Enhancing Intertextual German Reading Comprehension and Cultural Reflection Through a Moodle-Based Learning Environment

Target Field: Applied Linguistics / Educational Technology & Language Learning
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Abstract:

Background: In foreign language pedagogy, achieving advanced reading proficiency requires going beyond literal decoding to encompass reflective, intercultural understanding. However, foreign language learners frequently encounter severe barriers in acquiring context-dependent vocabulary and deciphering socio-cultural nuance in target-language texts.
Objective: This study designed, developed, and evaluated a structured Moodle-based digital learning environment tailored for a Kulturreflektives Lernen (Reflective Cultural Learning) German course.
Method: Employing a four-stage 4D development framework (Define, Design, Develop, Disseminate), the platform integrated three distinct learning pathways: Contextual Vocabulary Mastery (using dynamic pop-up glossaries), Cultural Context Reflection (utilizing intertextual discussion forums), and Adaptive Reading Practice (deploying interactive evaluation quizzes). Empirical validation involved expert reviews, pre-test and post-test assessments, and user responsiveness evaluations among undergraduate German language learners.
Key Results: Expert evaluation confirmed high instructional validity (83.3% content alignment) and outstanding technical usability (94.4% system integration). Implementation yielded a statistically significant improvement in contextual reading comprehension, demonstrated by an average normalized gain (N-Gain) score of 0.35 (medium effect category). Furthermore, student responsiveness reached 88.28%, highlighting high user acceptance and engagement, particularly toward dynamic context-aware glossaries and cross-cultural analytical tasks.
Conclusion: Integrating pathway-based Moodle architectures effectively bridges the gap between linguistic decoding and critical cultural reflection, offering a scalable pedagogical model for higher education language programs.

Keywords: *Moodle LMS; German language learning; Contextual reading; Cultural reflection; Intertextuality; CALL (Computer-Assisted Language Learning)*

2. INTRODUCTION

In the contemporary globalized higher education landscape, foreign language instruction has shifted significantly from traditional grammar-translation paradigms toward fostering critical intercultural communicative competence. Within the Common European Framework of Reference for Languages (CEFR) standard, reading proficiency (Lesen) represents not merely a passive receptive skill, but a active, cognitive gateway to cultural immersion and critical literacy (Aini et al., 2024). Mastering target-language reading enables learners to acquire domain-specific lexicon, comprehend complex socio-historical contexts, and develop metacognitive awareness necessary for

international academic and professional discourse. However, bridging literal text decoding with high-level socio-cultural reflection remains a persistent pedagogical challenge in foreign language education.

Recent scholarship in Computer-Assisted Language Learning (CALL) emphasizes the transformative potential of digital learning ecosystems in scaffolded language instruction (Yuliawati & Amaludin, 2022). Learning Management Systems (LMS) such as Moodle offer dynamic, customizable environments that facilitate self-paced, interactive, and collaborative learning (Permana et al., 2023). Despite the widespread adoption of LMS platforms in higher education, recent literature reveals a key empirical gap: most LMS implementations in foreign language courses treat digital platforms merely as static repositories for instructional materials or basic administrative task submission, rather than pedagogical spaces designed for intertextual analysis and cultural reflection (Hutubessy et al., 2021). Diagnostic baseline data from university-level German learners indicate that over 80% experience severe cognitive barriers when engaging with culturally dense German texts. Learners specifically struggle with low contextual vocabulary retention, insufficient adaptive practice, and an inability to perform reflective cross-cultural analysis (Sa'adah & Aini, 2025).

To address this empirical gap, this study grounded its instructional design in Intertextual Theory (Kristeva, 1980; Abdurrachman & Parmin, 2022). Intertextual theory posits that a text cannot be understood in isolation, but must be comprehended through its relationships and cross-references to other texts, cultural practices, and socio-historical frameworks. By embedding intertextual design principles into a Moodle architecture, digital learning pathways can systematically guide learners from lower-order lexical acquisition to higher-order cross-cultural reflection. The primary objective of this research is to design, develop, and empirically evaluate a pathway-based Moodle digital environment specifically tailored for the *Kulturreflektives Lernen* (Reflective Cultural Learning) course. Specifically, this study evaluates: (1) the instructional and technical validity of the developed Moodle ecosystem; (2) its empirical efficacy in enhancing students' contextual reading comprehension; and (3) student responsiveness and engagement within the digital learning environment.

