



AIK-Based Digital Media and the CVIDLL Model: Improving Indonesian Students' Productive Language Skills

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Abstract: Islamic higher education institutions increasingly use digital media, yet many platforms remain generic and insufficiently aligned with institutional values. This study aimed to examine the effectiveness of AIK-based digital media and empirically examine the Contextual Value-Integrated Digital Language Learning (CVIDLL) model for developing students' writing and speaking skills. A quasi-experimental nonequivalent control-group pretest-posttest design was conducted with 63 fourth-semester Indonesian Language Education students at Universitas Muhammadiyah Sumatera Utara, comprising an experimental group ($n = 32$) and a control group ($n = 31$). Data were collected using validated writing and speaking rubrics and an AIK-integration perception questionnaire. ANCOVA showed significantly greater gains for the experimental group in writing (18.4 compared with 7.3; $p < .001$; partial $\eta^2 = .44$) and speaking (17.6 compared with 7.3; $p < .001$; partial $\eta^2 = .39$). Students also reported highly positive perceptions of AIK integration ($M = 4.28/5.00$). These findings support CVIDLL as a contextual framework for integrating Islamic institutional values into digital language learning.

Abstrak: Perguruan tinggi Islam memanfaatkan media digital, tetapi banyak media pembelajaran masih bersifat umum dan belum selaras dengan nilai-nilai kelembagaan. Penelitian ini bertujuan menguji efektivitas media digital berbasis AI-Islam dan Kemuhammadiyah (AIK) serta model Contextual Value-Integrated Digital Language Learning (CVIDLL) dalam mengembangkan keterampilan menulis dan berbicara mahasiswa. Penelitian menggunakan desain kuasi-eksperimen kontrol nonekuivalen dengan pretest-posttest pada 63 mahasiswa semester IV Pendidikan Bahasa Indonesia Universitas Muhammadiyah Sumatera Utara, terdiri atas kelompok eksperimen ($n = 32$) dan kontrol ($n = 31$). Data dikumpulkan menggunakan rubrik menulis dan berbicara tervalidasi serta kuesioner persepsi integrasi AIK. Hasil ANCOVA menunjukkan peningkatan kelompok eksperimen yang signifikan lebih besar pada keterampilan menulis (18,4 dibandingkan 7,3; $p < 0,001$; partial $\eta^2 = 0,44$) dan berbicara (17,6 dibandingkan 7,3; $p < 0,001$; partial $\eta^2 = 0,39$). Persepsi mahasiswa terhadap integrasi AIK sangat positif ($M = 4,28/5,00$). Temuan ini mendukung CVIDLL sebagai kerangka untuk mengintegrasikan nilai Islam dalam pembelajaran bahasa digital.

A. Introduction

Digital technology has fundamentally transformed language learning in higher education, reshaping how students access knowledge and develop language competencies. This transformation accelerated during the COVID-19 pandemic, prompting institutions worldwide to adopt digital learning environments and integrate technology into teaching (Bond et al., 2021). Consequently, digital learning has evolved from a complementary approach into an integral component of higher education, requiring flexible and learner-centered pedagogical practices. In language education, particularly in writing and speaking, digital media facilitates authentic communication, collaborative learning, immediate feedback, and learner autonomy through learning management systems, multimedia applications, collaborative writing tools, videoconferencing, and artificial intelligence-assisted environments. These technologies enable meaningful language practice, academic communication, and higher-order thinking beyond the classroom (Bahari et al., 2025). However, digital media effectiveness depends not merely on technological sophistication but on pedagogical design and alignment with learners' linguistic, social, cultural, and educational contexts. Without appropriate instructional strategies, technology may reproduce conventional practices rather than transform learning. Effective digital language learning therefore requires sound pedagogy, learner engagement, contextual relevance, and authentic interaction (Hadizadeh & Tasong, 2026; Darvin & Norton, 2016; Kessler, 2018).

This concern is particularly important in Indonesia, the world's largest Muslim-majority country, where the Muhammadiyah and Aisyiyah Higher Education Institutions (PTMA) network, comprising 172 institutions, positions Islamic values as part of its academic identity. Al-Islam and Kemuhammadiyahan (AIK), including tawhid, akhlak, and tajdid, are intended to inform academic learning across courses, including Indonesian language instruction, rather than being confined to dedicated AIK courses (Dimyathi et al., 2025). Accordingly, PTMA language learning should develop linguistic competence alongside ethical communication and responsible digital participation. Yet many digital learning platforms remain generic and value-neutral, with limited attention to the specific needs of value-based institutions (Al Lily et al., 2020). This situation creates a gap between PTMA's institutional commitment to AIK integration and its implementation in digitally mediated language classrooms.

