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**PENGEMBANGAN GAME EDUKASI DIGITAL MATERI WUJUD
BENDA BERORIENTASI PADA KETERAMPILAN PENGAMATAN
SISWA**

(Penelitian *Design and Development* pada Pembelajaran IPA Kelas V Sekolah
Dasar)

SKRIPSI

Diajukan untuk Memenuhi Sebagian dari Syarat Memperoleh Gelar Sarjana
Pendidikan pada Program Studi Guru Sekolah Dasar



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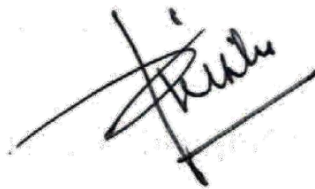
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SISWA**

(Penelitian Desain dan Pengembangan pada Pembelajaran IPA Kelas V Sekolah
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Diajukan untuk Memenuhi Sebagian Syarat Memperoleh Gelar Sarjana
Pendidikan pada Program Studi Guru Sekolah Dasar

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Agustus 2022

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Pengembangan *Game* Edukasi Digital Materi Wujud Benda Berorientasi pada Keterampilan Pengamatan Siswa

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ABSTRAK

Penelitian ini dilakukan berdasarkan adanya permasalahan siswa dalam mempelajari materi wujud benda yang bersifat abstrak. Dalam mempelajari materi wujud benda umumnya hanya terbatas pada penggunaan media teks dan gambar pada buku. Hal tersebut membuat siswa mudah bosan bahkan kurang mengerti terhadap materi yang diajarkan. Sehingga penggunaan media yang bervariasi perlu dipertimbangkan dalam pembelajaran. Penelitian ini bertujuan untuk mengembangkan media game edukasi digital “BEJUBE” untuk pembelajaran IPA pada materi wujud benda sebagai salah satu alternatif media pembelajaran. Metode yang digunakan dalam penelitian ini D&D (*Design and Development*) dan model ADDIE (*Analysis, Design, Development, Implementation and Evaluation*). Hasil dari penelitian ini menunjukkan bahwa game edukasi digital “BEJUBE” dapat meningkatkan semangat siswa dalam mengikuti pembelajaran serta membantu guru membuat proses pembelajaran menjadi lebih menyenangkan. Respon dari pengguna game edukasi digital “BEJUBE” ini sangat positif. Pengembangan media pembelajaran game edukasi digital “BEJUBE” mendapatkan penilaian dari ahli media dan ahli materi sehingga masuk dalam kategori “Sangat Layak” untuk media pembelajaran. Maka dari itu, game edukasi digital “BEJUBE” sesuai untuk digunakan dalam proses pembelajaran IPA khususnya pada materi wujud benda.

Kata kunci: Pembelajaran IPA, Media pembelajaran, Game edukasi, Model ADDIE

The Development of Digital Educational Game on Object Forms Materials Student Observation Skill Oriented

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ABSTRACT

This research is motivated on the students' problems in studying the object forms material as an abstract object. There's only few media (text/picture media) that can be used for study this material. Because of that, students easily bored and even less understand the material that being taught. So that the use of varied media needs to be considered in learning. This study aims to develop a digital educational game "BEJUBE" for science learning on object forms material as an alternative learning media. The method used in this research is D&D (Design and Development) and the ADDIE model (Analysis, Design, Development, Implementation and Evaluation). The results of this study indicate that the digital educational game "BEJUBE" can increase students' enthusiasm in participating learning process and can help teachers make the learning process more fun for the students. The response from users of the digital educational game "BEJUBE" is very positive. The development of the digital educational game learning media "BEJUBE" received a good score from media experts and material experts so that it was included in the "Very Eligible" category for learning media. Therefore, the digital educational game "BEJUBE" is suitable for use in the science learning process, especially in objects form material.

