

DAFTAR PUSTAKA

- Adodo, S.O. & Gbore, L. O.(2012). Prediction of attitude and interest of science students of different ability on their academic performance in basic science. *International Journal of Psychology and Counselling*, 4(6), 68-72.
- Alkan, F. & Erdem, E. (2012). The relationship between teacher self-efficacy and competency perceptions of chemistry teacher candidates. *Procedia-Social and Behavioral Sciences*, 47, 1927-1932.
- Anwar, Y. (2014). *Perkembangan pedagogical content knowledge (PCK) calon guru biologi pada peserta pendekatan konsekutif dan pada peserta pendekatan konkuren.*(Disertasi). Sekolah Pascasarjana, Universitas Pendidikan, Bandung.
- Arrington, C.A, Hill, J.B., Radfar, R., Whisnant, D.M. & Bass, C.G. (2008). Peer mentoring in the general chemistry and organic chemistry laboratories. *Journal of Chemical Education*, 85(2), 278-290.
- Assaraf, O. B.V. & Even, C. (2011). Positions toward science studies in medicine among university graduates of medicine and the teenaged participants of the “medical systems” study program. *Journal Science Education Technology*, 20, 317–332.
- Aumiller, M.F. (1972). *Teaching high school chemistry: A handbook of effective techniques*. New York: Parker Publishing Company.
- Azwar, S. (2011). *Reliabilitas dan validitas*. Yogyakarta: Pustaka Pelajar.
- Barkley, E.F., Cross, K.P. & Major. C.H. (2005). *Collaborative learning techniques*. San Fransisco: Jossey-Bass.
- Baumert, J., Kunter, M., Blum, W., Brunner, M., Voss, T., & Jordan, A. (2010). Teachers mathematical knowledge, cognitive activation in the classroom and student progress. *American Educational Research Journal*, 47(1), p. 133-180.
- Bektas, O., Ekiz, B., Tuysuz, M., Kutucu, E.S., Tarkin, A. & Kondakci, E.U. (2013). Pre-service chemistry teacher’s pedagogical content knowledge of the nature of science in the particle nature of matter. *Chemistry.Education.Research and.Practice*, 14, 201-213.

- Benli, E. & Sarikaya, M. (2012). The investigation of the effect of problem based learning to the academic achievement and the permanence of knowledge of prospective science teacher: the problem of the boiler stone. *Procedia - Social and Behavioral Sciences*, 46, 4317 – 4322.
- Bennett, J., Hogarth, S., Lubben, F., Campbell, B. & Robinson, A. (2010). Talking science: the research evidence on the use of small group discussions in science teaching. *International Journal of Science Education*, 32 (1), 69-95.
- Bleicher, R. E. (2004). Revisiting the stebi-b: measuring self-efficacy in preservice elementary teachers. *School Science and Mathematics*, 108 (8), 383- 391.
- Bleicher, R., E. (2006). Nurturing confidence in preservice elementary science teachers. *Journal of Science Teacher Education*, 17(2), 165-187.
- Blonder, R., Jonatan, M., Dov, Z.B., Benny, N., Rap, S. & Sakhnini, S. (2013). Can you tube it? providing chemistry teachers with technological tools and enhancing their self-efficacy beliefs. *Chemical Education. Research and Practicet*, 14, 269-285.
- Borg, R.W. & Gall, M.D. (1983). *Educational research: An introduction*, Fourth Edition. New York: Longman.
- Bower, M. & Richards, D. (2006). Collaborative learning: some possibilities and limitations for students and teachers. *Proceedings of the annual ascilite conference: Who's learning? Whose technology?*, The University of Sydney.
- Brand, B. R., & Wilkins, J. L. M. (2007). Using self-efficacy as a construct for evaluating science and mathematics methods courses. *Journal of Science Teacher Education*, 18(2), 297-312.
- Çapa, Y., Çakiroğlu, J., & Sarikaya, H. (2005). The development and validation of a Turkish version of teachers' sense of efficacy scale. *Education and Science*, 30(137), 74-84.
- Chauvot, J.B. (2008). Curricular knowledge and the work of mathematics teachers educator. *Issues in Teacher Education*, 17(2), 83-99.
- Chang, C.Y. (2010). Does problem solving = prior knowledge + reasoning skills in earth science? an exploratory study. *Research of Science Education*, 40, 103–116.

