

DAFTAR PUSTAKA

- Abdullah, K. H., & Aziz, F. S. A. (2021). Mapping of laboratory safety research: a bibliometric review. *Malaysian Journal of Public Health Medicine*. <http://www.mjphm.org/index.php/mjphm/article/view/864>
- Alenazi, S. M., & Bugis, B. A. (2023). The Role of Laboratory Information System in Improving the Delivery of Laboratory Services: A Recent Systematic Review. *Combinatorial Chemistry and High Throughput Screening*, 26(8), 1451–1460. <https://doi.org/10.2174/1386207325666220914112713>
- Ali, M. T., Lykknes, A., & Tiruneh, D. T. (2023). Examining the Effects of Supervised Laboratory Instruction on Students' Motivation and Their Understanding of Chemistry. *Education Sciences*, 13(8). <https://doi.org/10.3390/educsci13080798>
- Aljuhani, K., Sonbul, M., Althabiti, M., & Meccawy, M. (2018). Creating a Virtual Science Lab (VSL): the adoption of virtual labs in Saudi schools. *Smart Learning Environments*, 5(1). <https://doi.org/10.1186/s40561-018-0067-9>
- Alvarez-Chavez, C. R., Flores-Soto, A. A., Arce-Corrales, M. E., Esquer-Peralta, J., & Munguía-Vega, N. E. (2021). Tool for the Integrated Assessment of Health, Safety, Civil, and Environmental Protection Management in High School Laboratories (IHSCE Tool). *ACS Chemical Health and Safety*, 28(4), 279–289. <https://doi.org/10.1021/acs.chas.0c00110>
- Andayani, Y., Junaidi, E., Hadisaputra, S., Hakim, A., Studi, P., Kimia, P., Kimia, T. P., Kelola, T., & Barat, T. (2022). *Pengelolaan laboratorium kimia sekolah di kota mataram*. I(1), 43–46. <https://doi.org/10.29303/jpimi.v1i1.718>
- Arnita Niroha Halawa, & Dety Mulyanti. (2023). Faktor-Faktor Yang Mempengaruhi Peningkatan Kualitas Mutu Instansi Pendidikan Dan Pembelajaran. *Inspirasi Dunia: Jurnal Riset Pendidikan Dan Bahasa*, 2(2), 57–64. <https://doi.org/10.58192/insdun.v2i2.757>
- Asmarany, A. I., Djunaedi, Hakim, A. A., Saefudin, A., & Judijanto, L. (2024). Effective Laboratory Management: Efforts to Improve Science Education Management in Islamic Boarding Schools. *Jurnal Penelitian Pendidikan IPA*, 10(8), 5673–5680. <https://doi.org/10.29303/jppipa.v10i8.8250>
- Boesdorfer, S. B., & Livermore, R. A. (2018). Secondary school chemistry teacher's current use of laboratory activities and the impact of expense on their laboratory choices. *Chemistry Education Research and Practice*, 19(1), 135–148. <https://doi.org/10.1039/c7rp00159b>
- Boyar, K., Pham, A., Swantek, S., Ward, G., & Herman, G. (2021). Laboratory Information Management Systems (LIMS). In *Cannabis Laboratory Fundamentals* (pp. 131–151). Springer International Publishing. https://doi.org/10.1007/978-3-030-62716-4_7
- Bristot, P. P., & Erdmann, R. H. (2019). *From the Classroom to the Laboratory : A Framework Proposal to Design a Management Laboratory*. 46(2010), 119–126.
