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Teacher Advocacy for Gamified Digital Learning Laboratories: A Qualitative Analysis of Positive Perceptions and Enhancement Strategies for English Language Teaching in Indonesia

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ABSTRACT

In the context of English language teaching (ELT) in Indonesia, understanding teacher perceptions is crucial for successful implementation. This study aims to explore the positive perceptions of Indonesian elementary and junior high school teachers regarding Platform Digital Pembelajaran Bahasa Inggris (PDPBI), Digital Learning Laboratories (DLL), and gamified DLLs, and to synthesize their constructive suggestions for system enhancement. A qualitative need analysis was conducted via a structured questionnaire with five teachers. Data were analyzed thematically to identify key themes related to benefits and proposed modifications. Teachers perceive these platforms as significant tools for enhancing flexibility, student motivation, interactivity, and differentiated learning. Their advocacy is not uncritical; they provide nuanced recommendations for improving features (intuitive UI/UX, better audio-visuals), content (curriculum-aligned, relevant), exercise genres (varied and HOTS-inclusive), and gamification mechanics (educative rewards, healthy ranking systems, contributor recognition for teachers). The findings suggest that Indonesian teachers are proactive advocates for gamified DLLs. Their insights provide a valuable framework for developers and policymakers to create more effective, engaging, and pedagogically sound digital learning environments that are supported by their primary users—the teachers themselves.

Keywords: *Generation Z, Hoaxes, Digital Literacy, Media Education, Digital Natives*

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PENDAHULUAN

The landscape of language education in the 21st century is increasingly digital, interactive, and student-centered. The rapid evolution of Information and Communication Technology (ICT) has precipitated a paradigm shift from traditional, teacher-centric methods to more dynamic, technology-enhanced learning environments (Warschauer, 2000; Stockwell, 2012). In Indonesia, a nation with vast geographical and socio-economic diversity, digital platforms present a promising avenue to address challenges in educational access and quality, particularly in the domain of English Language Teaching (ELT), which is essential for global competitiveness (Lauder, 2008).

Within this digital shift, two concepts have gained significant traction: the Digital Learning Laboratory (DLL) and gamification. A DLL, or laboratorium pembelajaran daring, moves beyond simple digital repositories to become a structured, interactive online space where students can explore, experiment, and engage with learning materials autonomously or

under guidance (Mayer, 2009). Concurrently, gamification—the application of game-design elements in non-game contexts—has emerged as a powerful strategy to enhance user engagement, motivation, and participation (Deterding et al., 2011). In educational settings, gamification leverages elements like points, badges, leaderboards, and challenges to make learning processes more enjoyable and compelling (Kapp, 2012). Recent theoretical advancements, such as the Systemic Gamification Theory (SGT), propose a more holistic, human-centered model that integrates game elements into cohesive systems aligned with contextual needs, including cultural diversity and individual traits (Coelho & Abreu, 2025).

The effectiveness of gamification in education has been systematically documented. A meta-analysis by Sailer and Homner (2020) found significant small-to-medium effects of gamification on cognitive ($g = 0.49$), motivational ($g = 0.36$), and behavioral learning outcomes ($g = 0.25$), though the authors noted that factors contributing to successful gamification remain partially unresolved. Similarly, a scientometric review by Gini et al. (2025) identified six key research clusters in educational gamification, including gamified learning experience, student learning, K-12 education, and gamification effectiveness, while highlighting significant gaps concerning long-term impact and the isolated effects of individual game elements. A comprehensive literature review by Triantafyllou et al. (2025) concluded that gamification is most effective when instructional design principles are used to ensure training content meets learners' needs and expectations. In the specific domain of language learning, Laksanasut (2025) synthesized evidence showing that gamification enhances vocabulary retention, grammatical accuracy, and communicative fluency, with platforms like Duolingo and Kahoot! demonstrating best practices.

The Indonesian government has promoted the use of technology in education through various initiatives, especially after the recent policy on educational digitalization (Presidential Instruction of the Republic of Indonesia Number 7, 2025). Research on digital transformation in Indonesian education has identified five key dimensions for evaluation: digital infrastructure, learning content and platforms, digital competence, institutional support, and effectiveness of digital learning (Wijaya et al., 2025). However, case studies of Indonesia's Digital School Program reveal that digital transformation in teaching remains largely limited to the use of technology for creating teaching materials and conducting assessments, with teachers' innovations requiring further support and guidance (Utami et al., 2025). Furthermore, studies on teacher digital literacy across Indonesian provinces indicate that while teachers demonstrate competence in ethical and technological domains, significant deficiencies persist in the cognitive dimension, particularly concerning critical evaluation of information credibility (Zulaikha et al., 2025).

However, the success of any educational technology intervention hinges not on the technology itself, but on its acceptance and effective use by teachers (Ertmer & Ottenbreit-Leftwich, 2010). Teachers are the gatekeepers and primary implementers of innovation in the classroom. Their perceptions, beliefs, and competencies fundamentally shape how technology is integrated into pedagogy (Inan & Lowther, 2010). The Technology Acceptance Model (TAM) has been extensively used to understand teacher adoption of educational technologies. Recent studies have extended TAM to consider teachers' needs and concerns in the design of educational technology (Frøsig, 2023), and have demonstrated that perceived usefulness, perceived ease of use, and attitudes significantly influence teachers' behavioral intention to use ICT (Cao et al., 2025). In the Indonesian context, research on gamification-based learning management systems has shown that while gamification initially boosts engagement and motivation, sustained self-management poses challenges (Slamet & Basthomi, 2024), and thoughtfully integrated gamification elements can enhance learner engagement and stimulate autonomous learning behaviors (Slamet et al., 2024).

While existing literature often highlights barriers to technology integration, such as lack of resources, training, or support (e.g., Bingimlas, 2009), there is a need to amplify the voices of teachers who see the potential in these tools and can provide constructive, practice-informed guidance for their improvement. Leiss et al. (2025) found that teachers' attitudes, subjective

norms, and perceived self-efficacy are important predictors of their intention to use gamification, though actual application is mediated by intention. Similarly, Helvich et al. (2025) developed and validated a scale measuring teacher-perceived applicability of gamification and its perceived effect on learners' motivation and learning outcomes. This study addresses the existing gap by focusing specifically on the positive perceptions and proactive suggestions offered by Indonesian teachers, contributing to the growing body of research on teacher acceptance of gamified digital learning (Kalana & Junaini, 2025).

Drawing on data from a need analysis questionnaire administered to five elementary and junior high school teachers, this article argues that teachers are not passive recipients of technological tools but active, critical advocates. They recognize the profound benefits of gamified DLLs, including enhanced flexibility, student motivation, and support for differentiated instruction. More importantly, their experiences in the classroom equip them to provide detailed, practical recommendations for refining these platforms to better serve pedagogical goals. This article will systematically explore these perceived benefits and synthesize the teachers' proposed enhancements for features, content, exercise genres, and gamification mechanics for both students and educators. By doing so, it aims to provide an evidence-based roadmap for developing gamified DLLs that are both technologically robust and pedagogically effective, ultimately fostering a more engaging and successful English language learning experience for Indonesian students.