Keywords: Science Learning, Learning Media, Educational Games, ADDIE Model

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DAFTAR PUSTAKA

- Abdul, J., Felicia, P., & A, L. (2015). Game play engagement and learning in game-based learning: A systematic review. *Review of Educational Research*, 85(2): 740-779.
- Adams, D., & Beauchamp, G. (2021). Other Knowings and Experiencing Otherness: Children's Perspectives of Playing a Hunting Game in A Nature Reserve. *Australian Journal of Environmental Education*, 37, 224–239.
- Adams, E., & Rollings, A. (2007). *Game Design and Development*. New Reader Publishing.
- Adi, Y. K., & Widodo, A. (2018). PEMAHAMAN HAKIKAT SAINS PADA GURU DAN SISWA SEKOLAH DASAR. *Edukasi Journal*, 10(1), 55–72. <https://doi.org/10.31603/edukasi.v10i1.1831>
- Adittia, A. (2017). PENGGUNAAN MEDIA PEMBELAJARAN AUDIO VISUAL UNTUK MENINGKATKAN HASIL BELAJAR IPS PADA SISWA KELAS IV SD. *Mimbar Sekolah Dasar*, 4(1). <https://doi.org/10.23819/mimbar-sd.v4i1.5227>
- Almisad, B. (2020). The Degree of Achieving ISTE Standards among Pre-Service Teachers at “the Public Authority for Applied Education and Training” (PAAET) in Kuwait from Their Point of Views. *World Journal of Education*, 10(1), 69. <https://doi.org/10.5430/wje.v10n1p69>
- Alshatri, S. H. H., Wakil, K., Jamal, K., & Bakhtyar, R. (2019). Teaching aids effectiveness in learning mathematic. *International Journal of Educational Research Review*, 4(3), 448–453. <https://doi.org/10.24331/ijere.573949>
- Amelia, L. (2014). PENERAPAN METODE DEMONSTRASI UNTUK MENINGKATKAN HASIL BELAJAR SISWA KELAS IV SD NEGERI ULEE GLE PADA PELAJARAN SAINS MATERI PERUBAHAN WUJUD BENDA. *Jurnal Tunas Bangsa*, 1(1), 28.
- Amna, K., Farzana, H. A., & Muddasir, M. (2017). Use of digital game based learning and gamification in secondary school science: The effect on student engagement, learning and gender difference. *Education and Information Technologies*, 22, 2767–2808. <https://doi.org/10.1007/s10639-017-9622-1>
- Angko, N., & Mustaji. (2013). PENGEMBANGAN BAHAN AJAR DENGAN MODEL ADDIE UNTUK MATA PELAJARAN MATEMATIKA KELAS 5 SDS MAWAR SHARON SURABAYA. *Kwangsan Jurnal Teknologi Pendidikan*, 1(1).
- Bahrin, S., Alifah, S., & Mulyono, S. (2017). *Rancang Bangun Sistem Informasi Survey Pemasaran dan Penjualan Berbasis Web*. 2(2), 8.
- Balbag, M. Z. (2018). Views of Prospective Science Teachers on Including the Concept of Plasma in Science Curricula. *International Journal of Instruction*, 11(2), 569–584.
- Bundu, P. (2006). *Penilaian Keterampilan Proses Dan Sikap Ilmiah Dalam Pembelajaran Sains SD*. Depdiknas.
- Cetin, Z., & Ata, S. (2020). The Relationship between Parents Attachment to Their Parents and Children's Creatives. *Early Child Development and Care*, 192(4), 653–664. <https://doi.org/10.1080/03004430.2020.1788547>

