

DAFTAR PUSTAKA

- Aan Nurjanah, Ali Sudin, Atep Sujana, “Literasi Sains dalam Pembelajaran PBL(Penelitian Preexperimental terhadap siswa kelompok atas, tengah, dan bawah SDN Waringin II dan SDN Palasah I di Kecamatan Palasah Kabupaten Majalengka pada Materi Energi Panas)”*Jurnal Pena Ilmiah Vol 2, No 1*, (Program Studi PGSD UPI Kampus Sumedang, 2017), hh. 581-590.
- Afiana, J., Anna Permanasari, Any Fitriani, “Penerapan Project Based Learning Terintegrasi STEM untuk Meningkatkan Literasi Sains Siswa Ditinjau dari Gender” *Jurnal Universitas Pendidikan Indonesia, Bandung*, Volume 2, Nomor 2, ISSN: 2406-9205, 2016: 202-212
- Alfathy, R. M. H., dkk., “Penerapan Aktivitas AESOP’S Berbantuan Guidance Worksheet untuk Meningkatkan Pemahaman Konsep Sains dan Sikap Ilmiah” *Jurnal Pendidikan IPA Veteran*, Volume 2-Nomor 1 2018, Universitas Negeri Semarang, Semarang, Indonesia h.72
- Anderson & Krathwohl, *Pembelajaran, Pengajaran dan Asesmen* (Yogyakarta: Pustaka Belajar, 2010)
- Aningtyas, A., Mimien Henie Irawati, & Hadi Suwono, “Pengaruh Model Pembelajaran *Connect Extend Challenge* Melalui Peta Konsep Terhadap Penalaran Saintifik Siswa Biologi”, *Jurnal Pendidikan Sains, Vol. 3, No.1*, ISSN: 2338-9117, Universitas Negeri Malang, 2015:17-21
- Aoun, J.E. “Robot-proof: higher education in the age of artificial intelligence”, US: *MITPress*, 2017.
- Arends, R. I., *Learning to Teach*, (Central Connecticut State University, 2012), h. 270
- Ardianto, Didit & Bibin Rubini, “Literasi Sains dan Aktivitas Siswa Pada Pembelajaran IPA Terpadu Tipe SHARED”, *USEJ (Unnes Science Education Journal)* prodi Pendidikan IPA, Progrma Pascasarjana Universitas Pakuan, Bogor, (Volume 5, No. 1, p-ISSN: 2252-6617, 2016: 1167-1174
- Asmuniv. Pendekatan Terpadu Pendidikan STEM Dalam Upaya Mempersiapkan Sumber Daya Manusia Indonesia Yang Memiliki Pengetahuan Interdisipliner Untuk Menyongsong Kebutuhan Bidang Karir Pekerjaan Masyarakat Ekonomi ASEAN (MEA). *Jurnal. Widyaiswara PPPPTK-VEDC Malang*, 2015:1-9

- Astawa, I M. W., W. Sadia, W. Suastra “Pengaruh Model Pembelajaran Berbasis Proyek terhadap Sikap Ilmiah dan Konsep Diri Siswa SMP”, Thesis, Progrma studi Pendidikan IPA Program Pascasarjana. Universitas Pendidikan Ganesha, Singaraja, 2015.
- Braithwaite, D. W. & Robert L. G. “Effects of Variation and Prior Knowledge on Abstract Concept Learning”, *Journal Cognition and Instruction*, 33(3), ISSN: 0737-0008, DOI: 10.1080/07370008.2015.1057215, (Carnegie Mellon University & Indiana University, 2015:226-256
- Boyles, B., “Reality and Augmenten Reality in Education”, *Papper*, United States Military Academy, West Point, NY, 2017:1-9.
- Brown, Ryan, Joshua Brown, Kristin Reardon, & Chris Merril, “ Understanding STE: Current Perception”, *Journal Technology and Engineering Teacher*, Volume 70, No. 6, State university, Normal, IL, 2011:5-10
- BSNP. *Paradigma Pendidikan Nasional Abad XXI*. Versi 1.0. Jakarta, 2010.
- Budiman, A. A., “Aplikasi *Mobile Augmented Reality* berbasis android sebagai media pembelajaran”, *Jurnal teknik dan ilmu komputer*, Vol. 21, No. 6, Universitas Darma Persada, Jakarta, 2017:60-72
- Bundu, P. *Penilaian Keterampilan Proses Dan Sikap Ilmiah Dalam Pembelajaran Sains – SD*. Jakarta: Departemen Pendidikan Nasional Direktorat Jendral Pendidikan Tinggi, 2006
- Bybee, R. W. *The case for STEM education: Challenges and opportunity*. National Science Teachers Association (NSTA) Press, Arlington, 2013
- Candiasa, I M. *Pengujian Instrumen Penelitian Disertai Aplikasi ITEMAN dan BIGSTEPS*. Singaraja: Undiksha Press, 2011
- Candiasa, I M. *Statistik Multivariat Disertasi Aplikasi SPSS*. (Singaraja: Undiksha Press, 2011
- Cao, Z., Yu Wang, Dianqing Li, “Quantification of Prior Knowledge in Geotechnical Site Characterization”, ELSEVIER *Journal Engineering Geology*, DOI: 10. 1016. Department of Architecture and Civil Engineering, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong, 2015:107-116
- Capraro, R. M., Capraro, M. M., Morgan, J. R., & Slough, S. W., “STEM ProjectBased Learning: An Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach”, *International Journal of*

