity. *Educational Research and Review*, 5(8), hlm. 432–438
- Howard-Jones, P. A. (2002). A dual-state model of creative cognition for supporting strategies that foster creativity in the classroom. *International Journal of Technology and Design Education*, 12(3), 215–226.

- Howard, T. J., Culley, S. J., & Dekoninck, E. (2008). Describing the creative design process by the integration of engineering design and cognitive psychology literature. *Design Studies*, 29(2), hlm. 160–180.
- Hsu, R.C. & Liu, W. (2005). Project based learning as a pedagogical tool for embedded system education. *IEEE*, 362–366.
- Ismet, Liliasari, & Agus Setiawan. 2012. Profil awal kompetensi multirepresentasi mahasiswa pada konsep kinematika gerak translasi. *Prosiding Seminar Nasional Pendidikan Sains, Volume 1, No. 1, Tahun 2012*. Yogyakarta.
- Jones, B. F., Rasmussen, C. M., & Moffitt, M. C. (1997). *Real-life problem solving: A collaborative approach to interdisciplinary learning*. Washington, DC: American Psychological Association.
- Kamata, M. & Paku, M. (2007). Exploring faraday's law of electrolysis using zinc–air batteries with current regulative diodes. *Journal of Chemical Education*, 84 (4), hlm. 674–676.
- Katchevich, D. Hofstein, A. & Mamlok-Naaman, R. (2013). Argumentation in chemistry laboratory: inquiry and confirmatory experiments. *Research in Science Education*, 43, hlm. 317–345.
- Kaufman, J.C. & Beghetto, R.A. (2009). Beyond big and little: the four c model of creativity. *Review of General Psychology*, 13(1), 1–12.
- Kılınç, A. (2007). The opinions of Turkish high school pupils on inquiry-based laboratory activities. *The Turkish Online Journal of Educational Technology*, 6 (4), artikel 6, hlm. 56–71.
- Kim, M. & Chin, C. (2010). Pre-service teachers' views on practical work with inquiry orientation in textbook-oriented science classrooms. *International Journal of Environmental & Science*, 6, hlm. 23–37.
- Koray, O. & Koksal, M.S. (2009). The effect of creative and critical thinking based laboratory application on creative and logical thinking ability of prospective teachers. *Asia Pasific Forum on Science Learning and Teaching*. 10 (1).
- Krajcik, J.S., Czerniak, C. & Berger, C. (1999). *Teaching children science: A project-based approach*. Boston: McGraw Hill College.
- Krajcik, J. S., Blumenfeld, P.C., Marx, R.W. & Soloway, E. (1994). A collaborative model for helping middle-grade science teachers learn project-based instruction. *The Elementary School Journal*, 94(5), hlm. 483–497.

- Laffey, J., Tupper, T. Musser, D. & Wedman, J. 1998. A computer-mediated support system for project-based learning. *Educational Technology Research and Development*, 46(1), hlm. 73–86.
- LaFratta, C.N., Jain, S., Pelse, I., Simoska, O. & Elvy, K. (2013). Using a homemade flame photometer to measure sodium concentration in a sports drink. *Journal of Chemical Education*, 90 (3), hlm. 372–375.
- Lagowski, J.J. (1990). Entry-level sciences courses: The weak link. *Journal of Chemical Education*, 67, hlm. 541–542.
- Lawson, A.E. (1979). *AETS. yearbook the psychology of teaching for thinking and creativity. Clearing House for Science, Mathematics, and Environmental Education: The Ohio State University College of Education.*
- Lemař, M.A., Aljinovic, E.M. & Lozano, M.E. (2002). Using a homemade spectrophotometer in teaching biosciences. *Biochemistry And Molecular biology Education*, 30 (2), hlm. 106 –110.
- Liliasari. 2007. Model-model pembelajaran berbasis teknologi informasi untuk mengembangkan keterampilan generik sains dan berfikir tingkat tinggi pelajar. *Seminar Proceeding of The First International Seminar of Science Education*. Science Education Program Graduate School. Indonesia University of Education. Bandung.
- Lorsbach, A. & Tobin, K. (1992). Constructivism as a referent for science teaching. *NARST research Matters*
- Lou, S., Chung, C., Dzan, W. & Shih, R. (2012). Construction of a creative instructional design model using blended, project-based learning for college students. *Creative Education*, 3 (7), hlm. 1281–1290
- Lubart, T.I. (2000-2001). Models of the Creative Process: Past, Present and Future. *Creativity Research Journal*, 13(3 & 4), hlm. 295–308.
- Lyall, R.J. (2010). Practical work in chemistry: Chemistry students' perceptions of working independently in a less organized environment. *Chemistry Education Research and Practice*, 11 (4), hlm. 302–307.
- Marzano, R.J. (1993). *Dimension of Thinking: A Frame Work for Curriculum and Instruction*. Virginia. Association for Supervision and Curriculum Development.
- Marx, R. W., Blumenfeld, P.C., Krajcik, J.S., Blunk, M., Crawford, B., Kelly, B. & Meye, K.M. (1994). Enacting project-based science: Experiences of four middle grade teachers. *Elementary School Journal*, 94, hlm. 517-538.