Literature Review

The integration of technology into language learning is not a novel phenomenon, but its pace and sophistication have accelerated dramatically in the 21st century. To contextualize the perceptions and suggestions of the teachers in this study, it is essential to trace the theoretical and practical evolution of technology in language education, define the core concepts under investigation, and understand the psychological principles that underpin gamification, all within the specific framework of the Indonesian educational landscape.

The Evolution of Technology in English Language Teaching (ELT)

The journey of technology in ELT has evolved from supplementary tools to central, integrative platforms. This evolution can be charted through several key phases. The earliest form, Computer-Assisted Language Learning (CALL), emerged in the 1960s and 70s, characterized by behaviorist "drill and practice" programs on mainframe computers, where the computer acted as a mechanical tutor (Warschauer & Healey, 1998). The 1980s saw a shift towards communicative CALL, aligned with the rise of communicative language teaching, which emphasized using language for authentic communication through programs that stimulated discussion and writing (Jones & Fortescue, 1987).

The advent of the internet marked the beginning of Integrative CALL (Warschauer, 2000), which moved beyond the computer as a tool to a gateway for global communication. This phase leveraged multimedia and computer-mediated communication (CMC) to integrate skills and provide authentic audiences, as seen in email exchanges and web quests. The most recent progression is the move towards Mobile-Assisted Language Learning (MALL) and now, towards intelligent, gamified ecosystems (Stockwell, 2012). MALL emphasizes learning "on-the-go" through smartphones and tablets, offering unparalleled accessibility. The current trend, as reflected in this study, involves the fusion of these technologies into comprehensive Digital Learning Laboratories (DLLs) that are social, collaborative, and gamified, representing a holistic integration of technology into the learning process (Godwin-Jones, 2014).

Digital Learning Laboratories (DLLs): A New Paradigm for Learning

The concept of a Digital Learning Laboratory (DLL) or laboratorium pembelajaran daring extends far beyond a simple collection of digital resources or a Learning Management System (LMS). It is a structured, immersive, and interactive digital environment designed to simulate the experiential and exploratory nature of a physical laboratory. Grounded in constructivist learning theories (Piaget, 1970; Vygotsky, 1978), a DLL provides a "sandbox" where learners can actively construct knowledge through interaction with digital objects, tools, and peers.

Mayer's (2009) cognitive theory of multimedia learning provides a crucial framework for designing effective DLLs. The theory suggests that people learn more deeply from words and pictures than from words alone, and it outlines principles for reducing extraneous cognitive load, managing essential processing, and fostering generative processing. Recent extensions of cognitive load theory have specifically addressed digital learning environments, with Skulmowski and Xu (2022) proposing a new perspective on extraneous cognitive load that accounts for interactive learning media, immersion, and realism. They argue that certain design factors can induce task-irrelevant cognitive load while still promoting motivation, necessitating a balanced approach aligned with desired learning outcomes. Similarly, Das (2025) emphasizes that the goal of digital pedagogy should not be to eliminate cognitive load entirely but to optimize it, transforming cognitive effort into meaningful learning experiences through adaptive pacing, segmented content delivery, and visual signaling.

In the context of gamified language learning, Feng and Yang (2025) investigated how different types of feedback (learner-regulated, peer-regulated, and collaborative-regulated) affect cognitive load management, finding that collaborative-regulated feedback led to a 15% improvement in writing performance and a 20% reduction in cognitive load. Tatlı et al. (2022) explored digital storytelling in an online EFL course and found increased vocabulary achievement and improved speaking skills despite high cognitive load due to technical incompetency, suggesting that repeated use can mitigate initial cognitive demands. Twabu (2025) further proposed an expanded framework incorporating AI-enhanced cognitive load management, where artificial intelligence dynamically adjusts content presentation based on learner needs and performance.

A well-designed DLL, therefore, is not just a repository but a cognitively optimized space. It offers (1) a structured exploration to guide the pathways for students to discover linguistic rules and patterns; (2) an authentic practice (simulations and scenarios) to mimic real-world language use; (3) an immediate, automated and formative feedback to help students identify and correct errors in real-time (this is also a feature highlighted as crucial by the participating teachers); and (4) the differentiated pathways to make it possible for students to engage with materials at their own pace and level of difficulty to address the diverse needs within a single classroom.

The Psychology and Pedagogy of Gamification

Gamification in education is defined as "the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 9). Its power lies in its ability to tap into fundamental human psychological drivers. Two theories are particularly relevant here: Csikszentmihalyi's Flow Theory (1990) and Deci and Ryan's Self-Determination Theory or SDT (1985).

Flow Theory describes a state of complete immersion and focused energy in an activity. Gamification elements like clear goals, immediate feedback, and challenges that match the user's skill level (a concept directly suggested by Participant 05's "*level kesulitan berjenjang*") are direct pathways to inducing this optimal psychological state for learning. However, recent empirical work has challenged the direct applicability of Flow Theory to gamification. Chapman et al. (2025) conducted an experimental evaluation comparing students' academic outcomes with measures of SDT and Flow Theory in both gamified and non-gamified versions of a course. While gamification significantly improved academic outcomes (withdrawals, failures, dropouts, and performance), there were no significant differences on 18 of 19 subscales assessing SDT and Flow Theory constructs. The authors suggest that these theories may be insufficient explanations for gamification's effectiveness and call for alternative theoretical frameworks.

Self-Determination Theory posits that intrinsic motivation is fueled by the satisfaction of three core psychological needs. First of these is competence, meaning the need to feel effective and master challenges. Gamification mechanics like points, levels, and progress bars fulfills this by providing clear indicators of growing competence (Participants 01, 02, 03, 04). Next is the autonomy or the need to control one's own actions and choices. The gamified systems offer this through choice of avatars, selection of learning paths, or optional challenges. Lastly, relatedness or the need to feel connected to others is equally crucial. Leaderboards, team challenges, and

shared badges can foster a sense of community and healthy competition, a benefit noted by several teachers, though with caveats about its implementation.

Gao (2024) argues that three underexplored ideas in SDT—the continuum of motivation, the mutually supportive nature of basic psychological needs, and the functional significance of an event—can advance gamification research and practice. Attention to these ideas can help develop a nuance instead of a simplistic approach to gamification design. Özakşehir and Arkün Kocadere (2025) developed a Need Satisfaction of Gamification Features Scale and found that autonomy was satisfied the most by providing options, competence by points, and relatedness by peer comments. Importantly, learners' intrinsic motivation had a stronger relationship with autonomy than with relatedness or competence, implying that gamification design supporting basic psychological needs could facilitate intrinsic motivation. Luu et al. (2025) extended this to EFL contexts, proposing a theoretical framework that incorporates mediating factors of task authenticity and anxiety reduction, and the moderating variable of cultural power distance in collectivist EFL cultures.

