DAFTAR PUSTAKA

Al-nakhle, H. (2022). The effectiveness of scenario-based virtual laboratory simulations to improve learning outcomes and scientific report writing skills. *PLOS ONE*, *17*(11), e0277359. https://doi.org/10.1371/journal.pone.0277359

Banerjee, A. C. (1995). Teaching chemical equilibrium and thermodynamics in undergraduate general chemistry classes. *Journal of Chemical Education*, *2*(10), 879–881. https://doi.org/10.1021/ed072p879

Bilali (Halluni), E., Vadohej, F., Kroni, M., & Lezha, E. (2016). Pedagogical assumptions via the internet culture. *European Journal of Multidisciplinary Studies*, *1*(2), 347. https://doi.org/10.26417/ejms.v1i2.p347-351

Chang, Y.-S., Chou, C.-H., Chuang, M.-J., Li, W.-H., & Tsai, I.-F. (2023). Effects of virtual reality on creative design performance and creative experiential learning. *Interactive Learning Environments*, *31*(2), 1142–1157. https://doi.org/10.1080/10494820.2020.1821717

Chen, C. J. (2006). The design, development and evaluation of a virtual reality based learning environment. *Australasian Journal of Educational Technology*, *22*(1). https://doi.org/10.14742/ajet.1306

Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed). Routledge.

Conrad, A. W., & Kowalske, M. G. (2018). Using self-efficacy beliefs to understand how students in a general chemistry course approach the exam process. *Chemistry Education Research and Practice*, *19*(1), 265–275. https://doi.org/10.1039/C7RP00073A

Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed). Pearson.

Dalgety, J., & Coll, R. K. (2006). Exploring first-year science students' chemistry self-efficacy. *International Journal of Science and Mathematics Education*, *4*(1), 97–116. https://doi.org/10.1007/s10763-005-1080-3

Dyer, J., Gregersen, H. B., & Christensen, C. M. (2011). *The innovator's DNA: Mastering the five skills of disruptive innovators*. Harvard Business Press.

Eilks, I., & Gulacar, O. (2016). A colorful demonstration to visualize and inquire into essential elements of chemical equilibrium. *Journal of Chemical Education*, *93*(11), 1904–1907. https://doi.org/10.1021/acs.jchemed.6b00252

Elen, J., Clarebout, G., Léonard, R., & Lowyck, J. (2007). Student-centred and teacher-centred learning environments: What students think. *Teaching in Higher Education*, *12*(1), 105–117. https://doi.org/10.1080/13562510601102339

Ferrell, J. B., Campbell, J. P., McCarthy, D. R., McKay, K. T., Hensinger, M., Srinivasan, R., Zhao, X., Wurthmann, A., Li, J., & Schneebeli, S. T. (2019). Chemical exploration with virtual reality in organic teaching laboratories. *Journal of Chemical Education*, *96*(9), 1961–1966. https://doi.org/10.1021/acs.jchemed.9b00036

Gay, L. R., Mills, G. E., & Airasian, P. W. (2012). *Educational research: Competencies for analysis and applications* (10th ed). Pearson.

Girgin, S., & Sarioğlu, S. (2020). The effect of using virtual reality in 6th grade science course the cell topic on students academic achievements and attitudes towards the course. *Turkish Journal of Science Education*, *17*(1), 109–125. https://doi.org/10.36681/tused.2020.16

Guan, J.-Q., Wang, L.-H., Chen, Q., Jin, K., & Hwang, G.-J. (2023). Effects of a virtual reality-based pottery making approach on junior high school students' creativity and learning engagement. *Interactive Learning Environments*, *31*(4), 2016–2032. https://doi.org/10.1080/10494820.2021.1871631

Gungor, A., Kool, D., Lee, M., Avraamidou, L., Eisink, N., Albada, B., Van Der Kolk, K., Tromp, M., & Bitter, J. H. (2022). The use of virtual reality in a chemistry lab and its impact on students' self-efficacy, interest, self-concept and laboratory anxiety. *Eurasia Journal of Mathematics, Science and Technology Education*, *18*(3), em2090. https://doi.org/10.29333/ejmste/11814

Haase, J., Hoff, E. V., Hanel, P. H. P., & Innes-Ker, Å. (2018). A meta-analysis of the relation between creative self-efficacy and different creativity measurements. *Creativity Research Journal*, *30*(1), 1–16. https://doi.org/10.1080/10400419.2018.1411436

Hartley, K. A., Plucker, J. A., & Long, H. (2016). Creative self-efficacy and teacher ratings of student creativity in Chinese elementary classrooms. *Thinking Skills and Creativity*, *22*, 142–151. https://doi.org/10.1016/j.tsc.2016.10.001