- Cha, J., Kan, S.-Y., Chia, P. W., & Chia, P. S. (2022). Use of the Chemical SWOT Methodology to Enable Students to Analyse and Discuss the Socio-scientific Issues in the Classroom. *Asian Journal of University Education (AJUE)*, 18(1), 143–151. <https://doi.org/10.24191/ajue.v18i1.17180>
- Chu, S. (2009). Digital Game-Based Learning in Higher Education. *Information Science Reference*, 1120–1124. <https://doi.org/10.4018/978-1-60566-026-4.ch178>
- Chumsukon, M. (2021). Developing Geography Curriculum Framework for Promoting Pre-Service Teachers' Creative Thinking Through Instructional Media Production. *Journal of Education and Learning*, 10(5), 197–210. <https://doi.org/10.5539/jel.v10n5p197>
- Clark, R. E., & Choi, S. (2005). Five Design Principles for Experiments on the Effects of Animated Pedagogical Agents. *Journal of Educational Computing Research*, 32, 209-225.
- Couldry, N., & Andreas, H. (2013). Conceptualizing Mediatization: Contexts, Traditions, Arguments. *Communication Theory* 23 (3): 191–202. <https://doi.org/10.1111/comt.12019>
- Darina, D., Christo, D., Gennady, A., & Galia, A. (2016). Gamification in Education: A Systematic Mapping Study. *Educational Technology & Society*, 18(3), 75–88.
- Daryanto. (2010). *Media Pembelajaran Peranannya Sangat Penting Dalam Mencapai Tujuan Pembelajaran*. Gava Media.
- DeCoita, I., & Richardson, T. (2018). Teachers and Technology: Present Practice and Future Directions. *Contemporary Issues in Technology and Teacher Education*, 18(2), 362–378.
- Dickey, M. D. (2015). *K-12 Teachers Encounter Digital Games: A Qualitative Investigation of Teacher's Perceptions of The Potential Digital Games for K-12 Education*. 23(4), 485–495. <https://doi.org/doi.org/10.1080/10494820.2013.788036>
- Djauhari, N. (2012). *Pengantar Geologi. Edisi Kedua*. (2 ed.). Pakuan University Press.
- Efe, H., & Topsakal, U. U. (2021). Opinions of Pre-Service Teachers on The Use of Educational Digital Games in Science Lessons. *International Journal of Education*, 10(1), 45–57. <https://doi.org/10.34293/education.v10i1.4284>
- Eryilmaz, S. (2021). Compare Teachers and Students Attitudes According to Mobile Educational Applications. *The Turkish Online Journal of Educational Technology (TOJET)*, 20(1).
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*. 74(2):59-109.
- Ghani, M. T. A., Hamzah, M., Daud, W. A. A. W., & Romli, T. R. M. (2022). The Impact of Mobile Digital Game in Learning Arabic Language at Tertiary Level. *Contemporary Educational Technology*, 14(1), 344. <https://doi.org/10.30935/cedtech/11480>
- Gibson, D., Halverson, W., & Riedel, E. (2007). Gamer teachers. *Information Science Publishing*, 175–188.
- Ginanjari, A. A. (2019). Analisis Tingkat Keterbacaan Teks dalam Buku Ajar Bahasa Indonesia. *Jurnal Literasi*, 4(2), 175–181.

- Guler, M. S., & Cakir, E. (2020). Analysis of the relationship between digital game playing motivation and physical activity. *African Educational Research Journal*, 8(1), 9–16. <https://doi.org/10.30918/AERJ.8S1.20.002>
- Guthrie, J. T., & Wigfield, A. (2012). *Instructional contexts for engagement and achievement in reading*. Springer.
- Håkansson-Lindqvist, M., & Pettersson, F. (2019). Digitalization and school leadership: On the complexity of leading for digitalization in school. *International Journal of Information and Learning Technology*, 36(3), 218–230.
- Halim, M. S. A. A., Hashim, H., & Yunus, M. M. (2020). Pupils' Motivation and Perceptions on ESL Lessons through Online Quiz-Games. *Journal of Educatuon and e-Learning Research*, 7(3), 229–234. <https://doi.org/DOI:10.20448/journal.509.2020.73.229.234>
- Hamizul, M., & Nik Mohd Rahimi, N. Y. (2015). Design and development of Arabic online games: A conceptual paper. *Procedia Social and Behavioral Sciences*, 174, 1428–1433. <https://doi.org/10.1016/j.sbspro.2015.01.771>
- Hartanto, T. B. (2017). ANALISIS PENGARUH JUMLAH PENDUDUK, PENDIDIKAN, UPAH MINIMUM DAN PRODUK DOMESTIK REGIONAL BRUTO (PDRB) TERHADAP JUMLAH PENGANGGURAN DI KABUPATEN DAN KOTAPROVINSI JAWA TIMUR TAHUN 2010-2014. *Jurnal Ilmu Ekonomi Terapan*, 2(1). <https://doi.org/10.20473/jiet.v2i1.5502>
- Hauge, T. E. (2014). Up-take and use of technology: Bridging design for teaching and learning. *Technology, Pedagogy & Education*, 23(3), 311–323.
- Hendrawan, G. B., & Marlina, R. (2022). Persepsi Siswa Terhadap Penggunaan Game Edukasi Digital Pada Pembelajaran Matematika. *Jurnal Pembelajaran Matematika Inovatif*, Volume 5, No. 2. <https://doi.org/10.22460/jpmi.v5i2.395-404>
- Hermanns, J., & Keller, D. (2022). The Development, Use, and Evaluation of Digital Games and Quizzes in an Introductory Course on Organic Chemistry for Preservice Chemistry Teachers. *Journal of Chemical Education*, 99(4), 1715–1724. <https://doi.org/10.1021/acs.jchemed.2c00058>
- Hsu, T. Y., & Chiou, G. F. (2011). Preservice Teachers' Awareness of Digital Game-Supported Learning. VA: AACE.
- Hurd, D., & Jennings, E. (2009). *Standardized Educational Games Rating: Suggested Criteria*.
- Hurlock, E. B. (2007). *Child Development* (6 ed.). Erlangga.
- J. Ellis, T., & Levy, Y. (2010). *A Guide for Novice Researchers: Design and Development Research Methods*. 107–118. <https://doi.org/10.28945/1237>
- Jusuf, H. (2016). Penggunaan Gamifikasi dalam Proses Pembelajaran. *Jurnal TICOM*, 5(1), 1–6.
- Juwantara, R. A. (2019). Analisis Teori Perkembangan Kognitif Piaget pada Tahap Anak Usia Operasioanl Konkret 7-12 Tahun dalam Pembelajaran Matematika. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah*, 9(1), 27–34.
- Karim, A. A. (2016). Meningkatkan Pemahaman Konsep Perubahan Wujud Benda Pada Siswa Kelas IV SDN 3 Siwalempu Melalui Pendekatan Contextual Teaching and Learning (CTL). *Jurnal Kreatif Tadulako*, 4(2), 18.

