



Integrating Digital Media-Based Local Wisdom to Enhance National Insight: The Role of Digital Readiness

Yoyo Zakaria Ansori^{1*}, Adiwijaya², Mohd Razif Idris³, Mohamad Gilar Jatisunda⁴,
Dede Salim Nahdi⁵

^{1,4,5}Universitas Majalengka, Indonesia

²Telkom University, Indonesia

³Universiti Kuala Lumpur, Malaysia

*Correspondence to: al.anshory0928@unma.ac.id

Abstract: This study examined the effect of local wisdom-based digital learning media on elementary students' national insight while controlling for digital readiness. A quasi-experimental matching-only pretest-posttest control group design was employed. Participants were selected through purposive sampling from one public primary school, yielding 54 Grade V students. To reduce selection bias, students were matched on pretest national insight scores, prior academic achievement, and gender distribution, yielding equivalent experimental ($n = 27$) and control ($n = 27$) groups. Data were collected using a 20-item National Insight Test ($\alpha > .80$) and an 18-item Digital Readiness Scale assessing technological competence, attitudes, and self-efficacy ($\alpha > .80$). The intervention lasted four weeks, with the experimental group receiving culturally grounded digital instruction and the control group receiving conventional instruction. Data were analyzed using Analysis of Covariance (ANCOVA), with posttest national insight as the dependent variable and digital readiness as a covariate. Assumption tests were satisfied ($p > .05$). The overall model was statistically significant, $F(2, 51) = 14.87, p < .001$, explaining 37% of variance in posttest scores ($R^2 = .37$). Digital readiness significantly predicted national insight, $F(1, 51) = 18.42, p < .001$, partial $\eta^2 = .27$, while instructional condition showed a smaller but significant effect, $F(1, 51) = 4.36, p = .041$, partial $\eta^2 = .08$. The findings suggest that although culturally grounded digital media enhances national insight, students' digital readiness plays a more substantial role in determining learning outcomes.

Keywords: digital readiness; local wisdom; local wisdom-based digital media; national insight; quasi-experimental design

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INTRODUCTION

Recent scholarship has increasingly emphasized the transformative role of digital media in education in response to rapid technological developments reshaping teaching and learning practices (Charalampous, 2024; Klein, 2023). From a digital divide perspective, technological expansion does not automatically ensure equitable outcomes, as disparities in access, competence, and meaningful engagement persist across socio-economic and regional contexts. Digital transformation influences how learners acquire, construct, and disseminate knowledge, while the expansion of e-learning platforms and digital literacy initiatives has widened participation opportunities (Carabregu-Vokshi et al., 2024; Obojska & Vaiouli, 2025). Nevertheless, structural inequalities remain evident in primary education, where differences in digital access, competence, and instructional scaffolding shape learning trajectories (Galustyan et al., 2025; Loglo & Zawacki-Richter, 2023). Within this context, digital readiness is an individual-level characteristic that reflects learners' preparedness to participate effectively in digital environments.

Technology acceptance perspectives further suggest that instructional technologies yield educational benefits only when users possess sufficient competence, confidence, and perceived utility. Empirical evidence shows that digital readiness predicts engagement, persistence, and learning performance in online and blended contexts (Fuchs et al., 2022; Fjærestad & Xenofontos, 2025; Bhutto et al., 2025; Silva et al., 2022). Conceptually, it encompasses cognitive, affective, and contextual capacities that enable learners to access and utilize digital resources effectively (Assefa et al., 2021; Chounta et al., 2024; Kaufman et al., 2024). These capacities may independently influence learning outcomes regardless of instructional format, thereby posing a potential confounding factor in evaluating digital interventions.