Kapp (2012) further distinguishes between "structural gamification," which applies game elements to propel a learner through content without changing the content itself (e.g., points for completing quizzes), and "content gamification," which applies game elements and thinking to the content itself (e.g., a narrative storyline for a lesson). The suggestions from teachers, such as varied "*genre latihan*" and "*storytelling berbasis game*" (Participant 01), indicate a desire for both types.

Teacher Perception as a Critical Success Factor

The successful integration of technology is not guaranteed by its mere presence. As Ertmer and Ottenbreit-Leftwich (2010) argue, teacher beliefs about teaching and learning, their pedagogical knowledge, and their technology skills are the ultimate determinants of whether technology transforms learning or merely digitizes traditional practices. Teachers act as "gatekeepers" for innovation (Cuban et al., 2001).

Research by Inan and Lowther (2010) shows that teachers' perceived usefulness and ease of use of a technology (constructs from Davis's, 1989, Technology Acceptance Model) are significant predictors of its integration. The Technology Acceptance Model (TAM) has been extensively applied to understand teacher adoption of educational technologies. Frøsig (2023) proposed an expanded Educational Technology Acceptance Model (EdTAM) that considers a double-user scenario, focusing on both the needs and concerns of teachers as well as the needs of students. This model is particularly relevant for gamified DLLs, where teachers are not only users but also co-designers and facilitators.

Recent studies have examined TAM in gamification contexts. Kalana and Junaini (2025) conducted a systematic review of gamification and TAM, analyzing 72 papers and finding that nearly half incorporated new external variables into the original TAM framework. Gong et al. (2025) applied TAM to evaluate gamified English instruction in Chinese junior high schools, finding that TAM-derived measures of technology acceptance showed a strong positive correlation with learning outcomes ($r = 0.73$). In the Indonesian context, Harmadi et al. (2025) found significant positive relationships between digital literacy, teacher motivation, and TPACK, with digital literacy accounting for 73.5% of the variability in TPACK and teacher motivation explaining 75.1%.

The integration of TPACK with gamification has also been explored. Tanthong and Pimvichai (2022) synthesized gamification and TPACK into five teaching steps, demonstrating how the framework can be applied to English language teaching. Rani and Kaur (2025) investigated the interplay of TPACK for games (TPACK-G) and self-efficacy in game-based learning adoption, identifying self-efficacy as the strongest predictor of adoption. Gejandran and Abdullah (2025) developed a model showing that TPACK, teacher behavior, and self-efficacy significantly influenced gamification implementation, and gamification mediated the relationships between these variables and teaching effectiveness.

Furthermore, teachers are not just end-users; they are potential "co-designers" (Penuel et al., 2007). Potvin et al. (2023) found that co-design facilitated the professionalization of teachers when teachers had agency, partners developed trust through vulnerability, and partners

experienced small successes together. Sudla and Piromsombat (2023) conducted a meta-analysis of co-designed interventions and found that learning activities implemented through co-designed interventions had heterogeneous effect sizes depending on research design characteristics. Their practical, classroom-based insights are invaluable for creating tools that are pedagogically sound and contextually appropriate, as evidenced by the detailed modification requests in the data.

The Indonesian Educational Context

Any discussion of educational technology in Indonesia must be situated within its unique socio-cultural and infrastructural context. While the government has actively promoted technology use through policies like the *Kurikulum Merdeka* (Merdeka Curriculum) which emphasizes differentiated learning and the development of digital literacy, significant challenges remain (Gea, 2024; Reza et al., 2023; Sianturi, 2025).

The digital divide is a persistent issue, with disparities in internet access and quality between urban and rural areas (Participant 05's primary concern about "*ketersediaan jaringan internet*" is a national reality). Imaduddin and Firdaus (2025) analyzed ICT integration in Indonesian education through the lenses of Diffusion of Innovation, TPACK, SAMR, Constructivism, and Connectivism, identifying the need for locally responsive strategies that prioritize sustainable teacher professional development and inclusive infrastructure expansion. Zulaikha et al. (2025) assessed digital literacy across Indonesian provinces, finding that teachers generally exhibit a "fairly good" level of digital literacy, with higher competence in ethical and technological domains, but significant deficiencies in the cognitive dimension, particularly concerning critical evaluation of information credibility.

Furthermore, teacher readiness varies widely. While some teachers are adept digital users, others require substantial professional development, a need explicitly stated by Participant 01 regarding the need for "*pelatihan atau workshop*" for DLLs. Research on gamification in Indonesian English learning has shown promising results. Farisca and Warni (2025) employed an explanatory sequential mixed-methods design with 33 eleventh-grade students and found statistically significant improvements in motivation and creativity, though challenges included limited access to digital devices, unstable internet connectivity, and differences in student adaptability.

Specifically regarding gamification in teaching speaking, Nurlaila et al. (2024) explored Indonesian EFL teachers' perceptions and found that teachers have a positive perception toward gamification, with the most popular elements being roleplay, competition, and giving rewards. However, teachers tended to be monotonous in implementing game elements and had mixed conceptions about gamification and game-based learning. Gunawan (2025) conducted a comprehensive literature analysis of 14 empirical studies on gamification for teaching English to young learners (ages 7-12) published between 2020 and 2025, finding that when gamification is aligned with specific learning objectives, it increases learner motivation, encourages active engagement, and improves holistic language development. Blended gamification and multimodal techniques were shown to be especially successful.

Pramesworo et al. (2023) identified that gamification, blended learning, adaptive learning technologies, and online collaboration platforms effectively engage millennial learners. They emphasized that to successfully implement these new approaches, institutions should invest in faculty development programs, upgrade technological infrastructure, and foster a culture of innovation and collaboration.

Studies on ELT in Indonesia (cf. Gea, 2024; Sianturi, 2025) have often highlighted the tension between traditional examination-focused cultures and the move towards communicative, student-centered approaches. Gamified DLLs, therefore, are introduced into an ecosystem that is simultaneously encouraging innovation and grappling with foundational constraints. Understanding teacher perceptions within this complex landscape is critical for designing sustainable and scalable interventions.

METHOD

This study employed a qualitative research design to conduct an in-depth need analysis, aiming to capture the rich, detailed perceptions and suggestions of practicing teachers regarding gamified Digital Learning Laboratories (DLLs). A qualitative approach was deemed most appropriate as it prioritizes understanding the "lived experiences" and subjective viewpoints of participants, allowing for the emergence of complex insights that quantitative surveys might overlook (Creswell & Poth, 2018).

Research Design

The study utilized a descriptive qualitative design, focusing on a structured need analysis through an open-ended questionnaire. This method was chosen to systematically gather focused data while granting participants the freedom to provide critical, personal, and experience-based responses, as explicitly encouraged in the questionnaire instructions. This approach aligns with the goal of obtaining "thick description" of the teachers' perspectives (Geertz, 1973).