- Chang, E., Yew, E.H. J. & Schmidt, H.G. (2011). Effects of tutor-related behaviours on the process of problem-based learning. *Advance in Health Science Education*, 16, 491–503.
- Chen, B. & Wei, B. (2015). Examining chemistry teacher's use of curriculum materials: in view of teacher's pedagogical content knowledge. *Chemical Education Research and Practice*. DOI. 10.1039/c4rp00237g. www.rsc.org/cerp. Diakses tanggal 16 Februari 2015.
- Coenders, F., Terlouw, C., Dijkstra, S & Pieters, J. (2010). The effects of the design and development of a chemistry curriculum reform on teachers' professional growth: a case study. *Journal Science Teacher Education*, 21, 535–557.
- Danim, S. & Khairil. (2011). *Psikologi pendidikan*. Bandung: Alfabeta.
- De Jong, O., J. Van Driel, & N. Verloop. (2005). Pre-service teachers' pedagogical content knowledge of using particle models in teaching chemistry. *Journal of Research in Science Teaching*, 42 (8), 947–64.
- De Nobile, J. (2007). Primary teacher knowledge of science concepts and professional development: implications for a case study, teaching science. *Journal of the Australian Science Teachers Association*, 53(2), 20-23.
- Derri, V., Papamitrou, E., Vernadakis, N., Koufou, N & Zetou, E. (2014). Early professional development of physical education teachers: effect on lesson planning. *Procedia-Social and Behavioral Science*, 152, 778-783.
- DITPSMK. (2014). "Spektrum Keahlian Sekolah Menengah Kejuruan". www.psmk.kemdikbud.go.id/data/. (diunduh tanggal 7 Mei 2014).
- Dogru, M. (2008). The application of problem solving method on science teacher trainees. *Journal of Environmental & Science Education*, 3(1), 9-18.
- Dominowski, R.L. (2002). *Teaching undergraduates*. New Jersey: Lawrence Erlbaum Associates Publishers.
- Dolfing, R., Bulte, M.W., Pilot, A. & Vermunt, J.D. (2011). Domain-specific expertise of chemistry teachers on context-based education about macro-micro thinking in structure-property relations. *Research of Science Education*, DOI. 10. 1007/s11165-011-9211-z. open access at Springerlink.com, 22 Maret 2011.

- Eilks, I., & Byers, B. (2010). The need for innovative methods of teaching and learning chemistry in higher education-reflections from project of the european chemistry thematic network. *Chemistry .Education research and. Practice.*, 11, 233-240.
- Fahyuddin, Liliarsari, Sabandar, J. & Martoprawiro, M.A. (2015). Perbandingan metode kolaborasi dengan contoh tugas dan belajar individual dalam pengembangan kemampuan pemecahan masalah. *Cakrawala Pendidikan*, XXXIV(1), 34-46.
- Faraday, S., Overton, C., & Cooper, S. (2011). *Effective Teaching and Learning in Vocational Education*. London: LSN. http://policyconsortium.co.uk/wp-content/uploads/2012/01/110052RP_effective-VET_final-report1.pdf.
- Finch, C. dan Crunkilton, J.R. (1984). *Curriculum development in vocational and technical education : planning,content and implementation*. Boston : Allyn and Bacon, Inc.
- Gado, I., Verma, G. & Simonis, D. (2008). Middle grade teachers' perceptions of their chemistry teaching efficacy: findings of a one year long professional development program. *Georgia Educational Researcher*, 6 (1), 46-57.
- Garet, M.S., Porter, A.C., Desimone, L., Birman, B.F. & Yoon, K.S. (2011). What makes professional development effective? result from a national sample of teachers. *American Educational Research Journal*, 38, 915-945.
- Gavora, P. (2010). Slovak pre-service teacher self-efficacy: theoretical and research considerations. *The New Educational Review*, 21(2), 17-30.
- Ghazi, S.R., Shahzada, G., Shah, M.T. & Shauib, M. (2013). Teacher's professional competencies in knowledge of subject matters at secondary level in southern district of khyber pakhtunkhwa, pakistan. *Journal of Educational and Social Research*, 3 (2), 453-460.
- Gibson, S., & Dembo, M.H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76, 569-582.
- Glasson, G.E. & Lalik, R.V. (1993). Reinterpreting the learning cycle from a social constructivist perspective: a qualitative study of teachers' beliefs and practices. *Journal of Research In Science Teaching*, 30, 187-207.
- Hake, R.R. (1998). Interactive-engagement versus traditional methods: a six-thousand-student survey of mechanics test data for introductory physicscourse. *American Journal of Physics*, 66(1), 64-74.