Beyond technological considerations, culturally responsive pedagogy emphasizes that meaningful learning occurs when instruction connects with students' cultural identities and lived experiences. Integrating digital media with local wisdom aligns global technological engagement with local cultural grounding (Contreras et al., 2023; Engelbrecht & Borba, 2024). In the Indonesian context, innovation is expected to strengthen global competencies while preserving cultural continuity. Local wisdom—region-specific knowledge and practices embedded in social life—supports character formation, cultural identity, and socio-ecological awareness (Murfiah

& Ayuningtyas, 2024). Empirical studies indicate that local wisdom-based learning enhances critical thinking, environmental literacy, creativity, and social resilience (Elvianasti et al., 2023; Zahrotin et al., 2025). When translated into digital formats, culturally grounded media such as interactive videos and storytelling applications improve engagement and communication skills (Dwi et al., 2022; Sella, 2025; Bustomi et al., 2025; Tazhitova et al., 2025). In localized contexts such as Songan Village, dialect-based integration has increased instructional relevance (Astuti & Artawan, 2025). However, successful implementation remains closely linked to readiness conditions, including teacher readiness assessed through validated instruments (Arjaya et al., 2024).

Despite expanding evidence supporting digital media and local wisdom independently, limited research has examined their integration within fully digital primary environments while statistically controlling for learner-level readiness differences. Prior studies often focus on semi-digital formats (Darmawati et al., 2024) or on the motivational outcomes of digital games and storytelling (Ibda et al., 2024; Munajah et al., 2023), but rarely examine whether gains derive from media design or from pre-existing learner characteristics. This omission is methodologically consequential, as educational technology research underscores the importance of explicit causal reasoning and statistical control in non-randomized designs (Weidlich et al., 2024). Without accounting for baseline differences, estimated treatment effects may reflect prior characteristics rather than instructional impact. Digital readiness is both theoretically and empirically grounded as a learner attribute influencing outcomes. It predicts engagement and self-regulated learning in online settings (Fuchs et al., 2022), and, from a digital divide perspective, disparities in technological preparedness reflect structural inequalities that shape students' capacity to benefit from instruction (Constancio, 2025). Methodological reviews further caution that insufficient control of learner differences may lead to overestimation or misinterpretation of intervention effects (Vuogan & Li, 2024). Accordingly, failure to statistically control for digital readiness risks confounds the estimated effectiveness of local wisdom-based digital interventions and weakens internal validity.

From a constructivist perspective, learning outcomes such as national awareness depend on learners' active cognitive engagement rather than exposure alone (Karantalos & Koukopoulos, 2022; Diyal, 2024). Sociocultural theory similarly views digital tools as mediational means whose effectiveness depends on learners' readiness to internalize knowledge (Lantolf & Xi, 2023). Domain-specific prior knowledge significantly shapes information processing (Simonsmeier et al., 2022), and digital capabilities are associated with academic performance and engagement (Ibrahim & Aldawsari, 2023). Cognitive research further indicates that evaluative interpretation is influenced by prior competencies (Flick et al., 2022), reinforcing the need to account for pre-existing learner attributes. Therefore, digital readiness must be treated analytically as a covariate—a pre-existing characteristic statistically controlled to estimate the net effect of instructional treatment. In this study, digital readiness is not conceptualized as a mediating mechanism but as a control variable included to enhance precision and internal validity in assessing the impact of locally wisdom-based digital media.

Against this backdrop, uncertainty remains about whether culturally grounded digital media independently enhances primary students' national awareness, or whether differences are attributable to variations in readiness. This study examines the effect of local wisdom-based digital media on national awareness while statistically controlling for digital readiness. It investigates whether instructional groups differ significantly after adjustment and whether digital readiness predicts national awareness within the same analytical model. Accordingly, it is hypothesized that: 1) national awareness differs between instructional groups after controlling for digital readiness, and 2) digital readiness significantly predicts national awareness. Conducted in Majalengka Regency—characterized by strong cultural heritage and relatively limited digital infrastructure—this quasi-experimental study, employing ANCOVA, provides a more precise evaluation of the value of value-based digital education. By explicitly modeling digital readiness as a covariate rather than a mediator, the study clarifies the relative contribution of instructional design and learner preparedness in primary education contexts.

METHODS

This study employed a quasi-experimental matching-only pretest–posttest concontrol-groups design to examine the effect of locally wisdom-based digital learning media on elementary students' national insight while statistically controlling for digital readiness as a covariate. Quasi-experimental designs are widely applied in educational research when random assignment is impractical, allowing cautious causal inference under authentic school conditions (Gopalan et al., 2020). Randomization was not feasible due to institutional scheduling constraints; therefore, a structured matching procedure was implemented to enhance baseline equivalence and mitigate selection bias, consistent with established matching methodologies in non-randomized research (Rephann & Isserman, 1994). The study was conducted in one public primary school in Majalengka Regency, selected for its representativeness of semi-urban schools characterized by moderate digital infrastructure and culturally rich local content. Although the single-site setting limits external validity, the intervention model was designed to enable replication in comparable primary education contexts.