- Cahyana, U., Lestari, I., Irwanto, I., & Suroso, J. (2024). Development of a mobile learning network for science with augmented reality and its impact on students' literacy and numeracy. *International Journal of Innovative Research and Scientific Studies*, 7(2), 576–586. <https://doi.org/10.53894/ijirss.v7i2.2685>

- Camel, V., Maillard, M. N., Descharles, N., Le Roux, E., Cladière, M., & Billault, I. (2021). Open Digital Educational Resources for Self-Training Chemistry Lab Safety Rules. *Journal of Chemical Education*, 98(1), 208–217. <https://doi.org/10.1021/acs.jchemed.0c00094>
- Cattaneo, A. A. P., Antonietti, C., & Rauseo, M. (2022). Computers & Education How digitalised are vocational teachers ? Assessing digital competence in vocational education and looking at its underlying factors. *Computers & Education*, 176(March 2021), 104358. <https://doi.org/10.1016/j.compedu.2021.104358>
- Charness, N., & Boot, W. R. (2015). Technology, Gaming, and Social Networking. *Handbook of the Psychology of Aging, Eighth Edition*, 389–407. <https://doi.org/10.1016/B978-0-12-411469-2.00020-0>
- Cossa, E. F. R., & Uamusse, A. A. (2015). Effects of an In-service Program on Biology and Chemistry Teachers' Perception of the Role of Laboratory Work. *Procedia - Social and Behavioral Sciences*, 167, 152–160. <https://doi.org/10.1016/j.sbspro.2014.12.656>
- Cruickshank, Brandon., Chang, Raymond., & Chang, Raymond. (2008). *Problem-solving workbook to accompany General chemistry, the essential concepts, fifth edition, Raymond Chang.*
- Dan, M. (2021). REFORMASI MANAJEMEN PENDIDIKAN : Artikel Info Abstrak. 5(2), 183–190.
- Darwiyanti, A., & Suyuti, S. (2022). *Manajemen pendidikan* (Issue December).
- de Jong, T. et al. (2021). Digital laboratories in science education: A review of current trends and future directions. *Educational Research Review*, 32, 100370.
- de Jong, T., Sotiriou, S., & Gillet, D. (2021). Innovations in STEM education: The role of technology-supported laboratories. *Journal of Science Education and Technology*, 30, 1–10.
- Dewi, C., Pahriah, P., & Purwadi, A. (2021). The urgency of digital literacy for generation Z students in chemistry learning. ... *Journal of Emerging Technologies* <https://www.learntechlib.org/p/219984/>
- Dharma, S. (2022). Manajamen Sarana Dan Prasarana Pendidikan Persekolahan Berbasis Sekolah. *Direktorat Jenderal Peningkatan Mutu Pendidik Dan Tenaga Kependidikan*, 6–99.
- Dickerson, D. E., & Ackerman, P. J. (2016). Risk-based Maintenance Management of U.S. Public School Facilities. *Procedia Engineering*, 145, 685–692. <https://doi.org/10.1016/j.proeng.2016.04.069>
- Djalolova, D. F., Azimova, M. N., & Azimova, F. K. (2021). *PEDAGOGICAL STRATEGIES AS AN ACTIVE COMPONENT OF WORKING WITH*. 2(November), 47–53.
- Elseria. (2016). Efektifitas Pengelolaan Laboratorium IPA. *Jurnal Ilmiah Manajemen Pendidikan Program Pascasarjana*, 109–121.
- Elzagheid, M. (2023). Chemical technicians: Good laboratory practice and laboratory information management systems. In *Chemical Technicians: Good Laboratory Practice and Laboratory Information Management Systems*. De Gruyter. <https://doi.org/10.1515/9783111191492>
- Emda Fakultas Tarbiyah dan Keguruan UIN Ar-Raniry Banda Aceh, A. (2014). LABORATORIUM SEBAGAI SARANA PEMBELAJARAN KIMIA DALAM

- MENINGKATKAN PENGETAHUAN DAN KETRAMPILAN KERJA ILMIAH. In *Lantanida Journal* (Vol. 2, Issue 2).
- Evana, Y., Fitria, H., & Fitriani, Y. (2021). The management of science laboratory at senior high school in digital era. *JPGI (Jurnal Penelitian Guru Indonesia)*, 6(3), 660. <https://doi.org/10.29210/021105jpgi0005>
- EZEANO, ALICE ; EZEUDU, FLORENCE. (2018). Application of Laboratory Management Skills by Chemistry Teachers in Enugu Application of Laboratory Management Skills by Chemistry Teachers in Enugu State. *Journal of Education and Practice*, 4(July), 159–165.