- Mednick, S.A. (1962). The associative basis of the creative process. *Psychological Review*, 69 (3), hlm. 220-232.
- Mercer, G. D. (1991). A low-cost, portable, and safe apparatus for lecturehall conductivity demonstration. *Journal of Chemical Education*, 68 (7), hlm. 619–620.
- Merritt, M.V., Schneider, M.J., & Darlington, J.A. (1993). Experimental design in the general chemistry laboratory. *Journal of Chemical Education*, 70 (8), hlm. 660–662.
- Moje, E.B., Collazo, T., Carrillo, R. & Marx, R.W. (2001). “Maestro, what is ‘quality’?”: Language, literacy, and discourse in project-based science. *Journal of Research in Science Teaching*, 38(4), hlm. 469–498.
- Mott, J.R., Munson, P.J., Kreuter, R.A., Chohan, B.S. & Sykes, D.G. (2014). Design, development, and characterization of an inexpensive portable cyclic voltammeter. *Journal of Chemical Education*, 91 (7), hlm. 1028–1036.
- Munandar, S.C. U. (2003). *Kreativitas & keberbakatan. Strategi mewujudkan potensi kreatif & bakat*. Jakarta: PT Gramedia Pustaka Utama.
- National Research Council. (2000). *Inquiry and national science education standards*. Washington D.C.: National Academy Press.
- National Research Council.(1996). *National science education standards*. Washington D.C.: National Academy Press
- Olatoye, R.A., & Adekoya, Y.M. (2010). Effect of project-based, demonstration and lecture teaching strategies on senior secondary students' achievement in an aspect of agricultural science. *International Journal of Educational Research and Teaching*, 1 (1), hlm. 19–29.
- Pecsok, R.L.; Shields, L.D.; Cairns, T.; McWilliam, I.G. (1976). *Modern methods of chemical analysis*, 2nded. NY: John Wiley and Sons.
- Peraturan Presiden Republik Indonesia No 8 Tahun 2012, tentang Kerangka Kualifikasi Nasional Indonesia.
- Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia No 49 Tahun 2014, tentang Standar Nasional Pendidikan Tinggi.
- Piaw, C.Y. (2004). *Creative and critical thinking styles*. Kuala Lumpur: Ampang Press.
- Pickering, M. (1987).What goes on in students’ heads in lab? *Symposium on Algorithms and Problem Solving*, 64 (6), hlm. 521-523.

- Price, S. Roussos, G. Falcao, T.P. & Sheridan, J.G. (2009). Technology and embodiment: relationship and implication for knowledge, creativity and communication. beyond current horizons. *Technology Children School and Famile*. London Knowledge Lab.
- Poedjiadi, A. (2001). *Pengantar filsafat ilmu bagi pendidik*. Bandung. Yayasan Cendrawasih
- Pun, S. (2012). Collaborative learning a means to creative thinking in design. *International Journal of Education and Information Technology*, 6 (1), hlm. 33–40.
- Puntambekar, S. & Hübscher, R. (2005). Tools for scaffolding students in a complex learning environment: what have we gained and what have we missed? *Educational Psychologist*, 40(1), hlm. 1–12.
- Quagliano, J.M. & Marks, C.A. (2013). Demystifying spectroscopy with secondary students: designing and using a custom-built spectrometer. *Journal of Chemical Education*, 90 (10), hlm. 1409–1410
- Ravitz, J. (2010). Beyond changing culture in small high schools: reform models and changing instruction with project-based learning. *Peabody Journal of Education*, 85, hlm. 290–312.
- Ravitz, J. (2009). Does project based learning help foster communities of learners in small us high schools? *Paper presented at meetings of the European Association for Research on Learning and Instruction*. Amsterdam, NL.
- Razik, T. (1966). Creativity, nature nurture, and measurement and evaluation. *Theory into Practice*, 5, hlm. 147-150.
- Rettich, T. & Battino, R. (1989). An inexpensive and easily constructed device for quantitative conductivity experiments. *Journal of Chemical Education*, 66 (2), 168–169.
- Rhodes, J.M. (1961). An analysis of creativity. *Phi Delta Kappa*, 7, hlm. 305–310.
- Runco, M.A., & Chand, I. (1995). Cognition and creativity. *Educational Psychology Review*, 7, 243–267.
- Runco, M.A. (2004). Creativity. *Annual Review of Psychology*, 55, 657–687.
- Russel, C.B. & Weaver, G.C. (2011). A comparative study of traditional, inquiry-based, and research-based laboratory curricula: Impacts on understanding of the nature of science. *Chemistry Education Research and Practice*, 12 (1), hlm. 57–67.