Participants were selected using purposive sampling, with inclusion criteria aligned with the research objectives (Tajik et al., 2025). Students were required to be officially enrolled in Grade V and to complete both

pretest and posttest assessments; incomplete cases were excluded from analysis. A total of 54 students met these criteria. Prior to group allocation, students were matched on 1) pretest national insight scores; 2) prior semester academic achievement (GPA equivalent), and 3) gender distribution. Students were ranked by pretest scores, paired based on comparable academic performance, and assigned to the experimental or control group in equal numbers within each pair. The use of pretest measures as a primary matching criterion is empirically supported as an effective strategy for reducing selection bias in non-randomized studies (Hallberg et al., 2018), aligning with contemporary standards emphasizing group comparability and transparent experimental practice (Englis & Frederiks, 2024). Baseline equivalence was confirmed using independent-samples t-tests, which indicated no statistically significant differences between groups ($p > .05$), and an effect size analysis (Cohen's $d < 0.20$) demonstrated negligible practical differences. The final sample consisted of 27 students in the experimental group and 27 in the control group, a size consistent with methodological recommendations for quasi-experimental educational research (Bulus, 2021). Instruction was delivered in intact classroom settings to minimize cross-group interaction during the intervention period.

The intervention consisted of a locally developed digital learning media package integrating regional cultural values into civic education content. Materials were delivered through interactive PowerPoint-based modules featuring audio narration, animated visuals, embedded quizzes, and reflective prompts, presented offline via a classroom projector and teacher-operated laptop to accommodate limited internet access. The program comprised four thematic modules, each lasting approximately 45–60 minutes and implemented over four weeks. Content incorporated local folklore from Majalengka, traditional proverbs that reflect national values, visual representations of regional cultural symbols, and case-based scenarios that link local traditions to civic responsibility. Each cultural element was explicitly connected to dimensions of national awareness, including unity, civic responsibility, and cultural identity. Instruction followed a structured sequence: orientation and activation of prior knowledge, digital cultural exploration, guided discussion, interactive assessment, and reflective consolidation. The design was grounded in principles of culturally responsive pedagogy and digitally supported contextual learning (Ilhami et al., 2019). The control group received identical thematic content through conventional textbook-based instruction without digital media integration.

Two instruments were administered. The National Insight Test consisted of 20 multiple-choice items measuring students' understanding of identity, citizenship, and national values. Content validity was established through expert review by civic education specialists, and reliability analysis indicated high internal consistency (Cronbach's $\alpha > .80$). The Digital Readiness Scale comprised 18 Likert-type items assessing attitudes, digital skills, and self-efficacy in the use of digital technologies. Construct validity was supported through alignment with established digital readiness frameworks, and reliability coefficients ($\alpha > .80$) were consistent with prior findings (Assefa et al., 2021). The study was conducted over four weeks. During the pretest phase, both groups completed the National Insight Test and the Digital Readiness Scale. The experimental group then received digital media-based instruction, while the control group received conventional instruction. At the conclusion of the intervention, both groups completed the National Insight Test as a posttest measure. Data were analyzed using Analysis of Covariance (ANCOVA), with digital readiness treated as a covariate to statistically control for individual differences in technological preparedness. Prior to analysis, assumptions of normality (Kolmogorov–Smirnov test), homogeneity of variance (Levene's test), linearity, and homogeneity of regression slopes were examined and satisfied ($p > .05$). Effect sizes were calculated using partial eta squared (η^2p) for treatment and covariate effects, Cohen's d for gain score comparisons, and R^2 to indicate explained variance. Effect magnitudes were interpreted according to conventional benchmarks (small = .01, medium = .06, large = .14 for η^2p).

