TA'DIB JOURNAL, 29 (1), 2026, (January-June)

ISSN: 1410-8208 (*Print*) 2580-2771 (*Online*)
Available online at https://ejournal.uinmybatusangkar.ac.id/ojs/index.php/takdib

Validation of the DIGA-FAM Model: A Differentiated Game-Based Formative Assessment Using Wordwall

Received: 05-02-2026; Revised: 14-05-2026; Accepted: 05-06-2026

Vivi Indriyani*)
Universitas Negeri Padang
E-mail: viviindriyani@fbs.unp.ac.id

Ary Ramadhan
Universitas Negeri Padang
E-mail: aryramadhan@fbs.unp.ac.id

Anisa Nurjanah
Universitas Negeri Padang
E-mail: anisanurjanah@fbs.unp.ac.id

Lira Hayu Afdetis Mana
Universitas PGRI Sumatera Barat
E-mail: lirahayu@upgrisba.ac.id

Leli Lismay
Coventry University, United Kingdom
E-mail: lismayl@coventry.ac.uk

*) *Corresponding Author*

Abstract: Integrating differentiated instruction with game-based formative assessment remains underexplored in language education research, as most existing studies address these approaches in isolation rather than as a unified framework. Conventional formative assessment frequently fails to accommodate individual learner differences and lacks meaningful technology integration, limiting its effectiveness in diverse classroom contexts. To address this gap, this study develops and validates the DIGA-FAM Model (Differentiated Instruction and Game-Based Formative Assessment Model), a novel framework that systematically integrates gamification, formative assessment, and differentiated instruction using the Wordwall application. This study employed a development research design based on the Plomp (1997) model, focusing on the Prototyping Phase, which encompasses product elaboration and expert validation. Validation data were analyzed using descriptive quantitative and qualitative approaches. Expert validation results demonstrated high validity across three aspects: content (90%), language (91%), and graphics (82.5%), confirming that the model is theoretically sound and contextually appropriate for language learning. The DIGA-FAM Model contributes a replicable, differentiated formative assessment framework that bridges the gap between gamification and adaptive pedagogy, offering a structured alternative to conventional assessment practices in language education.

Abstrak: *Integrasi pembelajaran yang dibedakan dengan penilaian formatif berbasis permainan masih belum banyak dieksplorasi dalam penelitian pendidikan bahasa, karena sebagian besar studi yang ada membahas pendekatan-pendekatan ini secara terpisah, bukan sebagai kerangka kerja yang terpadu. Penilaian formatif konvensional seringkali gagal mengakomodasi perbedaan individu peserta didik dan kurang memiliki integrasi teknologi yang bermakna, sehingga membatasi efektivitasnya dalam konteks kelas yang beragam. Untuk mengatasi kesenjangan ini, penelitian ini mengembangkan dan memvalidasi Model DIGA-FAM (Pengajaran Diferensiasi dan Model Penilaian Formatif Berbasis Permainan), sebuah kerangka kerja baru yang secara sistematis mengintegrasikan gamifikasi, penilaian formatif, dan pengajaran yang dibedakan menggunakan aplikasi Wordwall. Penelitian ini menggunakan desain penelitian pengembangan berdasarkan model Plomp (1997), dengan fokus pada Fase Prototipe, yang mencakup elaborasi produk dan validasi ahli. Data validasi dianalisis menggunakan pendekatan kuantitatif dan kualitatif deskriptif.*

Hasil validasi ahli menunjukkan validitas tinggi pada tiga aspek: konten (90%), bahasa (91%), dan grafis (82,5%), yang menegaskan bahwa model ini secara teoritis kuat dan sesuai secara kontekstual untuk pembelajaran bahasa. Model DIGA-FAM memberikan kontribusi berupa kerangka kerja penilaian formatif yang dapat direplikasi dan dibedakan, yang menjembatani kesenjangan antara gamifikasi dan pedagogi adaptif, serta menawarkan alternatif terstruktur untuk praktik penilaian konvensional dalam pendidikan bahasa.

