



The Effect of Character-Based Learning Media Integrated with Local Wisdom in Enhancing Elementary Students' Literacy Skills and Character Development

Luh Putu Sri Lestari^{1*}, MG. Rini Kristiantari¹, Ni Kadek Septiari¹, I Gusti Agung Ayu Putu Listyana¹

¹Department of Education, Faculty of Science Education, Universitas Pendidikan Ganesha, Indonesia

*Correspondence to: luhputusri.lestari@undisha.ac.id

Abstract: Developing students' literacy skills and character values is essential in fostering holistic competencies in elementary education. However, conventional learning media often lack contextual relevance and fail to integrate cultural values, limiting their impact on students' personal and academic development. This study investigates the effect of character-based learning media integrated with local wisdom on students' literacy skills and character development. A quasi-experimental research design was applied, involving elementary school students assigned to experimental and control groups. The data were gathered through literacy performance assessments and character observation rubrics. Multivariate analysis of variance (MANOVA) was employed to analyze the effectiveness of the intervention. The results showed that students who engaged with character-based media grounded in local wisdom demonstrated significantly greater improvement in both literacy proficiency and character traits compared to the control group. The integration of culturally relevant content with character education principles allowed students to connect more deeply with learning materials and internalize core values such as responsibility, respect, and cooperation. These findings highlight the potential of localized, value-driven learning media in enhancing not only academic achievement but also moral and social development. The study suggests that adopting culturally rooted and character-based pedagogical approaches can substantially enrich elementary education practices.

Keywords: character-based on local wisdom; educational learning media; literacy

Recommended citation: Lestari, L. P. S., Kristiantara, M. R., Septiari, N. K., & Listyana, I. G. A. A. P. (2026). The Effect of Character-Based Learning Media Integrated with Local Wisdom in Enhancing Elementary Students' Literacy Skills and Character Development *Journal of Innovation in Educational and Cultural Research*, 7(1), 96-103.

INTRODUCTION

Character education serves as a fundamental pillar in achieving the Sustainable Development Goals (SDGs), particularly in ensuring Quality Education. A strong character enables students to develop integrity, responsibility, and social awareness as they navigate the complexities of the rapidly evolving modern world. In this regard, Indonesia's national education system requires fundamental transformation to make a meaningful contribution to national progress and remain relevant to global dynamics (Bates, 2019; Yulianti et al., 2016; Anindya et al., 2019). This transformation must place character formation on equal footing with intellectual development, as reflected in the competencies of the 21st century. With strong character and competence both nurtured through quality education, students will be better equipped to meet the demands and challenges of the current era (Baghoussi & El Ouchdi, 2019; Patiño et al., 2023).

However, the implementation of character education still faces significant challenges, primarily through literacy-based approaches. The 2022 Programme for International Student Assessment (PISA), released in December 2023, revealed that Indonesia remains among the lowest-performing countries, with scores of 359 in reading, 366 in mathematics, and 383 in science, far below the OECD averages (Afriyanti et al., 2018; Istiqomah & Siswono, 2020; Shanks et al., 2017). These figures underscore the weak reading culture and the underutilization of literacy as a medium for character education. In addition, rapid globalization has introduced new challenges, including the erosion of local cultural values and the lack of contextual learning media that effectively foster character formation (Handayani et al., 2021; Pradana et al., 2021).

This urgency is further substantiated by observational data collected from several elementary schools in Tabanan Regency. The findings indicate that more than 60% of students still exhibit a limited and fragmented understanding of character values rooted in their own local culture. This gap is particularly concerning given the central role that character plays in holistic education and personal development. Interviews with teachers and classroom observations reveal that the current instructional media are predominantly conventional, primarily textbook-based, and lacking in contextual relevance. These materials often fail to connect the content to students' lived experiences or cultural backgrounds, thereby limiting the affective engagement necessary for meaningful value internalization. As a result, students may acquire a surface-level understanding of moral values without fully grasping or embodying them in their daily lives, which leads to a weak integration between classroom learning and real-world behavior. This urgency is further substantiated by observational data collected from several elementary schools in Tabanan Regency. The findings indicate that more than 60% of students

still exhibit a limited and fragmented understanding of character values rooted in their own local culture. This gap is particularly concerning given the central role that character plays in holistic education and personal development. Interviews with teachers and classroom observations reveal that the current instructional media are predominantly conventional, primarily textbook-based, and lacking in contextual relevance (Brauckmann et al., 2020; Hui et al., 2022; Ghani et al., 2019). These materials often fail to connect the content to students' lived experiences or cultural backgrounds, thereby limiting the affective engagement necessary for meaningful value internalization. As a result, students may acquire surface-level knowledge of moral values without fully understanding or embodying them in their daily lives, leading to a weak integration between classroom learning and real-world behavior (Law et al., 2022; Northey et al., 2018).