AIK integration requires a theoretical foundation connecting language development, contextual relevance, and digital participation. The proposed Contextual Value-Integrated Digital Language Learning (CVIDLL) model is grounded in three complementary perspectives. First, Vygotsky (1978) social constructivism emphasizes that language development is mediated through social interaction, collaboration, scaffolding, and cultural contexts. Second, contextual learning connects new knowledge with learners' prior experiences, real-life situations, and sociocultural environments, increasing the relevance of writing and speaking activities (Laela et al., 2025). Third, critical digital literacy conceptualizes technology as a transformative learning environment that promotes ethical awareness, critical reflection, responsible participation, and informed decision-making

(Boentolo et al., 2024). Integrating these perspectives positions digital media not simply as a delivery channel but as a contextual environment for developing productive language skills, digital competence, academic identity, and AIK-oriented values (Griffiths, 2023).

A critical review of prior research reveals four converging gaps. First, studies of digital media in language learning have emphasized technological effectiveness, engagement, and motivation, while values, identity, and character education remain under-examined (Darvin & Norton, 2016; Kessler, 2018). Second, research integrating religious values into learning has often remained conceptual or philosophical rather than empirically testing measurable learning outcomes (Bruggeman et al., 2022). Third, although digital innovations in language learning are abundant, limited research integrates Islamic institutional values while examining writing and speaking simultaneously (Chen & Kim, 2023); much technology-and-language research remains centered on EFL/ESL contexts that do not directly represent Indonesian-language learning in Islamic institutions with distinctive sociocultural characteristics (Nurjanah et al., 2025). Fourth, technology integration and values-based education have largely been investigated separately, leaving limited systematically tested frameworks that combine both dimensions. Thus, PTMA's commitment to AIK values has developed faster than the empirical and pedagogical tools available to operationalize these values in digital language instruction.

To address these gaps, this study develops and empirically examines the Contextual Value-Integrated Digital Language Learning (CVIDLL) model, a pedagogical framework integrating contextual learning, digital literacy, and Al-Islam and Kemuhammadiyah (AIK) value-based character education within a unified instructional design. CVIDLL embeds AIK values into authentic writing and speaking activities, technology-enhanced interaction, collaborative learning, and reflective experiences rather than treating them as supplementary content. The model connects productive language development with ethical, religious, and social values through meaningful digital learning. Its novelty lies in systematically combining institutional Islamic values with digital language learning while examining writing and speaking outcomes using psychometrically validated instruments. Unlike approaches treating digital language learning, character education, and values integration separately, CVIDLL integrates these dimensions within one instructional model. The framework may also inform language lecturers and Islamic higher education institutions seeking adaptable value-integrated digital learning practices (Bond et al., 2020; Pangrazio et al., 2020).

This study was guided by three research questions concerning the effectiveness of AIK-based digital learning media and students' perceptions of its implementation: To what extent does AIK-based digital learning media improve students' writing skills compared with conventional digital learning media? To what extent does AIK-based digital learning media improve students' speaking skills compared with conventional digital learning media? and how do students perceive the integration of Al-Islam and Kemuhammadiyah (AIK) values into digital learning media, and to what extent are these perceptions associated with gains in their productive language skills?

B. Method

This study employed a quasi-experimental nonequivalent control-group pretest-posttest design (Creswell, 2022) to examine the effectiveness of AIK-based digital media in developing students' productive language skills. The study was conducted over one semester (16 weeks) during the 2025/2026 academic year in the Indonesian Language Education Program at Universitas Muhammadiyah Sumatera Utara (UMSU). The participants were 63 fourth-semester students, comprising 32 students in the experimental group and 31 students in the control group. Participants were selected through purposive sampling based on active course enrollment, access to digital learning devices, and completion of the basic AIK course. The experimental and control groups were naturally formed instructional groups rather than randomly assigned individuals. Their baseline characteristics were comparable, including mean cumulative grade point averages of 3.42 and 3.38, respectively.

Data were collected using writing and speaking assessment rubrics, a student perception questionnaire, and classroom observation. The writing and speaking rubrics assessed students' productive language performance, including linguistic aspects and AIK-value integration. The perception questionnaire examined students' responses to AIK-based digital media, including content relevance, ease of use, motivation, Islamic character integration, and contextual fit. The questionnaire used a five-point Likert scale, with higher scores indicating more positive perceptions.

Before the intervention, both groups completed writing and speaking pretests to establish baseline performance. The experimental group subsequently participated in a 16-week learning intervention using AIK-based digital media incorporating interactive videos, collaborative writing, AIK-oriented discussion forums, and contextual worksheets. The control group received conventional digital media consisting of general videos, standard writing tools, and general discussion forums. The intervention was designed to distinguish AIK-integrated contextual learning from conventional digital learning while maintaining the same overall instructional period. After the intervention, both groups completed the corresponding posttests, while students in the experimental group completed the perception questionnaire. Classroom observations were conducted throughout the learning process to document student engagement.

