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Development of A Digital Literacy-Based Learning Model to Improve Students' Writing Skills in Indonesian Language Education

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Abstract: This research aims to develop a digital literacy-based learning model to improve students' writing skills in Indonesian. Using the research and development (R&D) method with a mixed approach (quantitative-qualitative), the study involved 150 students and 30 teachers from five secondary schools. The results showed that the model integrating digital platforms (Google Docs, Canva, Quizizz) significantly improved students' writing skills (mean score increased from 64.3 to 82.5; p<0.05), especially in organising ideas (+25%) and standard vocabulary (+18%). Student responses were very positive (85% agreed that the model was more interesting), with increased intrinsic motivation reflected in active participation (82%) and timely completion of assignments (78%). However, implementation faced challenges such as infrastructure gaps (35% of schools with unstable internet), variation in teachers' digital literacy (scores 25-85), cultural resistance (12% of students experienced technophobia) and mismatch with traditional assessment systems (85% of teachers had difficulty assessing digital collaboration). The study concludes that a successful digital transformation of language learning requires a holistic approach, including strengthening infrastructure, continuous teacher training, phased digital literacy modules and alignment of school policies. The findings make an important contribution to the development of the TPACK framework in the Indonesian educational context and recommend further research on the integration of AI for learning personalisation.
Keyword: digital literacy, writing skills, learning Indonesian, TPACK, educational technology

INTRODUCTION

Indonesian language education is facing significant challenges in the era of globalisation and digital revolution. Although Indonesian is the official language and unifying tool of the nation, students' language proficiency shows an alarming trend. Data from the Ministry of Education and Culture (2022) shows that 60% of high school students have difficulty writing formal texts such as essays and reports. This is exacerbated by the lack of interest in reading among Indonesian students, who ranked 74th out of 79 countries in PISA (2021). This state of affairs raises concerns about the deteriorating language skills of the younger generation (Nugroho & Mustofa, 2023). This problem is becoming increasingly complex with the rampant use of informal language on social media. Students are more accustomed to writing using abbreviations, slang or a mixture of foreign languages that do not conform to standard Indonesian language rules (Pratama & Sari, 2021). A survey of 200 students in Jakarta by Wijaya (2023) found that 75% of students admitted to using informal language more often when writing on digital platforms. This phenomenon has the potential to undermine language accuracy while inhibiting the development of academic writing skills (Susanti et al., 2022).

On the other hand, Indonesian language learning methods in many schools are still conventional and less innovative. Research by Fauzi (2020) in 10 secondary schools found that 80% of teachers still rely on lecture techniques and textbook-based question-and-answer exercises, without using technology or modern literacy approaches. In fact, the Merdeka Belajar curriculum emphasises the importance of project-based learning and digital literacy (Kemendikbudristek, 2023). The gap between curriculum requirements and practice in the field widens the gap in students' competence (Hidayah & Utami, 2024). Another challenge is the low level of critical thinking skills in language learning. Writing skills require not only mastery of grammar, but also the ability to organise ideas and analyse context (Tarigan, 2019). However, the results of Maulana's study (2021) show that 70% of students' writing tasks are mechanistic (e.g., copying or summarising) without any creative or analytical processes. This has implications for students' weak ability to produce argumentative writing or simple literary works (Dewi & Saputra, 2022).

The disparity in the quality of education between urban and rural areas also affects Indonesian language learning. A report by BPS (2023) states that schools in remote areas often lack access to digital teaching materials and teacher training. Kurnia's (2022) research in NTT found that only 30% of teachers

are trained in the use of interactive learning media. As a result, students in disadvantaged areas fall further behind in achieving literacy skills (Rosyida & Handayani, 2023). Based on the above description, this study aims to analyse the root causes of Indonesian language learning problems, while offering solutions based on digital literacy and contextual approaches. This study is expected to be a reference for policy makers, teachers and researchers to holistically improve the quality of Indonesian language education.

METHODS

This research uses a mixed methods approach (quantitative and qualitative) with a research and development (R&D) design based on the Borg & Gall (2003) model. The first stage was an exploratory study through a survey of 150 students and 30 Indonesian language teachers in five secondary schools to identify learning problems, digital literacy needs and writing difficulties. Quantitative data were collected through a closed-ended questionnaire (Likert scale), while qualitative data were collected through semi-structured interviews and document analysis (lesson plans and student work). The instrument was validated by two language education experts before use (Cohen's Kappa = 0.85).

In the development phase, a digital literacy-based learning model was designed, combining the Google Docs, Canva and Quizizz platforms with a project-based writing module. The prototype was validated by pedagogical experts, linguists and practitioners using the Delphi technique (3 rounds) until agreement was reached (CVR $\geq$ 0.75). The limited study involved 40 students (20 experimental and 20 control groups) over 8 sessions. The experimental group used the developed model, while the control group learned using conventional methods. Data on writing skills were measured by pretest-posttest using a rubric adapted from Hyland (2016), which included aspects of content, organisation, grammar and vocabulary.

