

## DAFTAR PUSTAKA

- Alberts, C., (2009), Teaching: From Disappointment to Ecstasy, *Teaching Sociology* **37(3)**: 269-282.
- Anderson, dan Karthwol, (2001), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Longman, New York.
- Asan, A dan Haliloglu, Z., (2005), Implementing Project Based Learning In Computer Classroom, *The Turkish Online Journal of Educational Technology* **4(3)**.
- Badge, J.L., Dawson, E., Cann, A.J., dan Scott, J., (2008), Assessing the Accessibility of Online Learning, *Innovations in Education and Teaching International* **45(2)**: 103-113.
- Baran, M dan Maskan, A., (2010), The Effect of Project-Based Learning on Pre-Cervice Physics Teachers' Electrostatic Achievements, *Cypriot Journal of Educational Sciences* **5**: 243-257.
- Barton, R., (2004), *Teaching Secondary Science with ICT*, Open University Press, London.
- Barzegar, N., Farjad, S., dan Hosseini, N., (2012), The Effect of Teaching Model Based on Multimedia and Network on the Student Learning (Case Study: Guidance School in Iran), *Procedia- Social and Behavioral Sciences* **47**: 1263-1267.
- Belawati, T., (2003), *Pengembangan Bahan Ajar*, Pusat Penerbitan UT, Jakarta.
- Borg, W.R., and Gall, M.D., (1983), *Educational Research: An Introduction (4ed)*, Longman, Newyork and London.
- Clark, R., (1981), *Cognitive Prespective Theory and Psyc Educational Design*, University Of Southern California, California.
- Corrigan, M.J., Bill, M.L., dan Slater, J.R., (2009), The Development of A substance Abuse Curriculum In A Master's of Social Work Program, *Journal of Social Work Education* **45(3)**: 513-521.
- Dalyono, M., (2001), *Psikologi Pendidikan*, Rineka Cipta, Jakarta.
- Davis, E.J., Pauls, S., dan Dick, J., (2016), Project-Based Learning in Undergraduate Environmental Chemistry Laboratory: Using EPA Methods to Guide Student Method Development for Pesticide Quantitation, *Journal of Chemical Eduacation* **40(30)**.
- Degeng, I.N.S., (1989), Pengaruh Penstrukturan Isi Teks Ajar dan Strategi Belajar Terhadap Perolehan Belajar Mengingat Fakta dan Memahami Konsep, *Forum Penelitian Pendidikan* **6(1)**: 74-91.

- Departemen Pendidikan Nasional, (2007), *Naskah Akademik Kajian Kebijakan Kurikulum Mata Pelajaran Ilmu Pengetahuan Sosial (IPS)*, Badan Penelitian dan Pengembangan Pusat Kurikulum, Jakarta.
- Djamarah, S.B., dan Zain, A., (2006), *Strategi Belajar Mengajar*, Rineka Cipta, Jakarta.
- Dolan, E., (2009), Recent Research in Science Teaching and Learning, *CBE-Life Science Education* **8(3)**: 162-164.
- Doppelt, Y., (2003), Implementation and assessment of project-based learning in flexible environment, *Instructional Journal of Technology and Design Education*, **13**: 255-272.
- Eliza, F., (2013), Pengembangan Bahan Ajar Berbasis Multimedia Interaktif Mata Kuliah Gambar Listrik yang Menggunakan Autocad pada Program Studi Pendidikan Teknik Elektro FT UNP, *Jurnal Teknologi Informasi dan Pendidikan* **6(2)**: 63-89.
- Fregolente, L.V., Venturelli, H.C.D.A., Rodrigues, J., Silva, E.M.D., Diniz, I.S., and Maciel, M. R.W., (2018), Project-Based Learning Applied to Distillation and Absorption Education: Integration Between Industry and a Chemical Engineering Undergraduate Course, *Chemical Engineering Transaction* **69**: 427-432.
- Gay, L.R., (1991), *Educational Evaluation and Measurement: Competencies for Analysis and Application*, Second edition, Macmillan Publishing Company, New York.
- Ghazali, M. N., (2008), *Pembangunan dan Penilaian Perisian Kursus Pengajaran dan Pembelajaran Multimedia Interaktif "Analisis Kualitatif Garam" Dalam Subjek Kimia. (Development and assessment of interactive multimedia teaching and learning courseware "qualitative analysis of salt" in chemistry)*, Thesis, Universiti Kebangsaan Malaysia.
- Gultom, E., Situmorang, M., dan Silaban, R., (2015), Pengembangan Bahan Ajar Inovatif dan Interaktif Melalui Pendekatan Saintifik Pada Pengajaran Termokimia, *Jurnal Pendidikan Kimia* **7(2)**: 49-56.
- Goto, K., Pelto, H., Pelletier, D.L., dan Tiffany, J.S., (2010), "It Really Opened My Eyes:" The Effect on Youth Peer Educators of Participating in an Action Research Project, *Human Organization* **69(2)**: 192-200
- Hanson, R., (2015), Using Micro Science Equipment to Facilitate The Study of Qualitative Analysis – A Case Study in An Undergraduate Class, *European Journal of Basic and Applied Science*, **2(2)**:11-18.
- Harjianto, M., (2007), Pengembangan bahan Ajar untuk Peningkatan Kualitas Pembelajaran Program Pendidikan Pembelajaran Sekolah Dasar, *Didaktika* **2(1)**: 216-226.
- Herron, J.D., (1996), *The Chemistry Classroom: Formulas for Successful Teaching*, American Chemical Society: Washington, DC.