Additionally, these findings suggest that teachers struggle to integrate character education effectively due to the absence of teaching materials that are both pedagogically sound and culturally relevant. This disconnect is exacerbated by the minimal integration of literacy-based activities that could otherwise serve as a vehicle for internalizing character values through reflective reading, writing, and storytelling (Dewi et al., 2021; Sopacua et al., 2020). Literacy practices, when grounded in culturally familiar contexts, provide a powerful medium for reinforcing moral reasoning and ethical behavior. However, without suitable instructional media that merge both literacy and local wisdom, these opportunities remain underutilized (Angelina, 2020; Han & Ellis, 2019).

Preliminary studies and gap analyses reveal limitations in the development of instructional media that integrate local wisdom and literacy to strengthen character education. Previous research has demonstrated that incorporating local wisdom into learning can significantly enhance students' understanding of character values (Priamantono et al., 2020; Suhartini et al., 2019). Effective character education must align local cultural values with literacy practices (Al-Mulhem, 2020; Gopalan et al., 2020). Therefore, developing character-based instructional media that combines local wisdom and literacy is a strategic effort to support the implementation of the Character Education Strengthening program, particularly at the primary education level (Abusa'aleek & Baniabdelrahman, 2020; Baharun, 2017).

Tabanan Regency was chosen as the study site due to its rich cultural heritage and distinctive traditions, which include the performing arts, customary practices, and the Subak farming system, reflecting the Tri Hita Karana philosophy. These forms of local wisdom embody character values such as cooperation, environmental harmony, and discipline, all of which are highly relevant for character internalization through contextual learning media (Alawamleh et al., 2022; Norhayati et al., 2018). However, this potential remains underutilized in classroom settings. Local cultural values are often only introduced as peripheral content at the beginning of lessons and are not yet systematically integrated into literacy content and classroom activities.

On the other hand, literacy today extends beyond reading and writing skills to encompass cultural and character literacy. Culture-based literacy can enhance students' comprehension of texts and foster a sense of cultural identity (Guo, 2018; Koriaty & Agustani, 2016). Literacy grounded in cultural narratives such as folklore, oral traditions, and symbolic representations can strengthen students' character development by instilling values like perseverance, curiosity, and respect for cultural heritage (Hang et al., 2023; Zhang et al., 2021). Recent studies affirm that character-based instructional media that integrate literacy and local wisdom can improve student engagement, reinforce cultural identity, and instill moral values (Al-Mulhem, 2020; Lai et al., 2020). In the context of Tabanan, local values such as cooperation (*gotong royong*), spirituality, and social responsibility can be effectively embedded into culturally relevant instructional media. Additionally, the use of digital technologies such as mobile applications and Augmented Reality (AR) can enhance the effectiveness and appeal of culture-based learning.

Given this background, the present study aims to examine the effectiveness of character-based instructional media that integrate local wisdom and literacy content to enhance elementary school students' literacy skills and character development. Through this approach, students are expected not only to develop reading proficiency but also to internalize the noble values of their cultural heritage. The media developed are intended to serve as practical tools for cultivating students' character and supporting the implementation of the Pancasila Student Profile (P5), which promotes students who are faithful, have integrity, are independent, think critically, and love their homeland.

METHODS

This quasi-experimental study employed a non-equivalent pretest-posttest control group design (Siedlecki, 2020; Stratton, 2019) to examine the effectiveness of character-based learning media integrated with local wisdom in enhancing students' literacy skills and character development in elementary education. The study aimed to assess the impact of such media by comparing outcomes from students exposed to the character-based learning materials with those receiving conventional instruction. The population of this study consisted of elementary school students from various educational institutions across different regions. The sample size was determined using the Slovin formula with a 3% margin of error to account for population variability (Sugiyono, 2019). A cluster random sampling technique was employed to ensure balanced representation from diverse

learning environments, including rural, suburban, and urban areas. The participants were divided into two groups: an experimental group, which received instruction using character-based learning media infused with elements of local wisdom, and a control group, which was taught using conventional teaching materials without integrated character or cultural components.