Data were analyzed using descriptive statistics, independent-samples t-tests, paired-samples t-tests, ANCOVA, Pearson correlation, and multiple regression. Independent-samples t-tests were used to examine baseline equivalence between the groups, whereas paired-samples t-tests examined within-group changes from pretest to posttest. ANCOVA was the principal inferential analysis for comparing posttest writing and speaking performance between groups while controlling for corresponding pretest scores. Before ANCOVA, assumptions concerning normality, homogeneity of variance, linearity, and homogeneity of regression slopes were examined. Effect sizes were interpreted using partial eta squared (η^2). Pearson correlation examined the association between media-use intensity and writing and speaking gains, while regression analysis examined the contribution of

media-use intensity, forum-participation quality, and AIK-perception scores to variation in language gains.

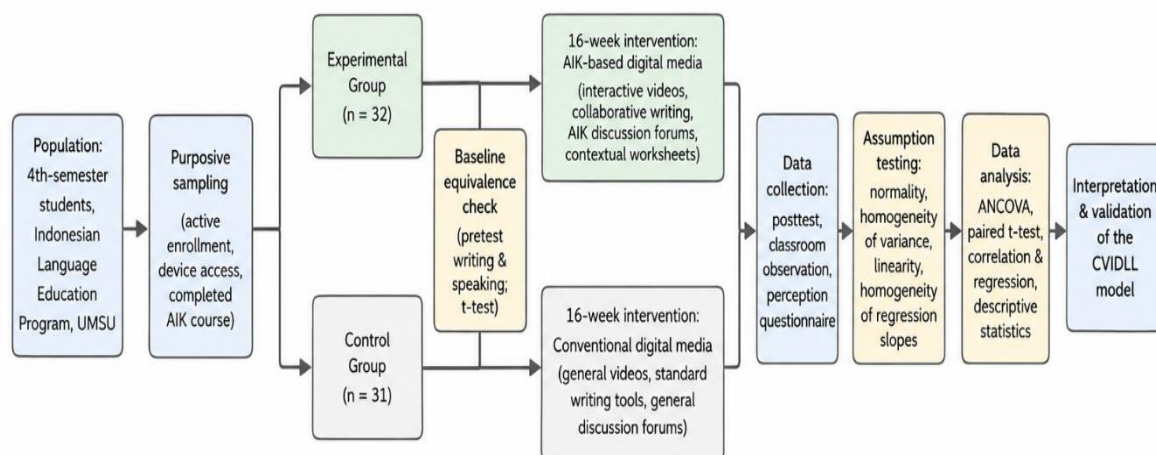


Figure 1. Research Flow Diagram

Figure 1. Research Flow Diagram presents the overall research procedure, beginning with participant selection and group formation, followed by baseline testing, the 16-week intervention, posttest and perception data collection, assumption testing, statistical analysis, and interpretation of the empirical findings in relation to the CVIDLL model.

C. Result

Demographic Profile of Research Participants

The study involved 63 fourth-semester students enrolled in the Indonesian Language Education Program at Universitas Muhammadiyah Sumatera Utara. The participants were divided into an experimental group consisting of 32 students and a control group consisting of 31 students. Both groups were enrolled in the same semester and study program. The mean cumulative grade point average (CGPA) was 3.42 for the experimental group and 3.38 for the control group. Thus, the participant profile was relatively comparable in terms of academic level and study-program affiliation. The complete demographic profile is presented in Table 1.

Table 1. Demographic Profile of Research Participants

Group	Number of Students	Semester	Study Program	Mean CGPA
Experimental	32	IV	Indonesian Language Education	3.42
Control	31	IV	Indonesian Language Education	3.38
Total	63	–	–	–

Source: Primary research data (2025)

Research Instruments: Types, Constructs, and Psychometric Quality

Four instruments were employed to collect data on students' productive language performance, perceptions of AIK integration, and engagement during the learning process. The writing assessment rubric consisted of five assessment aspects and demonstrated acceptable internal consistency (Cronbach's $\alpha = 0.87$) and content validity (CVI = 0.91). The speaking assessment rubric comprised six aspects and also demonstrated acceptable reliability ($\alpha = 0.84$) and content validity (CVI = 0.88). Both performance rubrics were reviewed by three experts, comprising two language-assessment specialists and one AIK curriculum specialist.

The AIK-integration perception questionnaire consisted of 24 items and demonstrated high internal consistency ($\alpha = 0.91$) and content validity (CVI = 0.93). In addition, the classroom observation sheet contained 15 indicators and obtained an inter-rater agreement coefficient of $\kappa = 0.79$. These results indicate that the instruments met the reported psychometric criteria for use in the study.