- Fauzi, R., Ar, H., & Wahyu, H. (2024). *Digitalization of information systems and educational laboratory management in higher education institutions*. 8(2), 260–270.
- Febri Setiya Rini, E., Aditia, K., & Siswanto, P. (2024). Analysis of Science Laboratory Management to Support Science Learning: A Systematic Review. *Science Education Journal*, 5(1), 49–58. <https://doi.org/10.37251/isej.v5i1.799>
- Fern, C. W., & Payne Jr., J. H. (1994). Laboratory information management systems. *Nuclear Plant Journal*, 12(4), 24–29. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-0028465598&partnerID=40&md5=2d37059b2c8e7b4367a342eaba05ddfd>
- Ferrell, J. B., Campbell, J. P., McCarthy, D. R., & ... (2019). Chemical exploration with virtual reality in organic teaching laboratories. *Journal of Chemical* <https://doi.org/10.1021/acs.jchemed.9b00036>
- Formella-Zimmermann, S., Kleespies, M. W., & Dierkes, P. W. (2022). Motivation and Technology Acceptance in a Neuroscience Student Lab—An Empirical Comparison Between Virtual Experiments With and Without Hands-on Elements. *Frontiers in Education*, 7. <https://doi.org/10.3389/feduc.2022.817598>
- Fu, Q., Lai, J., Zhong, T., & Ran, L. (2023). Design and Implementation of Clinical LIS360 Laboratory Management System Based on AI Technology. *International Journal of Computational Intelligence Systems*, 8, 1–12. <https://doi.org/10.1007/s44196-023-00207-8>
- Fushshilat, I., Rahmat, A., Somantri, Y., & Haritman, E. (2018). Laboratory management: Digital laboratory information system (DLIS) concept. *IOP Conference Series: Materials Science and Engineering*, 434(1), 1–5. <https://doi.org/10.1088/1757-899X/434/1/012286>
- Hera, R. (2017). STUDI KASUS PENGELOLAAN LABORATORIUM SMA LAB SCHOOL UNIVERSITAS SYIAH KUALA BANDA ACEH. *Jurnal Bionatural*, 4(1).
- Herath, N., Duffield, C., & Zhang, L. (2023). Public-school infrastructure ageing and current challenges in maintenance. *Journal of Quality in Maintenance Engineering*, 29(2), 401–419. <https://doi.org/10.1108/JQME-06-2021-0043>
- Hernández-de-Menéndez, M., Guevara, A. V., & ... (2019). Virtual reality laboratories: a review of experiences. *International Journal on* <https://doi.org/10.1007/s12008-019-00558-7>
- Hidayat, T., Rukmana, O., & Nurrahman, A. A. (2020). Design information system of registration and scheduling information laboratory of information systems and the decision of Bandung Islamic University. *Journal of Physics: Conference Series*, 1469(1), 1–9. <https://doi.org/10.1088/1742-6596/1469/1/012134>

- Hofstein, A. (2004). INVITED SPECIAL SECTION: Contributions of Educational Research to the Practice of Chemistry Education Laboratory and Practical Work THE LABORATORY IN CHEMISTRY EDUCATION: THIRTY YEARS OF EXPERIENCE WITH DEVELOPMENTS, IMPLEMENTATION, AND RESEARCH. *Chemistry Education: Research and Practice*, 5(3), 247–264.