Ethical standards were upheld through written informed consent from students and legal guardians, anonymized participant coding, secure data storage, and confidential handling of student records. The conceptual framework positioned local wisdom–based digital media as the independent variable, national insight as the dependent variable, and digital readiness as the covariate. By statistically adjusting for baseline differences in digital readiness, the ANCOVA model enabled a more precise estimation of treatment effects and strengthened internal validity. The conceptual relationships among variables are illustrated in Figure 1.

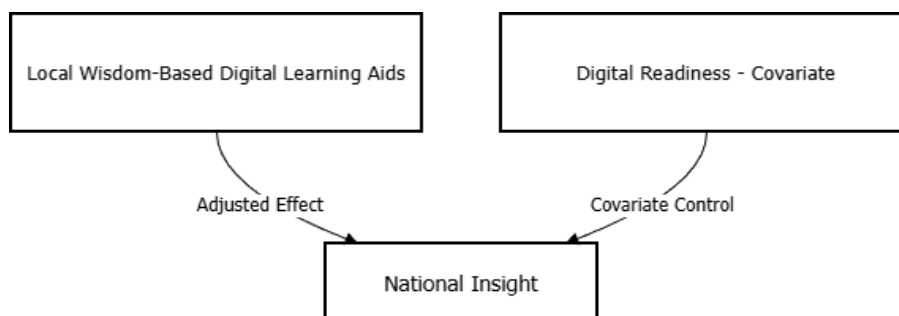


Figure 1. ANCOVA-based conceptual framework of the study

RESULT AND DISCUSSION

Prior to conducting inferential analysis, descriptive statistics were computed to examine changes in students' national insight scores across instructional conditions. Table 1 presents the means and standard deviations for both groups at pretest and posttest.

Table 1. Descriptive Statistics of National Insight Scores (Pretest–Posttest)

Group	Measurement	N	Mean	SD
Local Wisdom–Based Digital Media	Pretest	27	62.30	4.85
Local Wisdom–Based Digital Media	Posttest	27	75.05	4.10
Conventional Instruction	Pretest	27	61.85	4.92
Conventional Instruction	Posttest	27	72.90	4.35

As shown in Table 1, both groups demonstrated substantial improvements in national insight scores from pretest to posttest. The experimental group receiving local wisdom–based digital media increased from a mean of 62.30 (SD = 4.85) to 75.05 (SD = 4.10), reflecting a mean gain of 12.75 points. Similarly, the control group improved from 61.85 (SD = 4.92) to 72.90 (SD = 4.35), corresponding to a mean gain of 11.05 points. Although both instructional approaches were associated with meaningful gains, the experimental group demonstrated a slightly greater improvement, with a gain difference of 1.70 points relative to the control group. The magnitude of this difference appears modest but consistent with small-to-moderate instructional effects commonly observed in school-based intervention research. The standard deviations remained comparable across groups and measurement occasions, suggesting stable variability and no indication of abnormal dispersion patterns. These descriptive findings indicate that national insight increased over the instructional period in both conditions. However, descriptive comparisons alone cannot determine whether the observed differences in posttest scores reflect a statistically meaningful treatment effect after accounting for individual differences in digital readiness. Therefore, inferential analysis using Analysis of Covariance (ANCOVA) was conducted to examine the adjusted effect of instructional treatment while controlling for digital readiness as a covariate. Before conducting the main inferential analysis, the assumptions underlying ANCOVA were examined to ensure the model's appropriateness. The assumptions tested included normality of residuals, homogeneity of variance, linearity between the covariate and the dependent variable, and homogeneity of regression slopes. As presented in Table 2, all assumptions were satisfied ($p > .05$ where applicable), indicating that the data met the requirements for covariance analysis.

Table 2. Summary of ANCOVA Assumption Tests

Assumption	Test Used	Statistic	df	p	Interpretation
Normality of residuals	Kolmogorov–Smirnov	D = 0.087	54	.200	Residuals normally distributed
Homogeneity of variance	Levene's Test	F = 1.34	1, 52	.253	Equal variances assumed
Linearity	Regression (Covariate → DV)	F = 18.42	1, 52	< .001	Linear relationship confirmed
Homogeneity of regression slopes	Interaction (Group × Digital Readiness)	F = 1.12	1, 50	.295	Slopes are homogeneous

The results presented in Table 2 indicate that all required assumptions for ANCOVA were satisfied ($p > .05$ where applicable). Therefore, the data were considered appropriate for subsequent covariance analysis, and the adjusted treatment effects were interpreted with confidence in the robustness of the statistical model. An Analysis of Covariance (ANCOVA) was conducted to examine the adjusted effect of instructional condition on students' posttest national insight scores while statistically controlling for digital readiness. Posttest national insight served as the dependent variable, instructional condition (local wisdom–based digital media vs. conventional instruction) as the fixed factor, and digital readiness as the covariate.