Participants and Context

A purposive sampling technique was used to select participants who could provide information-rich cases relevant to the research phenomenon (Patton, 2015). The criteria for selection were specifically designed to identify experienced educators who were directly engaged with the context of English language teaching (ELT) and had some exposure to educational technology.

The final sample consisted of five teachers who met the following general characteristics:

a. Teaching Experience: All participants possessed substantial teaching experience, with each having approximately or over 10 years in the profession. This ensured that their perceptions were informed by deep practical knowledge and a longitudinal understanding of pedagogical challenges and evolutions.
b. Teaching Context and Subject: The participants were actively teaching in an English as a Foreign Language (EFL) context in Indonesia. The majority taught English-related subjects. However, the sample also included teachers who taught other subjects but used English as the primary medium of instruction at the elementary or junior high school level. This diversity strengthens the study by incorporating perspectives from both language specialists and content teachers utilizing English, reflecting a realistic school scenario.
c. Familiarity with Technology: A key criterion was that all participants were familiar with or had prior experience using technological platforms to support English learning. This was crucial to ensure that their responses were grounded in actual use rather than hypothetical assumptions, thereby increasing the validity and practical relevance of their feedback.

To protect their anonymity and confidentiality, as per standard ethical research practices, the participants are referred to in this study as Participant 01 through Participant 05.

Data Collection Instrument and Procedure

The primary data collection instrument was a meticulously designed, structured questionnaire titled "*Kuesioner untuk Guru: Platform Gamifikasi Digital Learning Laboratory sebagai Sarana Peningkatan Kemampuan Profesional dan Pedagogik Guru*." The questionnaire was divided into three main parts below.

First is the informed consent and instructions part. The document began with a clear statement of the research's purpose (including the handling of data) within the scheme of a Community Partnership Program (*Program Kemitraan Masyarakat* or *PKM*). It provided detailed instructions encouraging participants to provide critical and personal responses, and permitted the use of voice notes or other audio apps to facilitate ease and depth of response. A timeframe of 1-2 weeks for completion was given.

The researcher profile was given next. All names and contact details of the research team were provided to establish credibility and allow for clarification if needed. Lastly, the questionnaire items, the core of the instrument, consisted of 10 open-ended questions designed to elicit comprehensive data. The questions progressed from assessing foundational knowledge (Q1-Q3), through personal usage patterns (Q4-Q6), to evaluative perceptions of advantages and

disadvantages (Q7-Q8), and finally, to forward-looking, constructive suggestions for system modification under hypothetical scenarios of agreement and disagreement (Q9-Q10).

Data collection was conducted remotely. The questionnaire was distributed to the selected participants, who then submitted their responses within the stipulated timeframe using the suggested modes of communication (e.g., written text, voice notes).

Data Analysis

The data from the five participants were analyzed using a reflexive thematic analysis approach, following the six-phase framework outlined by Braun and Clarke (2006, 2019) [REF39]. Reflexive thematic analysis was chosen for its theoretical flexibility and its emphasis on the researcher's active role in knowledge production, which aligns with the interpretive aims of this study (Braun & Clarke, 2019).

In the first data familiarization phase, the researchers repeatedly reviewed all submitted responses, including transcribing voice notes, to gain an intimate understanding of the content. Initial observations and potential patterns were noted. In initial code generation, systematic coding was performed across the entire dataset to identify and label significant phrases or ideas related to perceptions, experiences, and suggestions (e.g., "flexibility," "motivation," "internet barrier," "request for better UI"). This process was iterative, with codes being refined as new patterns emerged.

In theme-searching, those initial codes were then collated and grouped into potential overarching themes that captured meaningful patterns in the data, such as "Perceived Benefits," "Identified Shortcomings," and "Suggested Modifications for Features." Visual mapping tools were used to explore relationships between codes. These potential themes were checked, in theme-reviewing phase, against the coded data and the entire dataset to ensure they formed a coherent pattern and accurately represented the participants' responses. This involved refining the themes, splitting some, collapsing others, and discarding those with insufficient supporting data.

Each theme was clearly defined and given a concise, informative name that captured its essence in the next phase of theme-naming/defining. For example, "Enhanced Flexibility, Accessibility, and Differentiation" was defined as teacher perceptions of how gamified DLLs enable learning across time and space and cater to diverse student needs. The final step, the report-producing, involved weaving the thematic analysis into a structured narrative, as presented in the following sections, using compelling extract-examples from the participants to illustrate each theme and sub-theme.

This rigorous methodological approach ensures that the findings presented are a faithful and systematic representation of the voices and professional insights of the participating teachers, with attention to both the manifest content (explicit statements) and latent meaning (underlying assumptions) within the data (Braun & Clarke, 2019).

RESULTS

The analysis of the questionnaire responses revealed a wealth of data that paints a picture of Indonesian teachers as engaged, critical, and proactive agents in the integration of educational technology. Their responses demonstrate not only a clear understanding of the concepts but also a nuanced and practice-informed perspective on the value and potential of gamified Digital Learning Laboratories (DLLs). Three major thematic clusters emerged from the analysis: (1) Foundational Understanding and Experiential Basis, (2) Perceived Benefits of Gamified DLLs, and (3) A Blueprint for Enhancement: Teacher-Driven Modifications.

Foundational Understanding and Experiential Basis

Before delving into evaluations and suggestions, it was crucial to establish that the participants' responses were grounded in a solid conceptual grasp and practical experience. They were fractionated below.

Conceptual Clarity

The teachers displayed a consistent and accurate understanding of the core concepts under investigation. They defined a Platform Digital Pembelajaran Bahasa Inggris (PDPBI) not merely as a website, but as a comprehensive "*aplikasi dan situs web yang dirancang untuk*

membantu pengguna... untuk meningkatkan kemampuan bahasa Inggris" [application and website designed to help users improve their English skills] (Participant 01), highlighting its role as a facilitative tool. Their perception of a Digital Learning Laboratory (DLL) extended beyond a simple online space to a "*fasilitas berbasis teknologi dan media digital*" [technology and digital media-based facility] designed to create a more "*interaktif dan fleksibel*" [interactive and flexible] learning experience (Participant 01). Participant 02 aptly noted its function in enabling independent practice, a core tenet of a laboratory approach.

Most notably, their understanding of gamification was sophisticated, moving beyond a simplistic "learning through games" to a more nuanced integration of game elements. Participant 03 defined it as the "*penerapan elemen permainan (poin, badge, ranking, dll.) dalam pembelajaran online agar siswa lebih termotivasi, aktif, dan menikmati proses belajar*" [application of game elements (points, badges, rankings, etc.) in online learning so that students are more motivated, active, and enjoy the learning process]. Participant 04 further elaborated that its purpose is to make learning "lebih menarik, memotivasi, dan menyenangkan bagi siswa" [more interesting, motivating, and enjoyable for students].

