

## DAFTAR PUSTAKA

- Abrami, G., & Mehler, A. (2018). A UIMA database interface for managing NLP-related text annotations. In Proceedings of the 11th Edition of the Language Resources and Evaluation Conference, May 7 – 12. Miyazaki, Japan.
- Abrami, G., Mehler, A., & Spiekermann, C. (2019, July). Graph-based format for modeling multimodal annotations in Virtual Reality by means of VAnnotatoR. In C. S. M. Antona (Ed.), Proceedings of the 21st International Conference on Human-Computer Interaction, HCII 2019 (pp. 251 – 358). Cham: Springer.
- Abrami, G., Spiekermann, C., & Mehler, A. (2019). VAnnotatoR: Ein Werkzeug zur Annotation multimodaler Netzwerke in dreidimensionalen virtuellen Umgebungen. In P. Sahle (Ed.), Proceedings of the 6th Digital Humanities Conference in the German-Speaking Countries, DHD 2019 (pp. 354 – 355). Frankfurt, Germany.
- Ahmed, S. (2019). Chat and Learn: Effectiveness of Using WhatsApp as A Pedagogical Tool to Enhance EFL Learners Reading and Writing Skills. In *International Journal of English Language and Literature Studies* (Vol. 8, Issue 2, pp. 61–68). <https://doi.org/10.18488/journal.23.2019.82.61.68> Vol. 8, N
- Anderson, J.R. (1983). The architecture of cognition. Cambridge, MA: Harvard University Press.
- Anderson, S.A., Barrett, C., Huston, M., Lay, L., Myr, G., & Sexton, D. (1992). A mastery learning experiment. Yale, MI: Yale Public Schools.
- Andreas Dünser, Lawrence Walker, Heather Horner, and Daniel Bentall. 2012. Creating interactive physics education books with *Augmented Reality*. In Proceedings of the 24th Australian Computer-Human Interaction Conference (OzCHI '12). Association for Computing Machinery, New York, NY, USA, 107–114. <https://doi.org/10.1145/2414536.2414554>
- An, Y.-J. (2013). Systematic Design of Blended PBL: Exploring the Design Experiences and Support Needs of PBL Novices in An Online Environment. *Contemporary Issues in Technology and Teacher Education*, 13(1), 61–79.
- Andresen, B. B., Brink, K., & UNESCO Institute for Information Technologies in Education. (2013). Multimedia in education: Curriculum. Moscow: UNESCO Institute for Information Technologies in Education
- Anthes, C., Garcia-Hernández, R. J., Wiedemann, M., & Kranzlmüller, D. (2016). State of The Art of Virtual Reality Technology. *2016 IEEE Aerospace Conference*, 1–19. <https://doi.org/https://doi.org/10.1109/AERO.2016.7500674>

- Anuar, S., Nizar, N., & Ismail, M. A. (2021). The Impact of Using *Augmented Reality* as Teaching Material on Students' Motivation. *Asian Journal of Vocational Education And Humanities*, 2(1), 1–8. <https://doi.org/https://doi.org/10.53797/ajvah.v2i1.1.2021>
- Arends, R. I. (2012). *Learning to Teach* (B. Mejia, Ed.; 9th ed.). McGraw Hill.
- Argaw, A. S., Haile, B. B., Ayalew, B. T., & Kuma, S. G. (2016a). The effect of *Problem Based Learning* (PBL) instruction on students' motivation and problem solving skills of physics. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(3), 857–871.
- Argaw, A. S., Haile, B. B., Ayalew, B. T., & Kuma, S. G. (2016b). The Effect of Problem-Based Learning (PBL) Instruction on Students' Motivation and Problem Solving Skills of Physics. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(3), 857–871. <https://doi.org/https://doi.org/10.12973/eurasia.2017.00647a>
- Arsyad, A. (2011). Media Pembelajaran. Jakarta: PT Raja Grafindo Persada.
- Azuma, R. T. (1997). A Survey of *Augmented Reality*. *Presence: Teleoperators & Virtual Environments*, 6(4), 355–385. <https://doi.org/https://doi.org/10.1162/pres.1997.6.4.355>
- Bacca Acosta, J. L., Baldiris Navarro, S. M., Fabregat Gesa, R., Graf, S., & others. (2014). *Augmented Reality Trends in Education: A Systematic Review of Research and Applications*. *Journal of Educational Technology and Society*, 2014, Vol. 17, Núm. 4, p. 133-149.
- Ball, A.L.& Garton, B.L. Modeling higher order thinking: the alignment between objectives, classroom discourse, and assessment.(2005), Journal of Agricultural Education
- Banathy, B. H. (1991). Educational systems design: A journey to create the future. Englewood Cliffs, New Jersey: Educational Technology Publications.
- Barrett, T., Cashman, D., & Moore, S. (2010). Designing Problems and Triggers in Different Media: Challenging All Students. In *New Approaches to Problem-based Learning* (pp. 18–35). Routledge. <https://doi.org/9780203846926>
- Barrett, T., & Moore, S. (2010). *New Approaches to Problem-Based Learning: Revitalising Your Practice in Higher Education*. Routledge.
- Barrows, H. S. (1986). A Taxonomy of Problem-Based Learning Methods. *Medical Education*, 20(6), 481–486. <https://doi.org/https://doi.org/10.1111/j.1365-2923.1986.tb01386.x>