Table 2. Research Instruments: Types, Constructs, and Psychometric Quality

Instrument	Skill Measured	Number of Items	Reliability (α)	Validity
Writing Rubric	Argumentative essay writing	5 aspects	0.87	CVI = 0.91
Speaking Rubric	Academic oral presentation	6 aspects	0.84	CVI = 0.88
AIK Questionnaire	Perception of value integration	24 items	0.91	CVI = 0.93
Observation Sheet	Engagement in the learning process	15 indicators	0.82	Kappa = 0.79

Note: α = Cronbach's alpha; CVI = Content Validity Index; Kappa = Cohen's kappa.

Treatment Timeline

The intervention was implemented over 16 weeks and consisted of four sequential phases: orientation, intensive treatment, consolidation, and closure. During Weeks 1–4, the orientation phase focused on students' adaptation to the digital learning environment and AIK-related topics. Students were introduced to the learning platforms, received baseline AIK-themed videos, and completed the pretest.

The intensive treatment phase was conducted during Weeks 5–10 and constituted the core intervention. Students in the experimental group engaged with AIK-themed interactive videos, collaborative writing activities using Google Docs, and AIK-oriented discussion forums. During Weeks 11–12, the consolidation phase provided extended writing and speaking practice accompanied by AIK-integrated feedback. Finally, Weeks 13–16 constituted the closure phase, involving contextual worksheets, posttesting, completion of the perception questionnaire, and final classroom observation.

Table 3. Treatment Timeline

Phase	Weeks	Focus	Key Activities (Experimental Group)
Orientation	1–4	Adaptation to digital media and AIK topics	Introduction to platforms; baseline AIK-themed videos; pretest
Intensive treatment	5–10	Core intervention delivery	AIK-themed interactive videos, collaborative writing (Google Docs), AIK discussion forums
Consolidation	11–12	Deepening & practice	Extended writing/speaking practice with AIK-integrated feedback
Closure	13–16	Stabilization & assessment	Contextual worksheets, posttest, perception questionnaire, final observation

Normality Test Results (Shapiro-Wilk)

The normality of the writing and speaking scores was examined using the Shapiro-Wilk test. The results indicated that all pretest and posttest scores in both groups were normally distributed, as all significance values exceeded .05. For writing, the Shapiro-Wilk statistics ranged from $W = 0.968$ to $W = 0.978$, with p values ranging from .432 to .721. For speaking, the statistics ranged from $W = 0.970$ to $W = 0.981$, with p values ranging from .501 to .812. Therefore, the normality assumption required for subsequent parametric analyses was satisfied.

Table 4. Normality Test Results (Shapiro-Wilk)

Variable	Group	W	p	Interpretation
Writing Pre-test	Experimental	0.972	0.548	Normal
Writing Pre-test	Control	0.968	0.432	Normal
Writing Post-test	Experimental	0.978	0.721	Normal
Writing Post-test	Control	0.975	0.614	Normal
Speaking Pre-test	Experimental	0.970	0.501	Normal
Speaking Pre-test	Control	0.973	0.566	Normal
Speaking Post-test	Experimental	0.981	0.812	Normal
Speaking Post-test	Control	0.977	0.683	Normal

All variables were normally distributed ($p > .05$).

Linearity Test

The linearity assumption was examined to determine whether a linear relationship existed between the pretest covariates and corresponding posttest outcomes. The results showed no significant deviation from linearity for either writing or speaking. For writing, the linearity test yielded $F = 1.142$ with $p = .327$, whereas for speaking, $F = 1.287$ with $p = .291$. Because both significance values exceeded .05, the relationships between the pretest and posttest scores were considered linear, satisfying the linearity assumption for ANCOVA.

Table 6. Linearity Test

Dependent Variable	Predictor	F	Sig.	Interpretation
Writing Post-test	Writing Pre-test	1.142	0.327	Linear
Speaking Post-test	Speaking Pre-test	1.287	0.291	Linear

No significant deviation from linearity ($p > .05$)

Homogeneity of Regression Slopes

The homogeneity of regression slopes assumption was examined through the interaction between group membership and the corresponding pretest score. The interaction was not statistically significant for writing, $F = 0.486$, $p = .489$, or speaking, $F = 0.612$, $p = .437$. These findings indicate that the relationship between the covariate and the dependent variable did not differ significantly between the experimental and control groups. Thus, the homogeneity of regression slopes assumption was satisfied for both outcomes, supporting the subsequent use of ANCOVA.