Evidence of Practical Engagement

The teachers' conceptual knowledge was firmly backed by hands-on experience. Their responses to usage questions (Q4-Q6) revealed a diverse and active engagement with a range of platforms. Commonly cited tools included (1) game-based quizzing platforms such as Kahoot, Quizizz, Blooket, Bamboozle, Gimkit; (2) general learning management systems (LMS) like Google Classroom and Moodle; (3) specialized skill platforms including Duolingo, Cambridge Go, Quill, Story Jumper, and (4) creative or coding tools like Scratch.

This extensive list demonstrates that these are not novice users but experienced practitioners who have experimented with various technological tools. Participant 05's nuanced approach, using gamification as an "ice breaker *atau pembangkit motivasi*" [ice breaker or motivation booster], indicates a reflective and pedagogically driven application of technology, rather than a mere adoption of trends. This experiential basis lends significant credibility to their subsequent evaluations and suggestions.

Perceived Benefits of Gamified DLLs

The teachers identified a constellation of benefits associated with PDPBI, DLLs, and gamified DLLs. These advantages form the core of their advocacy as shown by these 4 sub-themes.

Enhanced Flexibility, Accessibility, and Differentiation

A dominant theme was the breaking down of temporal and spatial barriers to learning. Participants consistently highlighted that these platforms provide access to materials and practice "*dimana saja, kapan saja*" [anywhere, anytime] (Participant 05). This flexibility was seen as crucial given the diverse circumstances of Indonesian students.

Furthermore, teachers recognized the power of these platforms to support differentiated learning. Participant 01 stated that DLLs are "*cocok untuk gaya belajar yang berdiferensiasi*" [suitable for differentiated learning styles], while Participant 04 noted that "*materi dapat disajikan secara luas, variatif, dan bisa disesuaikan dengan kebutuhan siswa*" [materials can be presented broadly, variatively, and can be adjusted to student needs].

Increased Student Motivation, Engagement, and Enjoyment

This was the most frequently cited benefit, particularly in relation to gamification. Teachers observed that gamified DLLs, "*meningkatkan partisipasi serta motivasi belajar siswa*" [increase student participation and learning motivation] (Participant 01), "*membuat pembelajaran lebih menyenangkan*" [make learning more enjoyable] (Participant 02), and make learning activities feel "*lebih ringan*" [lighter/more effortless] (Participant 03). The element of "challenge" (Participant 01) and "*tantangan*" (Participant 04) was seen as a key driver in transforming learning from a chore into an engaging activity.

Promotion of Interactivity and Authentic Practice

Teachers appreciated how these platforms move learning beyond passive reception to active participation. Participant 01 noted that PDPBI enhances collaboration and creativity, using English in "*konteks nyata*" [real contexts]. The use of breakout rooms in Zoom for "*latihan*

percakapan atau presentasi secara virtual" [conversation practice or virtual presentations] (Participant 02) was cited as a prime example of using a DLL to simulate authentic communicative practice.

Facilitation of Formative Assessment and Practical Utility

From a teacher's perspective, these tools offer "*cara yang menyenangkan*" [a fun way] (Participant 05) to conduct assessment. The immediate feedback mechanisms inherent in platforms like Kahoot and Quizizz allow teachers to "*memantau progres siswa*" [monitor student progress] (Participant 02) in real-time. Moreover, they are seen as "*praktis*" [practical] (Participant 04), helping teachers present material in an interactive and flexible way, thereby reducing the administrative burden of traditional methods.

A Blueprint for Enhancement: Teacher-Driven Modifications

The most compelling evidence of the teachers' constructive advocacy lies in their detailed suggestions for improving gamified DLLs (Q9). Their recommendations provide a practical blueprint for developers and policymakers across five dimensions, presented under these 5 sub-themes.

Feature Enhancements – Prioritizing Usability and Functionality

Teachers called for an interface that is intuitive, engaging, and efficient. Their specific requests included intuitive UI/UX which had "*Layout yang ramah anak*" [child-friendly layout] (Participant 01), "*desain sederhana, tombol navigasi yang jelas*" [simple design, clear navigation buttons] (Participant 02), and a clear avoidance of "UI/UX *yang terlalu ramai, kompleks, dan membingungkan*" [UI/UX that is too busy, complex, and confusing] (Participant 04).

For media, they requested rich and relevant with features such as "*Tambahan fitur audio visual yang menarik*" [addition of interesting audio-visual features] (Participant 01) and "*audio-visual lebih interaktif*" [more interactive audio-visual] (Participant 03). The tracking function or "*progress pencapaian*" [achievement progress] was mentioned to record students' accomplishments (Participant 05). All these, the technical performance was most vital as the platforms must be "*ringan dijalankan di berbagai perangkat*" [lightweight to run on various devices] (Participant 04), a critical consideration in areas with limited hardware.

Content Requirements – Relevance, Alignment, and Adaptability

The teachers emphasized that content is king. Their primary demands were first directed toward curriculum alignment, "*Konten yang relevan dengan kurikulum*" [content relevant to the curriculum] (Participant 01) and "*sesuai dengan kurikulum yang berlaku*" [in accordance with the applicable curriculum] (Participant 02). They also required contextual relevance which "*Relevan dengan kehidupan siswa*" [relevant to students' lives] (Participant 03) and "*materi autentik, dan kontekstual*" [authentic and contextual material] (Participant 02).

Differentiated difficulty was next on the list, "*Disesuaikan dengan tingkat kemampuan siswa*" [adjusted to students' ability levels] (Participant 01) and "*level kesulitan berjenjang*" [tiered difficulty levels] (Participant 05). More importantly, the teachers asked for editability, i.e. the crucial ability for content to be "editable" (Participant 05) and for teachers to "*menyusun dan memodifikasi materi sesuai kebutuhan*" [compile and modify materials according to needs] (Participant 02).

Diversified Exercise Genres – Beyond Simple Quizzes

Teachers expressed a desire to move beyond multiple-choice to a richer set of activity types that cater to different skills and cognitive levels. Their suggestions included "cloze test, complex multiple choice, scrambled words" (Participant 04), or "matching, *dan* storytelling *berbasis* game" [matching and game-based storytelling] (Participant 01) and "*role-play virtual*" [virtual role-play] (Participant 02). Participant 05 specifically called for exercises that "*menyentuh HOTS*" [touch Higher-Order Thinking Skills], indicating a desire to use technology for developing critical thinking, not just rote memorization.

Student-Facing Gamification – Fostering Healthy Motivation

The teachers' suggestions reveal a careful consideration of the psychological impact of gamification on learners. They first advocated for educative rewards, i.e. "*Sistem reward yang sifatnya edukatif*" [educative reward system] (Participant 01), such as "*sistem bintang, poin, ranking, badge*" [star system, points, ranking, badges] (Participant 04).

Then, they concerned about healthy competition, saying "*leaderboard yang sehat dan bisa di-reset*" [healthy and resettable leaderboard] (Participant 01), while cautioning against "*ranking ketat yang bisa menimbulkan persaingan tidak sehat*" [strict ranking that can cause unhealthy competition] (Participant 03) or systems that cause students to feel "*minder*" [inferior] (Participant 02). Balanced design came next which was a focus on ensuring the game mechanics support, rather than overshadow, the learning objectives.