- Hamalik, O. (2006). *Pendidikan guru berdasarkan pendekatan kompetensi*. Jakarta: Bumi Aksara.
- Hamidah, D. (2011). *Pengembangan profesional guru biologi sma melalui program pelatihan pedagogical content knowledge pada materi genetika*. (Disertasi), Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Bandung.
- Hammond, L.D. & Sykes, G. (1999). *Teaching as the learning profession*. San Fransisco: Jossey-Bass.
- Hammond, L.D. & Bransford, J. (2005). *Preparing teaching for a changing world (what teachers should learn and be able to do)*. San Francisco: John Wiley & Son. Inc.
- Harskamp, E. & Ding, N. (2006). Structured collaboration versus individual learning in solving physics problems. *International Journal of Science Education*, 21(14), 1669-1688.
- Hiebert, J., Gallimore, R & Stigler, J.(2002). A knowledge base for teaching proffesion: what would it look like and how can we get one? *Educational Researcher*, 31(5), pp.3-15.
- Hogan, K. (1999). Thinking aloud together: A test of an intervention to foster students' collaborative scientific reasoning. *Journal of Research in Science Teaching*, 36, 1085–1109.
- Hume, A. & Berry, A. (2011). Constructing cores—a strategy for building pck in pre-service science teacher education. *Research in Science Education*, 41, 341–355.
- Jong, S. & Chuan, S. (2009). Developing in-service science teachers' pck through a peer coaching-based model. *Education Research*, 3, 87-108.
- Juris`evic, M., Margareta, V., Marek K., & Natas`a, G. (2012). The interplay of students' motivational orientations, achievements and their perception of learning within the their chemistry hands-on approach to visible spectrometry. *Chemistry Education Research and Practice*, 13, 237–247.
- Justi, R. & van Driel, J. (2005). A case study of the development of a beginning chemistry teacher's knowledge about models and modelling. *Research in Science Education*, 35, 197–219.

- Kansanen, P. (2003). Studying—the realistic bridge between instruction and learning. an attempt to a conceptual whole of the teaching–studying–learning process. *Educational Studies*, 29 (2/3), 221-232.
- Kapyla, M., Heikkinen, JP. & Asunta, T. (2009). Influence of content knowledge on pedagogical content knowledge: the case teaching photosynthesis and plant growth. *International Journal of Science Education*, 31(10), 1395-1415.
- Karaman, A. (2012). The place of pedagogical content knowledge in teacher education. *Atlas Journal of Science Education*, 2 (1), 56-60.
- Karisan, D., Senay, A. & Ubuz, B. (2013). A science teacher's pck in classes with different academic success levels. *Journal of Educational and Instructional Studies*, 3(1), 22-31.
- Khasawneh, S.A., Olimat, Q., & Abu, T. (2008). Measuring the perceptions of vocational education students regarding the application of national vocational teacher standard in the classrooms: the key to human resource education in jordan. *IJAES*, 2(1), 24-37.
- Khezerlou, E. (2013). Teacher autonomy perceptions of iranian and turkish efl teachers. *Journal of History Culture and Art Research*, 2(2), 199-211.
- Kunandar (2007). *Guru profesional impelementasi ktsp dan sukses dalam sertifikasi guru*. Jakarta: Rajawali Pers.
- Lankford, D. (2010). *Examining the pedagogical content knowledge and practice of experience secondary biology teachers for teaching diffusion and osmosis*. (Dissertation) Graduate School. University of Missouri.
- Lavonen, J. & Krzywacki, H. (2012). Teacher Education In Finland: Knowledge Building In The Chemistry And Physics Teacher Education Programme At Helsinki University. *Artikel Hokkaido University Collection pf Scholarly and Academic Papers (HUSCAP)*. <http://hdl.handle.net/2115/49484>.
- Lee, E. & Luft, J.A. (2008). Experienced secondary science teacher's representation of pedagogical content knowledge. *International Journal of Science Education*, 30, 1343-1363.
- Leech, N.L., Barrett, K.C., & Morgan, G.A.(2005). *SPSS for intermediate statistics: use and interpretation*. New Jersey: Lawrence Erlbaum Associates, Inc.