- Environmental & Science Education*, 5(4), <http://doi.org/10.1007/978-94-6209-143-6> (Turki, 2013).
- Chimini, Ciara (2019), See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/329581654> Industry 4.0 Technologies Impacts in the Manufacturing and Supply Chain Landscape: An Overview: Proceedings of SOHOMA 2018
- Chiappetta, E. L., & Alfred T. C. *Science Instruction in the Middle and Secondary Schools*. New York: Macmillan Publishing Company, 1994.
- Christensen, R., Gerald Knezek, and Tandra Tyler-Wood, Alignment of Hands-On STEM Engagement Activities With Positive STEM Dispositions in Secondary School Students. *Journal of Science Education and Technology*, vol. 24, DOI: 10.1007/s10956-9572-6. University of North Texas, Texas, 2015:898-909
- Creswell, John W., *Research Design: Pendekatan Kualitatif, Kuantitatif, dan dan Mixed, edisi ketiga*, Yogyakarta: Pustaka Pelajar, 2010
- Dantes, Nyoman. *Desain Eksperimen Dan Analisis Data*, Undiksha, Singaraja, 2012
- Data Laporan Hasil US Kabupaten Manggarai, Provinsi NTT
- DeBoer, G. E., “Scientific Literacy: Another Look at Its Historical and Contemporary Meanings and Its Relationship to Science Education Reform”, *Journal Of Research In Science Teaching Vol. 37, NO. 6, PP. 582-601*(Department of Education, Colgate University, Hamilton, New York ,2000), h. 587
- Dugger, W. E., Evolution of STEM In The U. S. “, *ITEEA Technology and Engineering bring STEM to Life*, (XXII International Confrence on Technological Education in Schools, Colleges, and Universitas, Moscow, Russia, October 5, 2016:1-43
- Echols, John M. & Hassan Shadily, *Kamus Inggris Indonesia Edisi yang Diperbaharui*, Gramedia Pustaka utama, Jakarta, 2002
- Ekawati, Elvin Yusliana , “A model of scientific attitudes assessment by observation in physics learning based scientific approach: case study of dynamic fluid topic in high school”, *Journal of Physics: Conference Series, Series 795 (2017) 012056, doi:10.1088/1742-6596/795/1/012056*, Departement of Sebelas Maret University, Surakarta Indonesia, 2017

- English, L. D. & Donna T. K. "STEM learning through engineering design: fourth-grade students' investigations in aerospace" *International Journal of STEM Education*. Vol. 2, No. 14, DOI 10.1186/s40594-015-0027-7. Queensland, Australia, 2015: 1-18
- Erdogan, S. C. "Science teaching Attitudes and Scientific Attitudes of re-service Teachers of gifted Student", *Journal Of Education and Practice*, Vol. 8, No. 6, ISSN: 2222-1735. Istanbul University, Turkey, 2017:164-170
- Estapa, A. T. & Kristina M. T. "Supporting Integrated STEM In The Elementary Classroom: a Professional Development Approach Centered On An Engineering Design Challenge" *International Journal of STEM Education*. USA. Vol. 4, No. 6, DOI: 10.1186/sA0594-017-0058-3, Iowa State University, USA, 2017:1-16
- Fengfeng Ke & Yu-Chang Hsu, "Mobile Augmented-Reality Artifact Creation As a Component of Mobile Computer-Supported Collaborative Learning", *Journal Educational Technology Faculty Publications and Presentations*, DOI: 10.1016, Florida State University, 2015:20-31
- Fraenkel, J. R. & Norman E. W. *How to Design and Evaluation Research*. New York: Graw-Hill Inc., 1993
- Gabbet, T. J., Ben Walker, & Shane Walker, "Influence of Prior Knowledge of Exercise Duration on Pacing Strategies During Game-Based Activities", *International Journal of Sports Physiology and Performance*, Vol. 10, DOI: 10.1123, Australian Catholic University, Brisbane, Australia, 2015:298-300
- Galant, D. J. Science, Technology, Engineering, Mathematics (STEM) Education. *Journal STEM*, Ohio State University, 2015:1-8
- Gipson, C. L. Jamie L. Gorman, & Eric E. Hessler, "Top-down (prior knowledge) and Bottom-up (perceptual Modality) Influences on Spontaneous Interpersonal Synchronization", *Article Psychologi and Life Science*, Vol. 20, No. 2, (Georgia Institute of Technology, Atlanta, 2016:193-222
- Gogoi, M. & Binoy M. "Scientific Attitude Of Secondary School Students Of Sivasagar District In Relation To Their Achievement In Science". *International Journal of Innovation Sciences and Research*, Vol.5, No. 02. Department of Education, Dibrugarh University, 2016:637-641
- Greehow, C., Thor Gibbins, & Melissa M. Morizer, "Re-Thinking Scientific Literacy Out-of-School: Arguing Science Issues In a Niche Facebook Application", *ELSEIVER Journal Computers in Human Behavior*, Vol. 53. University of Maryland, 2015: 593-604