- Barrows, H. S., Tamblyn, R. M., & others. (1980). *Problem-Based Learning: An Approach to Medical Education* (Vol. 1). Springer Publishing Company.
- Beaumont, N. J., Jones, L., Garbutt, A., Hansom, J. D., & Toberman, M. (2014). The Value of Carbon Sequestration and Storage in Coastal Habitats. *Estuarine, Coastal and Shelf Science*, 137, 32–40. <https://doi.org/https://doi.org/10.1016/j.ecss.2013.11.022>
- Bell, J., Holroyd, H. (2009). Review of Human Reliability Assessment Methods. Health and Safety Laboratory. Harpur Hill, Buxton
- Binanto, I. (2010). *Multimedia Digital-Dasar Teori dan Pengembangannya* (N. WK, Alek, Bowo, & A. Sadewa, Eds.). Penerbit Andi.
- Bjork, E. L., Little, J. L., Storm, B. C. (2014) Multiple-choice testing as a desirable difficulty in the classroom. *Journal of Applied Research in Memory and Cognition*, 3(3), 165-170: <https://doi.org/10.1016/j.jarmac.2014.03.002>
- Bloom, B. S. (1976). Human Characteristics and School Learning. In *Human characteristics and school learning*. McGraw-Hill.
- Boud, D., & Feletti, G. (1998). *The Challenge of Problem-Based Learning*. Psychology Press. <https://doi.org/https://doi.org/10.4324/9781315042039>
- Branch, R. M., & Dousay, T. A. (2015). *Survey of Instructional Design Models*.
- Brassler, M., & Dettmers, J. (2017). How to Enhance Interdisciplinary Competence - Interdisciplinary Problem-Based Learning versus Interdisciplinary Project-Based Learning. *Interdisciplinary Journal of Problem-Based Learning*, 11(2). <https://doi.org/https://doi.org/10.7771/1541-5015.1686>
- Butchart, B. (2011). *Augmented Reality for Smartphones*.
- Cai, S., Wang, X., & Chiang, F.-K. (2014). A Case Study of Augmented Reality Simulation System Application in A Chemistry Course. *Computers in Human Behavior*, 37, 31–40. <https://doi.org/https://doi.org/10.1016/j.chb.2014.04.018>
- Carnduff, J., & Reid, N. (2003). *Enhancing Undergraduate Chemistry Laboratories: Pre-Laboratory and Post-Laboratory Exercises*. Royal Society of Chemistry.
- Chen, C.-M., & Tsai, Y.-N. (2012). Interactive Augmented Reality System for Enhancing Library Instruction in Elementary Schools. *Computers & Education*, 59(2), 638–652. <https://doi.org/https://doi.org/10.1016/j.compedu.2012.03.001>

- Chi, H.L., Kang, S.C. and Wang, X., 2013. Research trends and opportunities of *Augmented Reality* applications in architecture, engineering, and construction. *Automation in Construction* 33: 116-122.
- Chiang, T. H. C., Yang, S. J. H., & Hwang, G.-J. (2014). An *Augmented Reality-Based Mobile Learning System to Improve Students' Learning Achievements and Motivations in Natural Science Inquiry Activities*. *Journal of Educational Technology & Society*, 17(4), 352–365.
- Chimowitz MI, Logian EL, Caplan LR. Keakuratan diagnosis neurologis di samping tempat tidur. *Sejarah Neurologi*. 1990; 28 (1):78–85.
- Clouston, T. J., Westcott, L., Whitcombe, S. W., Riley, J., & Matheson, R. (2010). *Problem-Based Learning in Health and Social Care*. <https://doi.org/DOI:10.1002/9781444320541>
- Conway, J., & Little, P. ((2000)). From Practice to Theory: Reconceptualising Curriculum Development for PBL. *Problem-Based Learning. Educational Innovation across Disciplines—a Collection of Selected Papers*. Singapore: Temasek Centre for Problem-Based Learning, 169, 79.
- Craig, Alan. B. (2013). *Understanding Augmented Reality: Concepts and Applications*.
- Dale, E. (1969). *Audiovisual Methods in Teaching*.
- Daniela Linda, 2020. New Perspectives on Virtual and *Augmented Reality*. Routledge, Vanderbilt Avenue, New York. ISBN: 9780367432119
- Delisle, R. (1997a). *How to Use Problem-Based Learning in The Classroom*. Ascd.
- Delisle, R. (1997b). *How to use problem-based learning in the classroom*. Ascd.
- Deng, Z., Yu, Y., Yuan, X., Wan, N., & Yang, L. (2013). Situation and Development Tendency of Indoor Positioning. *China Communications*, 10(3), 42–55. <https://doi.org/https://doi.org/10.1109/CC.2013.6488829>
- Demir, I., Yildirim, E., Sermet, Y., & Sit, M. A. (2018). FLOODSS: Iowa flood information system as a generalized flood cyberinfrastructure. *International Journal of River Basin Management*, 16(3), 393–400.
- Dewey, J. (1963). *Experience and Education*. Collier Books. <https://doi.org/0020136609>
- Dewey, J. (1899). *The school and society*. Champaign, IL: Souther Illinois University Press.