- Hicks, R.D., dan Bevsek, H.M., (2012), Utilizing Problem-Based Learning in Qualitative Analysis Lab Experiments, *Journal of Chemical Education*, **89(2)**: 254-257.
- Ho, S.S.S., Kember, D., Lau, C.B.S., Yeung, M.Y.M.A., Leung, D.Y.P., dan Chow, M.S.S., (2009), An Outcomes-based Approach to Curriculum Development in Pharmacy, *Am J Pharm Educ* **73(1)**: 14-19 .
- Howe, E.M., (2009), Henry David Thoreau, Forest Succession & The Nature of Science: A Method for Curriculum Development, *The American Biology Teacher* **71(7)**: 397-404.
- James, M., (2006), Assessment, Teaching, and Theories of Learning. Di dalam Gardner, John (Ed.), *Assessment and Learning*, SAGE Publications Ltd, London.
- Jones, L.L., (2016), How Multimedia-Based Learning and Molecular Visualization Change the Landscape of Chemical Education Research, *Journal of Chemical Education* **40(30)**.
- Joni, R.T., (1984), *Pengembangan Paket Belajar*, Depdikbud, P2LPTK, Jakarta.
- Karpen, M.E., Handeleiter, J., dan Schaertel, A., (2004), Integrating computational chemistry into the physical chemistry laboratory curriculum: A Wet Lab/Dry Lab Approach, *Journal of Chemical Education* **81**: 475-477.
- Kulasekara, G.U., Jayatilleke, B.G., dan Coomaraswamy, U., (2011), Learner Perceptions on Instructional Design of Multimedia in Learning Abstract Concepts in Science at a Distance, *Open Learning* **26(2)**: 113-126.
- Kolluru, S., (2012), An Active-Learning Assignment Requiring Pharmacy Students to Write Medicinal Chemistry Examination Questions, *American Journal of Pharmaceutical Education* **76(6)**: 1-7.
- Lazarowicz, R., dan Tamir, P., (1994), *Research on using laboratory instruction in science: in D. Gabel (Ed), Hand Book Of Research On Science Teaching And Learning*, Macmillan, New York.
- Liao, C.Y., (1999), Effects of Multimedia on Students' Achievement: A Meta-Analysis, *Journal of Education Multimedia and Multimedia*, **8(3)**: 255 – 278.
- Majid, A., (2007), *Perencanaan Pembelajaran*, PT Rineka Cipta, Bandung.
- Menteri Pendidikan dan Kebudayaan Republik Indonesia, (2015), *Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia Nomor 32 Tahun 2015 tentang Standar Nasional Pendidikan Republik Indonesia*, Jakarta.
- Milkova, E., (2014), Multimedia Application for Educational Purpose: Development of Algorithmic Thinking, *Applied Computing and Informatics*, **11**: 76-88.