- Rye, J., Landenberger, R. & Warner, T.A. (2013). Incorporating concept mapping in project-based learning: lessons from watershed investigations. *J Sci Educ Technol*, 2013, hlm. 22, 379–392.
- Scholz, F. (2005). Teaching pH measurements with a student-assembled combination quinhydrone electrode. *Journal of Chemical Education*, 82 (5), hlm. 782–786.
- Schacter, J., Thum, Y.M. & Zifkin, D. (2006). How much does creative teaching enhance elementary school students' achievement? *Journal of Creative Behavior*, 40(1), 47–72 (2006).
- Sesen, B.A. & Tarhan, L. (2013). Inquiry-based laboratory activities in electrochemistry: High school students' achievements and attitudes. *Res Sci Educ*, 43, hlm. 413–435.
- Singer, S. R., Hilton, M. L. & Schweingruber, H. A. (2005). *America's lab report: investigations in high school science*. [Online]. Diakses dari http://www.nap.edu/catalog.php?record_id=11311#orgs.
- Skoog, D.A., Holler, F.J., & Crouch, F.R. (2007). *Principles of Instrumental Analysis*, 6th ed. Canada. Thomson Brooks/Cole.
- Smith, C.J. (2012). Improving the school-to-university transition: using a problem-based approach to teach practical skills whilst simultaneously developing students' independent study skills. *Chemistry Education Research and Practice*, 13, hlm. 490–499.
- Starko, A.J. (2010). *Creativity in the classroom: schools of curious delight*, 4th edition. New Jersey: Lawrence Erlbaum Associates, Inc. Publishers.
- Sternberg, R.J. (2003). Creative thinking in the classroom. *Scandinavian Journal of Educational Research*, 47(3), hlm. 325–338.
- Stokes, D.R. (2007). Incubated cognition and creativity. *Journal of Consciousness Studies*, 14(3), hlm. 83–100.
- Streiner, D.L., Norman, G.R. & Cairney, J. (2015). *Health measurement scales a practical guide to their development and use*. (edisi kelima). UK: Oxford University Press.
- Suparno, P. (1997). *Filsafat konstruktivisme dalam pendidikan*. Yogyakarta. Kanisius.
- Szeinberg, G.A. & Weaver, G.C. (2013). Participants' reflections two and three years after an introductory chemistry course-embedded research experience. *Chemistry Education Research and Practice*, 14 (1), hlm. 23–35.