- Dewey, J. (1938). *Experience and education*. New York, NY: Kappa Delta Pi.
- Dewey, J., & Small, A.W. (1897). *My pedagogic creed*. New York, NY: EL Kellogg & Company
- Dick, W., Carey, L., & Carey, J. (2005). *The Systematic Design of Instruction*. Pearson/Allyn and Bacon.
- Dick, W., Carey, L., & Carey, J. O. (2015). Systematic Design of Instruction, The, 8th edition. In *Systematic Design of Instruction, The, 8th edition* (8th ed.). Pearson.
- Dolmans, D. H. J. M., Loyens, S. M. M., Marcq, H., & Gijbels, D. (2016). Deep and Surface Learning in Problem-Based Learning: A Review of The Literature. *Advances in Health Sciences Education*, 21, 1087–1112. <https://doi.org/https://doi.org/10.1007/s10459-015-9645-6>
- Drăghicescu, L. M., Petrescu, A.-M., Cristea, G. C., Gorghiu, L. M., & Gorghiu, G. (2014). Application of Problem-Based Learning Strategy in Science Lessons- Examples of Good Practice. *Procedia-Social and Behavioral Sciences*, 149, 297–301. <https://doi.org/https://doi.org/10.1016/j.sbspro.2014.08.245>
- Drigas, A., & Mitsea, E. (2021). 8 Pillars X 8 Layers Model of Metacognition: Educational Strategies, Exercises &Trainings. International Journal of Online and Biomedical Engineering (iJOE), 17(08), pp. 115–134. <https://doi.org/10.3991/ijoe.v17i08.23563>
- Dryden, G., & Vos, J. (1999). *The Learning Revolution: To Change The Way The World Learns*. Torrance.
- Dunleavy, M., & Dede, C. (2014). Augmented Reality Teaching and Learning. *Handbook of Research on Educational Communications and Technology*, 735–745. [https://doi.org/https://doi.org/10.1007/978-1-4614-3185-5\\_59](https://doi.org/https://doi.org/10.1007/978-1-4614-3185-5_59)
- Dünser, A., Walker, L., Horner, H., & Bentall, D. (2012). November). Creating interactive physics education books with Augmented Reality. Proceedings of the 24th Australian computer-human interaction conference (pp. 107–114). ACM
- Dutta, K. (2015). *Augmented Reality for e-Learning*. Seminar Augmented Reality, Mobile & Wearable. Aachen: Augmented Reality, Mobile & Wearable.
- Eggen, P., & Kauchak, D. (2013). *Educational psychology: Windows on class- rooms* (9th ed.). Columbus, OH: Pearson Education
- Erdogan, T., & Senemoglu, N. (2017). PBL in Teacher Education: Its Effects on Achievement and Self-Regulation. *Higher Education Research & Development*, 36(6), 1152–1165. <https://doi.org/https://doi.org/10.1080/07294360.2017.1303458>

- Ersoy, E., & Başer, N. (2014). The Effects of Problem-Based Learning Method in Higher Education on Creative Thinking. *Procedia-Social and Behavioral Sciences*, 116, 3494–3498. <https://doi.org/https://doi.org/10.1016/j.sbspro.2014.01.790>
- Feehily, R. (2016). The Contractual Certainty of Commercial Agreements to Mediate in Ireland. *Irish Journal of Legal Studies Vol*, 6, 1.
- Feehily, R (2017): The Law Teacher, DOI: 10.1080/03069400.2016.1273457
- Fernández-Ahumada, E., Montejo-Gámez, J., Sánchez-Zamora, P., Benlloch-González, M., Ortiz-Medina, L., Beato, M. C., & Taguas, E. V. (2020). Development of Professional Skills in Higher Education. *New Perspectives on Virtual and Augmented Reality: Finding New Ways to Teach in a Transformed Learning Environment*, 64.
- Fidan, M., & Tuncel, M. (2019). Integrating Augmented Reality Into Problem Based Learning: The Effects on Learning Achievement and Attitude in Physics Education. *Computers & Education*, 142, 103635. <https://doi.org/https://doi.org/10.1016/j.compedu.2019.103635>
- Filbeck, R. (1974). Systems in Teaching and Learning. *Institute of Education Science*, 2.
- Frannita, E. L. (2015). *Pengembangan dan Analisis Media Pembelajaran Perakitan Komputer Berbasis Augmented Reality untuk Platform Android di SMK YPKK 1 Sleman*. Universitas Negeri Yogyakarta.
- Furht, B. (2011). *Handbook of Augmented Reality*. Springer Science & Business Media. <https://doi.org/https://doi.org/10.1007/978-1-4614-0064-6>
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational Research: An Introduction*, Eighth Edition, Pearson Education, Inc. USA
- Gall, Meredith D, Gall, J.P., & Borg, W R & Gall, W.R (1983). *Educational Research, An Introduction*. 4th ed. New York and London: Longman Inc.p.772.
- Gagne, R. M. (1965). *The Conditions Of Learning*. Holt, Rinehart and Winston, United States of America
- Gentry, C. G. (1994). *Introduction to instructional development: Process and technique*. Belmont, CA: Wadsworth Publishing Company.
- Gewurtz Rebecca E, Coman Liliana, Dhillon Shaminder, Jung Bonny, Solomon Patty. (2016). Problem-based Learning and Theories of Teaching and Learning in Health Professional Education. *Journal of Perspectives in Applied Academic Practice | Vol 4| Issue 1*. McMaster University, Canada