- Khumaedi, M., Widjanarko, D., Setiadi, R., & Setiawan, A. (2021). Evaluating The Impact of Audio-Visual Media on Learning Outcomes of Drawing Orthographic Projections. *International Journal of Education and Practice*, 9(3), 613–624. <https://doi.org/10.18488/journal.61.2021.93.613.624>
- Kim, S., Chang, M., Deater-Deckard, K., Evans, M. A., Norton, A., & Samur, Y. (2017). Educational games and learners' game engagement in elementary school classrooms. *Journal of Computers in Education*, 4, 394–418.
- Kurniawati, I. D., & Nita, S. (2018). Media Pembelajaran Berbasis Multimedia Interaktif untuk Meningkatkan Pemahaman Konsep Mahasiswa. *Journal of Computer and Information Technology*, 1(2), 68–75.
- Kustandi, C., & Sutjipto, B. (2011). *Media Pembelajaran Manual dan Digital*. Ghalia Indonesia.
- Kustandi, C., & Sutjipto, B. (2013). *Media Pembelajaran: Manual dan Digital*. Ghalia Indonesia.
- Liliweri, A. (2011). *Komunikasi serba ada serba makna*. Prenada Media.
- Mahmudah, L. (2017). PENTINGNYA PENDEKATAN KETERAMPILAN PROSES PADA PEMBELAJARAN IPA DI MADRASAH. *ELEMENTARY: Islamic Teacher Journal*, 4(1). <https://doi.org/10.21043/elementary.v4i1.2047>
- Marisa, F., Tubagus, M. A., Anastasia, L. M., & Syahroni, W. I. (2020). Gamifikasi (Gamification) Konsep dan Penerapan. *Journal of Information Technology and Computer Science*, 5(3), 219–228. <https://doi.org/10.31328/jointecs.v5i3.1490>
- Miftah, M. (2009). Model dan Format Analisis Kebutuhan Multimedia Pembelajaran Interaktif. *Jurnal Teknologi Pendidikan*, 13(1), 95–106.
- Morgan, L., & Turner, I. (2021). Can Playing Table-Top Role-Play Games Help Children Learn? *Association for Science Education*, 170, 30–32.
- Nand, K., Baghaei, N., Casey, J., Barmada, B., Mehdipour, F., & Liang, H.-N. (2019). Engaging children with educational content via Gamification. *Smart Learning Environments*, 6:6. <https://doi.org/10.1186/s40561-019-0085-2>
- Nicola Whitton, & Langan, M. (2019). *Fun and games in higher education: An analysis of UK student perspectives*, *Teaching in Higher Education*. 24:8, 1000–1013. <https://doi.org/10.1080/13562517.2018.1541885>
- Ninghardjanti, P., Dirgatama, C. H. A., & Wirawan, A. W. (2020). *Buku Berbasis Riset: Pembelajaran Multimedia Berbasis Mobile Learning* (1 ed., Vol. 1). CV. Pena Persada.
- Noraddin, E., & Kian, N. T. (2014). Academics' Attitudes Toward Using Digital Games for Learning & Teaching in Malaysia. *Malaysian Online Journal of Educational Technology*, 2. <https://files.eric.ed.gov/fulltext/EJ1085940.pdf>
- Nurfauzi, Y., Wahyono, D., Rahmawati, F., & Yasin, N. M. (2020). Innovative education approaches by geriatric pharmacists and their training needs: A systematic review. *Tropical Journal of Pharmaceutical Research*, 19(7), 1525–1533. <https://doi.org/10.4314/tjpr.v19i7.27>
- Nurrita, T. (2018). PENGEMBANGAN MEDIA PEMBELAJARAN UNTUK MENINGKATKAN HASIL BELAJAR SISWA. *MISYKAT: Jurnal Ilmu-ilmu Al-Quran, Hadist, Syari'ah dan Tarbiyah*, 3(1), 171. <https://doi.org/10.33511/misykat.v3n1.171>