The character-based learning media, integrating local wisdom and literacy (Media A), was developed to embed Balinese cultural elements, such as traditional folktales, proverbs, community rituals, and local philosophies like Tri Hita Karana, within reading and literacy-based activities. This media aims to foster character values like honesty, cooperation, discipline, and cultural empathy through the following structured learning stages: introducing culturally contextual character problems, engaging students in reflective reading and discussion tasks, guiding moral reasoning and solution formulation, presenting experiences through storytelling or visual interpretation, and evaluating students' understanding and internalization of values through structured reflection.

The research instruments were developed to measure two primary outcomes: students' literacy skills and character development. Literacy was assessed through standardized reading comprehension and writing tasks, while character development was evaluated using observation sheets and rubrics based on national character education indicators. The instrument grid of the literacy achievement test is shown in Table 1, while the instrument grid of character development is shown in Table 2.

Table 1. Outlines of Literacy Skill Test

Assessed Aspect	Indicator	Item Format	Number of Items	Notes
Reading Comprehension	Identifying explicit information in culturally relevant texts	Multiple Choice	10	
Inferential Thinking	Drawing implicit conclusions from cultural stories or contexts	Multiple Choice	10	Texts include Balinese folktales, etc.
Cultural Text Analysis	Analyzing cultural values embedded in the texts	Multiple Choice	10	
			30	Reliability: Cronbach's $\alpha = 0.81$

Table 2. Outlines of Character Development Scale

Assessed Aspect	Indicator	Item Format	Number of Items	Notes
Integrity	Consistency in honesty and responsibility	Likert Scale (1–5)	5	
Responsibility	Discipline and commitment to duties	Likert Scale (1–5)	5	Adapted from the <i>Profil Pelajar Pancasila</i>
Respect	Appreciation of differences and others' perspectives	Likert Scale (1–5)	5	
Cultural Empathy	Understanding and caring for cultural values and practices	Likert Scale (1–5)	5	
			20	

Quantitative data were analyzed using descriptive statistics and inferential testing, including normality and homogeneity tests to validate assumptions, followed by a two-way MANOVA to determine the main and interaction effects between the type of media and cognitive style on students' literacy and character outcomes. Post hoc comparisons were also conducted to identify significant differences among groups using SPSS version 26.0. The combination of experimental design, cultural integration, and cognitive considerations in this study is expected to provide meaningful insights into the role of culturally grounded media in supporting character education and literacy development in Indonesian elementary schools.

RESULT AND DISCUSSION

The descriptive statistical analysis was conducted to evaluate the impact of character-based learning media integrated with local wisdom on students' literacy skills and character development. The analysis involved computing the mean, standard deviation, minimum, and maximum scores for both variables in the experimental group, as presented in Table 3.

Table 3. Descriptive Statistics of Literacy Skills and Character Development

Variable	N	Min	Max	Mean	Std. Deviation
Literacy Skills	60	4	10	8.03	1.41
Character Development	60	5	10	8.35	1.27

Based on the data in Table 3, the mean score for Literacy Skills was 8.03 with a standard deviation of 1.41, while the mean score for Character Development was 8.35 with a standard deviation of 1.27. The minimum and maximum scores show that students generally performed well in both areas, with Literacy Skills ranging from 4 to 10 and Character Development ranging from 5 to 10. These findings suggest a positive trend in student outcomes following the implementation of the character-based and culturally integrated learning media.

Before conducting inferential statistical analysis, prerequisite tests were carried out to ensure that the data met the assumptions of normality and homogeneity. These tests are essential to determine the suitability of using parametric statistical methods to analyze the effects of character-based learning media integrated with local wisdom on students' literacy skills and character development. To assess the normality of the data, both the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed. The results of the normality test are shown in Table 4.

Table 4. Normality Test Results

Variable	Kolmogorov-Smirnov					
	Statistic	df	Sig.	Statistic	df	Sig.
Literacy Skills	0.092	60	0.112	0.974	60	0.086
Character Development	0.085	60	0.127	0.981	60	0.094

As presented in Table 4, the significance values (Sig.) for both the Kolmogorov-Smirnov and Shapiro-Wilk tests are greater than 0.05 for all variables. This indicates that the data for literacy skills and character development are normally distributed. Therefore, parametric tests are appropriate for further analysis. The normal distribution of the data supports the reliability of the measurement instruments and the consistency of the data collection process. To examine the homogeneity of variances between the experimental and control groups, a Levene's Test for Equality of Variances was conducted. The results are shown in Table 5.