- Gijselaers, W. H., & Schmidt, H. G. (1990). *Development and Evaluation of a Causal Model of Problem-Based Learning.* <https://api.semanticscholar.org/CorpusID:58306337>
- Gredler, M. E. (2012). Understanding Vygotsky for The Classroom: Is it too Late? *Educational Psychology Review*, 24, 113–131. <https://doi.org/https://doi.org/10.1007/s10648-011-9183-6>
- Gustafson, K. L. & Branch, R. (1997). Revisioning models of instructional development. *Educational Technology Research and Development*, 45(3), 73–89.
- Hannafin, M. J. ((2006)). Functional contextualism in learning and instruction: Pragmatic science or objectivism revisited? *Educational Technology Research and Development*, 54(1), 37–41.
- Hannafin, M. J., & Hill, J. R. (1997). Student-centered learning and interactive multimedia: Status,
- Hockly, N. (2019a). *Augmented Reality.* *ELT Journal*, 73(3), 328–334. <https://doi.org/https://doi.org/10.1093/elt/ccz020>
- Hockly, N. (2019b). *Augmented Reality.* *ELT Journal*, 73(3), 328–334. <https://doi.org/https://doi.org/10.1093/elt/ccz020>
- Hoffman, K., Hosokawa, M., Blake Jr, R., Headrick, L., & Johnson, G. ((2006)). Problem-Based Learning Outcomes: Ten Years of Experience at The University of Missouri-Columbia School of Medicine. *Academic Medicine*, 81(7), 617–625. <https://doi.org/DOI:10.1097/01.ACM.0000232411.97399.c6>
- Hung, W. (2011). Theory to Reality: A Few Issues in Implementing Problem-Based Learning. *Educational Technology Research and Development*, 59, 529–552. <https://doi.org/https://doi.org/10.1007/s11423-011-9198-1>
- Hwang, G.-J., Wu, P.-H., Chen, C.-C., & Tu, N.-T. (2016). Effects of An *Augmented Reality*-Based Educational Game on Students' Learning Achievements and Attitudes in Real-World Observations. *Interactive Learning Environments*, 24(8), 1895–1906. <https://doi.org/https://doi.org/10.1080/10494820.2015.1057747>
- Ihsan Hisyam & Zaki Ahmad. (2023) 2nd International Conference on Statistics, Mathematics, Teaching, and Research. IOP Conf. Series: Journal of Physics: Conf. Series 1028 (2018) 012165 doi :10.1088/1742-6596/1028/1/012165.
- Itamiya, T., Tohara, H., & Nasuda, Y. (2019, March). *Augmented Reality* floods and smoke smartphone app disaster scope utilizing real-time occlusion. In 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR) (pp. 1397–1398). IEEE

- Jabarullah, N. H., & Iqbal Hussain, H. (2019). The Effectiveness of Problem-Based Learning in Technical and Vocational Education in Malaysia. *Education+Training*, 61(5), 552–567. <https://doi.org/https://doi.org/10.1108/ET-06-2018-0129>
- Jacobson, M. J. (2015). Authentic problem solving and learning: Lessons learned and moving forward. In Y. H. Cho, I. S. Caleon, & M. Kapur (Eds.). *Authentic problem solving and learning in the 21st century*. Singapore: Springer.
- Januszewski, A., & Molenda, M. (2013). *Educational Technology: A Definition with Commentary*. Routledge.
- Jeffri, N.F., & Awang Rambli, D.R. (2021). A review of *Augmented Reality* systems and their effects on mental workload and task performance. *Heliyon*, 7. <https://doi.org/https://doi.org/10.1016/j.heliyon.2021.e06277>
- Jin, J., & Bridges, S. M. (2014). Educational Technologies in Problem-Based Learning in Health Sciences Education: A Systematic Review. *Journal of Medical Internet Research*, 16(12), e251. <https://doi.org/https://doi.org/10.2196/jmir.3240>
- Jivram, T., Kavia, S., Poulton, E., Hernandez, A. S., Woodham, L. A., & Poulton, T. (2021). The Development of A Virtual World Problem-Based Learning Tutorial and Comparison with Interactive Text-Based Tutorials. *Frontiers in Digital Health*, 3, 611813. <https://doi.org/10.3389/fdgth.2021.611813>
- Jonassen, D. H. (2012). Designing for Decision Making. *Educational Technology Research and Development*, 60, 341–359. <https://doi.org/https://doi.org/10.1007/s11423-011-9230-5>
- Jonassen, D. H., & Hernandez-Serrano, J. ((2002)). Case-Based Reasoning and Instructional Design: Using Stories to Support Problem Solving. *Educational Technology Research and Development*, 50(2), 65–77. <https://doi.org/https://doi.org/10.1007/BF02504994>
- Jonassen, D. H., & Hung, W. ((2008)). All Problems are Not Equal: Implications for PBL. *Interdisciplinary Journal of Problem-Based Learning*, 2(2), 10.
- Jones, B. F., Rasmussen, C. M., & Moffitt, M. C. (1997). *Real-Life Problem Solving: A Collaborative Approach to Interdisciplinary Learning*. American Psychological Association.
- Lee, K. (2012). How AR Works in Education and Training. *TechTrends*, 56(2), 13–21.
- Ke, F., & Hsu, Y.-C. (2015). Mobile Augmented-Reality Artifact Creation as A Component of Mobile Computer-Supported Collaborative Learning. *The Internet and Higher Education*, 26, 33–41. <https://doi.org/https://doi.org/10.1016/j.iheduc.2015.04.003>