Keywords: DIGA-FAM model, differentiation instruction, games based learning, formative assessment

INTRODUCTION

Assessment plays a crucial role in education as a means of monitoring the learning process and evaluating the achievement of established learning objectives (Beebe et al., 2010; Karadag et al., 2020). In language learning, assessment of the four skills (listening, speaking, reading, and writing) holds strategic importance because it reflects students' overall communicative competence development (Kusumawati, 2020; Tanewong, 2019). Through this assessment process, teachers can obtain a more accurate picture of students' progress in mastering language skills (Slamet & Mukminatien, 2024). Information obtained from assessment also serves as a basis for teachers in designing learning methods that better suit students' needs (Oo et al., 2022). Assessment further serves as a tool for mapping students' strengths and weaknesses in language learning, allowing teachers to adjust their instructional approaches accordingly (Prasetyarini et al., 2021). This mapping allows teachers to determine the necessary interventions for optimal learning, including identifying learning difficulties faced by students (Rahman, 2015). Good assessment also provides direction for teaching strategies to be used in subsequent learning processes, as appropriate formative assessment practices can help teachers improve the quality of instruction based on evidence of student achievement (Costa Akoyt, 2024).

Among various assessment approaches, formative assessment has received substantial scholarly attention due to its capacity to provide continuous feedback, support self-regulation, and inform instructional decisions (Özer Özkan & Ozkan, 2025; Kamaluddin et al., 2022; Kurniawan et al., 2022). Formative assessment allows teachers to adjust instruction based on information obtained in class and provides evidence of students' position in the learning process (Hibatulloh & Aini, 2024). Furthermore, formative assessment helps students understand their strengths and weaknesses to design more effective learning (Prasetyarini et al., 2021). The enormous potential of formative assessment is, however, often not optimally realized in the classroom, as some teachers still do not clearly understand its function in learning (Acar-Erdol & Yildizli, 2018), while others place more emphasis on test-based achievement (Tu et al., 2020). A narrow focus on cognitive aspects, such as memorization and factual questions, causes assessment to lose its value in encouraging critical thinking and deep understanding (Kristiawan et al., 2016). Time constraints and administrative burdens further make it difficult for teachers to implement formative assessment on a continuous basis (Lee et al., 2012), and the difficulty in providing personalized feedback remains a persistent challenge that is often time-consuming and prone to error (Haudek et al., 2011). Despite these challenges, numerous studies confirm the significant benefits of formative assessment, including its capacity to improve the quality of teaching (Baleni, 2015), close the gap between current and expected outcomes (Téllez et al., 2024), and strengthen student motivation (Aust et al., 2024).

This study is grounded in three interconnected theoretical foundations that collectively frame the development of the

DIGA-FAM Model. First, Differentiated Instruction Theory (Tomlinson, 2001) posits that effective teaching requires adjusting content, process, and product according to students' readiness, interests, and learning profiles, ensuring that assessment tasks are responsive to individual learner differences (Deunk et al., 2018; Ndlovu, 2025). Second, Formative Assessment Theory (Black & Wiliam, 1998) emphasizes that assessment should function as a pedagogical tool rather than merely an evaluative instrument, providing timely and actionable feedback that closes the gap between current and expected learning outcomes (Costa Akoyt, 2024; Widiastuti & Saukah, 2017). Third, Gamification Theory (Deterding et al., 2011) proposes that the deliberate incorporation of game elements, such as points, leaderboards, and adaptive challenges, into non-game educational contexts can enhance intrinsic motivation and sustained engagement (Indriasari et al., 2020; Landers et al., 2019). The integration of these three theories is necessary because each theory addresses a distinct but complementary dimension of the assessment challenge: differentiation addresses learner diversity, formative assessment addresses pedagogical function, and gamification addresses engagement and motivation. Together, they form the conceptual backbone of the DIGA-FAM Model, offering a theoretically coherent foundation for the design of an adaptive, game-based formative assessment framework. Without this triangulated theoretical grounding, any model addressing differentiated, game-based assessment risks remaining conceptually fragmented and practically ineffective.