Table 7. Homogeneity of Regression Slopes

Dependent Variable	Interaction Term	F	Sig.	Interpretation
Writing Score	Group $\times$ Pre-test	0.486	0.489	Assumption met
Speaking Score	Group $\times$ Pre-test	0.612	0.437	Assumption met

The Group $\times$ Pre-test interaction was not significant, confirming the assumption was met

Baseline Equivalence

Pretest scores showed no significant difference between groups for writing (Experimental $M = 61.4$, $SD = 7.2$; Control $M = 60.9$, $SD = 7.8$; $t(61) = 0.28$, $p = .78$) or speaking (Experimental $M = 59.7$, $SD = 8.1$; Control $M = 60.1$, $SD = 7.9$; $t(61) = -0.21$, $p = .83$), confirming that post-intervention differences can be attributed to the treatment rather than pre-existing ability (Creswell, 2022; Fraenkel et al., 2019).

Table 8. Comparison of Pretest Scores between the Experimental and Control Groups

Skill	Experimental ($M \pm SD$)	Control ($M \pm SD$)	$t(61)$	Sig. (p)
Writing	61.4 ± 7.2	60.9 ± 7.8	0.28	0.78
Speaking	59.7 ± 8.1	60.1 ± 7.9	-0.21	0.83

No significant difference was found ($p > 0.05$) for either skill

Pretest-Posttest Comparison and Effect Size

Following the 16-week intervention, the experimental group achieved a writing posttest mean of 79.8 ($SD = 6.1$; gain = 18.4) versus 68.2 ($SD = 7.5$; gain = 7.3) for the control group, ANCOVA $F(1,60) = 47.3$, $p < .001$, partial $\eta^2 = 0.44$. For speaking, the experimental group reached 77.3 ($SD = 7.4$; gain = 17.6) versus 67.4 ($SD = 7.8$; gain = 7.3) for the control group, $F(1,60) = 38.9$, $p < .001$, partial $\eta^2 = 0.39$.

Following established benchmarks for η^2 (small = .01, medium = .06, large $\geq$.14; Creswell, 2022), both effects fall well within the large-effect category, indicating that AIK-based digital media accounts for a substantial share of the variance in productive-language gains beyond what conventional media achieves.

Table 9. Pretest-Posttest Comparison

Group	Skill	Pretest (M $\pm$ SD)	Posttest (M $\pm$ SD)	Gain Score	Sig. (p)
Experimental	Writing	61.4 $\pm$ 7.2	79.8 $\pm$ 6.1	18.4	< 0.001
Experimental	Speaking	59.7 $\pm$ 8.1	77.3 $\pm$ 7.4	17.6	< 0.001
Control	Writing	60.9 $\pm$ 7.8	68.2 $\pm$ 7.5	7.3	0.024
Control	Speaking	60.1 $\pm$ 7.9	67.4 $\pm$ 7.8	7.3	0.031

ANCOVA: *writing* $F(1,60) = 47.3$, $p < .001$, $\eta^2 = 0.44$ (large); *speaking* $F(1,60) = 38.9$, $p < .001$, $\eta^2 = 0.39$ (large)

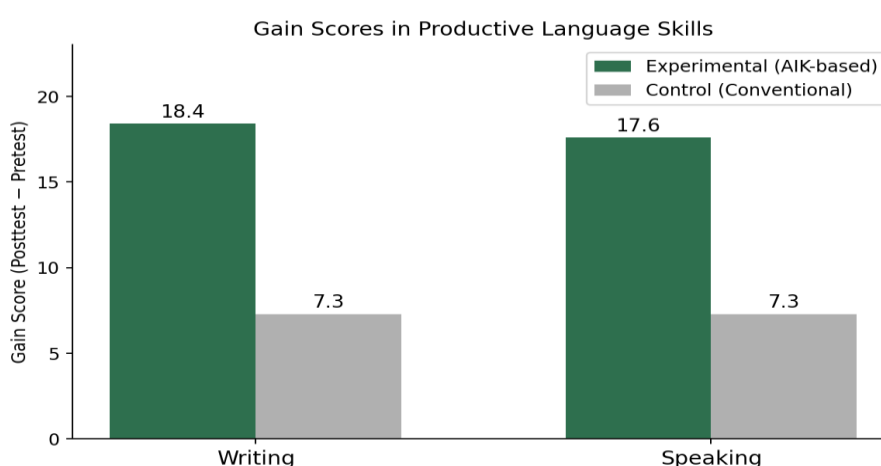


Figure 2. Gain Scores in Writing and Speaking

Writing Skill by Assessment Aspect

The experimental group outperformed the control group across all writing aspects, most notably in AIK-value integration (M = 80.9 vs. 54.2, a 26.7-point gap – the largest disparity observed), followed by grammar (11.9), diction and vocabulary (11.7), content and ideas (11.8), and text organization (11.6), consistent with contextualized, technology-supported writing instruction improving idea development and text organization (Ho, 2022; Kessler, 2018).