- Griese, B., Malte Lehmann & Bettina Roesken-Winter, "Refining Questionnaire-based Assessment of STEM Students Learning Strategies", *International Journal of STEM Education*, vol. 2, No. 12, DOI:10.1186/s40594-015-0025-9. Ruhr-Universitat Bochum, Germany, 2015:1-12
- Gupta, S., "Influence Of Students' Gender And Stream Of Study On Scientific Attitude And Attitude Towards Science", *International of Research Granthaalaya*, Vol. 13., No. 12, ISSN: 2350-0530, (Research Scholar, Education Department, AMU, INDIA, 2015), h. 186-192
- Hacieminoglu, E. "Elementary School Students' Attitude toward Science and Related Variables". *ISER International Journal of Environmental & Science Education*, 11(2), ISSN: 1306-3065, DOI: 10.12973/ijese.2016.288a. Necmettin Erbakan University, TURKEY, 2016:35-52
- Hailikari, T. *Assesing University Students prior knowledge: implications for Theory and Practice*. University of Helsinki Departement of Education Research Report, 2009
- Han, S., Bugrahan Yalvac, Mary M. Capraro, & Robert M. Capraro, "In-service Teachers' Implementation and Understanding of STEM Project Based Learning". *Eurasia Journal of Mathematics, Science & Technology Education*, 11(1), DOI: 10.12973/eurasia.2015.1306a, ISSN: 1305-8223. Sungkyunkwan University, KOREA, Texas A&M University, USA, Aggie STEM & Texas A&M University, USA, 2015:63-76
- Handayani, L. G. R. Kontribusi Faktor-faktor Yang Memepengaruhi Literasi Sains Siswa SMP Negeri Se-kabupaten Buleleng. Thesis, Program studi Pendidikan IPA Program Pascasarjana Universitas Pendidikan Ganesha, Singaraja, 2015
- Handayani, V. T. "Pengaruh Pengetahuan Awal, Kedisiplinan Belajar, Dan Iklim Komunikasi Kelas Terhadap Hasil Belajar Produktif Akuntansi Siswa SMK". *Jurnal Ekonomi Pendidikan dan Kewirausahaan*, Volume 3, Nomor 1. SMK Negeri 3 Bangkalan, 2015:91-102
- Harlen, Wynne, *The Teaching Of Science: Studies In Primary Education*, London: David Fulton Publishers
- Hendryadi. "Content Validity (Validitas Isi)". *Teorionline Personal Paper*, 2014
- Hennies, N., Matthew A. Lambon Ralph, Marleen Kempkes, James N. Cousins, and Penelope A. Lewis., "Sleep Spindle Density Predicts the Effect of Prior Knowledge on Memory Consolidation", *The Journal of Neuroscience*, 36(13), DOI:10.1523/JNEUROSCI.3162-15.2016. Neuroscience and

Aphasia Research Unit, School of Psychological Sciences, University of Manchester, United Kingdom, Department of Systems Neuroscience, University Medical Center Hamburg-Eppendorf, Germany, & Duke-National University of Singapore Graduate Medical School, Singapore 169857, and 4School of Psychology, Cardiff University, Tower Building, United Kingdom, 2016:3799-3810

- Hergenhahn, B. R. & Matthew H. O. *Theories Of Learning (Teori Belajar)*, Diterjemahkan oleh Triwibowo B. S. Jakarta: Kencana Pernada Media Group, 2008
- Howe, A. C. & Linda J. *Engaging Children In Science*. New York: Maxwell Macmillan International, 1993.
- Hobson, A. The Surprising Effectiveness of college scientific Literacy Courses. *The Physics Teacher*, 2008:404-406
- Indrawaty, Y, M. Ichwan, dan Wahyu Putra, “Media Pembelajaran Interaktif Pengenalan Anatomi Manusia Menggunakan Metode *Augmented Reality* (AR)”, *Jurnal Informatika*, Jurusan teknik informatika institut Teknologi Nasional Bandung, Bandung, 2016, h. 11-22
- Indrawati, N. P. S. Pengaruh Model Pembelajaran Berbasis Masalah Terhadap Keterampilan Berpikir Kritis Dan Sikap Ilmiah Siswa Pada Pembelajaran Sains SMP”, Thesis, Program studi Pendidikan IPA Program Pascasarjana. Universitas Pendidikan Ganesha, Singaraja, 2015
- Ismail, I, Anna Permanasari, & Wawan Setiawan, “Efektivitas Virtual Lab Berbasis STEM dalam Meningkatkan Literasi Sains Siswa dengan Perbedaan Gender”, *Jurnal Universitas Pendidikan Indonesia, Bandung*, 2016:106-124
- Ismail, M. I. “Pengaruh Bentuk Penilaian Formatif Terhadap Hasil Belajar IPA Setelah Mengontrol Pengetahuan Awal Siswa”, *Jurnal Biotek, Volume 3 Nomor 2*, Fakultas Tarbiyah dan Keguruan Universitas Islam Negeri Alauddin Makassar, Desember 2015:1-8
- Jebson, S. R. & Amos Z. H. “Students` Attitude Towards Science Subjects In Senior Secondary Schools In Adamawa State, Nigeria”. *International Journal of Research in Applied, Natural and Social Sciences (IMPACT: IJRANSS)*, Vol. 3, Issue 3, ISSN(E): 2321-8851; ISSN(P): 2347-4580. Department of Science Education, Federal University, Kashere, Gombe, Nigeria & National Open University of Nigeria, Yola Study Centre, Yola, Adamawa State, Nigeria, 2015:117-124