Teacher-Facing Gamification – Recognizing and Motivating Contributors

A particularly insightful set of recommendations focused on motivating teachers themselves to contribute to the platform. Their first top-most suggestion was professional recognition such as "*sistem level* (beginner, intermediate, advanced)" [level system] (Participant 01) or "*badge penghargaan untuk kontribusi materi*" [award badges for material contributions] (Participant 03) to acknowledge their expertise and effort.

Equally important was tangible value, i.e. rewards that provide "*manfaat secara nyata dan dapat diaplikasikan pada pembelajaran di sekolah*" [real benefits that can be applied to school learning] (Participant 01) and a focus on "*kualitas kontribusi*" [quality of contribution] (Participant 02) over mere quantity.

Probably the most important was collaborative resources constituting the creation of a "*bank soal dari data base system dan sumbangsih soal dari guru*" [question bank from the database system and teacher contributions of questions] (Participant 05), to foster a community of practice.

DISCUSSION

The findings of this study provide a rich, nuanced picture of Indonesian elementary and junior high school teachers' positive perceptions of gamified Digital Learning Laboratories (DLLs) and their constructive suggestions for system enhancement. The results demonstrate that these experienced educators are not passive recipients of technology but active, critical advocates who recognize the pedagogical value of gamified DLLs while also articulating clear, practice-informed requirements for their improvement. This discussion interprets these findings in relation to existing literature, positions them within the broader field of educational technology research, and articulates the study's contributions, limitations, and recommendations.

The study's findings align with and extend prior research. The teachers' recognition of gamification's motivational benefits corroborates the meta-analytic evidence of Sailer and Homner (2020) and the systematic reviews of Triantafyllou et al. (2025) and Gini et al. (2025). Their emphasis on healthy competition and avoidance of demotivating leaderboards resonates with the critical work of Hanus and Fox (2015) and the practical insights of Helvich et al. (2025). Their call for content editability and curriculum alignment reflects the specific needs of the Indonesian context, as documented by Wijaya et al. (2025), Utami et al. (2025), and Zulaikha et al. (2025). Their suggestions for teacher-facing recognition systems extend the co-design literature (Penuel et al., 2007; Potvin et al., 2023) and align with the "double-user" scenario proposed by Frøsig (2023).

For educational technology developers, the teachers' feedback provides an invaluable design brief. Developers should prioritize: (1) intuitive, "*ramah anak*" (child-friendly) interfaces with clear navigation and lightweight performance across diverse devices; (2) editable, curriculum-aligned content that respects teacher autonomy; (3) varied exercise genres including HOTS-oriented tasks such as cloze tests, scrambled words, virtual role-plays, and game-based storytelling; (4) gamification mechanics that foster educative rewards and healthy competition, avoiding public leaderboards that demotivate lower-performing students; and (5) teacher-facing recognition systems such as leveling, contributor badges, and collaborative resource banks to transform teachers from consumers into a thriving community of practice. These design principles are not only applicable to Indonesia but also to other developing contexts facing similar infrastructural constraints. The successful development of gamified tools for sensitive topics, such as the game for verbal bullying prevention developed by Fajar et al.

(2024), demonstrates that thoughtful integration of game elements can address complex social and educational challenges. Similarly, the rigorous instrument development approach exemplified by Daya et al. (2025) in assessing creative thinking underscores the importance of valid, reliable assessment tools within gamified environments—a principle that should guide the design of DLL-based assessments.

To create an environment where these enhanced tools can flourish, school administrators and policymakers must: (1) invest in targeted professional development that goes beyond basic digital literacy to focus on pedagogical integration of gamified DLLs; (2) address infrastructural barriers, including internet access and device availability, while exploring offline functionalities for equitable access; (3) foster a culture of innovation where teachers are encouraged to experiment, share best practices, and contribute to co-design processes; and (4) allocate resources for localized content development that aligns with the Kurikulum Merdeka and responds to local linguistic and cultural contexts.

While this study provides rich qualitative insights, it opens several avenues for future investigation. First, large-scale quantitative studies based on the themes identified here could quantify the prevalence of these positive perceptions and design preferences among a larger, representative sample of Indonesian teachers. Second, student-centered research is urgently needed. The teachers in this study reported increased student motivation and engagement, but direct student perspectives—including their experiences with different gamification mechanics (e.g., leaderboards vs. personal progress bars)—would provide a crucial complementary view. Third, longitudinal impact studies should track the long-term effects of implementing teacher-co-designed gamified DLLs on specific English language proficiency outcomes, as well as on sustained student motivation and self-directed learning behaviors. Fourth, comparative studies across different regions of Indonesia (urban vs. rural, well-resourced vs. under-resourced) would help identify context-specific adaptations of the design principles proposed here. Fifth, action research in which teachers collaborate with researchers to implement, evaluate, and refine the modifications they suggested would bridge the gap between theory and practice in a powerful, iterative manner. Sixth, following the methodological rigor of Daya et al. (2025), future research should develop and validate instruments specifically designed to measure teacher perceptions of gamified DLLs and their impact on student learning outcomes in the Indonesian context. Additionally, as gamification increasingly intersects with other digital innovations, studies exploring the integration of AI-driven adaptive learning (cf. Twabu, 2025) and immersive technologies (VR/AR) into DLLs would be timely and valuable.

Three major thematic findings emerged from the analysis. First, teachers demonstrated a sophisticated conceptual understanding of PDPBI, DLLs, and gamification, aligning closely with theoretical definitions in the literature (Deterding et al., 2011; Kapp, 2012). Their understanding was not merely academic but was firmly grounded in practical experience with a diverse array of platforms including Kahoot, Quizizz, Blooket, Google Classroom, and Duolingo. This experiential foundation is crucial, as it means their evaluations and suggestions are derived from authentic classroom implementation rather than hypothetical speculation. This finding corroborates the work of Leiss et al. (2025), who found that teachers' attitudes toward gamification are significant predictors of their intention to use it, and extends that finding by showing that positive attitudes in this sample are accompanied by sophisticated conceptual knowledge and practical experimentation.

Second, teachers identified multiple benefits of gamified DLLs, including enhanced flexibility and accessibility, increased student motivation and engagement, promotion of interactivity and authentic practice, and facilitation of formative assessment. The emphasis on flexibility ("*dimana saja, kapan saja*") reflects a recognition of the affordances of digital learning to overcome geographical and temporal barriers, a benefit well-documented in the literature (Stockwell, 2012; Godwin-Jones, 2014). The consistent emphasis on motivation and engagement aligns with the meta-analytic findings of Sailer and Homner (2020), who reported significant effects of gamification on motivational ($g = 0.36$) and behavioral learning outcomes ($g = 0.25$). However, the teachers in this study went beyond simply noting increased motivation; they articulated how gamification achieves this effect—through challenge, enjoyment, and the

creation of a "ringan" (light/easier) learning atmosphere. This nuanced understanding supports the theoretical framework of Flow Theory (Csikszentmihalyi, 1990), where optimal experience occurs when challenges match skill levels, a concept explicitly mentioned by Participant 05 ("*level kesulitan berjenjang*").