Table 3. ANCOVA Results for Posttest National Insight Scores

Source	SS	df	MS	F	p	Partial η^2
Corrected Model	751.74	2	375.87	11.39	< .001	.31
Digital Readiness	607.86	1	607.86	18.42	< .001	.27
Instructional Condition	143.88	1	143.88	4.36	.041	.08
Error	1683.00	51	33.00	—	—	—
Corrected Total	2434.74	53	—	—	—	—

Note. $R^2 = .31$; Adjusted $R^2 = .29$. Dependent variable: Posttest National Insight.

The overall ANCOVA model was statistically significant, $F(2, 51) = 11.39$, $p < .001$, indicating that the combined predictors reliably explained variation in posttest national insight scores. The model accounted for 31% of the variance in posttest scores ($R^2 = .31$; adjusted $R^2 = .29$), demonstrating stable explanatory power after accounting for model complexity. Digital readiness emerged as a statistically significant covariate, $F(1, 51) = 18.42$, $p < .001$, with a partial eta squared (η^2p) of .27. This medium-to-large effect size indicates that students' preparedness to engage with digital learning environments substantially influenced national insight outcomes. After controlling for digital readiness, instructional condition demonstrated a statistically significant main effect, $F(1, 51) = 4.36$, $p = .041$, with a partial eta squared (η^2p) of .08. This small-to-moderate effect suggests that the local wisdom-based digital media provided an additional contribution to students' national insight beyond conventional instruction. The results indicate that both instructional design and learner-level digital preparedness play significant roles in shaping national insight outcomes. To further examine the contribution of digital readiness within the ANCOVA framework, parameter estimates were inspected. Table 4 presents the regression coefficients for the covariate, controlling for instructional condition.

Table 4. Parameter Estimates for Digital Readiness (Covariate)

Predictor	B	SE	t	p	95% CI	Partial η^2
Digital Readiness	0.62	0.14	4.29	< .001	[0.33, 0.91]	.27

Note. Dependent variable: Posttest National Insight.

Digital readiness emerged as a statistically significant covariate in the ANCOVA model, $F(1, 51) = 18.42$, $p < .001$, with a partial eta squared (η^2p) of .27. As shown in Table 4, the unstandardized regression coefficient ($B = 0.62$) indicates that for every one-unit increase in digital readiness, posttest national insight scores increased by approximately 0.62 points, holding instructional condition constant. The 95% confidence interval [0.33, 0.91] does not include zero, further confirming the effect's stability and statistical reliability. The partial η^2 of .27 indicates a medium-to-large effect size according to conventional benchmarks, indicating that digital readiness accounted for approximately 27% of the variance in posttest scores after controlling for error. This magnitude suggests that digital preparedness was not merely a peripheral factor but a substantive determinant of learning outcomes.

Substantively, the positive regression coefficient indicates that students with higher levels of technological competence, positive attitudes toward digital tools, and greater self-efficacy in digital environments tended to achieve higher levels of national insight, regardless of instructional format. The strength of this association underscores the central role of learner-level readiness in shaping engagement with instructional materials, particularly in technology-enhanced civic education contexts. Importantly, the considerable magnitude of the covariate effect justifies its inclusion in the analytical model. Without statistically controlling for digital readiness, estimates of instructional treatment effects could be confounded by pre-existing differences in students' capacity to benefit from digital learning environments. The findings therefore reinforce the methodological appropriateness of the ANCOVA approach and highlight the interplay between instructional innovation and learner characteristics in determining educational outcomes. To further examine the contribution of instructional condition within the ANCOVA framework, parameter estimates and adjusted means were inspected. Table 5 presents the regression coefficient associated with instructional condition after controlling for digital readiness, and Table 6 presents the estimated marginal means (adjusted means) for each group.