- Jeyanthi, R. "Scientific Attitude And Achievement In Science Of Upper Primary School Students". *International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS)* Vol. 4, Issue 7 , ISSN (P): 2348-0521, ISSN (E): 2454-4728. Department of Education, gandhigram Rural Institute – Deemed University, Gandhigram, India, 2016:129-132
- Johnson, Elaine B. 2014. *CTL (Contextual Teaching & Learning)*. Diterjemahkan oleh Ibnu Setiawan, Bandung: Kaifa.
- Johnson, R. A., & Wichern, D. W. *Applied Multivariate Statistical Analysis*. New Jersey: Prentice Hall, 2007:186
- Kaniawati, D. S., Ida Kaniawati, dan Irma Rahma Suwarma, Study Literasi Pengaruh Pengintegrasian Pendekatan STEM Dalam Learning Cycle 5E Terhadap Kemampuan Pemecahan Masalah Siswa Pada Pembelajaran Fisika, *Jurnal Nasional. Seminar Nasional Fisika (SeNaFi)*; Departemen Pendidikan FPMIPA, UPI Bandung, 2015:30-38
- Karner, T. & Julia W. "Functional Relevance of Students Prior Knowledge and Situational Uncertainty Durng Verbal Interactions in Vocational Classrooms: Evidence From a Mixed-methods Study" *Journal Empirical Research in Vocational Education and Training*, Vol. 7, No. 11, DOI: 10.1186/s40461-015-0023-7. Universitat Bamberg, Karntenstrabe Bamberg, Germany, 2015:1-26
- Karagozlu, D. & Fezile Ozdamli, "Student Opinions on Mobile Augmented Rreality Application and Developed Content in Science Class", *TEM Journal*, Vol. 6, Number 4, ISSN:2217-8309, DOI: 10.18421/TEM64-03, Near East University, Nicosia, Cyprus, November 2017:666-670
- Kapila, V. & Iskander, M. Lessons learned from conducting a K12 project to revitalize achievement by using instrumentation in Science Education. *Journal of STEM Education*, 15 (1), 2014. pp. 4. 6-51.
- Kemendikbud, "Peringkat dan Capaian PISA mengalami Peningkatan" *Biro Komunikasi dan Layanan Masyarakat Kementerian Pendidikan dan Kebudayaan*, tanggal 6 Desember 2016
- Kennedy, E., Elizabeth Dunphy, Bernadette Dwyer, Geraldine Hayes, Thérse McPhillips, Jackie Marsh, Maura O'Connor, Gerry Shiel, *Literacy in Early Childhood and Primary Education (3-8 years)*. Educational Research Centre, Dublin, 2012

- Kim, D., Jiangmei Yuan, Roger B. Hill, Prashant Doshi, & Chi N. Thai, "Robotics to promote elementary education pre-service teachers' STEM engagement, learning, and teaching" *Internasional Journal Computers And Education*, Vol. 19, <http://dx.doi.org/10.1016/j.compedu.2015.08.005>. College of Education, University of Georgia, USA, 2015:14-31
- Kiliç, A. Can project-based learning close the gap? Turkish student teachers and proenvironmental behaviours. *International Journal of Environmental & Science Education*, 5(4), 2010, hh. 495-509.
- Krajcik, J. & Ibrahim D. "How to Support Learners in Developing Usable Lasting Knowledge STEM". *International of Education in Mathematics, Science, And Technology (IJEMST)*, 5(1), DOI: 10.18404/ijemst.1686, ISSN: 2147-611X. Michigan State University & Usak University, 2015:21-28
- Koyan, I Wayan, *STATISTIK Teknik Analisis Data Kuantitatif*, Universitas Pendidikan Ganesha Press, 2012.
- Lacap, M. P. The Scientific Attitudes of Students Major in Science in the new teacher Education Curriculum. *Asia Pacifik Journal of Multydisciplinary Research, Volume 3, No. 5, ISSN: 2350-7756*. Pangasinan State University, Bayambang Campus, Philippines, 2015:7-15
- Lestari, D. A. B., dkk., "Implementasi LKS Dengan Pendekatan STEM (Science, Technology, Engineering, And Matematics) untuk Meningkatkan Kemampuan Berpikir Kritis Siswa", *Jurnal Fakultas Matematika dan Ilmu Pengetahuan Alam*, Universitas Negeri Semarang, 2018, h.204
- Liu, X. "Beyond Science Literacy: Science And The Public" *International Journal of Environmental & Science Education. Vol.4, No. 3, ISSN: 1306-3065*. State University of New York at Buffalo, USA, 2009:301-311
- Manduca, C. A. Ellen R. Iverson, Michael Luxenberg, R. Heather Macdonald, David A. McConnell, David W. Mogk, Barbara J. Tewksbury, "Improving undergraduate STEM education: The efficacy of discipline-based professional development", *Research Article*, 15 February 2017:1-6
- Martin, R., Carlos Efren Mora, Beatriz Anorbe-Diaz, dan Antonio Gonzales-Marrero, "Teaching Science for All Children Inquiry Methods for Constructing Understanding", Boston: Pearson education inc, 2005
- Martin-Gutierrez, J., Collen Sexton, Teresa Franklin, Jack Gerlovich, "Virtual Technoogies Trends in Education", *EUFASIA Journal of Mathematics Science and Technology Education, Vol. 13, No.2, ISSN: 1305-8223, DOI: 10.12973/eurasia.2017.0062a*, Universidad de La Laguna, Spain, 2017:480-492

