

Teacher's Perception of Web-Based Educational Games for Slow Learner Students: A Qualitative Case Study

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Abstract

The development of digital technology has encouraged the use of innovative learning media in elementary schools, including web-based educational games. However, their implementation for slow learners requires careful pedagogical consideration, particularly from the teacher's perspective. This study aims to explore teachers' perceptions of using web-based educational games to support slow learners. A qualitative case study was conducted involving a fourth-grade teacher and slow learner students at SD Negeri Panularan Surakarta, Indonesia. Data were collected through classroom observation, semi-structured interviews, open-ended questionnaires, and document analysis. The results indicate that teachers perceive web-based educational games as effective in increasing student engagement, supporting structured and repetitive learning, and facilitating students' cognitive responses. Visual features, immediate feedback, and gradual task presentation were found to be especially helpful. Despite challenges related to time constraints and technological resources, teachers showed positive attitudes toward their use. These findings highlight the importance of teachers' perceptions and pedagogical agency in supporting inclusive and adaptive learning practices in elementary classrooms.

Keywords: teacher perception, web-based educational game, slow learner

Abstrak

Perkembangan teknologi digital mendorong penggunaan media pembelajaran inovatif di sekolah dasar, termasuk game edukasi berbasis web. Namun, penerapannya bagi peserta didik slow learner memerlukan pertimbangan pedagogis yang matang, terutama dari perspektif guru. Penelitian ini bertujuan menggali persepsi guru terhadap penggunaan game edukasi berbasis web dalam mendukung pembelajaran slow learner. Metode yang digunakan adalah studi kasus kualitatif dengan melibatkan satu guru kelas IV dan peserta didik slow learner di SD Negeri Panularan Surakarta. Data dikumpulkan melalui observasi, wawancara semi terstruktur, angket terbuka, dan analisis dokumen. Hasil penelitian menunjukkan bahwa guru memandang game edukasi berbasis web efektif dalam meningkatkan keterlibatan belajar, mendukung pembelajaran berulang dan terstruktur, serta membantu respons kognitif siswa. Fitur visual, umpan balik langsung, dan penyajian bertahap dinilai sangat membantu. Meski terdapat kendala waktu dan fasilitas, guru tetap menunjukkan sikap positif. Temuan ini menegaskan pentingnya persepsi dan agensi pedagogis guru dalam mendukung pembelajaran inklusif dan adaptif.

Kata kunci: game edukasi berbasis web, persepsi guru, slow learner.



INTRODUCTION

Digital technology integration has revolutionized educational practices, particularly in elementary settings where web-based educational games combine visual stimuli, interactive tasks, and instantaneous feedback to enhance learning outcomes (Mayer, 2016). These attributes prove particularly advantageous for slow learner students, who often encounter difficulties with conventional instructional approaches that demand rapid cognitive processing. Slow learners, characterized by extended processing time, a frequent need for repetition, and a reliance on concrete representations, represent a substantial proportion of elementary school populations in Indonesia. Empirical reports from Ministry of Education (Kemdikbud, 2023) and recent statistical data on infrastructure (Pusmenjar, 2024) underscore a critical urgency: while digital access in primary schools has expanded significantly, the pedagogical utilization of these tools specifically tailored for students with cognitive delays remains disproportionately low, often leaving slow learners underserved in regular classrooms (Angelica, 2024).

Empirical evidence consistently documents the potential of digital game-based learning to enhance motivation and engagement among diverse learners, including those with slower cognitive paces (Harikrishnan et al., 2021; Hebert et al., 2021). However, the sustainability of such innovations is strongly mediated by teachers' perceptions, technological readiness, and classroom adaptability (Lopez & Martinez, 2023). In the Indonesian landscape, several studies have explored digital gamification, yet distinct gaps remain. For instance, Ardianti (2021) developed ethno-confidence games but focused primarily on media validation rather than the teacher's lived experience in the classroom. Similarly, Laksana (2024) introduced "Gamimath" an Android-based tool, but centered the investigation on technical development and validity for general students. Furthermore, while Riska (2024) explored inclusive bilingual games, the study focused on broad community service outcomes rather than the microscopic pedagogical journey of a teacher in a standard classroom setting. This research establishes its novelty by addressing this underexplored role of teacher perceptions in a specific, high-stakes context: a regular classroom at Panularan Elementary School, Surakarta, where a teacher must accommodate slow learners without the support of specialized assistant teachers.