- Pakpahan, N. F. B. (2022). The Effectiveness Of Achieve Student Between Learning Using Video-Based Media and Power Points in Enviromental Science Courses. *International Journal of Education and Teaching (IOJET+)*, 9(1), 604–611.
- Pettersson, F. (2021). Understanding Digitalization and Educational Change in School by Means f Activity Theory and The Levels of Learning Concept. *Education and Information Technologies*, 26, 187–204. <https://doi.org/10.1007/s10639-020-10239-8>
- Pramono, A., Pujiyanto, P., Puspasari, B. D., & Dhanti, N. S. (2021). Character Thematic Education Game “AK@R” of Society Themes for Children with Malang-Indonesian Visualize. *International Journal of Instruction*, 14(2), 179–196. <https://doi.org/10.29333/iji.2021.14211a>
- Pranatawijaya, V. H., Widiatry, W., Priskila, R., & Putra, P. B. A. A. (2019). Penerapan Skala Likert dan Skala Dikotomi Pada Kuesioner Online. *Jurnal Sains dan Informatika*, 5(2), 128–137. <https://doi.org/10.34128/jsi.v5i2.185>
- Prastowo, A. (2011). *Metode Penelitian Kualitatif dalam Perspektif Rancangan Penelitian*. Ar-ruzz Media.
- Prior, D., Mazanov, J., Meacheam, D., Heaslip, G., & Hanson, J. (2016). Attitude, digital literacy and self-efficacy: Flow-on effects for online learning behavior. *The Internet and Higher Education*, 29, 91–97.
- Rahmadi, I. F. (2019). Penguasaan Technological Pedagogical Content Knowledge Calon Guru Pendidikan Pancasila dan Kewarganegaraan. *Jurnal Civics*, 16 No. 2.
- Rahmawati, L. E., & Sulistyono, Y. (2021). Assessment and Evaluation on Text Readability in Reading Test Instrument Development for BIPA-1 to BIPA-3. *Asian Journal of University Education (AJUE)*, 17(3), 51–57.
- Rauf, I. A., & Ramadhan, A. (2017). Meningkatkan Pemahaman Perubahan Wujud Benda Dalam Pembelajaran Sains Melalui Metode Pada Eksperimen Siswa Kelas V Inpres 1 Lemo. *Jurnal Kreatif Online*, 6(1), 9.
- Richey, Rita. C., & Klein, J. D. (2014). Design and Development Research: Methods, Strategies, and Issues. *Lawrence Erlbaum Associates*. <https://doi.org/10.4324/9780203826034>
- Ronimus, M., Kuala, J., Tulane, A., & Lysine, H. (2014). Children’s engagement during digital game-based learning of reading: The effects of time, rewards, and challenge. *Computers & Education* 71(3): 237-246.
- Rosidah, A. (2016). PENERAPAN MEDIA PEMBELAJARAN VISUAL UNTUK MENINGKATKAN PEMAHAMAN KONSEP SISWA PADA MATA PELAJARAN IPS. *Jurnal Cakrawala Pendas*, 2(2). <https://doi.org/10.31949/jcp.v2i2.499>
- Rusdi, M. (2018). *Penelitian Desain dan Pengembangan Kependidikan*. Raja Grafindo Persada.
- Rusman. (2013). *Metode-Metode Pembelajaran: Mengembangkan Profesionalisme Guru*. PT. Raja Grafindo Persada.
- Salgarayeva, G. I. (2021). The Effects of Using Digital Game Based Learning in Primary Classes with Inclusive Education. *European Journal of Contemporary Education*, Vol 10 (2). <https://doi.org/10.13187/ejced.2021.2.450>