- Tamir, P. (1977). How are the laboratories used? *Journal of Research In Science Teaching*, 14(4), hlm. 311–316.
- Tavakol, M. & Dennick, R. (2011). Making sense of cronbach's alpha. *International Journal of Medical Education*, 2, hlm. 53–55.
- Thal, M.A. & Samide, M.J. (2001). Applied electronics: construction of a simple spectrophotometer. *Journal of Chemical Education*, 78 (11), hlm. 1510-1512.
- Thomas, J. W., Mergendoller, J. R. & Michaelson, A. (1999). *Project-based learning: a handbook for middle and high school teachers*. Novato, CA: The Buck Institute for Education.
- Thomas, J.W. (2000). *A Review of research on project-based learning*. <http://www.autodesk.com/foundation/PjBL/research>.
- Thomson, G. & Lordan, M. (1999). A review of creativity principles applied to engineering design. *Journal of Process Mechanical Engineering*, 213(17), hlm. 17–31.
- Tim Kurikulum dan Pembelajaran Direktorat Pembelajaran dan Kemahasiswaan Dirjen Dikti. (2014). *Buku Kurikulum Pendidikan Tinggi*. Jakarta: Kemendikbud.
- Tinker, R.F. (1992). *Thinking about science*. Princeton, NJ: College Entrance Examination Board.
- Tobin K. (1990). Research on science laboratory activities: in pursuit of better questions and answers to improve learning. *School Science and Mathematics*, 90(5), hlm. 403–418.
- Toplis, R. (2012). Students' views about secondary school science lessons: the role of practical work. *Res Sci Educ*, 42, hlm. 531–549.
- Trnova, E. (2014). IBSE and creativity development. *Science Education International*, 25(1), hlm. 8–18.
- Trowbridge, L. W. & Bybee, R. W. (1990). *Becoming a secondary school science teacher (5 th Ed.)*. Columbus OH: Merrill Publishing Company.
- Tsai, C. dan Tuan, H. (2006). *Investigating the inquiri-based instruction effects the 8th graders' perceptions about learning environments in the physical science*. Hongkong: APERA Conference.
- Undang-undang Republik Indonesia No. 20 Tahun 2003, Sistem Pendidikan Nasional

- Vanderveen, J.R., Martin, B. and Ooms, K.J. (2013). Developing tools for undergraduate spectroscopy: an inexpensive visible light spectrometer. *Journal of Chemical Education*, 90 (7), hlm. 894–899.
- Vygotsky, L.S. (1978). *Mind in society: the development of higher mental process*. Cambridge. Harvard University Press.
- Wahab, M.F. (2007). Fluorescence spectroscopy in a shoebox. *Journal of Chemical Education*, 84 (8), hlm. 1308–11312.
- Wakabayashi, F. & Hamada, K. J. (2006). A dvd spectroscope: a simple, high-resolution classroom spectroscope. *Journal of Chemical Education*, 83(1), hlm. 56-58.
- Wakabayashi, F., Hamada, K. & Sone, K. J. (1998). CD-ROM spectroscope: a simple and inexpensive tool for classroom demonstrations on chemical spectroscopy. *Journal of Chemical Education*, 75(12), hlm. 1569–1570.
- Welle-strand, A & Tjeldvoll, A. (2003). Creativity, curricula and paradigms *Scandinavian Journal of Educational Research*, 47 (3), 359–372.
- Wenning, C. J. (2005). Levels of inquiry: hierarchies of pedagogical practices and inquiry processes. *Journal of Physics Teacher Education*, 2 (3), hlm. 3–11.
- Wenning, C. J. (2010). Levels of inquiry: using inquiry spectrum learning sequences to teach science. *Journal of Physics Teacher Education, Online*, 5 (3), hlm. 11–20.
- White, C., Wood, K. & Jensen, D. (2012). From brainstorming to c-sketch to principles of historical innovators ideation techniques to enhance student creativity. *Journal of STEM Education*, 13, 5.
- Widhiarso, W. (2011). *Berkenalan dengan Korelasi Intrakelas*. [Online]. Diakses dari http://Widhiarso.staff.ugm.ac.id/files/reliabilitas_antar_rater.pdf.
- Wigton, B.T., Chohan, B.S., McDonald, C., Johnson, M., Schunk, D., Kreuter, R. & Sykes, D. (2011). A portable, low-cost, led fluorimeter for middle school, high school, and undergraduate chemistry labs. *Journal of Chemical Education*, 88 (8), hlm. 1182–1187.
- Wong, Y.L. & Siu, K.W.M. (2012). A model creative design process for fostering creativity of student in design education. *Int J Technol Des Educ*, 22, hlm. 437–450.
- Wurdinger, S & Qureshi, M. (2015). Enhancing college students' life skills through project based learning. *Innovative Higher Education*, 40(3), hlm. 279–283.

- Xu, Y. & Liu, W. (2010). A project-based learning approach: a case study in china. *Asia Pasific Education Review*, 11(3), hlm. 363–370.
- Yuu, T. & Nobuyoshi, K. (2009). A convenient measurement of oxygen concentration using zink-air battery. *Chemical Education Journal*, 13 (1), hlm. 1–7.
- Zhou, C., Holgaard, J.E., Kolmos, A. & Nielsen, J.D. (2010). Creativity development for engineering students: cases of problem and project based learning. *Joint International IGIP-SEFI Annual Conference 2010*, Trnava, Slovakia.