This research gap emerges amid expanding inclusive education mandates, in which regular classrooms increasingly accommodate diverse learners without specialized training (Permendikbud No. 70 Tahun 2009). The theoretical foundations of this study draw on constructivist perspectives, which emphasize experiential learning and repetition as essential for supporting the developmental trajectories of slow learners (Bruner, 1966), as well as Vygotsky's concept of the Zone of Proximal Development. Within digital learning contexts, web-based educational games operationalize these principles through structured tasks and immediate feedback. Similar patterns have been reported in international contexts, such as Minnesota, where teachers associate educational games with increased engagement among struggling learners, yet acknowledge persistent logistical challenges (Easterling, 2021).

Consequently, this investigation addresses the following research questions: (1) How does the teacher perceive benefits of web-based educational games for the engagement of slow learner students? (2) what implementation challenges emerge, and what attitudes characterize the teacher's intentions toward sustained use of web-based educational games? Accordingly, the objective of this study is to explore a fourth-grade teacher's perceptions at Panularan Elementary School through a qualitative case study approach, generating context specific insights to inform the advancement of inclusive pedagogy in Indonesian primary education.

METHODS

This investigation employed Yin’s (2018) qualitative case study design to deeply probe a single teacher’s perceptions of web-based educational games for slow learners within naturalistic regular classroom conditions. Site selection targeted Panularan Elementary School, Surakarta, a public institution exemplifying typical Indonesian primary contexts with moderate technological resources. The fourth-grade teacher served as purposive key informant, selected for her documented involvement across game planning, execution, and assessment phases spanning one semester. Four slow learner participants were identified based on teacher-maintained progress records and baseline observations indicating persistent instructional needs such as repeated explanations and extended task completion. Fourth grade was specially chosen because it represents a critical transition period in elementary education where academic concepts become more abstract, often making the learning gap for slow learners more pronounced compared to lower grades.

Research focus prioritized teacher sensemaking over student outcomes or multi-case comparisons, aligning with idiographic case inquiry principles. Multi-method triangulation ensured data robustness: (a) structured classroom observations captured implementation dynamics and teacher-student interactions using time-on-task protocols; (b) one semi-structured interview elicited experiential narratives, perceptual evaluations, and articulated challenges; (c) an open-ended questionnaire gathered reflective responses related to student engagement, cognitive stimulation, and practical considerations; and (d) document analysis reviewed lesson artifacts, student work products, and game session logs.

Data analysis followed Miles and Huberman’s (1994) interactive model, involving iterative processes of data condensation, thematic coding, and the use of visual displays to identify emerging patterns. Analytical credibility was strengthened through member checking and the maintenance of reflective records documenting key analytic decisions. Trustworthiness was further enhanced through prolonged engagement in the research setting, peer debriefing, and the use of thick description. Ethical considerations included obtaining informed consent and assent from participants, ensuring confidentiality through the use of pseudonyms, and emphasizing voluntary participation throughout the study.

RESULT AND DISCUSSION

The data analysis, conducted through the interactive model of miles and Huberman (1994), involved a continuous process of data condensation, data display, and conclusion drawing. This systematic approach allowed the raw data from six classroom sessions, comprising interviews, observations, and documents, to be distilled into four core themes that characterized the teacher’s perception. Table 1 illustrates this analytical bridge, showing how specific data points were condensed into thematic displays that inform the study’s conclusions.

Tabel 1. Thematic Analysis of Teacher Perceptions and Discussion Synthesis

Theme	Data Condensation	Interpretation and Comparison with Prior Studies
Engagement Enhancement	Quotes: “Students stayed focused through entire levels.” Observed: Increased attention span; higher	Web-based educational games transform passive observation into active engagement through immediate visual rewards. This mirrors findings by

	voluntary participation from passive learners.	Herbert et al. (2021) and Easterling (2021) regarding motivational gains in primary education setting.
Cognitive Stimulation	Quotes: “They began explaining pattern choices.” Observed: Independent task completion; emerging verbal metacognitive articulation.	Structured repetition loops facilitate cognitive scaffolding for slow learners. This aligns with Bruner’s (1966) constructivism and Lopez & Martinez (2023) regarding the role of digital scaffolding in knowledge retention.
Practicality & Feasibility	Quotes: “Easy to use with planning.” Observed: Quick onboarding after Session 1; alignment with existing curriculum goals.	Perceived ease of use is a primary determinant of technology adoption. This supports the Technology Acceptance Model (TAM) by Davis (1989) and reflects the teacher readiness noted by Shrestha (2023).
Implementation Barriers	Quotes: “35 minutes lessons too short for full cycles.” Observed: Need for initial teacher scaffolding; limited device access managed through student pairing.	Practical constraints in Indonesian schools require adaptive teacher agency. These findings resonate with Urnila (2024) regarding logistical hurdles and the “paradox” of technology integration in local primary contexts.