- Ishigami, T. (1997). International standardization of laboratory information systems. *Rinsho Byori. The Japanese Journal of Clinical Pathology*, 45(6), 559–563. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-0031160299&partnerID=40&md5=bb1b44df349e46527b164171409ec06f>
- Ismawati, R., Widiyatmoko, A., & Cahyono, A. N. (2023). Literature Review of Online Learning Technology in Chemistry Lab Activities. *Jurnal Penelitian Pendidikan IPA*, 9(10), 751–759. <https://doi.org/10.29303/jppipa.v9i10.3635>
- Iswanto, D., & Mulyono, H. B. (2021). Analisis Manajemen Laboratorium Terpadu Mikroskopis Di Fakultas Kedokteran Universitas Cenderawasih Jayapura Papua (Studi Kasus). *Indonesian Journal of Laboratory*, 4(1), 20. <https://doi.org/10.22146/ijl.v4i1.65346>
- Karmanova, A., Madybekova, G., Kavak, N., Ualikhanova, B., Zharylkassyn, A., & Umarova, Z. (2024). Developing the Professional Competence of Future Chemistry Teachers through Digital Technologies: A Case Study of Kazakhstan. *International Journal of Information and Education Technology*, 14(8), 1119–1126. <https://doi.org/10.18178/ijiet.2024.14.8.2140>
- Karnati, N. (2017). Implementasi Manajemen Pendidik Dan Tenaga Kependidikan Berbasis Sekolah Dalam Peningkatan Mutu Sekolah Dasar Di Kota Bekasi. *PARAMETER: Jurnal Pendidikan Universitas Negeri Jakarta*, 29(2), 185–191. <https://doi.org/10.21009/parameter.292.06>
- Kartikasari, S. N. (2019). Peran Laboratorium Sebagai Pusat Riset Untuk Meningkatkan Mutu Dari Lembaga Pendidikan Pada Jurusan THP_FTP_UNEJ. *Jurnal Temapela*, 2(1), 17–27. <https://doi.org/10.25077/temapela.2.1.17-27.2019>
- Kelley, E. W. (2021). LAB theory, HLAB pedagogy, and review of laboratory learning in chemistry during the COVID-19 pandemic. *Journal of Chemical Education*. <https://doi.org/10.1021/acs.jchemed.1c00457>
- Kementerian Pendidikan dan Kebudayaan. (2016). *Strategi Digitalisasi Sarpras*. 17.
- Kennepohl, D. (2021). Laboratory activities to support online chemistry courses: a literature review. *Canadian Journal of Chemistry*, 99(11), 851–859. <https://doi.org/10.1139/cjc-2020-0506>
- Koç, S., & Çavaş, B. (2022). The Effects of Laboratory Safety Professional Development Seminars Implemented on Science Teachers: Laboratory Safety Knowledge Levels. *Science Education International*, 33(4), 438–448. <https://doi.org/10.33828/sei.v33.i4.12>
- Lampiran Permen 24 2007 Standar Sarana Prasarana. (n.d.).
- Lasia, I. K. (2017). Development of Laboratory Management Based on Local Bali Wisdom to Improve the Quality of Services in Laboratory. *JPI (Jurnal Pendidikan Indonesia)*, 6(2), 181–190. <https://doi.org/10.23887/jpi-undiksha.v6i2.10237>
- Link, R. D., & Gallardo-Williams, M. (2022). We Should Keep Developing Digital Laboratory Resources in the Postpandemic Era. *Journal of Chemical Education*, 99(2), 519–520. <https://doi.org/10.1021/acs.jchemed.1c01197>

- Lukum, A., & Paramata, Y. (2015). An Analysis of the Students' Satisfaction Toward The Services of the Chemical Laboratory. *International Journal of Evaluation and Research in Education (IJERE)*, 4(1), 22. <https://doi.org/10.11591/ijere.v4i1.4488>
- Mahanani, C., Wening, S., Susanto, M. R., & Sudirman, A. (2020). The effect of laboratory knowledge, teaching practice experience, and work motivation on laboratory management. *Journal of Physics: Conference Series*, 1446(1). <https://doi.org/10.1088/1742-6596/1446/1/012042>
- Manarisip, A. J., Adawiyah, R., & Handayani, S. (2023). Competencies of Chemistry Teachers and Prospective Teachers: A Literature Review. *Jurnal Penelitian Pendidikan IPA*, 9(SpecialIssue), 191–197. <https://doi.org/10.29303/jppipa.v9ispecialissue.6031>
- Mancheño, M. J., Agüí, M. L., Elvira, E., Hernández-Cornejo, D., Osío Barcina, J., Hernández Cornejo, J., Agudo, C., Ribeiro, A., Sánchez-Portal, J., & Parra, M. (2024). A Chemistry Laboratory Miniature Model: A Window to Science. *Journal of Chemical Education*, 101(5), 1925–1931. <https://doi.org/10.1021/acs.jchemed.3c01266>
- Marais, E. (2023). The Development of Digital Competencies in Pre-Service Teachers. *Research in Social Sciences and Technology*, 8(3), 134–154. <https://doi.org/10.46303/ressat.2023.28>
- Mateu, J. (2014). VirtualTouch: A Tool for Developing Mixed Reality Educational Applications and an Example of Use for Inclusive Education. *International Journal of Human-Computer Interaction*, 30(10), 815–828. <https://doi.org/10.1080/10447318.2014.927278>
- Maulana.R.T. (2015). Pengembangan Sistem Informasi Manajemen Inventori Bengkel Dan Laboratorium Dengan Program Delphi Di Smk Muhammadiyah Prambanan. *E-Thesis*, 1–224.