- Muammar, H., Ahmad Hardjono, & Gunawan., “Pengaruh Model Pembelajaran Assure Dan Pengetahuan Awal Terhadap Hasil Belajar IPA-Fisika Siswa Kelas VIII SMPN 22 Mataram”, *Jurnal Pendidikan Fisika dan Teknologi*, Volume 1 No 3, ISSN. 2407-6902, Program Studi Pendidika Fisika FKIP Universitas Mataram, Juli 2015: 170-180
- Moh. Nuril Hudha, “Peningkatan HASil Belajar Siswa PAda Materi Perubahan Wujud Zat Menggunakan Media Pembelajaran Sensor Panas melalui Pendekatan Pembelajaran STEM di SDN Dawuhan 3 Situbondo”, (Program Studi Pendidikan Guru Sekolah Dasar Fakultas Keguruan dan Ilmu Pendidikan, Universitas Abdurachman Saleh Situbondo, 2016), hh. 110-123
- Moursund, D., “Project-Based Learning Using Information Technology “ *International Society for Technology in Education*, University of Oregon, 2017, H.53
- National Research Council, *Report To Congress*, 2011
- NRC, STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research. The National Academies of Science, 2014
- Navarra and Zaffaroni. *Science Today For the Elementary-School Teacher*. New York: Elmsford, 1961
- NGSS Release: Appendix F- Science and Engineering Practices in NGSS ms 1/33
- Okudan, Gul E. dan Sarah E. Rzasa, “A Project-Based Approach to Entrepreneurial Leadership Education”, *Journal Technovation*. Desember. Volume XX. 2004, hh. 1-16.
- Panneerselvam, M. & M. Muthamizhselvan. “The Secondary School students in relation to Scientific Attitude and Achievement in Science” *Journal of Research & Method in Education (IOSR-JRME)*, Volume 5, Issue 2 Ver. I, ISSN: 2320-7388, DOI: 10.9790/7388-05210508. Department of Pedagogical Science, Tamil Nadu Teachers Education University, Chennai, Tamil Nadu, India, 2015:05-08
- Permendikbud Nomor 23 Tahun 2015 Tentang Penumbuhan Budi Pekerti
- Permanasari, A., “STEM Education: Inovasi dalam Pembelajaran Sains”, *Prosiding Seminar Nasional Pendidikan Sains (SNPS)*, Aurakarta, 22 Oktober 2016, h. 23-34.

- Pertiwi, R., Abdurahman & Undang Rosidin, “Efektivitas LKS STEM Untuk Melatih Keterampilan Berpikir Kreatif Siswa” *Jurnal Pendidikan Fisika FKIP Universitas Lampung, Lampung*, 2016:11-19
- PISA Results From PISA 2000 For Indonesia, OECD, 2002
- PISA Results From PISA 2000 For Indonesia, OECD, 2006
- PISA 2015 Draft Science Framework, March 2013
- Potter, Michael K. and Erika Kustra, “A Primer on Learning Outcomes and the SOLO Taxonomy”, *Course Design for Constructive Alignment*, (Centre for Teaching and Learning, University of Windsor, 2012: 1-12
- Pramesti, N. P. D. A. Pengembangan Perangkat Pembelajaran IPA Dengan Setting Kooperatif *Group Investigation* (GI) Untuk Meningkatkan Literasi Sains (*Scientific Literacy*) Siswa SMP. Thesis, Program Studi Pendidikan Sains Program Pasca Sarjana Universitas Pendidikan Ganesha, Singaraja, 2015
- Rahmatiah, R., Supriyono Koes H., Sentot Kusairi, “Pengaruh *Scaffolding* Konseptual dalam Pembelajaran *Group Investigation* Terhadap Prestasi Belajar Fisika SMA Dengan Pengetahuan Awal Berbeda”. *Jurnal Pendidikan Fisika dan Teknologi, Volume II, Nomor 2, ISSN: 2407-6902*. Universitas Negeri Malang, April 2016:45-54
- Rahmawati. *Hasil TIMSS 2015: Diagnosa Hasil Untuk Perbaikan Mutu dan Peningkatan Capaian*. Presentasi Seminar Nasional, Purwakarta, 2016:1-12
- Rainey, K., *et.al.*, “A descriptive study of race and gender differences in how instructional style and perceived professor care influence decisions to major in STEM”, *International Journal of STEM Education*, <https://doi.org/10.1186/s40594-019-0159-2>, Vol. 6:6 (Department of Physics, University of Colorado Boulder, USA, 2019), h. 12.
- Rika Widya Sukmana, “ Pendekatan Science, Technology, Engineering and Mathematics (STEM) sebagai alternatif dalam Mengembangkan Minat Belajar Peserta Didik Sekolah Dasar”, *Jurnal Ilmiah Pendidikan Dasar, ISSN: 2477-2143, Volume II, No. 2*, PGSD FKIP Langlangbuana, 2017. Hh. 191-199.
- Rose, M. A., Vinson Carter, Josh Brown & Steven Shumway, “Status of Elementary Teacher Development: Preparing Elementary Teachers to Deliver Technology and Engineering Experiences. *Journal of Technology Education. vol. 28. NO. 2*, 2017.