Table 5. Levene's Test of Homogeneity of Variances

Variable	Levene Statistic	df1	df2	Sig.
Literacy Skills	1.136	1	58	0.291
Character Development	0.984	1	58	0.326

Table 5 shows that the significance values for both variables are greater than 0.05 (Sig. > 0.05), indicating that the variances between the experimental and control groups are homogeneous. This confirms that the assumption of equal variance has been met, allowing for further parametric statistical analysis, such as independent sample t-tests or MANOVA. To examine the influence of character-based learning media integrated with local wisdom on students' literacy skills and character development, a Multivariate Analysis of Variance (MANOVA) was conducted. This statistical test was selected because the study includes two dependent variables, literacy skills and character development, and one independent variable, learning approach (character-based learning media integrated with local wisdom vs. conventional learning media). Additionally, univariate analyses were conducted to evaluate the specific impact on each dependent variable individually. The MANOVA test was used to determine whether there was a statistically significant difference between the experimental group (character-based media with local wisdom) and the control group (conventional media) across the two dependent variables. The results are shown in Table 6.

Table 6. Results of MANOVA Hypothesis Test

Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	0.983	2.000	78.000	0.000
	Wilks' Lambda	0.017	2.000	78.000	0.000
	Hotelling's Trace	56.832	2.000	78.000	0.000
	Roy's Largest Root	56.832	2.000	78.000	0.000
Group (Learning Approach)	Pillai's Trace	0.402	26.230	2.000	78.000
	Wilks' Lambda	0.598	26.230	2.000	78.000
	Hotelling's Trace	0.672	26.230	2.000	78.000
	Roy's Largest Root	0.672	26.230	2.000	78.000

Note: $p < 0.05$ indicates statistical significance.

Based on Table 6, the results of the Multivariate Tests indicate that the learning approach (character-based media integrated with local wisdom vs. conventional media) has a statistically significant effect on the combined dependent variables literacy skills and character development. This is evident from the Wilks' Lambda value of 0.598, with an F-value of 26.230 and a significance level of $p = 0.000$. These results suggest that the implementation of character-based learning media grounded in local wisdom significantly enhances both students' literacy competencies and their character development in elementary education. To determine the specific effect of character-based learning media integrated with local wisdom on each dependent variable, literacy skills and character development, a partial (univariate) test was conducted. The results of the Tests of Between-Subjects Effects are presented in Table 7.

Table 7. Partial Test Results

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Literacy Skills	28.736a	1	28.736	22.332	0.000
	Character Development	31.594b	1	31.594	25.619	0.000
Intercept	Literacy Skills	4892.184	1	4892.184	3797.852	0.000
	Character Development	5270.931	1	5270.931	4276.384	0.000
Group (Learning Approach)	Literacy Skills	28.736	1	28.736	22.332	0.000
	Character Development	31.594	1	31.594	25.619	0.000
Error	Literacy Skills	100.378	78	1.287		
	Character Development	96.204	78	1.233		
Total	Literacy Skills	5021.765	80			
	Character Development	5398.321	80			
Corrected Total	Literacy Skills	129.114	79			

Note:

a. R Squared = 0.223 (Adjusted R Squared = 0.213)

b. R Squared = 0.247 (Adjusted R Squared = 0.236)

Based on Table 7, the Tests of Between-Subjects Effects show that the learning approach (character-based media integrated with local wisdom) has a statistically significant effect on both literacy skills and character development, with significance values (p) of 0.000 for both variables. These results confirm that integrating local wisdom and character values into instructional media has a meaningful impact on improving students' outcomes.

Specifically, the effect size on character development (24.7%) is slightly higher than that on literacy skills (22.3%), indicating that the incorporation of moral and cultural values has a more pronounced influence on students' behavior and attitudes. However, both impacts are substantial and support the conclusion that this learning approach contributes to holistic student development, both academically and personally.