- Limba, A. (2014). *Model penyiapan pedagogical content knowledge (PCK) calon guru untuk meningkatkan kemampuan merancang dan mengimplementasikan pengajaran fisika*. (Disertasi). Sekolah Pascasarjana, Universitas Pendidikan, Bandung.
- Loughran, J., Berry, A., & Mulhall, P. (2006). *Understanding and developing science teachers' pedagogical content knowledge*. Rotterdam: Sense Publishers.
- Majid, A. (2009). *Perencanaan pembelajaran mengembangkan standar kompetensi guru*. Bandung: Remaja Rosdakarya.
- Magnusson, S., Krajcik, J., & Borko, H. (1999). Nature, source and development of pedagogical content knowledge. In J. Gress-Newsome & N.G Lederman (Eds.). *Examining Pedagogical Content Knowledge* (hlm. 95-132). Dordrecht, Netherland: Kluwer.
- Mulhall, P., Berry, A. & Loughran, J. (2003). Frameworks for representing science teachers' pedagogical content knowledge. *Asia-Pacific Forum on Science Learning and Teaching*, 4, 2(2), 1-25.
- Mulyasa, E. (2009). *Implementasi ktsp: Kemandirian guru dan kepala sekolah*. Jakarta: Bumi Aksara.
- Nagata, K. & Ronkowski, S. (1998). *Collaborative Learning: Differences Between Collaborative and Cooperative Learning*. The Office of Instructional Consultation, University of California Santa Barbara. <http://www.oic.id.ucsb.edu/Resources/Collab-L/Differences.html>, [4 Januari 2006).
- NRC. (1996). *National science education standards*, Washington: National Academy Press.
- Naumescu, A.K., (2008). Science teacher competencies a knowledge based society. *Acta Didactica Napocensia*, 1(1), 25-31.
- NSTA (2012). *Standard for science teacher preparation*. Arlington VA: National Science Teachers Association.
- Okorie, E.U & Akubulo, F. (2013). Towards improving quality of education chemistry: an investigation into chemistry teacher's knowledge of chemistry curriculum. *International Journal of Emerging Science and Engineering*, 1 (9), 30-34.

- Overton, T., Potter, N. & Leng, C. (2013). A Study of Approaches to Solving Open-ended Problems in Chemistry. *Chemistry Education Research and Practice*, 14, 468-475.
- Ozden, M. (2008). The effect of content knowledge on pedagogical content knowledge: the case of teaching phases of matters. *Educational Science: Theory & Practice*, 8(2), 633-645.
- Palmer, D.H. (2006). Sources of self-efficacy in a science methods course for primary teacher education students. *Research in Science Education*, 36, 337-353.
- Park, S.H., Jang, J.Y, Chen, Y.C., & Jung, J. (2011). Is pedagogical content knowledge (pck) necessary for reformed science teaching?: evidence from an empirical study. *Research in Science Education*, 41, 245–260.
- Pendergast, D., Garvis, S. & Keogh, J. (2011). Pre-service student-teacher self-efficacy beliefs: an insight into making of teachers. *Australian Journal of Teacher Education*, 36 (12), 46-58.
- Peraturan Pemerintah RI Nomor 74 Tahun 2008 Tentang Guru.
- Peraturan Pemerintah RI Nomor 17 Tahun 2010 Tentang Penyelenggaraan dan Pengelolaan Pendidikan.
- Permendikbud RI Nomor 70 Tahun 2013 Tentang Kerangka Dasar dan Struktur Kurikulum Sekolah Menengah/Madrasah Aliyah Kejuruan.
- Permendiknas RI Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik dan Kompetensi Guru.
- Peterson, R.F & Treagust, D.V. (2001). A problem-based learning approach to science teacher preparation. D.R. Lavoie & W.M. Roth (eds). *Models of Science Teacher Preparation*, (hlm 49-66). Kluwer Academics Publisher, Netherland.
- Powell. C.B., Pamplin, K.L., Blake, R.E. & Mason, D.S. (2010). Summer profesional development in chemistry for inservice teachers using owl quick prep. *Journal of Science Education Technology*, 19,126-132.
- Pribadi, B.A. (2009). Model desain sistem pembelajaran. Jakarta: Dian Rakyat.
- Purwianingsih, W. (2011). *Pengembangan program pembekalan pedagogical content knowledge (PCK) bioteknologi melalui perkuliahan kapita selekta*