- Kemp, H., & Reupert, A. (2012). There ' s No Big Book on How to Care: Primary Pre-Service Teachers ' Experiences of Caring. 37(9).
- Kesim, M., & Ozarslan, Y. (2012). *Augmented Reality in Education: Current Technologies and The Potential for Education*. *Procedia-Social and Behavioral Sciences*, 47, 297–302. <https://doi.org/https://doi.org/10.1016/j.sbspro.2012.06.654>
- Kilbane, C. R., & Milman, N. B. (2014). *Teaching Models: Designing Instruction for 21st Century Learner*.
- Kipper, G., & Rampolla, J. (2012). *Augmented Reality: An Emerging Technologies Guide to AR* (B. Rearick, Ed.). Elsevier.
- Knowles, M. S. (1978). Andragogy: Adult Learning Theory in Perspective. *Community College Review*, 5(3), 9–20. <https://doi.org/https://doi.org/10.1177/009155217800500302>
- Lajoie, S. P., Hmelo-Silver, C. E., Wiseman, J. G., Chan, L., Lu, J., Khurana, C., et al. (2014). Using online digital tools and video to support international problem-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 8(2), 60–75.
- Layona R, Yulianto B, Tunardi Y. (2018). Web based *Augmented Reality* for Human Body Anatomy Learning, *Procedia Computer Science*, Volume 135. <https://doi.org/10.1016/j.procs.2018.08.197>.
- Lee, J. (2022). Problem-Based Gaming via An *Augmented Reality* Mobile Game and A Printed Game in Foreign Language Education. *Education and Information Technologies*, 27(1), 743–771. <https://doi.org/https://doi.org/10.1007/s10639-020-10409-8>
- Lee, K. (2012). *Augmented Reality in Education and Training*. *TechTrends*, 56, 13–21. <https://doi.org/https://doi.org/10.1007/s11528-012-0559-3>
- Lee, William W.& Diana L. Owens. ((2004)). *Multimedia Based Instructional Design*. Pfeiffer An Imprint of Wiley.
- Li, X., Xie, F., Li, X., Li, G., Chen, X., Lv, J., & Peng, C. (2020). Development, Application, and Evaluation of A Problem-Based Learning Method in Clinical Laboratory Education. *Clinica Chimica Acta*, 510, 681–684. <https://doi.org/https://doi.org/10.1016/j.cca.2020.08.037>
- Lin, P.-H., Huang, Y.-M., & Chen, C.-C. (2018a). Exploring Imaginative Capability and Learning Motivation Difference Through Picture E-book. *IEEE Access*, 6, 63416–63425. <https://doi.org/https://doi.org/10.1109/ACCESS.2018.2875675>

- Lin, P.-H., Huang, Y.-M., & Chen, C.-C. (2018b). Exploring Imaginative Capability and Learning Motivation Difference Through Picture E-Book. *IEEE Access*, 6, 63416–63425. <https://doi.org/https://doi.org/10.1109/ACCESS.2018.2875675>
- Loijens, L. W. S. (2017). *Augmented Reality for Food Marketers and Consumers*. Wageningen Academic Publishers. <https://doi.org/https://doi.org/10.3920/978-90-8686-842-1>
- Lytridis, C., Tsinakos, A., & Kazanidis, I. (2018). AR Tutor - An Augmented Reality Platform for Interactive Distance Learning. *Education Sciences*, 8(1), 6. <https://doi.org/https://doi.org/10.3390/educsci8010006>
- Manzanares, S., Carbonero-Martín, M. Á., & others. (2010). Types of Responses in 4-5 Year Old Children in Conservation, Classification, and Theory of Mind Tasks. *Psicothema*, 22(4), 772–777.
- Mark S. Sanders, Ernest McCormick.1993, Human Factors In Engineering and Design, 7 th.ed.,McGraw-Hill, Inc
- Miarso, Y. ((2004)). *Menyemai Benih Teknologi Pendidikan* (Jeffri & I. Fahmi, Eds.; Kedua). Kencana.
- Morisson,G.,Ross, S.,&Kempt, J.(2001). Designing Effective Instruction (3rd ed). New York: Jhon Wiley & Sons.
- Moody, J. A., Smith, J. D., & Ragan, B. W. (2005). Critical Shear Stress for Erosion of Cohesive Soils Subjected to Temperatures Typical of Wildfires. *Journal of Geophysical Research: Earth Surface*, 110(F1). [https://doi.org/https://doi.org/10.1029/\(2004\)JF000141](https://doi.org/https://doi.org/10.1029/(2004)JF000141)
- Moust Jos, Bouhuys Peter, Schmidt Henk. Fourth revised edition. 2021. Introduction to Problembased Learning A guide for students. Netherlands.
- Mota, J. M., Ruiz-Rube, I., Dodero, J. M., & Arnedillo-Sánchez, I. (2018). Augmented Reality Mobile App Development for All. *Computers & Electrical Engineering*, 65, 250–260. <https://doi.org/https://doi.org/10.1016/j.compeleceng.2017.08.025>
- Muhibin, S. ((2004)). *Psikologi Pendidikan*. Remaja Rosdakarya.
- Mustaqim, I., & Kurniawan, N. (2017). Pengembangan Augmented Reality Sebagai Media Pembelajaran Pengenalan Komponen Pneumatik di SMK. *Jurnal Pendidikan Teknologi Dan Kejuruan*, 14(2). <https://doi.org/https://doi.org/10.23887/jptk-undiksha.v14i2.10443>
- M.D.Roblyer. ((2003)). *Integrating Educational Technology into Teaching*, New Jersey, pearson Education.