Importantly, teachers also highlighted the role of gamified DLLs in supporting differentiated learning, a key goal of Indonesia's *Kurikulum Merdeka*. This finding aligns with the work of Sianturi (2025) on differentiated learning in the Indonesian context and extends it by showing how digital tools can operationalize differentiation in practice. The teachers' recognition of formative assessment as a benefit—using platforms for real-time progress monitoring—adds a practical, teacher-centric dimension to the literature, which has often focused on student outcomes. This finding resonates with the work of Helvich et al. (2025), who developed a scale measuring teacher-perceived applicability of gamification and its perceived effect on learners' motivation and learning outcomes.

Third, and most significantly, teachers provided a detailed, multi-dimensional blueprint for enhancing gamified DLLs. Their recommendations spanned features (intuitive UI/UX, rich media, progress tracking, lightweight performance), content (curriculum alignment, contextual relevance, differentiated difficulty, editability), exercise genres (varied types including HOTS-oriented tasks), student-facing gamification (educative rewards, healthy competition, balanced design), and teacher-facing gamification (professional recognition, tangible value, collaborative resources). This level of specificity is notable. Unlike previous studies that have reported general teacher support for technology (e.g., Ertmer & Ottenbreit-Leftwich, 2010), the teachers here acted as co-designers, offering concrete, actionable suggestions. This finding directly supports the co-design framework proposed by Penuel et al. (2007) and extended by Potvin et al. (2023), who found that co-design facilitates teacher professionalization when teachers have agency and partners develop trust.

This study's findings both align with and extend previous research in several important ways. First, the finding that teachers perceive gamification as enhancing motivation and engagement is consistent with a large body of literature, including the meta-analyses of Sailer and Homner (2020) and the systematic review of Triantafyllou et al. (2025). However, this study adds nuance by revealing that teachers are simultaneously aware of the risks of superficial engagement—a concern they articulate in their suggestions for "balanced design" and "educative rewards." This dual awareness (benefits and risks) is less frequently captured in the literature, which tends to focus on either positive outcomes or negative consequences separately (cf. Hanus & Fox, 2015, for the latter). The teachers in this study demonstrate a sophisticated, integrated perspective that recognizes gamification as a tool that must be carefully calibrated.

Second, the teachers' emphasis on content editability and curriculum alignment resonates with the Indonesian context literature. Wijaya et al. (2025) identified "learning content and platforms" as one of five key dimensions for evaluating digital transformation in Indonesian education. Utami et al. (2025) found that digital transformation in Indonesian schools remains largely limited to using technology for creating materials and conducting assessments, with teachers' innovations requiring further support. The teachers in this study are effectively demanding that support—they want platforms that they can adapt, not just consume. This finding also aligns with the work of Zulaikha et al. (2025), who found that while Indonesian teachers have adequate digital literacy in ethical and technological domains, they lack cognitive skills for critical evaluation of digital content. The demand for editability can be seen as a strategy to overcome this limitation—by empowering teachers to modify content, the platform respects their professional judgment and local knowledge.

Third, the teachers' recommendations for student-facing gamification reveal a cautious, ethical stance toward competition. They advocate for "healthy and resettable leaderboards" and caution against "strict ranking that can cause unhealthy competition" or systems that cause students to feel "inferior." This finding directly engages with the debate in the literature about the negative effects of competition. Hanus and Fox (2015) found that leaderboards can decrease motivation and satisfaction for lower-performing students. Chapman et al. (2025) found that while gamification improved academic outcomes, SDT and Flow Theory measures did not

show significant differences, suggesting that the mechanisms of gamification's effectiveness may not be fully captured by these theories. The teachers' practical wisdom—their recognition that competition must be managed to avoid demotivation—provides a valuable, ground-level insight that complements and extends these theoretical critiques.

Fourth, the teachers' suggestions for teacher-facing gamification (leveling systems, contributor badges, collaborative resource banks) address a relatively underexplored area in the gamification literature: how to motivate teachers as contributors. Most gamification research focuses on student outcomes (Gini et al., 2025) or, more recently, teacher acceptance (Leiss et al., 2025). However, the sustainability of gamified platforms depends on teacher engagement as content creators and curators. The teachers' recommendations align with the concept of "teacher as co-designer" (Penuel et al., 2007; Potvin et al., 2023) and with the findings of Gejandran and Abdullah (2025), who showed that gamification mediates the relationship between TPACK, teacher behavior, self-efficacy, and teaching effectiveness. By proposing a recognition system for teacher contributors, the teachers are essentially advocating for a professional learning community model embedded within the platform itself.

Fifth, and importantly for the journal's scope, the teachers' emphasis on developing Higher-Order Thinking Skills (HOTS) through gamified exercises aligns with the broader educational goals of fostering critical thinking and creativity. This finding resonates with Riwayatiningsih et al. (2025), who found that combining gamification with problem-based learning and multimodal strategies significantly increased engagement (90%), motivation (87%), and writing proficiency (22%), as well as marked development in critical thinking and creativity. Similarly, Wang and Tasir (2025) designed a MOOC environment embedded with gamification to enhance higher-order thinking, integrating the Mechanics, Dynamics, and Emotions (MDE) framework with Online Collaborative Learning principles. The teachers in this study are not asking for simple drill-and-practice games; they want exercises that "touch HOTS," reflecting a sophisticated understanding of the cognitive demands of language learning.

This study contributes to the global literature on gamification in education in several distinctive ways. First, it provides empirical evidence from the Indonesian context, which is underrepresented in the international gamification literature. Most large-scale studies on gamification originate from Western or East Asian contexts (e.g., Sailer & Homner, 2020; Gini et al., 2025). By foregrounding Indonesian teachers' voices, this study adds to the growing body of research on educational technology in the Global South (e.g., Wijaya et al., 2025; Utami et al., 2025; Imaduddin & Firdaus, 2025). The findings suggest that while teachers in Indonesia face unique infrastructural challenges (the "digital divide"), their pedagogical insights and design suggestions are remarkably aligned with those of teachers in better-resourced contexts. The demand for intuitive UI/UX, curriculum-aligned content, varied exercise types, and healthy competition is universal, but the emphasis on lightweight design ("ringan dijalankan di berbagai perangkat") and offline functionality is context-specific and crucial for scalability in resource-constrained environments.

Second, the study contributes to the emerging literature on teacher-facing gamification. While a systematic review by Kalana and Junaini (2025) identified gamification and TAM as a growing research area, most studies still focus on student-facing elements. The teachers in this study explicitly called for recognition systems for their own contributions, suggesting that platform designers should consider a "double-user" scenario (Frøsig, 2023) where both students and teachers are users whose motivation and engagement matter. This aligns with the co-design literature (Potvin et al., 2023; Sudla & Piromsombat, 2023) and suggests that the success of gamified DLLs depends not only on student acceptance but on teacher buy-in and ongoing contribution.