Table 1 presents the thematic analysis framework derived from the interactive model of Miles and Huberman (1994). This framework systematically organizes the teacher’s perceptions into four primary dimensions, which were synthesized through the iterative coding of observational field notes, interview transcripts, questionnaire responses, and document artifacts collected across the six classroom sessions. By condensing raw data into these thematic displays, the study ensures that each finding is directly supported by empirical evidence and linked to existing theoretical frameworks.

Theme 1: Engagement Enhancement through Interactive Elements

The engagement theme emerged as the most prominent pattern, driven by visual stimuli and reward mechanisms that transformed slow learners’ classroom participation. The teacher’s reflection, “Students who typically disengage after 10 minutes stayed focused through entire lessons,” encapsulates a shift from fragmented attention to sustained concentration. Field notes documented that compared to traditional workbook drills, games noticeably, reduced frustration like fidgeting. This interpretation aligns with Herbert et al. (2021) who argued that digital games act as a “motivational bridge” for

students with cognitive delays, providing a low-anxiety environment that encourages persistence.

Theme 2: Cognitive Stimulation via Structured Progression

Under the theme of cognitive stimulation, task scaffolding delivered in a step-by-step manner facilitated progressive independence. The teacher observed that students “began explaining pattern choices,” reflecting a level of metacognitive articulation that was previously absent. This finding operationalizes the principles of the Zone of Proximal Development, where the game’s immediate feedback function as a digital scaffold. This result mirrors Lopez and Martinez (2023), who found that repetitive interactive structures in Southeast Asian contexts support improved knowledge retention among learners with slower cognitive pacing. It suggests that for slow learners, the process of digital interaction is as vital as the content itself.

Theme 3: Practical Integration Potential

The teacher regarded the web-based games as highly practical, noting they were “easy to use with planning.” This perception of high “ease of use” and “usefulness” is a critical finding, as the Technology Acceptance Model (Davis, 1989) posits these as the two main drivers for long-term technology adoption. The finding is significant because it proves that even in a regular classroom at Panularan Elementary School where specialized assistant teachers are unavailable, provided the tools possess an intuitive interface. This corroborates Shrestha (2023), who noted that teacher readiness is often bolstered when digital tools do not add excessive administrative burdens.

Theme 4: Implementation Barriers and Mitigation Strategies

Despite the positive perceptions, the analysis revealed significant contextual constraints, particularly the “35-minute lessons” which the teacher deemed “too short for full cycles.” These logistical challenges, combined with restricted device access, required the teacher to employ adaptive strategies such as student pairing and prioritized rotation. These findings align with Urnila (2024), who documented that Indonesian teachers often face a “paradox” where high interest in technology is met with limited infrastructure. However, the teacher’s ability to mitigate these barriers through real-time scaffolding suggests that teacher agency remains the most crucial factor in inclusive digital practice, as also suggested by Jingga (2024).

CONCLUSION

This study concludes that web-based educational games are perceived by the teacher as a meaningful and feasible medium for supporting slow learner students in a regular fourth-grade classroom. Addressing the first research question, the findings demonstrate that the teacher perceived the games’ visual design, interactive mechanics, and reward features as essential tools to substantially engage participants who remained focused throughout full game cycles. Regarding the second research question, from a cognitive standpoint, the teacher observed that step-by-step tasks supported by built-in repetition helped slow learners follow instructions more independently and begin to justify their answer choices verbally, indicating strengthened basic reasoning. Finally, concerning the third research question, the teacher regarded the game as highly practical and compatible with the curriculum, although limited instructional time and device availability emerged as persistent challenges that required strategic classroom management. Overall, teacher belief and commitment emerge as the decisive conditions for the sustainable adoption of digital game-based learning within inclusive and adaptive primary education.

The findings imply that in regular school settings without specialized support staff, the integration of intuitive web-based games can function as a practical scaffolding tool to bridge the learning gap for students with cognitive delays. This suggests that pedagogical success for slow learners in inclusive settings is not solely dependent on

high-end infrastructure, but rather on the teacher's ability to orchestrate digital tools that offer immediate feedback and repetitive loops.

This research is characterized by several limitations. First, the study employed a single-case qualitative design involving only one teacher and four students at Panularan Elementary School, which limits the generalizability of the findings to broader or more diverse educational contexts. Second, the investigation focused primarily on teacher perceptions and qualitative behavioral shifts, without utilizing standardized quantitative metrics to measure long-term academic achievement.

Future research is recommended to involve a larger cohort of teacher across diverse school environments, including comparison between urban and rural settings, to provide a more comprehensive understanding of digital tool scalability. Furthermore, subsequent studies could implement a mixed-methods approach, complementing qualitative thematic insights with quantitative performance indicators to further strengthen the evidence base regarding the effectiveness of web-based games for slow learners.

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