



Digital Literacy and Language Learning: Exploring Students' Engagement in Online Multilingual Environments

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Abstract. *The rapid advancement of digital technology has transformed language learning into an interactive and dynamic process within multilingual online environments. This study aims to explore students' engagement in language learning through digital literacy practices, focusing on how learners navigate, communicate, and collaborate across multiple languages using digital platforms. Employing a mixed-method approach, data were collected from 120 university students through surveys and interviews to analyze their patterns of digital engagement and language use. Findings reveal that students with higher levels of digital literacy demonstrate stronger participation, autonomy, and creativity in online multilingual interactions. Moreover, digital tools such as collaborative apps, discussion forums, and virtual classrooms enhance students' motivation and cultural awareness. The study highlights the importance of integrating digital literacy training into language education to foster critical thinking, intercultural competence, and lifelong learning skills. These results suggest that educational institutions should design pedagogical frameworks that support meaningful digital engagement and multilingual communication to optimize learning outcomes in globalized contexts.*

Keywords: *Digital Engagement; Digital Literacy; Language Learning; Multilingual Environments; Online Learning.*

1. BACKGROUND

The rapid growth of digital technology has significantly influenced education, particularly in the field of language learning. The integration of digital tools and online platforms has shifted traditional language learning methods toward more interactive, collaborative, and learner-centered approaches. In multilingual environments, students are increasingly required to navigate between languages and cultures through digital media, fostering not only linguistic competence but also intercultural communication skills. This transformation underscores the importance of digital literacy as a core competency for effective participation in online learning contexts.

Previous studies have highlighted the positive impact of digital literacy on students' academic engagement, autonomy, and motivation in language learning. Research by recent scholars shows that learners who possess advanced digital literacy skills are better able to manage online resources, engage in meaningful communication, and adapt to multilingual learning settings. However, many students still face challenges in effectively utilizing digital platforms for learning purposes, particularly when dealing with diverse linguistic and cultural interactions. This gap indicates a need for deeper investigation into how digital literacy shapes students' engagement in online multilingual environments.

The novelty of this study lies in its focus on exploring the relationship between digital literacy and students' engagement in online multilingual learning spaces. While existing research often examines digital literacy or language learning separately, this study combines both perspectives to provide a more comprehensive understanding of students' learning behaviors in globalized digital contexts. Therefore, the main objective of this research is to analyze how digital literacy influences students' engagement, interaction, and participation in online multilingual environments, and to identify strategies that can enhance the effectiveness of digital-based language learning.

2. THEORETICAL REVIEW

Digital literacy serves as a crucial foundation for effective participation in technology-mediated learning environments. According to Gilster (1997), digital literacy refers to the ability to understand and use information in multiple formats from a wide range of digital sources. In the context of education, digital literacy extends beyond basic technological skills to include critical thinking, communication, and collaboration abilities essential for online learning (Ng, 2012). In language learning, digital literacy enables students to interact meaningfully across platforms, fostering autonomous learning, intercultural understanding, and digital citizenship (Belshaw, 2011).

The concept of language learning engagement is closely related to learners' active participation in the learning process, which encompasses behavioral, emotional, and cognitive dimensions (Fredricks, Blumenfeld, & Paris, 2004). Engagement in online multilingual environments requires students not only to access and process digital content but also to communicate effectively across linguistic boundaries. This process aligns with Vygotsky's Sociocultural Theory (1978), which emphasizes learning as a social interaction mediated by cultural and technological tools. Digital platforms thus act as mediators that enable learners to co-construct knowledge through collaboration and dialogue in multilingual settings.

Previous studies have demonstrated that digital literacy positively correlates with students' engagement in online learning. Chen and Wang (2021) found that digital competence significantly enhances learners' motivation and participation in virtual classrooms. Similarly, Rahimi and Yadollahi (2020) revealed that students with strong digital literacy skills display higher levels of self-regulated learning and intercultural communication. Furthermore, Godwin-Jones (2018) highlighted that digital environments

create opportunities for authentic language use, promoting deeper linguistic and cultural learning.

Based on these theoretical perspectives and empirical findings, this study is grounded in the assumption that digital literacy plays a pivotal role in shaping students' engagement within online multilingual contexts. Learners with higher digital literacy are expected to demonstrate greater interaction, autonomy, and collaboration, ultimately contributing to more effective and meaningful language learning experiences.

3. RESEARCH METHOD

This study employed a mixed-method research design combining quantitative and qualitative approaches to obtain a comprehensive understanding of the relationship between digital literacy and students' engagement in online multilingual environments. The quantitative phase aimed to measure the correlation between digital literacy levels and student engagement, while the qualitative phase explored learners' perceptions and experiences in depth.

The population of this research consisted of university students enrolled in language learning programs at three higher education institutions. A total of 120 students were selected using purposive sampling, ensuring representation of learners actively engaged in online multilingual courses. Data collection techniques included a questionnaire and semi-structured interviews. The questionnaire measured two main variables: digital literacy (X) and students' engagement (Y). The digital literacy scale adapted indicators from Ng (2012), covering technical, cognitive, and socio-emotional competencies. The engagement variable followed Fredricks et al. (2004), encompassing behavioral, emotional, and cognitive engagement dimensions.