- biologi SMA*. (Disertasi). Sekolah Pascasarjana, Universitas Pendidikan, Bandung.
- Puyate, S.T. (2008). constraints to the effective implementation of vocational education program in private secondary schools in port harcourt local government area. *Asia-Pacific Journal of Cooperative Education*, 9(1), 59-71.
- Quinn, T.T. (2013). An investigation of curriculum integration in a vocational school setting: a qualitative study. *Education Doctoral Theses*. Paper 104. <http://hdl.handle.net/2047/d20003039>.
- Ramey-Gassert, L., Shroyer, M. G., & Staver, J. R. (1996). A qualitative study of factors influencing science teaching self-efficacy of elementary level teachers. *Science Education*, 80(3), 283-315.
- Riduwan (2012). *Dasar-dasar statistika*. Bandung: Alfabeta.
- Riggs, I. dan Knochs, L. (1990). Toward the development of an elementary teacher's science teaching efficacy belief instrument. *Science Education*, 74, 625-637.
- Robinson, J.B. (2005). Identifying pedagogical content knowledge (PCK) in the chemistry laboratory. *Chemistry Education Research and Practice*, 6(2), 83-103.
- Rohaani, E.J, Taconis, R., & Jochems, W.M.G. (2009). Measuring teachers' pedagogical content knowledge in primary technology education. *Research in Science & Technological Education*, 27(3), 27-338.
- Rohandi (2014). Teacher's experiences in incorporating student's funds of knowledge to promote the leader of science. *Cakrawala Pendidikan*, XXXIII (3), 421-433.
- Roth, D.R & Lavoie, W.M. (2001). *Models of science teacher preparation*. New York: Kluwer Academics Publisher.
- Rozenszayn, R. & Assaraf, O.B.Z. (2009). When collaborative learning meets nature: collaborative learning as a meaningful learning tool in ecology inquiry based project. *Research in Science Education*, 41, 123-146.
- Sagala, S. (2009). *Kemampuan profesional guru dan tenaga kependidikan*. Bandung: Alfabeta.

- Sahin, M. (2010). Effects of problem-based learning on university students' epistemological beliefs about physics and physics learning and conceptual understanding of newtonian mechanics. *Journal of Science Education and Technology*, 19, 266–275.
- Sampson, V. & Clark, D.B. (2011). A comparison of the collaborative scientific argumentation practices of two high and two low performing groups. *Research in Science Education*, 41, 63–97.
- Schoon, K. J., & Boone, W. J. (1998). Self-efficacy and alternative conceptions of science of preservice elementary teachers. *Science Education*, 82(5), 553–569.
- Shulman, L.S. (1986). Who understand: knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14.
- Shulman, L.S. (1987). Knowledge and teaching of new reform. *Harvard Educational review*, 57, 1–22.
- Sirhan, G. (2007). Learning difficulties in chemistry: an overview. *Journal of Turkish Science Education*, 4(2), 1–12.
- Sulaiman, F. (2010). Students' perceptions of implementing problem-based learning in a physics course. *Procedia Social and Behavioral Sciences*, 7(C), 355–362.
- Suryadi, D. (2010). Didactical Design Research (DDR) dalam Pengembangan Pembelajaran Matematika. *Prosiding Semnas MIPA UM Malang*. www.fmipa.um.ac.id/index.php/component/attachments/download/265.html _diakses tanggal 2 Mei 2014.
- Tosun, C.& Taskesenligil, Y. (2013). The effect of problem-based learning on undergraduate students' learning about solutions and their physical properties and scientific processing skills. *Chemistry Education Research and Practice*, 14, 36–43.
- Trianto (2009). *Pembelajaran inovatif berorientasi konstruktivistik*. Surabaya: Prestasi Pustaka Publiser.
- Tschannen, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68(2), 202–248.
- Tschannen, M., dan Woolfolk, A. (2001). Teacher efficacy: capturing and elusive construct. *Teaching and Teacher Education*, 17, 783–805.