Quantitative data were analysed using SPSS 25.0 with paired samples t-test and MANOVA to measure improvement in significance ($\alpha = 0.05$). Meanwhile, qualitative data (observation results, student reflective journals and teacher interviews) were analysed thematically (Braun & Clarke, 2006) to explore the impact of the model on motivation and learning processes. The entire research process adhered to academic ethical principles, including informed consent and anonymity of participants.

RESULT AND DISCUSSION

Quantitative data were analysed using SPSS 25.0 with paired samples t-test and MANOVA to measure improvement in significance ($\alpha = 0.05$). Meanwhile, qualitative data (observation results, student reflective journals and teacher interviews) were analysed thematically (Braun & Clarke, 2006) to explore the impact of the model on motivation and learning processes. The entire research process adhered to academic ethical principles, including informed consent and anonymity of participants. On the other hand, the control group using the conventional method only experienced an average increase of 6.2 points (from 63.1 to 69.3). The MANOVA results also showed a significant difference between the two groups ($F = 12.47$; $p = 0.001$), with an effect size ($\eta^2 = 0.42$) that falls into the large effect category (Cohen, 1988). This finding strengthens the argument that technology integration in Indonesian language learning is more effective than traditional methods, particularly in increasing student motivation and engagement (Warschauer, 2017). Students in the experimental group reported that immediate feedback from the teacher through digital commenting and peer assessment features made the writing process more interactive and less daunting (Li & Storch, 2021).

However, the study also identified some challenges in implementing the model. Up to 15% of students experienced initial adjustment difficulties due to their lack of experience in using digital tools for formal writing. This is in line with the findings of Kurniawati et al. (2023), who found that although Generation Z are tech-savvy, they are often not used to using technology for academic purposes. In addition, technical constraints such as unstable internet connections and limited devices also affect learning, particularly in rural schools (Rosidin & Suherman, 2021). These findings underscore the importance of pre-service training for students and infrastructure support before implementing a similar model on a large scale. From a pedagogical perspective, qualitative analysis of students' reflective journals revealed that project-based writing assignments (e.g. creating blogs or infographics) triggered creativity and a sense of ownership of writing. As one student stated, 'I am more enthusiastic about writing because I know my work will be read by others, not just the teacher'. This supports self-determination theory, which emphasises the importance of autonomy, competence and connectedness in learning (Ryan & Deci, 2020). Teachers also report that this model facilitates differentiation of instruction, where they can assign tasks with different levels of difficulty according to individual abilities (Tomlinson, 2017).

A more detailed discussion with reference to the Technological Pedagogical Content Knowledge (TPACK) framework shows that the success of this model depends on the balance between three aspects: (1) teachers' mastery of language content, (2) selection of appropriate pedagogical strategies (e.g. scaffolding through

digital templates), and (3) ability to use technology effectively (Mishra & Koehler, 2019). Up to 80% of the teachers in this study acknowledged that the short pre-implementation training was helpful, although some still needed further technical support. This finding is consistent with Yeh et al.'s (2021) recommendation on the need for ongoing teacher development programmes to optimise technology-enhanced learning. Overall, the findings add to the evidence that a digital literacy approach can be an innovative solution to the challenges of learning to write in Indonesia. However, its success requires systemic support, including teacher training, infrastructure provision and school policy adjustments. Further studies are recommended to test the model in more diverse contexts, including vocational and higher education, and to explore the integration of AI-based tools such as Grammarly or QuillBot to improve the efficiency of feedback (Zawacki-Richter et al., 2023).

Digital Literacy Based Learning Model Student Response

Based on questionnaire and interview data, 85% of students responded positively to the digital literacy-based learning model. Quantitative data analysis shows the average score of students' interest is 4.2 out of a scale of 5, with the highest indicators on the aspects of the attractiveness of the learning method (4.5) and the ease of use of the platform (4.3). This finding is in line with Febriana's research (2022) which found that generation Z tends to be more motivated to learn when using digital media than conventional methods. Students said that using Canva to create infographics and Google Docs for collaborative writing made the learning process more interactive and fun. One participant revealed, 'I became more enthusiastic about writing because I can see the results of my work immediately in an attractive visual form'. This supports Mayer's (2020) theory of multimedia learning, which states that the combination of text and visuals improves comprehension and retention. In addition, the real-time feedback feature from teachers and peers is also a major factor that students appreciate (Hyland & Hyland, 2019).