Table 10. Writing Skill by Assessment Aspect ($p < .05$)

Assessment Aspect	Experimental (M)	Control (M)	Difference	Note
Content and ideas	82.1	70.3	11.8	Significant
Text organization	79.4	67.8	11.6	Significant

Diction and vocabulary	78.6	66.9	11.7	Significant
Grammar	77.3	65.4	11.9	Significant

Note: M = mean posttest score; Note column indicates significance ($p < 0.05$).

Comparison by Speaking Skill Assessment Aspect

The largest speaking gains were in diction with Islamic nuance (22.1), confidence conveying an Islamic worldview (19.3), and fluency in academic-Islamic terminology (17.8) consistent with Krashen (1985) Comprehensible Input Hypothesis and Mayer (2021) Multimedia Learning Theory, and with the social-constructivist role of forum-based discussion in negotiating meaning (Vygotsky, 1978)

Table 11. Gain Scores for Speaking Skill Assessment Aspects, Experimental Group

Assessment Aspect	Gain Score (points)	Note
Use of diction with Islamic nuance	22.1	Highest improvement
Confidence in conveying ideas based on an Islamic worldview	19.3	High improvement
Fluency in academic-Islamic terminology	17.8	High improvement

Student Engagement

The experimental group recorded 7.4 discussion contributions per student per session (vs. 3.2 for control) and 94.7% on-time assignment completion (vs. 79.3%). Observers noted marked enthusiasm when discussion topics touched on contemporary AIK-framed issues, suggesting that content relevance functioned as a catalyst for intrinsic motivation (Bond et al., 2021).

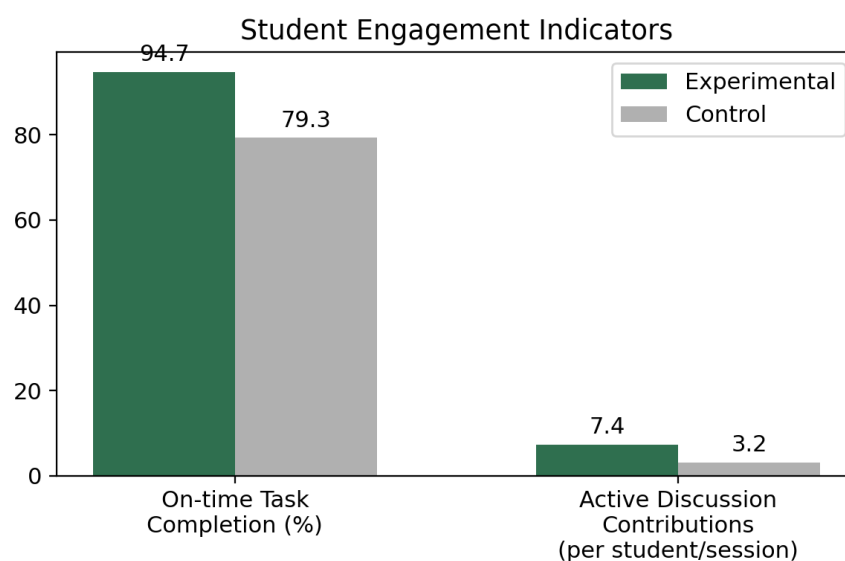


Figure 3. Student Engagement Indicators

Perceptions of AIK-Based Digital Media

Analysis of the perception questionnaire administered to the experimental group produced a highly positive and informative picture of students' responses to AIK-based digital media learning. Of the 32 students who completed the questionnaire, all (100%) reported that AIK-based digital media made Indonesian language learning feel more relevant to their daily lives as educated Muslims. As many as 96.9% of students strongly agreed or agreed that the integration of AIK values in digital media helped them understand that strong language competence is part of a Muslim's intellectual responsibility. The overall mean perception score reached 4.28 out of a maximum of 5.00, placing it in the very high category.

The dimension of Islamic character integration recorded the highest mean (4.47), indicating that students strongly appreciated language learning that did not set aside the formation of their character and Islamic identity (Dimyathi et al., 2025).