- Nicholls, G. (2002). *Developing Teaching and Learning in Higher Education*. Routledge.
- Okolie, U. C., Elom, E. N., Igwe, P. A., Binuomote, M. O., Nwajiuba, C. A., & Igu, N. C. N. (2020). Improving Graduate Outcomes: Implementation of Problem-Based Learning in TVET Systems of Nigerian Higher Education. *Higher Education, Skills and Work-Based Learning*, 11(1), 92–110. <https://doi.org/https://doi.org/10.1108/HESWBL-12-2018-0140>
- Oon, S. T. (2003). *Problem Based Learning and Creativity*. Thomson.
- Ott, M., & Freina, L. (2015). A literature review on immersive virtual reality in education: State of the art and perspectives. In Proceedings of eLearning and Software for Education (eLSE) (Issue 1, pp. 23–24, 133–141). Bucharest, Romania.
- Özdemir, M., Sahin, C., Arcagok, S., & Demir, M. (2018, April). The effect of augmented reality applications in the learning process: A meta-analysis study. *Eurasian Journal of Educational Research (EJER)*, 74, 165–186. doi:10.14689/ejer.2018.74.9
- Pellas, N., Fotaris, P., Kazanidis, I., & Wells, D. (2019). Augmenting the Learning Experience in Primary and Secondary School Education: A Systematic Review of Recent Trends in Augmented Reality Game-Based Learning. *Virtual Reality*, 23(4), 329–346. <https://doi.org/https://doi.org/10.1007/s10055-018-0347-2>
- Perdikakis, A., Araya, A., & Kiritsis, D. (2015). Introducing Augmented Reality in Next Generation Industrial Learning Tools: A Case Study on Electric and Hybrid Vehicles. *Procedia Engineering*, 132, 251–258. <https://doi.org/https://doi.org/10.1016/j.proeng.2015.12.492>
- Phon, D. N. E., Ali, M. B., & Abd Halim, N. D. (2014). Collaborative Augmented Reality in Education: A Review. *2014 International Conference on Teaching and Learning in Computing and Engineering*, 78–83. <https://doi.org/https://doi.org/10.1109/LaTiCE.2014.23>
- Phungsuk, R., Viriyavejakul, C., & Ratanaolarn, T. (2017). Development of a Problem-Based Learning Model via a Virtual Learning Environment. *Kasetsart Journal of Social Sciences*, 38(3), 297–306. <https://doi.org/https://doi.org/10.1016/j.kjss.2017.01.001>
- Pierce, J. W., & Jones, B. F. (1997). *Problem-Based Learning: Learning and Teaching in the Context of Problems. Contextual Teaching and Learning: Preparing Teachers to Enhance Student Success in and Beyond School*.

- Pintrich, P. R. ((2000)). The Role of Goal Orientation in Self-Regulated Learning. In *Handbook of self-regulation* (pp. 451–502). Elsevier. <https://doi.org/https://doi.org/10.1016/B978-012109890-2/50043-3>
- Pott, L. M., & Santrock, D. ((2007)). Teaching Without a Teacher: Developing Competence with A Bullard Laryngoscope using Only A Structured Self-Learning Course and Practicing on A Mannequin. *Journal of Clinical Anesthesia*, 19(8), 583–586. [https://doi.org/https://doi.org/10.1016/j.jclinane.\(2007\).06.004](https://doi.org/https://doi.org/10.1016/j.jclinane.(2007).06.004)
- Pribadi, B. A. (2021). *Esensi Model Desain Sistem Pembelajaran: Menciptakan Pembelajaran Sukses* (1st ed.). Raja Grafindo Persada.
- Pribadi, B. A. (2023). *Teknologi Pendidikan: Desain dan Konsep Esensial*. Rajawali Pers.
- Ragan, T. J., & Smith, P. L. (1999). Instructional design. New York: Macmillan Publishing Company.
- Reigeluth, C. M. (Ed.). (1983). Instructional-design theories and models: An overview of their current status. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Reigeluth, C. M. (Ed.). (1999). Instructional-design theories and models: A new paradigm of instructional theory. Mahwah, New Jersey: Lawrence Erlbaum Associates, Publishers.
- Reigeluth, C. M., & Carr-Chellman, A. A. (Eds.). (2009). Instructional-design theories and models: Building a common knowledge base (3rd ed.). New York: Routledge.
- Reiser, A. R., & Dick, W. (1996). *Instructional Planning a Guide for Teachers* (2nd ed.). Allan and Bacon.
- Retnawati, H. (2017). Teknik Pengambilan Sampel. *Disampaikan Pada Workshop Update Penelitian Kuantitatif, Teknik Sampling, Analisis Data, Dan Isu Plagiarisme*, 1–7.
- Robert Baran and Howard Maibach, (2017) *Textbook of Cosmetic Dermatology, Fifth Edition*, ISBN 9781482223934. CRC Press is an imprint of Taylor & Francis Group, an Informa business.
- Roblyer, M. D., & Doering, A. Herbert. (2013). *Integrating Educational Technology into Teaching*. Pearson/Allyn and Bacon Publishers.
- Ropawandi, D., Halim, L., & Husnin, H. (2022). Augmented Reality (AR) Technology-Based Learning: The Effect on Physics Learning during the COVID-19 Pandemic.