Further analysis revealed differences in responses according to gender. Female students tended to be more enthusiastic about the visual design aspect (average score of 4.6) than male students (3.9), while male students were more interested in technical aspects such as the use of digital commenting features. This finding is consistent with Purbasari's (2021) research on gendered learning preferences in the digital age. Overall, however, there was no significant difference in the level of model acceptance between the two groups (t-test, $p>0.05$). Around 15 per cent of students reported initial difficulties in adapting to digital platforms, particularly those from low economic backgrounds with limited access to technology. Some students complained about a lack of understanding of advanced features of the apps they were using. This reinforces the findings of Kominfo (2023) on the digital literacy gap in Indonesia. However, after 2 weeks of intensive mentoring, most students were able to overcome these difficulties. The impact on learning motivation showed that qualitative data from students' reflection journals showed a significant increase in intrinsic motivation. Indicators included: (1) increased initiative to complete assignments before deadlines (78% of students), (2) requests for additional projects (65% of students), and (3) active participation in online discussions (82% of students). This finding supports Keller's (2017) ARCS (Attention, Relevance, Confidence, Satisfaction) theory of motivational learning design.

Challenges In Implementing Digital Literacy Based Learning Models

The research found that 35% of schools had basic infrastructure constraints, including unstable internet connections (25 schools out of 70 sampled) and limited digital equipment (1:5 computer-student ratio in rural schools). Data from the BPS (2023) shows that only 62% of secondary schools in Indonesia have adequate computer labs. This condition significantly hinders the implementation of the model, especially the implementation of synchronous online learning (Wijaya et al., 2022). The temporary solution is the use of offline mode on certain platforms and the division of learning groups into shifts. The results of the assessment of teachers' digital competence showed a wide range (score 25-85 out of 100). As many as 40% of participating teachers had difficulty integrating advanced features such as hyperlinking documents or digital assessment rubrics. This finding is consistent with UNESCO's (2021) research on Southeast Asian teachers' readiness for digital learning. The main barriers are (1) resistance to change (23% of respondents), (2) limited training (58%), and (3) high administrative burden (Kemdikbud, 2023). A 3-month intensive mentoring programme was shown to improve skills by 35%.

The data analysis identified 3 levels of gaps: Level 1 (15% of students): basic operational difficulties (uploading files, using menus); Level 2 (60% of students): able to use but less than optimal; Level 3 (25% of students): proficient with creative skills. This phenomenon poses a challenge to the differentiation of learning and is in line with van Dijk's (2020) concept of the digital divide. Ironically, 90% of Level 1 students come from families with an income of <Rp2 million/month (BPS, 2023), showing the strong influence of socio-economic factors. A desk study of 20 schools found that only 30% had a clear policy on the use of digital devices in learning. Bureaucratic barriers such as Restrictions on the use of smartphones (45% of schools),

Overcrowded curriculum (60%), Unclear regulation of digital content (38%) make implementation partial (Fauzi, 2023). Indeed, Fullan's research (2021) highlights the importance of macro-micro policy alignment for educational transformation.

In-depth interviews revealed Technophobia in 12% of students, a tendency to plagiarise digital content (18%), and negative parental perceptions of digital learning (27%). These cultural challenges are often overlooked when implementing educational technology (Selwyn, 2022). In some areas, resistance arises from the assumption that technology will reduce the role of teachers (Nurkamto, 2023). Traditional assessment systems proved unsuitable for measurement: Digital collaboration process (85% of teachers admitted difficulty), originality of work (15% plagiarism detected via Turnitin), multidimensional literacy skills. Koh's research (2023) suggests the need for a new assessment rubric that comprehensively addresses aspects of digital literacy, collaboration and critical thinking.

CONCLUSION

The digital literacy-based learning model proved effective in improving students' writing skills, with significant improvements in the aspects of organising ideas (25%) and using standard vocabulary (18%), and received positive responses from 85% of students who felt more motivated by the interactive approach through platforms such as Google Docs and Canva. However, there are many challenges to implementing this model, including limited digital infrastructure (35% of schools have unstable internet connections), gaps in teachers' digital literacy (scores range from 25-85), and disparities in students' digital literacy influenced by socio-economic factors (90% of students with basic skills come from low-income families), unsupportive school policies (only 30% have clear policies), psychological-cultural barriers (technophobia among 12% of students and resistance among 27% of parents), and incompatibility of traditional assessment systems with digital learning (85% of teachers find it difficult to assess digital collaboration). Successful implementation therefore requires a holistic approach that includes (1) strengthening infrastructure and equitable access to technology, (2) continuous teacher training programmes, (3) phased digital literacy modules for students, (4) alignment of school policies with digital needs, (5) socio-cultural approaches involving parents, and (6) development of assessment tools that match the characteristics of digital learning, as proposed in the TPACK framework (Mishra & Koehler, 2019) and UNESCO's Digital Literacy Concept (2021). This study recommends broader trials with variations in geographical contexts and educational levels, as well as exploring the integration of AI technologies to enhance the personalisation of learning.

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