Table 12. Students' Perceptions of AIK Value-Based Digital Media

Perception Dimension	Mean Score	Category	% Agree/Strongly Agree	% Disagree
Relevance of AIK content	4.21	Very high	91.2%	3.1%
Ease of media use	4.08	High	87.5%	4.7%
Motivation to learn the language	4.34	Very high	93.8%	2.0%
Integration of Islamic character	4.47	Very high	96.9%	1.6%
Fit with the campus context	4.29	Very high	90.6%	3.1%

Note: scale 1–5 (1 = strongly disagree, 5 = strongly agree); SS = strongly agree

Qualitative and Correlational Analysis

Of 32 posttest essays, 28 (87.5%) organically integrated an AIK perspective into academic argumentation rather than using Qur'anic verses or hadith as ornamentation, and showed richer, more contextually accurate use of Islamic scholarly terminology (fiqh, ijtihad, tajdid, istilah) alongside formal academic vocabulary (Ilmiani & Miolo, 2021; Pangrazio et al., 2020). Media-use intensity correlated positively with writing ($r = .67$, $p < .001$) and speaking ($r = .61$, $p < .001$) gains, remaining significant after controlling for prior ability and baseline motivation; media-use intensity, forum-participation quality, and AIK-perception scores jointly explained 64.3% of the variance in writing gains ($R^2 = .643$, $F(3,28) = 16.9$, $p < .001$) and 58.7% of the variance in speaking gains.

Table 13. Correlation and Regression Analysis

Analysis	Value	Significance
Correlation between media-use intensity and writing gain score (r)	0.67	$p < 0.001$
Correlation between media-use intensity and speaking gain score (r)	0.61	$p < 0.001$

Analysis	Value	Significance
Variance in writing gain score explained by the regression model (R^2)	0.643	$F(3,28) = 16.9; p < 0.001$
Variance in speaking gain score explained by the regression model (R^2)	0.587	–

Weekly formative data show both groups improving similarly in weeks 1–4 (adaptation phase), the experimental group diverging sharply in weeks 5–10 (intensive-use phase, suggesting a threshold effect once students became accustomed to the media and AIK topics), and both groups plateauing in weeks 13–16, consistent with diminishing returns in skill learning (Bond et al., 2021).

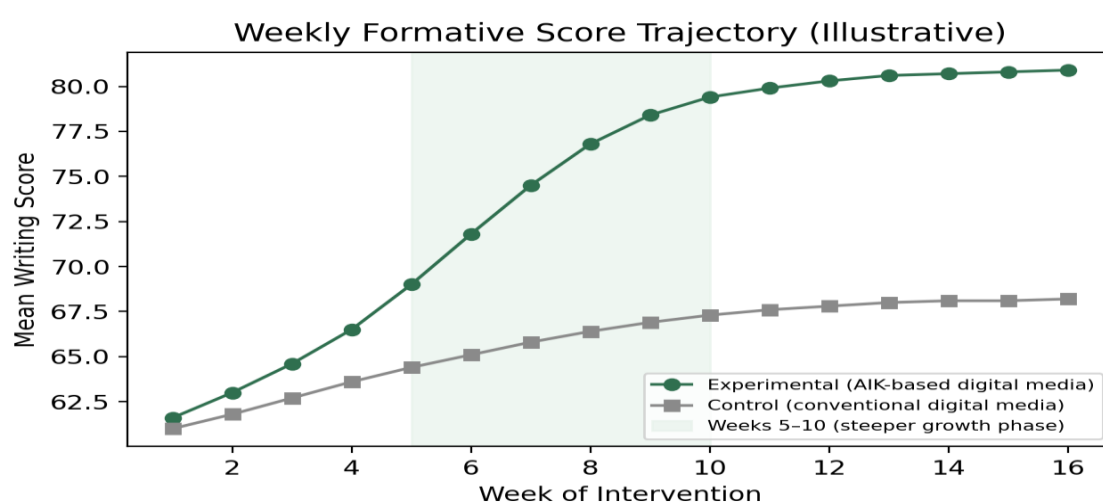


Figure 4. Weekly Formative Score Trajectory (Illustrative, Writing Skill)

Summary of Findings

Taken together, these results answer the three research questions posed in the Introduction: AIK-based digital media produced significantly larger gains than conventional media in both writing (RQ1) and speaking (RQ2), with large effect sizes and assumptions for ANCOVA fully satisfied; and students perceived the AIK integration very positively, with that perception correlating strongly with their language gains (RQ3). These findings jointly support the CVIDLL model proposed in this study.

D. Discussion

The findings show that AIK-based digital media produced substantially greater improvements in students' writing and speaking performance than conventional digital media. The experimental group gained 18.4 points in writing and 17.6 points in speaking, compared with 7.3 points for both skills in the control group. ANCOVA further indicated large effects for writing (partial $\eta^2 = .44$) and speaking (partial $\eta^2 = .39$). These findings suggest that the effectiveness of digital language learning is not determined by technological

delivery alone but by how digital resources are embedded within meaningful instructional contexts. The stronger performance of the experimental group may have resulted from the integration of AIK-oriented topics, contextual tasks, collaborative interaction, and opportunities to apply language to issues that were relevant to students' academic and institutional environment.