- Roberts, A. & Cantu, D. Applying STEM Instructional Strategies to Design and Technology Curriculum. *Internasional Journal Department of STEM Education and Professional Studies Old Dominion University*, Norfolk, VA, U.S.A. 2012:111-118
- Rufaida, S., & Sujiono, E. H. Pengaruh Model Pembelajaran dan Pengetahuan Awal terhadap Kemampuan Memecahkan Masalah Fisika Peserta Didik Kelas XI IPA MAN 2 Model Makassar. *Jurnal Pendidikan IPA Indonesia*, 2(2), (2013). 161–168.
- Roseman, J. E. Achieving Science Literacy For All: Contributions From AAAS Project 2061, *Paper* dipresentasikan 5 Maret 2015:1-6
- Rustaman, N. Y. Pembelajaran Sains Masa Depan Berbasis STEM Education”. *Prosiding Seminar Nasional Biologi Edukasi Bio-Edu 1*. Prodi Pendidikan Biologi STKIP Sumatera Barat, 2016:1-17
- Sa’adah & M. Kusasi. Meningkatkan Sikap Ilmiah Dan Pemahaman Konsep Menggunakan Model Pembelajaran Inkuiri Terbimbing (*Guided Inquiry*) Pada Materi Keseimbangan Kimia”, *Quantum, Jurnal Inovasi Pendidikan sains*, Vol. 8, No.1, ISSN: 2550-0716, Universitas Lambung Mangkurat, Banjarmasin, 2017:78-88
- Sadia, I W. *Model-model Pembelajaran Sains Konstruktivistik*, Yogyakarta: Graha Ilmu, 2014
- Sahin, A. *A Practice-based Model of STEM Teaching STEM Students on the Stage (SOS)TM*. Sense Publisher: Houston, USA, 2015
- Sahan, H. H., “The mediating role of scientific attitudes in the relationship between teacher candidates’ scientific epistemological beliefs and approaches to scientific research”, *Article, Academic Journal*, Vol. 12(11), Department of Science Education, Balikesir University, Turkey, 10 June 2017:601-608
- Saidin, Noor Dayana Abd Halim, dan Noraffandy Yahaya, “A Review of Research on Augmented Reality in Education: Advantages and Applications”, *Journal International Education Studies*, vol. 8, No., 13, ISSN: 1913-9020, Universiti Teknologi Malaysia, Malaysia, 2015:1-11
- Sakariyau, A. O., Michael O.Taiwo, & Olalere W. Ajagbe, “An Investigation on Secondary School Students’ Attitude Towards Science in Ogun State, Nigeria”. *Journal of Education and Practice*, Vol.7, No.28, ISSN 2222-1735. Microbiology Department, Federal University of Agriculture Abeokuta, Nigeria, Microbiology Department, Federal University of

- Agriculture Abeokuta, Nigeria, & Mathematics Department, University of Ilorin, Ilorin, Nigeria, 2016:125-128
- Santrock, John W., *Psikologi Pendidikan (edisi kedua)*, diterjemahkan oleh Tri Wibowo B. S., Kencana Prenada Media Group, Jakarta, 2007
- Saputro, R. E dan Dhanar Intan Surya Saputra, “Pengembangan Media Pembelajaran Mengenal Organ Pencernaan Manusia Menggunakan Teknologi *Augmented Reality*”, *Jurnal Buana Informatika*, vol. 6, No. 2, STMIK AMIKOM, Purwekerto, 2015, h. 159-171.
- Saribas, D. “Investigating The Relationship Between Pre-Service Teachers’s Scientific Literacy, Environmental Literacy and Life-long Learning Tendency”. *Journal Science Education International*, Vol. 26, Issue 1, Istanbul Aydin University, Turkey, 2015:80-100
- Sarah Fazilla, “Kemampuan Literasi Sains Mahasiswa PGSD pada MAta Kuliah Konsep Dasar Sains”, *Jurnal PGSD*, ISSN: 2355-3650 , Vol. 3, No. 2, (Program Studi PGSD, Universitas Almuslim, September 2016), hh. 22-28
- Schunk, D. H. *Learning Theories An Educational Perspective. Teori-teori pembelajaran: Perspektif Pendidikan*. Yogyakarta: Pustaka Pelajar, 2012.
- Septiani, A. “Penerapan Asesmen Kinerja Dalam Pendekatan STEM (Sains Teknologi Engineering Matematika) Untuk MengungkapKeterampilan Proses Sains” *Jurnal FPMSAINS Universitas Pendidikan Indonesia, Bandung*, 2016:654-659
- Seyranian,V., *et.al.*, “The longitudinal effects of STEM identity and gender on flourishing and achievement in college physics” *International Journal of STEM Education*, Vol. 5:40, doi.org/10.1186/s40594-018-0137-0, *International Journal of STEM Education*, USA, 2018, h. 12.
- Shahali, E. H. M, Lilia Halim, Mohamad Saffar Rasul, Kamisah Osman & Mohd Afendi Zulkifeli, “STEM Learning through Engineering Design: Impact on Middle Secondary Students’ Interest towards STEM” *EURASIA Journal of Mathematics Science and Technology Education*, Vol. 13, No. 5, ISSN : 1305-8223. National University of Malaysia, 2017:1189-1211
- Sidney, P. G. & Martha W. A. “Making Connections in Math: Activating a Prior Knowledge Analogue Matters for Learning”. *Journal Of Cognition And Development*, 16(1), ISSN: 1524-8372, DOI: 10.1080/15248372.2013.792091. University of Wisconsin-Madison, 2015:160-185