- Melani, S. (2019). *Manajemen Sarana dan Prasarana Pendidikan*. 1–5.
- Mogopodi, D., Paphane, B., & Petros, S. (2015). Assessment of chemical management practices and safety in junior secondary school laboratories in Gaborone. *Journal of Chemical Health and Safety*, 22(5), 17–27. <https://doi.org/10.1016/j.jchas.2015.01.001>
- Moutsakis, G., Paschalidou, K., & Salta, K. (2024). Chemistry laboratory experiments focusing on students' engagement in scientific practices and central ideas of chemical practices. *Chemistry Teacher International*. <https://doi.org/10.1515/cti-2024-0070>
- Muhith, A., Afkarina, D., Zahroh, F., Safitri, S. Z., Handayani, U. R., H, S. S. F., Aini, N., Dista, K. S., Inayah, S., Hidayah, A., Hayi, Moh. B., Sanjaya, A., Rahman, Abd., & Puspitasari, A. (2022). *Educational Laboratory Management*. <https://tunasbangsa.ac.id/seminar/index.php/senaris/article/view/183/184>
- Mukti, B. I., & Arikunto, S. (2020). *Laboratory Management of Science in Improving Student Achievements in Sma Lubuklinggau*. 397(Iclique 2019), 138–144. <https://doi.org/10.2991/assehr.k.200129.018>
- Muktiarni, M., Widiaty, I., Abdullah, A. G., Ana, A., & Yulia, C. (2019). Digitalisation trend in education during industry 4.0. *Journal of Physics: Conference Series*, 1402(7), 077070. <https://doi.org/10.1088/1742-6596/1402/7/077070>
- Mustari, M., Ph, D., Rahman, M. T., & Ph, D. (2014). *PENDIDIKAN*.
- Nisa, U., Sari, I., & Muhiddin, N. H. (n.d.). *Optimalisasi Pengelolaan Laboratorium*

- (*Laboratory Management*) sebagai Upaya untuk Meningkatkan Kinerja Pengelolaan dan Penggunaan Laboratorium Prodi Pendidikan IPA Universitas Negeri Makassar.
- OECD. (2019). *Safety in school science laboratories: OECD guidance*. OECD Publishing. <https://www.oecd.org/education/safety-in-school-science-laboratories.htm>
- Oluwole, O. G., Oosterwyk, C., Anderson, D., Adadey, S. M., Mnika, K., Manyisa, N., Yalcouye, A., Wonkam, E. T., Aboagye, E. T., Dia, Y., Uwibambe, E., Jonas, M., Priestley, R., Popel, K., Manyashe, T., de Cock, C., Nembaware, V., & Wonkam, A. (2022). The Implementation of Laboratory Information Management System in Multi-Site Genetics Study in Africa: The Challenges and Up-Scaling Opportunities. *Journal of Molecular Pathology*, 3(4), 262–272. <https://doi.org/10.3390/jmp3040022>
- Ovčjak, B., Heričko, M., & Polančič, G. (2015). Factors impacting the acceptance of mobile data services - A systematic literature review. *Computers in Human Behavior*, 53, 24–47. <https://doi.org/10.1016/j.chb.2015.06.013>
- Pertiwi, W. A., Sanjaya, L. A., Budi, A. S., Rasmi, D. P., Hasanah, H. A., Winarko, H. B., & Ash-Shiddiqy, A. R. (2021). Evaluation of physics laboratory management in state senior high school Jambi City. In N. H., F. R., I. W., B. E., B. F., P. T.B., & M. D. (Eds.), *AIP Conference Proceedings* (Vol. 2320). American Institute of Physics Inc. <https://doi.org/10.1063/5.0037880>
- Pfeiffer, A., & Uckelmann, D. (2019). Open digital lab for you-laboratory-based learning scenarios in education, research and qualification. *Proceedings of the 2019 5th Experiment at International Conference, Exp.at 2019*, 36–41. <https://doi.org/10.1109/EXPAT.2019.8876560>
- Purbohastuti, A. W., Gaffar, V., Disman, D., & Furqon, C. (2023). Technology Acceptance Model on Smartphones Applications: a Bibliometric Analysis. *Journal of Engineering Science and Technology*, 18(3), 25–32.