- Sanaky, H. A. (2011). *Media Pembelajaran (Buku Pegangan Wajib Guru dan Dosen)*. Kaukaba.
- Sanjaya, A. (2011). *Model—Model Pembelajaran*. Bumi Aksara.
- Saputra, P. A., & Nugroho, A. (2017). PERANCANGAN DAN IMPLEMENTASI SURVEI KEPUASAN PENGUNJUNG BERBASIS WEB DI PERPUSTAKAAN DAERAH KOTA SALATIGA. *JUTI: Jurnal Ilmiah Teknologi Informasi*, 15(1), 63. <https://doi.org/10.12962/j24068535.v15i1.a636>
- Sari, B. K. (2017). *DESAIN PEMBELAJARAN MODEL ADDIE DAN IMPLEMENTASINYA DENGAN TEKNIK JIGSAW*. 2–4, 16.
- Setyosari, P. (2010). *Metode Penelitian Penelitian dan Pengembangan*. Kencana.
- Siti Nazleen, A. R., & Zulliana, T. (2017). The effect of digital game-based learning on primary school students' English vocabulary achievement and acceptance. *Innovative Teaching and Learning Journal*, 1(1), 61–74.
- Sugiyono. (2015). *Metode penelitian pendidikan: Pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Suwarna. (2006). *Pengajaran Mikro Pendekatan Praktis dalam Menyiapkan Pendidik Profesional*. Tiara Wacana.
- Syaiful Bahri Djamarah & Zain. (2010). *Strategi Belajar Mengajar*. Rineka Cipta.
- Tasaik, H. L., & Tuasikal, P. (2018). Peran Guru dalam Meningkatkan Kemandirian Belajar Peserta Didik Kelas V SD Inpres Samberpasi. *Metodik Didaktik*, 14(1), 45–55. <https://doi.org/10.17509/md.v14i1.11384>
- Trianto. (2010). *Model Pembelajaran Terpadu: Konsep, Strategi, dan Implementasinya dalam Kurikulum Tingkat Satuan Pendidikan (KTSP)*. Bumi Aksara.
- Triyadi, S. (2015). *EFEKTIVITAS PENGGUNAAN MEDIA AUDIO-VISUAL UNTUK MENINGKATKAN KETERAMPILAN MENYIMAK SISWA PADA MATA PELAJARAN PENDIDIKAN BAHASA INDONESIA*. 3(2), 6.
- Udeozor, C., Abegao, F. R., & Glassey, J. (2022). An Evaluation of the Relationship Between Perceptions and Performance of Students in a Serious Game. *Journal of Educational Computing Research*, 60(2), 322–351. <https://doi.org/DOI: 10.1177/07356331211036989>
- Vaughan, T. (2011). *Multimedia: Making It Work*, 8th Edition. Dalam *Multimedia: Making It Work, 8th Edition*. McGraw-Hill.
- Vincent, L. S. (2019). Measuring Innovation in Education 2019: What Has Changed in the Classroom? *Educational Research and Innovation*. <https://doi.org/10.1787/9789264311671-en>
- Walker, D. F., & Hess, R. D. (1984). *Instructional Software: Principles and Perspectives for Design and Use*. Wadsworth Publishing Company.
- Wibawanto, W., & Nugrahani, R. (2018). Desain Antarmuka (User Interface) pada Game Edukasi. *Imajinasi: Jurnal Seni*, 12(2), 57–64. <https://doi.org/10.15294/imajinasi.v12i2.17472>
- Wilfried, A., Jantina, H., Irma, H., Monique, V., & Geert, D. (2014). Gender-inclusive game-based learning in secondary education. *International Journal of Inclusive Education*, 18(11), 1208–1218. <https://doi.org/10.1080/13603116.2014.885592>

- Wrzesien, M., & Raya, M. A. (2010). Learning in serious virtual worlds: Evaluation of learning effectiveness and appeal to learners in the E-junior project. *Computers & Education*. 55(1): 178-187.
- Yanto, D. T. P. (2019). Praktikalitas Media Pembelajaran Interaktif Pada Proses Pembelajaran Rangkaian Listrik. *Jurnal Inovasi Vokasional dan Teknologi*, 19(1), 75–82. <https://doi.org/10.24036/invotek.v19vi1.409>