- Singh, Ms Renu “ A Study Of Scientific Attitude Among The Students Of Science And Arts Groups In Relation To Their Social Interaction”, *KA AV International Journal Of Arts, Humanities & Social Sciences, KIJAH S/OCT-DEC2016/VOL-3/ISS-4/A39 ISSN:2348-4349, IMPACT FACTOR(2016) – 6.8712, 2016:302-312*
- Sing, R., & Rashmi Singh, “A Correlation Study of Scientific Attitude and Scientific Interest of class IX Students”, *The International Journal of Indian Psychology, Volume 3, Issue 3, No. 4, ISSN 2348-5396 (e), New Delhi, 2016:39-51*
- Siti Aisiyah, Anik Anekawati, dan Nisfil Maghfiroh Meita, “Hubungan Motivasi Belajar IPA, Pengetahuan Awal IPA, dan Hasil Belajar IPA, Serta Identifikasi Perbedaan Hubungan Berdasar Perspektif Pesisir”, (Studi Kasus di SMPN 2 Saronggi), P-ISSN : 2337-9820 E-ISSN : 2579-8464 DOI : <https://doi.org/10.31102/wacanadidaktika.6.02.127-139>, Desember 2018, *Wacana Didaktika Jurnal Pemikiran, Penelitian Pendidikan dan Sains Indonesia* (Program Studi Pendidikan IPA, FKIP, Universitas Wiraraja Sumenep, 2018), h. 128
- Slavit, D., Tamara Holmlund Nelson, and Kristin Lesseig, “The teachers’ role in developing, opening, and nurturing an inclusive STEM-focused school”. *International Journal of STEM Education, Vol. 3, No. 7, DOI: 10.1186/s40594-016-0040-5*. Washington State University Vancouver, USA, 2017:1-8
- Star, J. R., Bethany Rittle-Johnson, Kathleen Lynch, and Natasha Perova, “The Role of Prior Knowledge and Comparison in the Development of Strategy Flexibility: The case of Computational Estimation”, *The International Journal on Mathematics Education, Vol. 41, No 5, DOI: 10.1007/s11858-009-0181-9*. Harvard University, Amerika Serikat, 2018:1-28
- Stohlmann, M., Tamara J. Moore, Gillian H. Roehrig, Consideration for Teaching Integrated STEM Education”, *Journal of Pre-College Engineering Education Research (J-PEER), Vol. 2, Issue 1, DOI: 10.5703/12882843/4653*, University Of Minnesota, Twin Cities, 2012:28-34
- Subekti, H., dkk., “Mengembangkan Literasi Informasi Melalui Belajar Berbasis Kehidupan Terintegrasi STEM untuk Menyiapkan Calon Guru Sains dalam Menghadapi Era Revolusi Industri 4,0”, Artikel, 2018, Universitas Negeri Malang, h.87