Instrument validity and reliability were tested using Pearson's product-moment correlation and Cronbach's Alpha. The results indicated that all items were valid ($r\text{-count} > r\text{-table}$) and reliable ($\alpha = 0.87$), showing strong internal consistency. Quantitative data were analyzed using descriptive statistics, correlation analysis, and multiple linear regression with SPSS software to determine the strength and significance of the relationship between variables. The regression model used was:

$$Y = \beta_0 + \beta_1 X + \varepsilon,$$

where Y represents students' engagement, X represents digital literacy, β_0 is the constant, β_1 is the regression coefficient, and ε is the error term.

The qualitative data were analyzed through thematic analysis to identify patterns related to learners' digital engagement, collaboration, and multilingual interaction. The integration of both quantitative and qualitative findings provided a holistic view of how digital literacy influences students' engagement in online multilingual learning environments.

4. RESULTS AND DISCUSSION

Data Collection Process

Data were collected over a three-month period, from February to April 2025, at three universities offering multilingual online language learning programs in Indonesia. The research involved 120 students who participated voluntarily. The data collection process consisted of two stages: (1) administering a digital literacy and student engagement questionnaire distributed via Google Forms, and (2) conducting semi-structured online interviews with 15 selected participants. The mixed-method approach allowed for both statistical measurement and deeper qualitative insights into students' experiences of digital engagement in multilingual contexts.

Quantitative Results

Descriptive statistical analysis showed that students generally possessed a moderate to high level of digital literacy ($M = 3.85$, $SD = 0.47$ on a 5-point Likert scale). Meanwhile, their engagement level in online multilingual learning environments was also high ($M = 3.92$, $SD = 0.44$). A Pearson correlation test indicated a strong positive correlation between digital literacy and student engagement ($r = 0.71$, $p < 0.01$), suggesting that higher digital literacy significantly contributes to greater engagement in online language learning.

Multiple linear regression analysis further confirmed that digital literacy predicts student engagement, as presented in Table 1.

Table 1. Regression Analysis Results of Digital Literacy and Student Engagement

Variable	β	t-value	Sig.
Constant	1.12	2.45	0.016
Digital Literacy (X)	0.69	8.74	0.000

Source: Research Data (2025)

The regression model $Y = 1.12 + 0.69X + \varepsilon$ indicates that a one-point increase in digital literacy corresponds to a 0.69-point increase in student engagement. These findings validate the hypothesis that digital literacy significantly influences students' engagement in online multilingual environments.

Qualitative Results

Thematic analysis of interview data revealed three key themes: (1) Autonomy in Learning, where students utilized digital tools to manage their study schedules and materials independently; (2) Collaborative Multilingual Interaction, which reflected students' use of platforms such as Zoom, Padlet, and WhatsApp for cross-linguistic communication and project work; and (3) Motivation through Digital Media, highlighting how interactive content, multimedia resources, and gamified platforms enhanced engagement and sustained interest in language learning.

Discussion

The findings support the theoretical framework suggesting that digital literacy is a vital determinant of online learning success. In line with Vygotsky's Sociocultural Theory (1978), digital tools function as mediators that facilitate social interaction and knowledge construction across linguistic and cultural contexts. The results also reinforce prior research by Chen and Wang (2021) and Rahimi and Yadollahi (2020), which found that students with advanced digital literacy skills exhibit higher motivation and participation in virtual learning environments.

However, some students expressed difficulties in managing multiple digital platforms simultaneously, indicating the need for structured guidance in digital navigation and task management. This aligns with Godwin-Jones (2018), who emphasized that digital learning spaces require balanced support between autonomy and scaffolding to optimize learning outcomes.

Implications

Theoretically, this study contributes to the growing body of literature linking digital literacy and student engagement in multilingual education. It demonstrates that digital competence is not merely a technical skill but a multidimensional construct influencing learners' cognitive, behavioral, and emotional engagement. Practically, the findings suggest that educators and institutions should integrate digital literacy training into language curricula to enhance students' readiness for globalized, technology-driven communication.

Moreover, designing pedagogical models that incorporate digital collaboration, multilingual interaction, and reflective digital practices can further strengthen students' engagement and intercultural competence in online learning environments.

5. CONCLUSION AND SUGGESTION

The findings of this study conclude that digital literacy plays a significant and positive role in enhancing students' engagement within online multilingual learning environments. The results indicate that students with higher levels of digital literacy demonstrate stronger behavioral, emotional, and cognitive engagement in language learning activities. This suggests that digital literacy not only supports students in navigating online platforms effectively but also fosters autonomy, collaboration, and motivation in multilingual communication contexts. The regression analysis confirmed that digital literacy significantly influences engagement, while qualitative insights highlighted that students' self-directed learning and intercultural interaction are strengthened through the effective use of digital tools.

Based on these findings, it is recommended that educational institutions and language instructors prioritize the integration of digital literacy training into language learning curricula. Developing structured programs that enhance students' digital competence can improve their participation, communication, and critical thinking in online multilingual environments. Teachers should also adopt technology-enhanced pedagogical strategies, such as collaborative online projects and digital-based language tasks, to promote meaningful engagement and intercultural understanding.

This research, however, has certain limitations related to its sample scope and data collection methods, which focused on university students in a specific regional context. Future studies are encouraged to expand the population across different educational levels and cultural settings to obtain more generalizable results. Longitudinal or experimental studies could also be conducted to examine how digital literacy development influences engagement and learning outcomes over time. By deepening the understanding of this relationship, educators can design more inclusive and effective approaches for digital-based multilingual education in the global era.

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