Despite growing empirical support for each of these approaches independently, the literature reveals a significant gap in their integrated application within a unified formative assessment framework. Studies on game-based learning consistently demonstrate positive effects on student motivation, engagement, and performance, yet the effectiveness of these approaches depends heavily on theoretically grounded implementation mechanisms rather than the use of game elements alone (Dichev & Dicheva, 2017; Guan et al., 2024). Similarly, research on differentiated instruction confirms its value in addressing learner diversity, but its integration with digital assessment tools remains largely underdeveloped in empirical studies (Njagi, 2015; Şaban & Atay, 2023; Walton, 2017). Studies utilizing the Wordwall application illustrate this gap clearly, as prior research has applied Wordwall primarily in skill-specific contexts: writing (Darliani & Agustina, 2019), reading (Rahmawati & Wijayanti, 2022), sentence structure (Syam, 2015), and vocabulary mastery (Ilahiyati et al., 2023), without leveraging its adaptive difficulty features within a differentiation-based assessment framework. None of these studies systematically design tiered assessment tasks that adjust content, process, and product according to students' readiness levels, which represents a critical oversight given the diversity of learners in language classrooms. Furthermore, no existing model provides an explicit operational framework that combines differentiated task design with gamified digital assessment tools in a replicable and theoretically coherent structure. This gap constitutes a meaningful limitation in both the theoretical and practical landscape of language assessment research, underscoring the urgent need for an integrated model such as the one proposed in this study.

To address this gap, this study is guided by two research questions: (1) How is the DIGA-FAM Model designed as a differentiated, game-based formative assessment framework using the Wordwall application? and (2) How valid is the DIGA-FAM Model based on expert validation across content, language, and graphics aspects? This study develops and validates the DIGA-FAM Model, a novel formative assessment framework that systematically integrates Differentiated Instruction Theory, Formative Assessment Theory, and Gamification Theory through the Wordwall application. The model operationalizes

differentiation by providing tiered assessment tasks at easy, medium, and hard levels that differ across content, process, and product dimensions, aligned with students' readiness and learning profiles (Walton, 2017). Theoretically, this study contributes a structured conceptual framework that bridges the gap between gamification and adaptive pedagogy in language assessment, an integration that remains underexplored in prior literature. Practically, the DIGA-FAM Model offers language teachers a replicable, technology-supported assessment design that is more inclusive and engaging than conventional formative assessment practices. This innovation is expected to strengthen both the quality of language learning and the effectiveness of formative assessment in diverse classroom contexts.

METHOD

This study employed a research and development (R&D) design to develop and validate the DIGA-FAM Model, a differentiated, game-based formative assessment framework utilizing the Wordwall application. The development procedure follows the Plomp & Nieveen (2013) model, which consists of three phases: Preliminary Research (Indriyani et al, 2025; Indriyani et al, 2026), Prototyping Phase, and Assessment Phase. This article focuses specifically on the Prototyping Phase, which encompasses three operational stages: (1) designing a differentiated formative assessment instrument with tiered task levels aligned to students' readiness profiles; (2) developing game-based assessment activities using the Wordwall application across 12 interactive game templates; and (3) conducting expert validation to evaluate the model's feasibility prior to classroom implementation. The development process involved iterative cycles of design, review, and revision based on expert feedback before the final prototype was submitted for formal validation. This staged approach was adopted to ensure that the model was theoretically coherent, linguistically accessible, and visually appropriate before empirical testing with students. A procedural diagram of the development stages is presented in Figure 1.