- Qurrotul, A., Sukestyarno, Y. L., & Mulyono, S. E. (2022). *Management of Utilization of Chemistry Laboratory Based on Instructional Group Classroom to Support the Learning Process*. 11(2), 133–144.
- Rahmat, D., Yang, T., & Esa, M. (2023). *BERITA NEGARA*. 226.
- Rahmawati, I., Sholichin, H., & Arifin, M. (2017). Inquiry-based Laboratory Activities on Drugs Analysis for High School Chemistry Learning. *Journal of Physics: Conference Series*, 895(1), 1–7. <https://doi.org/10.1088/1742-6596/895/1/012117>
- Rahmawati, Y. (2023). Jurnal Riset Pendidikan Kimia. *Jurnal Riset Pendidikan Kimia*, 13(1), 49.
- Ramadhani, S. P. (2020). *Sulistyan Puteri Ramadhani , M . Pd*.
- Ramdan, M., Hikmah, A. B., & Apriyani, Y. (2019). *Sistem Informasi Manajemen Laboratorium Sekolah Berbasis Web Pada SMK Muhammadiyah Kawali*. 5(2), 80–89.
- Ramm, J. G., Dorscheid, G. L., Passos, C. G., & Sirtori, C. (2018). Development of a Waste Management Program in Technical Chemistry Teaching. *Journal of Chemical Education*, 95(4), 570–576. <https://doi.org/10.1021/acs.jchemed.7b00590>
- Raviv, A., Cohen, S., & Aflalo, E. (2019). How Should Students Learn in the School Science Laboratory? The Benefits of Cooperative Learning. *Research in Science Education*, 49(2), 331–345. <https://doi.org/10.1007/s11165-017-9618-2>
- Redecker C., P. Y. (2017). European framework for the digital competence of educators: DigCompEdu. Luxembourg: In Publications Office of the European Union.

- Restu, Sriadhi, Gultom, S., & Baharuddin. (2020). Management information system model to increase performance of educational laboratory | Model systemu informacji zarządzającej, by zwiększyć wydajność laboratorium edukacyjnego. *Polish Journal of Management Studies*, 21(2), 356–369. <https://doi.org/10.17512/pjms.2020.21.2.25>
- Richards-Babb, M., Bishoff, J., Carver, J. S., Fisher, K., & Robertson-Honecker, J. (2010). Keeping it safe: Chemical safety in the high school laboratory. *Journal of Chemical Health and Safety*, 17(1), 6–14. <https://doi.org/10.1016/j.jchas.2009.05.001>
- Rihm, S. D., Tan, Y. R., Ang, W., Quek, H. Y., Deng, X., Laksana, M. T., Bai, J., Mosbach, S., Akroyd, J., Kraft, M., Rihm, S. D., Tan, Y. R., Ang, W., Quek, H. Y., Deng, X., Laksana, M. T., & Bai, J. (n.d.). The Digital Lab Facility Manager : Automating operations of research laboratories through “ The World Avatar ” The Digital Lab Facility Manager : Automating operations of research laboratories through “ The World Avatar ”. *Nexus*, 1(3), 100031. <https://doi.org/10.1016/j.nynexs.2024.100031>
- Riswanto, Suseno, N., Partono, Harjati, P., & Dedy, H. A. (2019). School Laboratory Management Information System. *Journal of Physics: Conference Series*, 1361(1). <https://doi.org/10.1088/1742-6596/1361/1/012068>
- Rosada, D., Kadarisman, N., & Raharjo. (2017). Panduan Pengelolaan dan Pemanfaatan Laboratorium IPA. *Kementerian Pendidikan Dan Kebudayaan*, 1–132.