- Munthe, L.B., dan Situmorang, M., (2015), Pengembangan Media Pembelajaran untuk Meningkatkan Hasil Belajar pada Pengajaran Radioisotop, *Prosiding Semirata 2015 bidang MIPA BKS-PTN Barat, Universitas Tanjungpura Pontianak*.
- Munthe, S.D., (2011), *Analisis dan Standarisasi Buku Kimia Kelas X Berdasarkan Standar Isi KTSP*, Medan: Tesis Universitas Negeri Medan.
- Mahdjoubi, L., dan Rahman, M.A.A., (2012), Effects of Multimedia Characteristic on Novice CAD Learner's Practice Performance, *Architectural Engineering and Design Management* **8**: 214-225.
- Nurohman, S., (2008), *Pendekatan project based learning sebagai upaya internalisasi scientific method bagi mahasiswa calon guru fisika*, Yogyakarta: Universitas Negeri Yogyakarta.
- Okudan, G.E., dan Rzasa, S.E., (2004), A Project-Based Approach to Entrepreneurial Leadership Education, *Journal Technovation* **20**:1-16.
- Oughton, J.M., (2008), The Effect of Multimedia Development on High School Students' Knowledge Acquisition, general Problem-Solving Skills, and General design Skills, *Journal of Education Multimedia and Multimedia*, **7**,(4): 333 – 364.
- Panen, P., dan Purwanto, (2004), *Penulisan Bahan Ajar*, Ditjen Dikti Depdikbud, Jakarta.
- Panasan, M., dan Nuangchalerm, P., (2010), Learning Outcomes of Project-Based and Inquiry-Based Learning Activities, *Journal of Social Science*, **6**(2): 252-255.
- Peraturan Menteri Pendidikan dan Kebudayaan No. 59 Tahun 2014 tentang Langkah-Langkah Pembelajaran Berbasis Proyek*, Jakarta: Kemendikbud.
- Peraturan Menteri Pendidikan dan Kebudayaan No. 49 Tahun 2014 tentang Standar Nasional Pendidikan Tinggi*, Jakarta: Kemendikbud.
- Prastowo, A., (2012), *Panduan Kreatif Membuat Bahan Ajar Inovatif*, DIVA Press, Yogyakarta.
- Pujadi, A., (2007), Faktor-faktor yang Mempengaruhi Motivasi Belajar Mahasiswa, Fakultas Ekonomi Universitas Bunda Mulia, *Business & Management Journal* **3**(2).
- Russell, J. W., Kozma, R. B., Jones, T., Wykoff, J., Marx, N. dan Davis, J., (1997), Use of simultaneous-synchronized macroscopic, microscopic, and symbolic representations to enhance the teaching and learning of chemical concepts, *Journal of Chemical Education* **74**(3): 330–334.
- Robinson, J. K., (2013), Project-based learning: improving student engagement and performance in the laboratory. *Analytical and bioanalytical chemistry journal*, 405(1), 7-13.



- Sardiman, A.M., (1996), *Interaksi dan Motivasi Belajar Mengajar*, Raja Grafindo Persada, Jakarta.
- Setyosari, P., (2012), *Metode Penelitian Pendidikan dan Pengembangan*, Jakarta: Kencana Prenada Media Group.
- Silaban, R., Septiani, B., dan Hutabarat, W., (2015), Penyusunan Bahan Ajar Kimia Inovatif Materi Laju Reaksi Terintegrasi Pendidikan Karakter Siswa SMA, *Jurnal Tabularasa*, **12(1)**: 78-88.
- Simatupang, N.I., dan Situmorang, M.,(2013), Innovation of Senior High School Chemistry Textbook to Improve Students Achievement In Chemistry, Proceeding of The 2<sup>nd</sup> International Conference of the Indonesian Chemical Society 2013 October, 22-23<sup>th</sup> 2013,p.44-52.
- Situmorang, H., dan Situmorang, M., (2009), Keefektifan Media Komputer dalam Meningkatkan Penguasaan Kimia Siswa Sekolah Menengah Kejuruan pada Pengajaran Materi dan Perubahannya, *Jurnal Pendidikan Matematika dan Sain* **3(1)**: 45-51.
- Situmorang, M., (2003), *Efektivitas Model Pembelajaran Terhadap Peningkatan Prestasi Belajar Mahasiswa dalam Perkuliahan Kimia Analitik-1*, Laporan Hasil Penelitian, FMIPA Universitas Negeri Medan.
- Situmorang, M., (2004), Inovasi Model Pembelajaran Bidang Sain untuk Meningkatkan Prestasi Belajar Mahasiswa, *Prosiding Konvensi Nasional Pendidikan Indonesia (KONASPI)V Tgl 5-9 Oktober 2004, di Surabaya*.
- Situmorang, M., (2013), Pengembangan Buku Ajar Kimia SMA Melalui Inovasi Pembelajaran dan Integrasi Pendidikan Karakter untuk Meningkatkan Hasil Belajar Siswa, *Prosiding Semirata FMIPA Universitas Lampung 2013*: 237-246.
- Situmorang, M., (2012), *Kimia Analitik I (Kimia Analitik Dasar)*, Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Negeri medan, Medan.
- Situmorang, M., dan Sinaga, M., (2006), Inovasi Pembelajaran pada Mata Kuliah Kimia Analitik II, *Jurnal Pendidikan Matematika dan Sain* **1(2)**: 114-119.
- Situmorang, M., dan Situmorang, A.A., (2014), Efektifitas Modul Pembelajaran Inovatif untuk Meningkatkan Hasil Belajar pada Pengajaran Laju Reaksi, *Jurnal Penelitian Bidang Pendidikan* **20(2)**: 139-147.
- Situmorang, M., Sinaga, M., Tarigan, D.A., Sitorus, C.J., dan Tobing, A.M.L., (2011), The Affectivity of Innovated Chemistry Learning Methods to Increase Student's Achievement in Teaching of Solubility and Solubility Product, *Jurnal Penelitian Bidang Pendidikan* **17(1)**: 29-37.
- Situmorang, M., Sinaga, M., Tobing, A.M.L., Sitorus, C.J., dan Tarigan, D.A., (2010), Teaching Innovation in the Laboratory to Increase Student's Achievement in Chemistry, *Jurnal Penelitian Bidang Pendidikan* **17(1)**: 7-14.