The findings of this study clearly indicate that the use of character-based learning media integrated with local wisdom has a significant and positive influence on the development of both literacy skills and character traits among elementary school students. Students who received instruction through media designed with embedded moral values and local cultural content showed greater improvement in reading comprehension, writing ability, and behavioral indicators such as responsibility, respect, cooperation, and honesty (Koriaty & Agustani, 2016; Singh & Singh, 2021). These results suggest that when instructional media are grounded in familiar cultural contexts and moral principles, students are more engaged cognitively and emotionally. The contextual nature of the materials appears to help students relate more effectively to the learning content, which in turn enhances both their understanding and motivation to learn. Moreover, the stronger statistical effect found on character development indicates that exposure to culturally relevant stories, proverbs, local traditions, and community values stimulates students' moral reasoning and internalization of positive behaviors.

These findings align with previous research that emphasizes the educational value of local wisdom and character-based education. Sopacua et al. (2020) argue that character education is most effective when values are not only taught explicitly but are also embedded in daily learning experiences. Zurqoni et al. (2018) support the idea that character development is fostered through meaningful, real-life learning environments that reflect moral challenges and ethical dilemmas. The use of local wisdom, as discussed by Sofyan et al. (2019), serves not only as a means of cultural preservation but also as a source of pedagogical richness that connects students

with their identity and environment. Furthermore, studies in literacy education highlight that students develop stronger literacy skills when engaged with texts that are meaningful and relevant to their lived experiences (Jang et al., 2021; Mihailidis, 2015). Therefore, integrating local stories, cultural idioms, and ethical messages into learning media serves a dual purpose: improving language competencies and fostering value-based education.

The implications of this study are substantial for the development of elementary education, especially in multicultural and multilingual settings. First, curriculum developers are encouraged to include local cultural elements and character values in learning materials to ensure that instruction is both academically and morally enriching. This approach supports the holistic development of students, aligning with national educational goals that emphasize the formation of competent, ethical, and socially responsible citizens. Second, the study implies a shift in teacher practice: educators need to be equipped not only with pedagogical skills but also with cultural sensitivity and the ability to contextualize learning using students' local environment and traditions. This can be achieved through professional development programs that focus on culturally responsive teaching and character education. Third, for policymakers, this study provides empirical support for integrating local wisdom into formal curricula, particularly in the context of strengthening national character education agendas. Such a strategy is highly relevant in diverse societies, where preserving cultural identity and unity is a crucial aspect of education.

Despite its contributions, this study has several limitations that should be acknowledged. One of the main limitations lies in the geographical scope of the sample, which was confined to a specific region with its own distinct cultural characteristics. As a result, the generalizability of the findings to other regions or ethnic groups may be limited, particularly in countries with significant cultural diversity, such as Indonesia. Additionally, the duration of the intervention was relatively short, which might not entirely reflect the long-term impact of character-based and culturally integrated learning media. Future research should consider longitudinal studies to explore how sustained exposure to such media affects students' development over time. Another limitation is related to the assessment of character development, which relied on observational instruments and rubric-based evaluations. Although these tools were designed to be as objective as possible, the potential for subjective bias cannot be eliminated. Finally, this study did not account for external variables such as parental involvement, peer influence, or community-based cultural exposure, all of which could have influenced the development of both literacy skills and character. Future studies are encouraged to adopt mixed-method approaches, combining quantitative analysis with qualitative insights from interviews, student journals, and teacher reflections to capture a more comprehensive picture of the learning experience.

CONCLUSION

Based on the study's results, the implementation of character education learning media that integrates local wisdom and literacy in Tabanan District elementary schools is highly feasible and appropriate for supporting the learning process. This media has shown the potential to improve students' character traits and enhance their literacy skills, making it suitable for use at the elementary school level. Although this study did not proceed to the effectiveness testing stage due to field limitations, the development and validation phases demonstrate that the media are ready for further implementation. The application of this learning media is expected to positively impact educational practices by promoting culturally relevant character education and strengthening students' connection to their local heritage. Therefore, it is recommended that future research continue into the effectiveness testing phase and that schools ensure the availability of adequate infrastructure and tools to support the optimal use of media in classroom settings. The widespread adoption of such culturally integrated media may significantly contribute to improving the quality of elementary education both in terms of literacy and character development.