- Usak, M. (2009). Preservice science and technology teachers' pedagogical content knowledge on cell topics. *Educational Sciences: Theory & Practice*, 9(4), 2033-2046.
- Usak, M., Ozden, M. & Eilks, I. (2011). A case study of beginning science teachers' subject matter (SMK) and pedagogical content knowledge (PCK) of teaching chemical reaction in turkey. *European Journal of Teacher Education*, 34(4), 407-429.
- Varatharaj, R., Abdullan, A.G.K. & Ismail, A. (2015). The effect of teacher autonomy on assessment practices among malaysian cluster school teachers. *International Journal of Asian Social Science*, 5(1), 31-36.
- Van Driel, J.H., N. Verloop, & W. De Vos. 1(1998). Developing science teachers' pedagogical content knowledge. *Journal of Research in Science Teaching* 35(6), 673–95.
- Van Driel, J.H., De Jong, O., & N. Verloop. (2002). The development of preservice chemistry teachers' pedagogical content knowledge. *Science Teacher Education*, 86, 572-590.
- Vos, M.A.J., Taconis, R., Jochems, W.M. & Pilot, A. (2010). Teachers implementation context-based teaching materials: a framework for case-analysis in chemistry. *Chemistry Education Research and Practice*, 11, 193-206.
- Waite, W. M., Jackson, M. H., Diwan, A., & Leonardi, P. M. (2004). Student culture vs group work in computer science. *Proceedings of the 35th SIGCSE technical symposium on Computer science education*, Norfolk, Virginia, USA, 12–16.
- Warfa, A.R., Roehrig, G., Schneiderc, J., & Nyachwayad. (2014). Collaborative discourse and the modeling of solution chemistry with magnetic 3D physical models – impact and characterization. *Chemistry Education Research and Practice*, 15, 835-848.
- Widoyoko, E.P. (2009). *Evaluasi program pembelajaran*. Yogyakarta: Pustaka Pelajar.
- Widoyoko, E.P. (2012). *Teknik penyusunan instrumen penelitian*. Yogyakarta: Pustaka Pelajar.
- Williams, J. (2012). Using CoRe to develop the pedagogical content knowledge (PCK) of early career science and technology teachers. *Journal of Technology Education*, 24(1), 34-50.

- Wilson, R.F., Pan, Wei & Schumsky. (2012). Recalculating of the critical values for lawshe's content validity ratio. *Measurement and Evaluation in Counseling and Development*, 45(3), 197-210.
- Wiyarsi, A. (2013). *Analisis Kesesuaian Perkuliahan Kimia SMK dengan Permasalahan Pembelajaran di Sekolah*.(Laporan Studi Lapangan), Sekolah Pascasarjana, Universitas Pendidikan Indonesia.
- Wong, K.K.H & Day, J.F. (2009). A comparative study of problem-based and lecture-based learning in junior secondary school science, *Research in Science Education*, 39, 625–642.
- Woolfolk, A. (2008). *Educational psychology, active learning edition*. Boston: Allyn and Bacon.
- Yoona, H.G., Yoon, M.K., Gyoung, H., & Mijung, K. (2010). Collaborative reflection through dilemma cases of science practical work during practicum. *International Journal of Science Education*, 32(3), 283 — 301.
- Zhang, M., Lundeberg, M. & Ebehardt, J. (2011). Strategic facilitation of problem-based discussion for teacher professional development. *The Journal of The Learning Sciences*, 20, 342–394.
- Zimmerman , B.J. (2000). Self efficacy: an essential motive to learn. in self efficacy beliefs. *Contemporary Educational Psychology*, 25, 82-91.