- Suastra, I W. *Pembelajaran Sains Terkini; Mendekatkan Siswa dengan Lingkungan Alamiah Dan Sosial Budayanya*. Universitas Pendidikan Ganesha, Singaraja, 2017
- Subarayana. *Pengembangan Bahan Ajar*. IKIP PGRI Wates, Yogyakarta, 2005
- Sudarma, I K., “Pengaruh Penerapan Strategi Pembelajaran dan Pengetahuan Awal terhadap Pemahaman Konsep Sains dan Sikap Ilmiah Siswa Kelas V di Sekolah Dasar,” (Disertasi, Universitas Negeri Malang, 2012). <http://karya-ilmiah.um.ac.id/index.php/disertasi/article/view/23157>, (diakses tanggal 28 September 2018).
- Sugiyono. *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R & D*. Alfabet, Bandung, 2006
- Sumintono, Bambang & Wahyu Widhiarso, *Aplikasi Pemodelan Rasch Pada Assessment Pendidikan*, Trim Komunikata, Cimahi, 2015
- Sunarti, T. “Pemahaman Literasi Sains Mahasiswa Calon Guru Fisika Universitas Negeri Surabaya”, *Diseminarkan pada seminar nasional Fisika dan Pembelajarannya di Universitas Negeri Malang*, ISBN 978-602-71273-1-9. universitas Negeri Surabaya, Surabaya, 2015:34-39
- Syawaludin, R. A., Wibisono Sukmo Wardhono, Ratih Kartika Dewi, “Permainan *Mobile Augmented reality* Berbasis Lokasi Untuk Pengenalan Kehidupan Kampus Bagi Mahasiswa Baru Fakultas Ilmu Komputer Universitas Brawijaya”. *Jurnal pengembangan teknologi informasi dan ilmu komputer*, Volume 2, Nomor 8, ISSN: 2548-964X, Universitas Brawijaya, Malang, 2018
- Tarchi, Christian “Fostering reading comprehension of expository texts through the activation of readers’ prior knowledge and inference-making skills”, *International Journal of Educational Research*, 72, DOI: 10.1016/j.ijer.2015.04.013, Department of Education of Psychology University of Florence, Florence, Italy, 2015:80-88
- Teufela, C., Naresh Subramaniam, Veronika Doblenc, Jesus Perezc, Johanna Finnemann, Puja R. Mehta, Ian M. Goodyer, and Paul C. Fletcher, “Shift toward prior knowledge confers a perceptual advantage in early psychosis and psychosis-prone healthy individuals”. *Journal Psychological and Cognitive Sciences*, Volume 112, Nomor 43. Department of Psychology, University of Cambridge, October 27, 2015:13401-13406
- Thomas, J. W. A review of research on project-based learning. Retrieved 18 July 2005 from <http://www.autodesk.com/foundation>

- Tursinawati. “Analisis Kemunculan Sikap Ilmiah Siswa Dalam Pelaksanaan Percobaan Pada Pembelajaran IPA Di SDN Kota Banda Aceh”. *Jurnal Pionir, Volume 1, Nomor 1*, (Universitas Negeri Saiff Hidayatullah, Aceh, 2013:67-84.
- UNESCO, *Current Challenges In Basic Science Education*. Education Sector, France, 2010
- Utami, I. S., dkk., “Pengembangan STEM-A (Science, Technology, Engineering, Mathematic And Animation) Berbasis Kearifan Lokal Dalam Pembelajaran Sains”, P-ISSN: 2303-1832 *Jurnal Ilmiah Pendidikan sains Al-BiRuNi*, 06 (1) (2017) 67-73 DOI: 10.24042/jipf%20al-biruni.v6i1.1581 April 2017, h.1.
- Vieira, R. M. & Celina T. V. Fostering Scientific Literacy and Critical Thinking in Elementary Science Education. *Journal of Science and Mathematic Education, Vol. 14*, DOI: 10.1007/s10763-014-9605-2. University of Aveiro, Portugal, 2016
- Verma, A. K., Dickerson, D., & McKinney, S. Engaging Students in STEM Careers with Project-Based Learning—MarineTech Project. *Technology and engineering teacher*, 30., 2011.
- Williams, C. T., Emily M. Walter, Charles Henderson & Andrea L. Beach, “Describing undergraduate STEM teaching practices: a comparison of instructor self-report instruments” *International Journal of STEM Education a Springer Open Journal* Vol.2 No. 18, DOI: 10.1186/s40594-015-0031-y, Western Michigan University, USA, 2015:1-16
- Winarni,U., STEM: Apa, Mengapa, Dan Bagaimana. *Prosiding Semnas Pendidikan Sains Pascasarjana. Vol. 1*. Universitas Negeri Malang, 2016:976-984
- Woolfolk, A. *Educational Psycholgy Active Learning editian*. Terjemahan dari Helly Prajitno Soetjipto dan Sri Mulyantini Soetjipto. Yokyakarta: Pustaka Belajar, 2009
- Wulandari, N. & Hayat Sholihin, “Analisis Kemampuan Literasi Sains Pada Aspek Pengetahuan dan Kompetensi Sains Siswa Pada Materi Kalor”, *Jurnal EDUSAINS, UIN Jakarta Vol. 8, No. 2*, Jakarta, 2016:65-72
- Yager, R. E. *Science/Technology/Society, As Reform in Science Education*. New York: State University of New York Press.
- Yuniartini, N. W. Pengembangan Perangkat Pembelajaran IPA dengan *Setting Creative Problem Solving* Untuk Meningkatkan literasi sains dan Berpikir

Kreatif Siswa Kelas VIII SMP pada Pokok Bahasan Cahaya Dan Alat Optik. Thesis Program studi Pendidikan IPA Program Pascasarjana Universitas Pendidikan Ganesha Singaraja, Singaraja, 2015.

Zeidan, A. H. & Majdi R. J. "Science Process Skills and Attitudes Toward Science Among Palestinian Secondary School Students". *World Journal of Education*, Vol. 5, No. 1, ISSN: 1925-0746, DOI: 10.5430. Departemen of Technology Education, Palestine Technical University, Tulkarm, Palestine, 2016:13-24