Table 5. Parameter Estimate for Instructional Condition

Predictor	B	SE	t	p	95% CI	Partial η^2
Instructional Condition (Digital vs. Conventional)	2.10	1.01	2.09	.041	[0.05, 4.15]	.08

Note. Reference group = Conventional instruction—dependent variable: Posttest National Insight.

After statistically controlling for digital readiness, instructional condition demonstrated a significant main effect on posttest national insight scores, $F(1, 51) = 4.36$, $p = .041$, with a partial eta squared (η^2p) of .08. As shown in Table 5, the unstandardized coefficient ($B = 2.10$) indicates that students in the local wisdom-based digital media group scored, on average, 2.10 points higher on the adjusted posttest compared to students in the conventional instruction group. The 95% confidence interval [0.05, 4.15] does not include zero, confirming the statistical reliability of the effect. The partial η^2 value of .08 corresponds to a small-to-moderate effect size, indicating that approximately 8% of the explainable variance in posttest national insight scores was attributable to instructional condition after controlling for digital readiness.

Table 6. Estimated Marginal Means of Posttest National Insight

Instructional Condition	Adjusted Mean	SE	95% CI
Local Wisdom–Based Digital Media	74.82	0.79	[73.23, 76.41]
Conventional Instruction	72.72	0.79	[71.13, 74.31]

The estimated marginal means presented in Table 6 further illustrate the adjusted difference between groups. After controlling for digital readiness, students exposed to local wisdom–based digital media achieved higher adjusted posttest scores ($M = 74.82$) than those in the conventional instruction group ($M = 72.72$). The adjusted mean difference of approximately 2.10 points aligns with the regression coefficient reported in Table 5, confirming the model's internal consistency. Although the treatment effect was smaller than that of the covariate, its statistical significance suggests that the instructional intervention contributed meaningfully to student outcomes beyond individual differences in digital preparedness. In classroom-based intervention research, effect sizes in this range are considered educationally meaningful, particularly when implemented under naturalistic school conditions. Rather than functioning as a dominant determinant of achievement, the instructional treatment appears to operate synergistically with learner readiness. These findings indicate that pedagogical innovation in the form of culturally grounded digital media yields measurable benefits, but its effectiveness is partly contingent upon students' capacity to engage with digital learning environments.

This study found that instructional innovation and learner characteristics jointly shape national insight in primary education. Although the local wisdom–based digital media produced a statistically significant effect, digital readiness accounted for a larger proportion of variance, indicating that instructional improvements do not operate independently of learner capacity. This finding is consistent with prior research emphasizing the interdependence between pedagogical design and student readiness (Wayal, 2024). Technological readiness has been shown to influence individuals' ability to engage with and benefit from digital learning materials (Demircan et al., 2025), while systemic readiness is a prerequisite for meaningful technology integration in primary education (Arnav et al., 2026). Motivation and satisfaction in technology-enhanced contexts are also shaped by readiness and support structures (Ahmed, 2025), and digital literacy functions as an enabling mechanism in culture-responsive digital learning (Budiarti & Wakhudin, 2026). Broader reform perspectives further identify technological competence and 21st-century skills as critical to pedagogical transformation (Fitrah et al., 2025).

The findings also indicate that digital readiness acts as a mediating condition. Readiness has been identified as a prerequisite for effective digital participation (Surapaneni, 2025), with digital self-efficacy mediating the relationship between engagement and motivation (Dong, 2025). Digital literacy, efficacy, and attitudes are interrelated constructs that shape how learners interpret digital tools (Getenet et al., 2024), and greater competence enables more efficient cognitive processing in online environments (Skulmowski & Xu, 2022). In elementary settings, digital literacy mediates the relationship between e-learning implementation and instructional interaction quality (Toorani & Jafari, 2024). Together, these findings support the view that digital readiness constitutes an enabling infrastructure in technology-enhanced learning.