Intasao, N., & Hao, N. (2018). Beliefs about creativity influence creative performance: The mediation effects of flexibility and positive affect. *Frontiers in Psychology*, *9*, 1810. https://doi.org/10.3389/fpsyg.2018.01810

Ishiguro, C., Matsumoto, K., Agata, T., & Okada, T. (2022a). Development of the japanese version of the short scale of creative self. *Japanese Psychological Research*, 1–12. https://doi.org/10.1111/jpr.12418

Ishiguro, C., Matsumoto, K., Agata, T., & Okada, T. (2022b). Development of the Japanese Version of the Short Scale of Creative Self [1, 2]. *Japanese Psychological Research*, 1–12. https://doi.org/10.1111/jpr.12418

Jaussi, K. S., Randel, A. E., & Dionne, S. D. (2007). I am, i think i can, and i do: The role of personal Identity, self-Efficacy, and cross-application of experiences in creativity at work. *Creativity Research Journal*, *19*(2–3), 247–258. https://doi.org/10.1080/10400410701397339

Jemberie, L. W. (2021). Teachers' perception and implementation of constructivist learning approaches: Focus on Ethiopian Institute of textile and fashion technology, Bahir Dar. *Cogent Education*, *8*(1), 1907955. https://doi.org/10.1080/2331186X.2021.1907955

Jia, Q. (2010). A brief study on the implication of constructivism teaching theory on classroom teaching reform in basic education. *International Education Studies*, *3*(2), p197. https://doi.org/10.5539/ies.v3n2p197

Karwowski, M., Lebuda, I., & Wiśniewska, E. (2018). Measuring creative self-efficacy and creative personal identity. *The International Journal of Creativity and Problem Solving*, *28*(1), 45–47.

Kousathana, M., & Tsaparlis, G. (2002). Student's errors in solving numerical chemical-equilibrium problems. *Chemistry Education Reseacrh Practice*, *3*(1), 5–17. https://doi.org/10.1039/B0RP90030C

Kursch, M., Jaroslav, K., & Veteška, J. (2024). Effectiveness of virtual co-teaching: A new perspective on teaching. *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE)*, *12*(1), 31–40. https://doi.org/10.23947/2334-8496-2024-12-1-31-40

Lau, K. W., & Lee, P. Y. (2015). The use of virtual reality for creating unusual environmental stimulation to motivate students to explore creative ideas. *Interactive Learning Environments*, *23*(1), 3–18. https://doi.org/10.1080/10494820.2012.745426

Lawshe, C. H. (1975). A quantitative approach to content validity. *Personnel Psychology*, *28*(4), 563–575. https://doi.org/10.1111/j.1744-6570.1975.tb01393.x

Lee, J. H., Yang, E., & Sun, Z. Y. (2021). Using an immersive virtual reality design tool to support cognitive action and creativity: Educational insights from fashion designers. *The Design Journal*, *24*(4), 503–524. https://doi.org/10.1080/14606925.2021.1912902

Makransky, G., Terkildsen, T. S., & Mayer, R. E. (2019). Adding immersive virtual reality to a science lab simulation causes more presence but less learning. *Learning and Instruction*, *60*, 225–236. https://doi.org/10.1016/j.learninstruc.2017.12.007

Maksimenko, N., Okolzina, A., Vlasova, A., Tracey, C., & Kurushkin, M. (2021). Introducing atomic structure to first-year undergraduate chemistry students with an immersive virtual reality experience. *Journal of Chemical Education*, *98*(6), 2104–2108. https://doi.org/10.1021/acs.jchemed.0c01441

Manyilizu, M. C. (2023). Effectiveness of virtual laboratory vs. Paper-based experiences to the hands-on chemistry practical in Tanzanian secondary schools. *Education and Information Technologies*, *28*(5), 4831–4848. https://doi.org/10.1007/s10639-022-11327-7

McKenney, S., & Reeves, T. C. (2012). *Conducting educational design research*. Routledge.

Metto, E., & Ndiku Makewa, L. (2014). Learner-centered teaching: Can it work in Kenyan public primary schools? *American Journal of Educational Research*, *2*(11A), 23–29. https://doi.org/10.12691/education-2-11A-4

Mukasheva, M., Kornilov, I., Beisembayev, G., Soroko, N., Sarsimbayeva, S., & Omirzakova, A. (2023). Contextual structure as an approach to the study of virtual reality learning environment. *Cogent Education*, *10*(1), 2165788. https://doi.org/10.1080/2331186X.2023.2165788

Nanjappan, V., Uunila, A., Vaulanen, J., Välimaa, J., & Georgiev, G. V. (2023). Effect of immersive virtual reality in enchancing creativity. *Proceedings of the Design Society*, *3*, 1585–1594. https://doi.org/10.1017/pds.2023.159

Obeid, S., & Demirkan, H. (2023). The influence of virtual reality on design process creativity in basic design studios. *Interactive Learning Environments*, *31*(4), 1841–1859. https://doi.org/10.1080/10494820.2020.1858116