The findings are theoretically consistent with contextual learning theory, which explains that learning becomes more meaningful when new knowledge is connected with learners' prior experiences, real-life situations, and sociocultural environments. They are also compatible with Vygotsky (1978) social constructivism, particularly the roles of interaction, collaboration, scaffolding, and meaning negotiation in language development. The digital activities used in the intervention, particularly collaborative writing and discussion, provided opportunities for students to construct language knowledge through interaction rather than simply receive information. Research on digital collaborative writing similarly emphasizes knowledge sharing, mediation, scaffolding, and meaning negotiation as important mechanisms underlying digitally mediated language development. Thus, CVIDLL appears to operate through the interaction between contextual relevance and socially mediated digital learning rather than through technology in isolation.

The findings are also supported by previous research on integrating Islamic values into language education. Research indicates that Islamic values can be incorporated throughout different phases of digital-era language learning and have significant pedagogical and cultural implications (Dimyathi et al., 2025). Similarly, research on Indonesian language learning has shown that Islamic values can be integrated into language instruction to support both language development and the application of values in students' everyday lives. More recent work on technology-enhanced English learning has likewise found that integrating Islamic values into digital learning activities can increase engagement, meaningfulness, reflection, and students' connection with value-oriented learning. These studies support the present finding that value integration can become pedagogically meaningful when embedded in learning activities rather than presented as an additional topic.

The present study extends this literature by providing quantitative comparative evidence that value-integrated digital pedagogy can be associated with improvement in two productive language outcomes simultaneously. This is particularly important because previous studies have often focused either on the conceptual integration of Islamic values or on technology-supported language learning, whereas the present study connects both dimensions within the CVIDLL framework. The positive perception score ($M = 4.28/5.00$) and the positive associations between media-use intensity and writing ($r = .67$) and speaking gains ($r = .61$) further indicate that students perceived the value-integrated digital environment as meaningful. Recent scholarship similarly argues that Islamic values should be systematically embedded across learning materials, tasks, assessment, and classroom practices rather than treated as supplementary content.

Overall, the findings indicate that AIK-based digital media was more effective than conventional digital media in improving students' writing and speaking performance, while students also responded positively to AIK integration. The results therefore provide empirical support for CVIDLL as a contextual framework that connects digital language learning, social interaction, and institutional Islamic values. However, because the study used a quasi-experimental design and combined several instructional components within the intervention, the results should be interpreted as evidence supporting the integrated CVIDLL approach, rather than as evidence that AIK content alone caused the observed gains. This interpretation provides a more defensible answer to the study's research focus while strengthening the model's theoretical and practical contribution.

E. Implication

Theoretically, this study extends contextual learning and social-constructivist perspectives by demonstrating that institutional religious values can function as a contextual frame for developing productive language skills. The CVIDLL model operationalizes this integration as a testable and replicable pedagogical framework. Practically, the study provides curriculum designers, media developers, and language lecturers within PTMA with a value-integrated blueprint in which AIK content is authentically embedded through collaboration among language lecturers, AIK lecturers, and Muslim scholar-academics. The approach may inform broader implementation across PTMA and other Islamic higher education institutions with comparable sociocultural contexts. At the policy level, the findings provide empirical support for strengthening AIK integration across PTMA courses through shared digital learning resources.

F. Limitation and Suggestion for Further Research

This study has several limitations that may affect the generalizability of its findings. Although the ANCOVA assumptions were satisfied, the writing and speaking assessments still involved some rater subjectivity, particularly in evaluating AIK-value integration. Contextual factors, including students' religious education background, participation in Islamic activities outside campus, and access to digital resources at home, were not systematically controlled. In addition, purposive sampling and the use of a single study program at one PTMA institution may limit the generalizability of the findings across the wider PTMA network. The 16-week intervention may also be insufficient to determine the long-term retention of language skills and internalization of AIK values.

Future research should replicate the study with larger samples across multiple PTMA institutions and regions, incorporate blind or multiple raters to reduce potential scoring bias, and employ longitudinal designs to examine skill retention and sustained value internalization. Comparative studies across Islamic higher education contexts in different countries may also help determine which findings are specific to the Indonesian PTMA context and which may represent broader principles of value-integrated language education.

G. Conclusion

This study examined whether AIK-based digital media could improve students' writing and speaking skills compared with conventional digital media and provide a framework for integrating Islamic institutional values into digital language instruction. The experimental group demonstrated greater gains in writing (18.4 compared with 7.3) and speaking (17.6 compared with 7.3), with large effect sizes (partial $\eta^2 > .39$). These findings suggest that contextualized Islamic values can complement, rather than hinder, academic language development. The study proposes the CVIDLL model as an integrated framework linking AIK values with productive language development. Practically, CVIDLL can guide PTMA institutions in implementing authentic AIK-based digital learning through lecturer training, appropriate infrastructure, and shared digital resources.

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