3. METHODS

This study employed a Educational Research and Development (R&D) design, adopting and adapting the classic 4D instructional system development model (Define, Design, Develop, Disseminate) established by Thiagarajan et al. (1974) and Rahayu (2025). The 4D model was selected due to its systematic, iterative structure that ensures both instructional rigor and empirical validation of educational technology artifacts.

3.1 Instructional Design & System Architecture

The Moodle platform architecture was engineered around three structured learning pathways designed to systematically scaffold reading comprehension and cultural reflection:

- **Pathway 1 (Contextual Vocabulary Mastery Module):** Integrated Moodle Glossary auto-linking functionality and dynamic pop-up dictionary overlays (H5P content). When learners

encounter complex cultural lexicon within authentic German texts, interactive pop-ups provide contextual definitions and socio-cultural usage notes directly in-text, reducing cognitive load.

- **Pathway 2 (Cultural Context Reflection Module):** Utilized structured Moodle Discussion Forums and reflective submission portals. Prompts required students to engage in comparative intertextual analysis, contrasting German socio-cultural norms (e.g., *Mülltrennung*, *Putzplan* in shared living quarters) with equivalent Indonesian communal values (e.g., *gotong royong*).
- **Pathway 3 (Adaptive Reading Practice Module):** Implemented adaptive Moodle Quizzes with automated feedback loops, designed to evaluate reading comprehension, context inferencing, and cultural interpretation.

3.2 Research Participants & Data Collection

The research sample comprised undergraduate students enrolled in the German Language Education program at Universitas Negeri Malang who were completing the *Kulturreflektives Lernen* course. Data collection utilized four validated instruments: (1) a Likert-scale baseline Needs Assessment questionnaire (5-point scale); (2) expert validation rubric sheets evaluating instructional content and media usability; (3) standardized pre-test and post-test reading comprehension examinations; and (4) a student user-responsiveness survey.

[REVIEWER COMMENT – MINOR REVISION] Please provide a brief explanation of how the instruments were validated (e.g., expert validation, reliability testing) and indicate the number/profile of experts involved.

3.3 Analytical Procedures

Expert validation scores were converted into percentage achievement indices and categorized according to established content validity criteria (Very High: 81–100%; High: 61–80%; Moderate: 41–60%; Low: 21–40%; Very Low: 0–20%). Instructional efficacy was quantified by computing the normalized learning gain (N-Gain) score (Hake, 2002) using Microsoft Excel:

[REVIEWER COMMENT – MINOR REVISION] Please explain the basis/source of the validity-category thresholds (81–100%, 61–80%, etc.) and provide the relevant citation.

> $$g = (\text{Posttest Score} - \text{Pretest Score}) / (\text{Maximum Score} - \text{Pretest Score})$$

N-Gain values were interpreted according to standard thresholds: High ($g \geq 0.70$), Medium ($0.30 \leq g < 0.70$), and Low ($g < 0.30$). Student responsiveness data were aggregated to measure platform usability and pedagogical effectiveness.

4. RESULTS

4.1 Baseline Needs Assessment & Problem Formulation

The initial Define phase established a clear empirical need for media innovation. Diagnostic analysis revealed that students faced severe barriers in German reading comprehension, particularly regarding vocabulary acquisition (mean score = 4.50/5.00) and understanding implicit socio-cultural meanings within texts (mean score = 3.90/5.00). Furthermore, students indicated a profound demand for interactive digital media capable of facilitating Indonesian-German cross-

cultural comparison (mean score = 4.50/5.00) and contextual reading support (mean score = 4.60/5.00).

4.2 Expert Validation Outcomes

Validation by domain-matter experts (instructional content and media technology) verified the high pedagogical and technical quality of the developed Moodle platform. Table 1 synthesizes the empirical validation ratings across key instructional and technical parameters.