Third, the study provides empirical support for the integration of multiple theoretical frameworks. The teachers' emphasis on challenge and skill level matching (Flow Theory), autonomy and competence (SDT), and the need to manage cognitive load (CLT) suggests that effective gamified DLLs must be designed with attention to all three. This multi-theoretical approach is consistent with the Systemic Gamification Theory proposed by Coelho and Abreu

(2025), which emphasizes integration, emergence, synergy, and context as core principles for designing inclusive and effective gamified environments.

This study's primary novelty lies in its focus on teachers as active co-designers rather than passive adopters. While much of the gamification literature positions teachers as either barriers to or facilitators of technology integration (Ertmer & Ottenbreit-Leftwich, 2010), this study reframes them as essential partners in the design process. The teachers' detailed, multi-dimensional blueprint for enhancement is not a list of complaints but a constructive design document. This reframing has significant implications for how educational technology is developed: rather than designing platforms for teachers, developers should design platforms with teachers, or at least incorporate their detailed feedback as a core input. This study provides a model of how such teacher-driven design input can be systematically collected and analyzed.

Second, the study contributes to the literature by articulating a set of design principles specifically tailored to the Indonesian context but with broader applicability. These principles include: (a) lightweight, low-bandwidth design for resource-constrained environments; (b) editable, curriculum-aligned content that respects teacher autonomy; (c) varied exercise genres that promote HOTS; (d) healthy competition mechanisms that avoid demotivation; and (e) teacher-facing recognition systems that incentivize contribution. These principles are not found together in any single existing framework, though elements appear in various studies (e.g., Mayer's CLT principles for reducing extraneous load; SDT's emphasis on autonomy; co-design frameworks).

Third, the study contributes methodologically by demonstrating the value of qualitative need analysis in educational technology research. While large-scale surveys and experiments dominate the field (Gini et al., 2025; Sailer & Homner, 2020), the rich, contextual data obtained from open-ended questionnaires with experienced teachers provide insights that quantitative methods might miss. The teachers' quotes, preserved in their original language with translations, capture the nuance and practical wisdom of their perspectives.

This study makes three primary contributions. First, to theory, it provides empirical support for integrating Flow Theory, SDT, CLT, and co-design frameworks in the analysis of gamified DLLs. The teachers' responses demonstrate that effective gamification must simultaneously address motivational needs (autonomy, competence, relatedness), cognitive constraints (extraneous load), and professional recognition (teacher agency). Second, to practice, it offers a concrete, teacher-driven design blueprint for developers of gamified DLLs, including specific recommendations for features, content, exercise types, and gamification mechanics. Third, to policy, it highlights the need for targeted professional development (as requested by Participant 01) and infrastructure investment (as implied by concerns about internet access), while also emphasizing the importance of teacher autonomy and co-design in digital transformation initiatives.

This research has several limitations that must be acknowledged. First, the sample size is small (n=5), and while purposive sampling was appropriate for a qualitative need analysis, the findings are not statistically generalizable. The insights are rich and potentially transferable to similar contexts, but caution is warranted in extrapolating to all Indonesian teachers. Second, the study relies on self-reported data from a questionnaire. While the open-ended format allows for detailed responses, and the teachers' practical experience with platforms lends credibility, we do not have observational data on how they actually use these tools in the classroom. There may be a gap between what teachers say they do or want and what they actually do. Third, the study does not include student perspectives. The teachers' perceptions of benefits (e.g., increased motivation) are valuable, but direct student input would provide a more complete picture. Fourth, the Indonesian context is diverse, with significant variation in infrastructure, resources, and teacher readiness across provinces. The participants in this study were experienced and technology-familiar; less experienced or less technologically inclined teachers might have different perceptions.

Based on the findings, several practical recommendations emerge for developers, school administrators, and policymakers. For developers, the key recommendations are: (1) prioritize lightweight, low-bandwidth designs that function on diverse devices; (2) make

content editable and curriculum-aligned, respecting teacher autonomy; (3) include varied exercise genres that promote HOTS, not just multiple-choice quizzes; (4) design gamification mechanics that foster healthy competition (e.g., resettable leaderboards) and avoid demotivating public rankings; and (5) incorporate teacher-facing recognition systems (levels, badges, collaborative resource banks) to incentivize contribution. For school administrators and policymakers, the key recommendations are: (1) invest in targeted professional development that focuses on pedagogical integration, not just basic digital literacy; (2) address infrastructural barriers (internet access, device availability) as a prerequisite for equitable implementation; (3) foster a culture where teachers are positioned as co-designers, not just end-users; and (4) allocate resources for localized content development that aligns with the national curriculum and local contexts.

In summary, this study demonstrates that Indonesian elementary and junior high school teachers are not merely open to gamified DLLs but are active, critical advocates who offer a sophisticated, practice-informed blueprint for their improvement. Their positive perceptions are grounded in real classroom experience, and their suggestions for enhancement reflect a deep understanding of both pedagogical principles and contextual constraints. By foregrounding their voices, this study contributes to a more balanced, teacher-centered discourse on educational technology, one that recognizes teachers as essential partners in the design of effective digital learning environments.

CONCLUSION

This study set out to explore the positive perceptions of Indonesian elementary and junior high school teachers regarding Platform Digital Pembelajaran Bahasa Inggris (PDPBI), Digital Learning Laboratories (DLL), and gamified DLLs, and to synthesize their constructive suggestions for system enhancement. The findings paint a clear and compelling picture: the participating teachers are not merely open to using these technologies but are active, constructive, and critical advocates for their development. Their responses reveal a deep understanding of the pedagogical potential of these tools, grounded in years of practical classroom experience. They champion gamified DLLs for their ability to enhance flexibility, boost student motivation, promote interactivity, and support differentiated learning. More importantly, they transcend the role of end-users to become essential co-designers, providing a detailed, practical, and nuanced blueprint for creating more effective, engaging, and contextually appropriate digital learning ecosystems. In summary, the journey towards effective digital integration in Indonesian ELT classrooms is well underway. The teachers in this study are not just on this journey; they are demanding the map and helping to steer. By heeding their voices—their advocacy, their critiques, and their constructive suggestions—stakeholders can collaboratively build the next generation of gamified Digital Learning Laboratories. These platforms will be those that are not only technologically sophisticated but also pedagogically profound, inclusive, and contextually responsive. As the examples of gamified interventions for social issues (Fajar et al., 2024) and rigorous assessment development (Daya et al., 2025) illustrate, thoughtful design and validation are essential. Ultimately, the goal is not to gamify learning for its own sake but to enhance it—to unlock the potential of every Indonesian student to learn English in a motivating, meaningful, and effective way. The teachers' voices, amplified in this study, provide a clear and actionable path toward that goal.

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