Palincsar, A. S. (1998). Social constructivist perspectives on teaching and learning social. *Annual Reviews Psychol*, *49*, 345–375. https://doi.org/www.annualreviews.org

Park, N. K., Jang, W., Thomas, E. L., & Smith, J. (2021). How to organize creative and innovative teams: Creative self-efficacy and innovative team performance. *Creativity Research Journal*, *33*(2), 168–179. https://doi.org/10.1080/10400419.2020.1842010

Perdana, R., Budiyono, A., Sajidan, A., Sukarmin, A., & Rudibyani, R. B. (2020). Inquiry social complexity (ISC): Design instructional to empowerment critical and creative thingking (CCT) skills in chemistry. *Periódico Tchê Química*, *17*(34), 727–735. https://doi.org/10.52571/PTQ.v17.n34.2020.751_P34_pgs_727_735.pdf

Peris, M. (2022). Understanding Le Châtelier's principle fundamentals: Five key questions. *Chemistry Teacher International*, *4*(3), 203–205. https://doi.org/10.1515/cti-2020-0030

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? critique and recommendations. *Research in Nursing & Health*, *29*(5), 489–497. https://doi.org/10.1002/nur.20147

Reichardt, C. S. (2019). *Quasi experimentation: A guide to design and analysis*. Guilford Press.

Rintaningrum, R. (2023). Technology integration in English language teaching and learning: Benefits and challenges. *Cogent Education*, *10*(1), 2164690. https://doi.org/10.1080/2331186X.2022.2164690

Rivas, Y. C. (2020). Virtual reality and 21st century education. *International Research Journal of Management, IT and Social Sciences*, *7*(1), 37–44. https://doi.org/10.21744/irjmis.v7n1.820

Scavarelli, A., Arya, A., & Teather, R. J. (2021). Virtual reality and augmented reality in social learning spaces: A literature review. *Virtual Reality*, *25*(1), 257–277. https://doi.org/10.1007/s10055-020-00444-8

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, *30*(6), 933–958. https://doi.org/10.1016/j.jm.2004.06.007

Tierney, P., & Farmer, S. M. (2011). Creative self-efficacy development and creative performance over time. *Journal of Applied Psychology*, *96*(2), 277–293. https://doi.org/10.1037/a0020952

Tsirulnikov, D., Suart, C., Abdullah, R., Vulcu, F., & Mullarkey, C. E. (2023). Game on: Immersive virtual laboratory simulation improves student learning outcomes &

motivation. *FEBS Open Bio*, *13*(3), 396–407. https://doi.org/10.1002/2211-5463.13567

Tüysüz, C. (2010). The effect of the virtual laboratory on students' achievement and attitude in chemistry. *International Online Journal of Educational Sciences*, *2*(1), 35–37.

Udeozor, C., Toyoda, R., Russo Abegão, F., & Glassey, J. (2021). Perceptions of the use of virtual reality games for chemical engineering education and professional training. *Higher Education Pedagogies*, *6*(1), 175–194. https://doi.org/10.1080/23752696.2021.1951615

Ullah, S., Ali, N., & Rahman, S. U. (2016). The effect of procedural guidance on students' skill enhancement in a virtual chemistry laboratory. *Journal of Chemical Education*, *93*(12), 2018–2025. https://doi.org/10.1021/acs.jchemed.5b00969

Walker, J. P., Sampson, V., Zimmerman, C. O., & Grooms, J. A. (2011). A performance-based assessment for limiting reactants. *Journal of Chemical Education*, *88*(9), 1243–1246. https://doi.org/10.1021/ed1006629

Winkelmann, K., Keeney-Kennicutt, W., Fowler, D., & Macik, M. (2017). Development, implementation, and assessment of general chemistry lab experiments performed in the virtual world of second life. *Journal of Chemical Education*, *94*(7), 849–858. https://doi.org/10.1021/acs.jchemed.6b00733

Yaumi, M., Sirate, S. F. S., & Patak, A. A. (2018). Investigating multiple intelligence-based instructions approach on performance improvement of Indonesian elementary madrasah teachers. *SAGE Open*, *8*(4), 1–10. https://doi.org/10.1177/2158244018809216

Yusoff, M. S. B. (2019). ABC of content validation and content validity index aalculation. *Education in Medicine Journal*, *11*(2), 49–54. https://doi.org/10.21315/eimj2019.11.2.6

Zhang, Q., Shi, B., Liu, Y., Liang, Z., & Qi, L. (2024). The impact of educational digitalization on the creativity of students with special needs: The role of study crafting and creative self-efficacy. *Humanities and Social Sciences Communications*, *11*(1), 754. https://doi.org/10.1057/s41599-024-03232-w