*International Journal of Information and Education Technology*, 12(2), 132–140.  
<https://doi.org/10.18178/ijiet.2022.12.2.1596>

Rusman. (2018). *Model-Model Pembelajaran* (7th ed.). Rajawali Press.  
<https://doi.org/978-979-769-460-9>

Russell, A., & Molenda, H. (1986). *Instructional Media* (2nd ed.). John Wiley and Sons.

Sadiman, A. S., Harjito, Haryono, A., & R, R. (2011). *Media Pendidikan: Pengertian, Pengembangan, dan Pemanfaatannya*. PT Rajagrafindo Persada.  
<https://doi.org/978-979-769-474-6>

Sadowski, M., Birchman, J., & others. ((2005)). An Assessment of Graphics Faculty and Student Learning Styles. (2005) Annual Conference, 10–153.  
<https://doi.org/10.18260/1-2--14313>

Saidin, N. F., Halim, N. D. A., & Yahaya, N. (2015). A Review of Research on *Augmented Reality* in Education: Advantages and Applications. *International Education Studies*, 8(13), 1–8.  
<https://doi.org/http://dx.doi.org/10.5539/ies.v8n13p1>

Santrock, J. W. (2011). *Educational Psychology* (5th ed.). New York: McGraw-Hill Companies

Savin-Baden, M., & Major, C. H. ((2004)). *Foundations of Problem-Based Learning* (1st ed.). McGraw-Hill Education.

Schank, R. C. (1999). *Dynamic Memory Revisited* (1st ed.). Cambridge University Press.

Schunk, D. H. (2012). *Learning Theories: An Educational Perspective*. Boston: Pearson Education Inc.

Schmidt, H. G., Rotgans, J. I., & Yew, E. H. J. (2011). The Process of Problem-Based Learning: What Works and Why. *Medical Education*, 45(8), 792–806.

Schwendimann, B. A., De Wever, B., Hääläinen, R., & Cattaneo, A. A. P. (2018a). The State-of-the-Art of Collaborative Technologies for Initial Vocational Education: A Systematic Literature Review. *International Journal for Research in Vocational Education and Training*, 5(1), 19–41.  
<https://doi.org/https://doi.org/10.13152/IJRVET.5.1.2>

Schwendimann, B. A., De Wever, B., Hääläinen, R., & Cattaneo, A. A. P. (2018b). The State-of-the-Art of Collaborative Technologies for Initial Vocational Education: A Systematic Literature Review. *International Journal for Research in Vocational Education and Training*, 5(1), 19–41.  
<https://doi.org/https://doi.org/10.13152/IJRVET.5.1.2>

- Schuurmans, U. and Schuurmans, R., 2011. *Augmented Reality*. Van Duuren Media, Culemborg, the Netherlands, 246 pp.
- Seels, B. B., & Richey, R. C. (1994). *Instructional Technology: The Definition and Domains of The Field*. IAP.
- Siburian, J., Corebima, A. D., Saptasari, M., & others. (2019). The Correlation Between Critical and Creative Thinking Skills on Cognitive Learning Results. *Eurasian Journal of Educational Research*, 19(81), 99–114.
- Sidik, M. F., Vivanti, S. P., & Vivanti, S. P. (2021). *Pengembangan Media Pembelajaran Interaktif Berbasis Android Pada Materi Instalasi Jaringan Komputer Dengan Teknologi Augmented Reality (Studi Kasus: SMK YPKK 1 Sleman)*. Development of Android-Based Interactive Learning Media on Computer Network Installation Material with Augmented Reality Technology (Case Study: SMK YPKK 1 Sleman). University of Technology Yogyakarta.
- Sirakaya, M., & Kilic Cakmak, E. (2018). Effects of *Augmented Reality* on Student Achievement and Self-Efficacy in Vocational Education and Training. *International Journal for Research in Vocational Education and Training*, 5(1), 1–18. <https://doi.org/https://doi.org/10.13152/IJRVET.5.1.1>
- Sitti, S., Sopeerak, S., & Sompong, N. (2013). Development of Instructional Model Based on Connectivism Learning theory to enhance problem-solving Skill in ICT for daily Life of Higher Education Students. *Procedia-Social and Behavioral Sciences*, 103, 315–322. <https://doi.org/https://doi.org/10.1016/j.sbspro.2013.10.339>
- Sivapalan, M., Savenije, H. H. G., Blöschl, G., & others. (2012). Socio-Hydrology: A New Science of People and Water. *Hydrol. Process*, 26(8), 1270–1276. <https://doi.org/https://doi.org/10.1002/hyp.8426>
- Slavin R. Cooperative Learning: Theory, Research and Practice. Boston, MA: Allyn & Bacon 1990.
- Smaldino, S. E., Lowther, D. L., & Russell, J. D. (2014). *Instructional Technology & Media For Learning: Teknologi Pembelajaran dan Media untuk Belajar*. <https://doi.org/6028730599>
- Smaldino, S. E., Lowther, D. L., Russell, J. D., & Mims, C. ((2008)). *Instructional Technology and Media for Learning*. Pearson Merrill Prentice Hall Upper Saddle River, NJ.
- Smith, E., Romero, C., Donovan, B., Herter, R., Paunesku, D., Cohen, G., Dweck, C., & Gross, J. (2017). Emotion Theories and Adolescent Well-Being: Results of an Online Intervention. *Emotion*, 18. <https://doi.org/10.1037/emo0000379>