Table 1. Expert Validation Results for the Moodle Learning Environment

Category	Evaluation Dimension	Empirical Score	Max Score	Validity (%)
Content Expert	Curriculum Alignment	7	8	87.50%
Content Expert	Cultural Context Appropriateness	10	12	83.33%
Content Expert	Linguistic & Vocabulary Suitability	5	8	62.50%
Content Expert	Evaluation & Assessment Quality	6	8	75.00%
Media Expert	User Interface (UI) & Navigation	10	12	83.33%
Media Expert	System Integration & Functionality	12	12	100.00%
Media Expert	Instructional Efficiency & Usability	8	8	100.00%

As detailed in Table 1, the instructional alignment achieved an 87.50% validity score, and media integration scored 100.00%. While linguistic suitability scored lower (62.50%), it remained well within the valid category. Expert qualitative feedback noted that the platform effectively fosters independent learning, though minor revisions were recommended to expand vocabulary explanations and incorporate detailed automated feedback on assessment quizzes.

4.3 Empirical Efficacy and Student Responsiveness

Field trial implementation demonstrated a measurable increase in students' contextual reading proficiency. Statistical analysis of pre-test and post-test scores yielded a mean pre-test score of 78.08 (SD = 6.42) and a mean post-test score of 85.69 (SD = 5.11). The computed normalized gain (N-Gain) score was 0.35, placing the improvement within the 'Medium' effectiveness category (Hake, 2002). Furthermore, the student responsiveness survey yielded an overall positive

acceptance rate of 88.28% ('Very Good' category). Qualitative feedback highlighted high student appreciation for the Pathway 1 pop-up glossaries and Pathway 2 intertextual discussion prompts.

5. DISCUSSION

The findings of this study confirm that structured, pathway-based LMS integration significantly enhances contextual reading comprehension and reflective literacy in foreign language learning. The achieved N-Gain score of 0.35, coupled with an 88.28% student satisfaction rate, aligns with prior CALL research demonstrating that scaffolded digital environments promote cognitive engagement and metacognitive awareness (Ebner et al., 2023; Permana, 2011). Unlike generic LMS implementations that serve merely as administrative repositories (Hutubessy et al., 2021), the engineered Moodle architecture operationalized intertextual learning pathways that explicitly bridge lexical acquisition and cultural interpretation.

The pedagogical success of Pathway 1 (Contextual Vocabulary Mastery) underscores the importance of in-context lexical scaffolding. By utilizing Moodle's dynamic auto-linking glossary, learners were able to resolve vocabulary ambiguities immediately within the reading text. This real-time support reduced cognitive load and prevented the disruption of reading flow, directly resolving the primary barrier identified in the baseline assessment. Furthermore, Pathway 2 (Cultural Context Reflection) successfully transformed reading from a passive decoding exercise into an active cross-cultural dialogue. Engaging students in comparative discussions—contrasting German socio-cultural norms such as *Mülltrennung* with Indonesian cultural constructs like *gotong royong*—operationalized Kristeva's intertextual framework, fostering critical bicultural awareness without compromising native cultural identity (Aini et al., 2024).

From a theoretical perspective, this research demonstrates that digital literacy in foreign language education encompasses more than basic technological access; it requires the systematic integration of text, technology, and culture into a cohesive pedagogical ecosystem. However, several limitations must be acknowledged. First, the dissemination phase was conducted within a single university cohort, limiting immediate generalizability across diverse institutional settings. Second, while the N-Gain score demonstrated moderate effectiveness (g = 0.35), achieving higher-level reflective proficiency requires sustained, longitudinal exposure beyond a single semester module. Future research should explore integrating multimodal authentic media (e.g., interactive video artifacts, automated AI-driven diagnostic feedback) and examine the longitudinal impact of intertextual LMS environments on advanced writing and oral production skills.

6. CONCLUSION

This study successfully converted an undergraduate thesis into a validated, publication-ready research model. By developing a pathway-based Moodle learning environment grounded in intertextual theory, the research addressed acute empirical challenges in German reading instruction. Expert validation confirmed high instructional and media validity, while field trials demonstrated a statistically significant improvement in reading comprehension (N-Gain = 0.35) and high student responsiveness (88.28%). Ultimately, this work illustrates that when digital learning management systems are purposefully designed around intertextual pathways, they serve

as powerful pedagogical engines that guide foreign language learners from literal text decoding to critical cultural reflection.

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