At the same time, the significant—though modest—treatment effect suggests that culturally grounded digital media provides added pedagogical value. Structured integration of local wisdom enhances relevance in elementary education (Susanti & Rosa, 2026), while culturally themed digital formats promote higher-order thinking and civic engagement (Ismiyanti et al., 2025). Digital environments have been associated with the development of civic competencies (Insani, 2023), and civic learning is increasingly framed as a transformative process of identity formation (Hoggan-Kloubert & Mabrey III, 2022). Interactive digital environments strengthen motivational and affective engagement (Capone & Lepore, 2022; Jha et al., 2022), and well-aligned digital interventions can yield outcomes comparable to or stronger than those of analog formats (Fleissner-Martin et al., 2023).

Importantly, the relative magnitudes of effects highlight the interaction between structural and individual factors. Self-efficacy moderates techno-pedagogical competence and readiness (Oroh et al., 2025), while outcomes reflect the interplay between internal assets and contextual resources (Forbes & Kerr, 2023). Sustainable learning ecosystems require collaborative and systemic alignment (Khair, 2025; Tabunshchyk et al., 2024), and digital learning contributes to sustainable education only when competencies and systems are aligned (Sousa et al., 2022). Within culturally grounded pedagogy, effectiveness depends on readiness and professional capacity (Te Ava & Devi, 2022). From a theoretical perspective, these findings support a dual-lens framework integrating pedagogical design and learner capacity. Interactive civic media can support engagement when aligned with curricular objectives (Yunia et al., 2025), yet outcomes depend on coherence among tools, tasks, and theoretical grounding (Weisi & Rezghi, 2025). Digital competence shapes how affordances are interpreted (Zhang et al., 2025), and measurable gains depend on alignment between technology and pedagogy (Mudasir, 2024) and on motivational strategies across modalities (Uras Eren & Dikilitaş, 2025).

Overall, the findings suggest reconceptualizing digital media as a contingent catalyst rather than an autonomous driver of improvement. Technology's impact is mediated by human and contextual conditions (Aliyu

& Muhammad, 2026), and readiness to engage with advanced digital modalities determines the extent to which technology reinforces local wisdom values (Sutrisno et al., 2025). Digital literacy supports sustainable and reflective learning (Karanfiloğlu, 2025), while critical digital pedagogy emphasizes reflective consciousness (Gutiérrez-Ujaque, 2024). Meaningful transformation, therefore, emerges from alignment among cultural context, instructional design, and learner readiness (Zhang et al., 2026). Further research is needed to examine more explicitly the mediating and moderating mechanisms through which digital readiness conditions the impact of culturally grounded digital interventions across diverse educational contexts.

CONCLUSION

The present study examined the effect of local wisdom-based digital media on elementary students' national insight while controlling for digital readiness. The findings indicate that although culturally grounded digital instruction produced a statistically significant improvement, digital readiness exerted a stronger influence on learning outcomes. The most significant insight to emerge is that instructional innovation does not operate independently of learner capacity. Improvements in national insight were shaped not merely by exposure to culturally embedded digital content, but by the alignment between instructional affordances and students' digital competence. These results suggest that technology-enhanced learning should be conceptualized as an integrated ecosystem in which pedagogical design and learner readiness function as complementary dimensions. Digital media appears to act as a contingent catalyst rather than an autonomous driver of improvement; its effectiveness depends on students' technological skills, self-efficacy, and readiness to engage critically with digital content. The principal theoretical implication is that learner capacity mediates the impact of culturally responsive digital instruction in value-oriented learning. Several practical implications emerge. First, curriculum frameworks should explicitly integrate structured digital literacy development alongside content objectives. Digital competence, critical engagement, and reflective technology use must be embedded within instructional design rather than treated as peripheral skills. Second, media development should be responsive to students' readiness levels, incorporating differentiated scaffolding and progressive complexity to ensure equitable access and effectiveness. Third, systematic digital literacy training should be prioritized to maximize the impact of culturally grounded digital interventions. Despite its contributions, this study is limited by its quasi-experimental design, relatively small sample, and single-school context, which may constrain generalizability. Future research should employ larger, more diverse samples, longitudinal or randomized designs, and mediation or moderation analyses to clarify the mechanisms by which digital readiness conditions instructional effectiveness. Overall, this study contributes to the growing body of research indicating that sustainable educational transformation requires not only innovative digital media but also the systematic development of learner readiness within a coherent instructional framework.

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