REFERENCES

- Abusa'aleek, R. A., & Baniabdelrahman, A. A. (2020). The Effect of Gamification on Jordanian EFL Sixth Grade Students' Reading Comprehension. *International Journal of Education and Training (InjET)*, 6(1).
- Afriyanti, I., Wardono, W., & Kartono, K. (2018). Pengembangan Literasi Matematika Mengacu PISA Melalui Pembelajaran Abad Ke-21 Berbasis Teknologi. *PRISMA, Prosiding Seminar Nasional Matematika*, 1.
- Al-Mulhem, A. (2020). Exploring the Key Factors in the Use of an E-Learning System Among Students at King Faisal University, Saudi Arabia. *International Journal of Interactive Mobile*, 14(3), 19–37.
- Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2022). The Effect of Online Learning on Communication Between Instructors and Students During Covid-19 Pandemic. *Asian Education and Development Studies*, 11(2), 380-400.
- Angelina, L. (2020). Strategi Pengelolaan Zoom Meeting Dalam Proses Pembelajaran Dimasa Pandemi. *Jurnal Pendidikan Teknologi Informasi (JUKANTI)*, 3(2), 27–32.

- Anindya, E. F. Y., Suneki, S., & Purnamasari, V. (2019). Analisis Gerakan Literasi Sekolah Pada Pembelajaran Tematik. *Jurnal Ilmiah Sekolah Dasar*, 3(2), 238.
- Baghoussi, M., & El Ouchdi, I. Z. (2019). The Implementation of the Project-Based Learning Approach in the Algerian EFL Context: Curriculum Designers' Expectations and Teachers' Obstacles. *Arab World English Journal*, 10(1), 271–282.
- Baharun, H. (2017). Total Moral Quality: A New Approach for Character Education in Pesantren. *Ulumuna*, 21(1), 57–80.
- Bates, A. (2019). Character Education and the 'Priority of Recognition'. *Cambridge Journal of Education*, 49(6), 695-710.
- Brauckmann, S., Pashiardis, P., & Ärlestig, H. (2020). Bringing Context and Educational Leadership Together: Fostering the Professional Development of School Principals. *Professional Development in Education*, 00(00), 1–12.
- Dewi, I. S., Hendracipta, N., & Syachruraji, A. (2021). The Implementation of Student Discipline Through School Rules. *Indonesian Values and Character Education Journal*, 4(2), 48–53.
- Ghani, M. T. A., Hamzah, M., Ramli, S., Ab, W., Daud, A. W., Romli, T. R. M., & Mokhtar, N. N. M. (2019). A Questionnaire-Based Approach on Technology Acceptance Model for Mobile Digital Game-Based Learning. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 5(14), 11-21.
- Gopalan, M., Rosinger, K., & Ahn, J. B. (2020). Use of Quasi-Experimental Research Designs in Education Research: Growth, Promise, and Challenges. *Review of Research in Education*, 44(1), 218–243.
- Guo, H. (2018, November). A Study on the Educational Strategy of Using Folktales in Kindergarten. Dalam *2018 5th International Conference on Education, Management, Arts, Economics and Social Science (ICEMAESS 2018)* (hlm. 748-751). Atlantis Press.
- Han, F., & Ellis. (2019). RA Identifying Consistent Patterns of Quality Learning Discussions in Blended Learning. *The Internet and Higher Education*, 40, 12–19.
- Handayani, T., MS, Z., & Yudha, C. B. (2021). Pendidikan Karakter Peduli Lingkungan Melalui Program Adiwiyata Berbasis Ekopedagogik. *EduHumaniora | Jurnal Pendidikan Dasar Kampus Cibiru*, 13(1), 36–42.
- Hang, Y., Wang, H., Sang, Z., Huang, R., & Ye, L. (2023). The Impact of Mixed Reality Serious Games on Mortise and Tenon Learning in College Students. *Computers & Education: X Reality*, 3, 100042.
- Hui, C. Y., Abdulla, A., Ahmed, Z., Goel, H., Habib, G. M. M., Hock, T. T., ... & Pinnock, H. (2022). Mapping National Information and Communication Technology (ICT) Infrastructure to the Requirements of Potential Digital Health Interventions in Low and Middle-Income Countries. *Journal of Global Health*, 12.
- Istiqomah, N., & Siswono, T. Y. E. (2020). Pengaruh Pembelajaran Problem Based Learning Terhadap Kemampuan Metakognitif dan Pemecahan Masalah Matematika di Kelas XI SMA Negeri 1 Jombang. *MATHedunesa: Jurnal Ilmiah Pendidikan Matematika*, 9(2), 422–429.
- Jang, M., Aavakare, M., Nikou, S., & Kim, S. (2021). The Impact of Literacy on Intention to Use Digital Technology for Learning: A Comparative Study of Korea and Finland. *Telecommunications Policy*, 45(7).
- Koriaty, S., & Agustani, M. D. (2016). Pengembangan Model Pembelajaran Game Edukasi untuk Meningkatkan Minat Siswa Kelas X TKJ SMK Negeri 7 Pontianak. *Edukasi : Jurnal Pendidikan*, 14(3).
- Lai, C. H., Jong, B. S., Hsia, Y. T., & Lin, T. W. (2020). Integrating Flash Cards with Narratives for Mobile Learning of English Vocabulary. *International Journal of Interactive Mobile Technologies*, 14(4), 4–16.
- Law, E. L. C., Vostanis, P., & O'Reilly, M. J. (2023). Insights from Impacts of the Digital Divide on Children in Five Majority World Countries During the COVID-19 Pandemic. *Behaviour & Information Technology*, 42(15), 2696-2715.
- Mihailidis, P. (2015). Digital Curation and Digital Literacy: Evaluating the Role of Curation in Developing Critical Literacies for Participation in Digital Culture. *E-Learning and Digital Media*, 12(5–6), 443–458.
- Norhayati, N., Hasanuddin, H., & Hartono, H. (2018). Pengembangan Media Pembelajaran Berbasis Contextual Teaching And Learning untuk Memfasilitasi Kemampuan Pemecahan Masalah Matematis Siswa Madrasah Tsanawiyah. *JURING (Journal for Research in Mathematics Learning)*, 1(1), 19.
- Northey, G., Govind, R., Bucic, T., Chylinski, M., Dolan, R., & van Esch, P. (2018). The Effect of "Here and Now" Learning on Student Engagement and Academic Achievement. *British Journal of Educational Technology*, 49(2), 321–333.