- Situmorang, M., Sitorus, M., dan Situmorang, Z., (2015), Pengembangan Bahan Ajar Kimia SMA/MA Inovatif dan Interaktif Berbasis Multimedia, *Prosiding Semirata 2015 bidang MIPA BKS-PTN Barat, Universitas Tanjungpura Pontianak*.
- Situmorang, M., Sitorus, M., Hutabarat, W., dan Situmorang, Z., (2015), The Development of Innovative Chemistry Textbook to Improve Students Achievement of Bilingual Senior High School Students, *International Educational Studies (In Press)*.
- Solikhah, I., (2017), KKNi Dalam Kurikulum Berbasis Learning Outcomes. *IJOLTL, Indonesian Journal of Language Teaching and Linguistics* **12(1)**.
- Slavin, (1994), *Cooperative Learning Theory*, Second Edition, Allyn and Bacon, Massachusetts.
- Sudjana, N., (2009), *Penilaian Hasil Proses Belajar Mengajar*, Remaja Rosdakarya, Bandung.
- Sudjimat, D. A., (2016), Implementation of project based learning model in mechanical machining skills package of vocational high school, *In AIP Conference Proceedings* (Vol. 1778, No. 1, p. 030024), AIP Publishing.
- Sumarni, W., Wardani, S., Sudarman., dan Gupitasari, D.N., (2016), Project Based Learning (PBL) to Improve Psychomotoric Skills: A Classroom Action Research, *Jurnal Pendidikan IPA Indonesia*, **5(2)**:157-163.
- Susilawati, (2010), Tingkat kemampuan kognitif mahasiswa FKIP fisika dalam menyelesaikan soal-soal pada konsep dinamika partikel, *Prosiding Seminar Nasional Evaluasi Pendidikan FKIP Unsyiah*, Banda Aceh.
- Sutikno, M.S., (2007), *Peran Guru Dalam Membangkitkan Motivasi Belajar Siswa*, Sumbawa Barat.
- Tarigan, S., (2012), *Pengantar Teori Kurikulum*, Pascasarjana UNIMED, Medan
- Tasci, B.G., (2015), Project Based Learning From Elementary School to Collage, Tool: Architecture, *Procedia- Social and Behavioral Science*, **186**: 770-775.
- Turgut, H., (2008), Prospective Science Teachers' Conceptualizations About Project Based Learning, *International Journal of Instruction*, **1(2)**, 61-79.
- Varghese, J., Faith, M., dan Jacob, M., (2012), Impact of e-resources on Learning in Biochemistry: First-year Medical Students' Perceptions, *BMC Medical Education* **12**: 21-29.
- Wayan, S., (2009), *Metode Penelitian Pengembangan dan Teori Pengembangan Modul*, Makalah dalam Penelitian Bagi Guru TK, SD, SMP, SMA dan SMK tanggal 12-14 Januari 2009, di Kecamatan Nusa Penida Kabutan Klungkung.
- Zakiah, Silalahi, A dan Muchtar, Z., (2015), Pengembangan Penuntun Praktikum Tipe *Discovery* Dan Tipe *Project Based Learning* Pada Pembelajaran

Elektrolit Dan Non Elektrolit Di SMA, *Jurnal Pendidikan Kimia*, **7(11)**: 70-79.

Zhaparova, B., Schavaliyeva, Z., Kenenbaeva, M., Theulesova, A., Soltanbaeva., Janat, S.B., dan Baitlessova, N., (2016), On Training Future Teachers For Use of Multimedia Training Tools, *Global Media Journal*, **S2:19**.