- Rossete, C. A., & Ribeiro, M. G. (2021). Laboratory Technicians’ Use and Interpretation of Hazard Communication Elements on Chemical Labels. *ACS Chemical Health and Safety*, 28(3), 211–223. <https://doi.org/10.1021/acs.chas.0c00125>
- Rugaiyah. (n.d.). *DEVELOPING INFORMATION AND TECHNOLOGY-BASED CLINICAL SUPERVISION MODEL*.
- Sadjadi, E. N. (2023). Challenges and Opportunities for Education Systems with the Current Movement toward Digitalization at the Time of COVID-19. *Mathematics*, 11(2). <https://doi.org/10.3390/math11020259>
- Schenk, L., Taher, I. A., & Öberg, M. (2018). Identifying the Scope of Safety Issues and Challenges to Safety Management in Swedish Middle School and High School Chemistry Education. *Journal of Chemical Education*, 95(7), 1132–1139. <https://doi.org/10.1021/acs.jchemed.8b00054>
- Selvaraj, J. (2015). Inclusive education in New Zealand: policies, politics and contradictions. *International Journal of Inclusive Education*. <https://doi.org/10.1080/13603116.2014.907584>
- Sepulveda, J. L., & Young, D. S. (2013). The ideal laboratory information system. *Archives of Pathology and Laboratory Medicine*, 137(8), 1129–1140. <https://doi.org/10.5858/arpa.2012-0362-RA>
- Shana, Z., & Abulibdeh, E. S. (2020). Science practical work and its impact on students’ science achievement. *Journal of Technology and Science Education*, 10(2), 199–215. <https://doi.org/10.3926/JOTSE.888>
- Soedibyo. (2003). No 主観的健康感を中心とした在宅高齢者における 健康関連指標に関する共分散構造分析Title. *Teknik Bendungan*, 1, 1–7.
- Stricker, D., Gerweck, N., & Meyer, T. (2019). Measuring the safety climate of academic laboratories to improve safety behaviours. *Chemical Engineering Transactions*, 77, 271–276. <https://doi.org/10.3303/CET1977046>
- Stuart, R. B., & McEwen, L. R. (2016). The Safety ‘use Case’: Co-Developing Chemical Information Management and Laboratory Safety Skills. *Journal of Chemical*

- Education*, 93(3), 516–526. <https://doi.org/10.1021/acs.jchemed.5b00511>
- Suryadi, U., Arfandi, A., Program, D. P., Teknologi, S. P., & Kejuruan, D. (n.d.). *PENGEMBANGAN SISTEM INFORMASI PENGELOLAAN LABORATORIUM DI SEKOLAH MENENGAH KEJURUAN*.
- Suseno, N. (2018). *Prosiding Seminar Nasional Pendidikan MIPA FKIP Unila Bandar Lampung*.
- Sutiani, A. (2021). Implementation of an inquiry learning model with science literacy to improve student critical thinking skills. *International Journal of Instruction*. <http://digilib.unimed.ac.id/id/eprint/42164>
- Suyanta, O. : (2010). *MANAJEMEN OPERASIONAL LABORATORIUM*.
- Taloba, A. I., Elhadad, A., Rayan, A., El-Aziz, R. M. A., & ... (2023). A blockchain-based hybrid platform for multimedia data processing in IoT-Healthcare. In ... *Engineering Journal*. Elsevier. <https://www.sciencedirect.com/science/article/pii/S1110016822006251>
- Tisoglu, S., Cagiltay, K., & Kursun, E. (2021). Adoption of online multimedia resources in a general chemistry laboratory course context: A case study. *E-Learning and Digital Media*, 18(2), 185–208. <https://doi.org/10.1177/2042753020954968>
- Tüysüz, C., Şimşek, U., & Kara, Y. (2022). Hybrid chemistry laboratory instruction: A model integrating digital and hands-on practices in high school settings. *Education Sciences*, 12(10), 711. <https://doi.org/10.3390/educsci12100711>
- Vendamawan, R., Teknik, F., & Diponegoro, U. (2015). *Pengelolaan laboratorium kimia*. 11(02).