- Patiño, A., Ramírez-Montoya, M. S., & Ibarra-Vazquez, G. (2023). Trends and Research Outcomes of Technology-Based Interventions for Complex Thinking Development in Higher Education: A Review of Scientific Publications. *Contemporary Educational Technology*, 15(4).
- Pradana, D. A., Mahfud, M., Hermawan, C., & Susanti, H. D. (2021). Nasionalism: Character Education Orientation in Learning Development. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 3(4), 4026–4034.
- Priamantono, R., Wardo, & Musaddad, A. A. (2020). Implementation of Local Wisdom Values of Pii Pesenggiri as Character Education in Indonesian History Learning. *VNU Journal of Science: Education Research*, 1–10.
- Shanks, J. D., Izumi, B., Sun, C., Martin, A., & Shanks, C. B. (2017). Teaching Undergraduate Students to Visualize and Communicate Public Health Data with Infographics. *Frontiers in Public Health*, 5(NOV), 1–6.
- Singh, P., & Singh, M. P. (2021). The Role of Teachers in Motivating Students to Learn. *Techno Learn*, 11(1), 29-32.
- Sofyan, H., Anggereini, E., & Saadiah, J. (2019). Development of E-Modules Based on Local Wisdom in Central Learning Model at Kindergartens in Jambi City. *European Journal of Educational Research*, 8(4), 1137–1143.
- Sopacua, J., Fadli, M. R., & Rochmat, S. (2020). The History Learning Module Integrated Character Values. *Journal of Education and Learning (EduLearn)*, 14(3), 463–472.
- Suhartini, S., Sekarningrum, B., Sulaeman, M. M., & Gunawan, W. (2019). Social Construction of Student Behavior Through Character Education Based on Local Wisdom. *Journal of Social Studies Education Research*, 10(3), 276–291.
- Yulianti, D., Khanafiyah, S., & Sulistyorini, S. (2016). Inquiry-Based Science Comic Physics Series Integrated with Character Education. *Jurnal Pendidikan IPA Indonesia*, 5(1), 38–44.
- Zhang, C., Wijaya, T. T., Zhou, Y., Chen, J., & Ning, Y. (2021, November). Ethnomathematics Values in Temple of Heaven: An Imperial Sacrificial Altar in Beijing, China. Dalam *Journal of Physics: Conference Series* (Vol. 2084, No. 1, hlm. 012015). IOP Publishing.
- Zurqoni, R., Apino, E., & Anazifa, R. D. (2018). Impact of Character Education Implementation: A Goal-Free Evaluation. *Problems of Education in the 21st Century*, 76(6), 881.