- Stanimirovic, D., Damasky, N., Webel, S., Koriath, D., Spillner, A. and Kurz, D., 2014. A mobile *Augmented Reality* system to assist auto mechanics. 2014 IEEE International Symposium on Mixed and *Augmented Reality* (ISMAR), September 10-12, 2014. Munich, Germany. Available at: <http://tinyurl.com/lzrf2qz>
- Stanton, M. T., Guerin, S., & Barrett, T. (2017). The Transfer of Problem-Based Learning Skills to Clinical Practice. *Interdisciplinary Journal of Problem-Based Learning*, 11(2). <https://doi.org/https://doi.org/10.7771/1541-5015.1678>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (1st ed.). Alfabeta.
- Suparman, A. (2014). *Desain Instruksional Modern* (N. I. Sallama, Ed.). Erlangga.
- Suprijono, A. (2016). *Cooperative Learning Teori dan Aplikasi Paikem* (6th ed.). Pustaka Pelajar.
- Tacgin, Z. (2020). *Virtual and Augmented Reality: An Educational Handbook*. Cambridge Scholars Publishing. <https://doi.org/1-5275-4813-9>
- Tan, O. S. ((2004)). Students' Experiences in Problem-Based Learning: Three Blind Mice Episode or Educational Innovation? *Innovations in Education and Teaching International*, 41(2), 169–184. [https://doi.org/https://doi.org/10.1080/147032904\(2000\)208693](https://doi.org/https://doi.org/10.1080/147032904(2000)208693)
- Tyler, Ralph W (2004) Second Edition. *Basic Principles Of Curriculum And Instruction*. Routledge
- Thees, Michael., Kapp, S., Strzys, M. P., Beil, F., Lukowicz, P., & Kuhn, J. (2020). Effects of *Augmented Reality* on Learning and Cognitive Load in University Physics Laboratory Courses. *Computers in Human Behavior*, 108, 106316. <https://doi.org/https://doi.org/10.1016/j.chb.2020.106316>
- Tomaz, J. B., Mamede, S., Coelho Filho, J. M., Roriz Filho, J. de S., van der Molen, H. T., & others. (2015). Effectiveness of An Online Problem-Based Learning Curriculum for Training Family Medical Doctors in Brazil. *Education for Health*, 28(3), 187–193.
- Torp, L., & Sage, S. ((2002)). *Problems as Possibilities: Problem-Based Learning for K-12 Education*. Ascd.
- Tuckey, H., Selvaratnam, M., & Bradley, J. (1991). Identification and Rectification of Student Difficulties Concerning Three-Dimensional Structures, Rotation, and Reflection. *Journal of Chemical Education*, 68(6), 460. <https://doi.org/https://doi.org/10.1021/ed068p460>

- Vargas, Y. A. M., Rojas, E. E. M., & Castillo, V. S. (2019). Application of *Augmented Reality* as a Means of Interdisciplinary Learning. *Scientia et Technica*, 24(3), 479–489. <https://doi.org/https://doi.org/10.22517/23447214.21371>
- Watkins, R., Meiers, M. W., & Visser, Y. (2012). *A Guide to Assessing Needs: Essential Tools for Collecting Information, Making Decisions, and Achieving Development Results*. World Bank Publications.
- Academic, Wrobel. (2017). *Augmented Reality* for food marketers and consumers. In *Augmented Reality* for food marketers and consumers. <https://doi.org/10.3920/978-90-8686-842-1>
- Yen, J.-C., Tsai, C.-H., & Wu, M. (2013). *Augmented Reality* in The Higher Education: Students' Science Concept Learning and Academic Achievement in Astronomy. *Procedia-Social and Behavioral Sciences*, 103, 165–173. <https://doi.org/https://doi.org/10.1016/j.sbspro.2013.10.322>
- Yew, E. H. J., & Goh, K. (2016). Problem-Based Learning: An Overview of its Process and Impact on Learning. *Health Professions Education*, 2(2), 75–79. <https://doi.org/https://doi.org/10.1016/j.Handphonee.2016.01.004>
- Yin, J.-H., Chng, C.-B., Wong, P.-M., Ho, N., Chua, M., & Chui, C.-K. (2020). VR and AR in Human Performance Research—An NUS Experience. *Virtual Reality & Intelligent Hardware*, 2(5), 381–393. <https://doi.org/https://doi.org/10.1016/j.vrih.2020.07.009>
- Yoon, H., Woo, A. J., Treagust, D., & Chandrasegaran, A. L. (2014). The Efficacy of Problem-Based Learning in an Analytical Laboratory Course for Pre-Service Chemistry Teachers. *International Journal of Science Education*, 36(1), 79–102. <https://doi.org/https://doi.org/10.1080/09500693.2012.727041>
- Z.D. Draelos. (2010). *Cosmetic Dermatology: Products and Procedures*. Blackwell Publishing.
- Zins, C. ((2007)). Conceptual Approaches for Defining Data, Information, and Knowledge. *Journal of the American Society for Information Science and Technology*, 58(4), 479–493. <https://doi.org/https://doi.org/10.1002/asi.20508>