- Viitaharju, P., Yliniemi, K., Nieminen, M., & Karttunen, A. J. (2021). Learning experiences from digital laboratory safety training. *Education for Chemical Engineers*, 34, 87–93. <https://doi.org/10.1016/j.ece.2020.11.009>
- Walsh, E. M., & Tsurusaki, B. K. (2014). Science Classroom. *Nature Climate Change*, 4(4), 259–263.
- Wang, C.-Y., Wu, H.-K., Lee, S. W.-Y., Hwang, F.-K., Chang, H.-Y., Wu, Y.-T., Chiou, G.-L., Chen, S., Liang, J.-C., Lin, J.-W., Lo, H.-C., & Tsai, C.-C. (2014). A review of research on technology-assisted school science laboratories. *Educational Technology and Society*, 17(2), 307–320.
- Widharma, I. S., Sukarata, P., Sajayasa, I., Sangka, I., & Sunaya, I. (2022). Perancangan Sistem Informasi Manajemen Laboratorium Otomasi Berbasis Web Dengan Metode Prototype. *Jurnal Ilmiah Vastuwidya*, 5(2), 10–16. <https://doi.org/10.47532/jiv.v5i2.664>
- Widodo, A. et al. (2022). Barriers to effective chemistry lab use in Indonesian secondary schools: A teacher perspective. *International Journal of Science and Mathematics Education*, 20, 101–115.
- Xu, Y. (2022). Assisting Laboratory Management Based on Network Big Data Mining Technology. *Journal of Function Spaces*, 2022. <https://doi.org/10.1155/2022/2087287>
- Xue, J., Reniers, G., Li, J., Yang, M., Wu, C., & ... (2021). A bibliometric and visualized overview for the evolution of process safety and environmental protection. In *International Journal of* mdpi.com. <https://www.mdpi.com/1660-4601/18/11/5985>
- Yahya, D. P., Rahman, K. A. R., & Mulyadi, M. (2023). Management of Educational

- Facilities and Infrastructure: Literature Review on Educational Management. *Indonesian Journal of Educational Development (IJED)*, 4(3), 380–387. <https://doi.org/10.59672/ijed.v4i3.3221>
- Yeşiloğlu, S. N. (2021). Examining Pre-Service Teachers' Views about Online Chemistry Laboratory Learning Experiences Amid the Covid-19 Pandemic. *Journal of Turkish Science Education*, 18, 108–124. <https://doi.org/10.36681/tused.2021.75>
- Yuan, X., Xu, X., & Zhang, L. (2023). Study and Practice of Laboratory Safety Management and Asset Management Evaluation Based on Computational Intelligence. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao*, 2023(E55), 391–403.
- Zabala, G. M., & Dayaganon, A. J. (2023). Competency of Teachers and Laboratory Environment in an Online Setting as Predictors of Science Process Skills of Students: A Convergent Design. *Science Education International*, 34(3), 202–215. <https://doi.org/10.33828/sei.v34.i3.4>
- Zhang, X., Hu, X., Bai, Y., & Wu, J. (2020). Risk assessment of gas leakage from school laboratories based on the Bayesian network. *International Journal of Environmental Research and Public Health*, 17(2). <https://doi.org/10.3390/ijerph17020426>
- Zimmermann, F., Melle, I., & Huwer, J. (2021). Developing Prospective Chemistry Teachers' TPACK—A Comparison between Students of Two Different Universities and Expertise Levels Regarding Their TPACK Self-Efficacy, Attitude, and Lesson Planning Competence. *Journal of Chemical Education*, 98(6), 1863–1874. <https://doi.org/10.1021/acs.jchemed.0c01296>