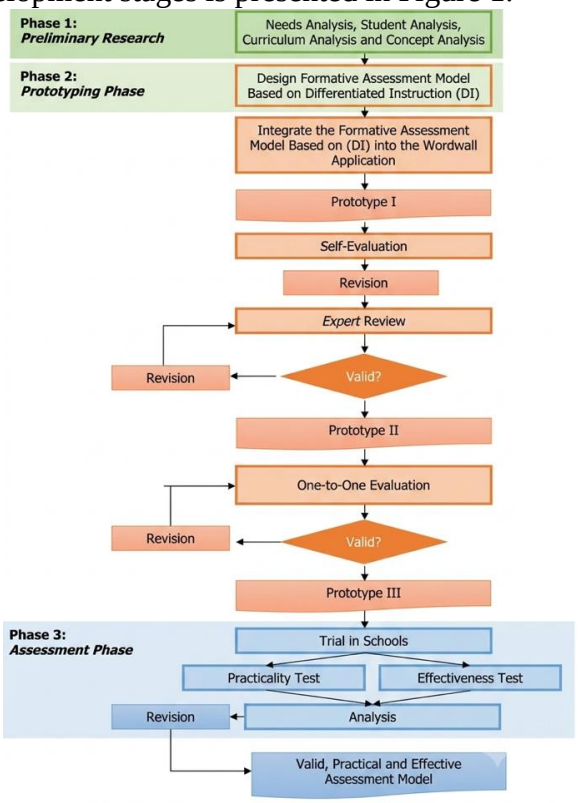

Figure 1. DIGA-FAM Model Development Flow

This study was conducted in the context of Indonesian language learning at the senior high school level, targeting heterogeneous classroom settings where learner diversity in terms of readiness, learning pace, and language proficiency is commonly observed. The DIGA-FAM Model was designed specifically for this educational level, as the demands of differentiated formative assessment are particularly acute in contexts where teachers must simultaneously address students with varying levels of language competence within a single classroom. The model targets language teachers as its primary users, providing them with a replicable and structured assessment design that can be adapted across different language topics and skill focuses. This contextual specification is intended to strengthen the external validity of the study by making the implementation context explicit and traceable for future replication studies.

The subjects of this study involved six expert validators selected through purposive sampling based on their academic qualifications and practical experience in their respective fields. The validators consisted of two assessment experts, two linguists, and two graphic design experts, each holding a minimum of a doctoral degree with active research engagement in their area of expertise. This purposive selection was employed to ensure that each validation domain (content, language, and graphics) was assessed by individuals with relevant and substantive expertise. The involvement of two validators per domain also enabled a preliminary examination of inter-rater consistency, strengthening the credibility of the validation outcomes. Expert validators provided both quantitative scores and qualitative written feedback, ensuring that the validation process captured both the measurable feasibility of the model and specific recommendations for revision.

The primary data collection instrument was an expert validation sheet developed specifically for this study, consisting of 40 items distributed across three assessment domains: content validity (16 items covering indicator suitability, question construction, and alignment with learning objectives), language validity (14 items covering diction, instructional clarity, and readability), and graphics validity (10 items covering visual appearance, design consistency, and media interactivity). Each item was rated using a four-point Likert scale ranging from 1 (not valid) to 4 (very valid), allowing for nuanced scoring beyond binary judgments. The validation sheet was reviewed for face validity by a peer review panel prior to its use, ensuring that the items adequately represented the constructs being measured. In addition to quantitative scores, each validator was asked to provide written comments and suggestions for each domain, which served as the basis for qualitative analysis and product revision.

Expert validation data were analyzed using two complementary approaches. Quantitatively, the scores from each validator were calculated to obtain a percentage score per domain using the formula: validity score = (total obtained score / total maximum score) × 100%. The resulting percentages were then interpreted against the validity categories proposed by Riduwan (2018): 81–100% (very valid), 61–80% (valid), 41–60% (fairly valid), 21–40% (less valid), and 0–20% (invalid). To strengthen the credibility of the quantitative findings, inter-rater agreement between the two validators within each domain was calculated using the percentage agreement index, providing an indication of scoring consistency across raters (Riduwan, 2018). Qualitatively, written comments and suggestions from all six validators were analyzed thematically to identify recurring patterns of feedback, areas requiring revision, and aspects of the model that were consistently affirmed across validators. The integration of quantitative validity scores and thematic qualitative analysis ensured that the conclusions regarding model feasibility were grounded in both numerical evidence and substantive expert judgment.

RESULTS AND DISCUSSION

The results of this study present the design of the DIGA-FAM Model which focuses on the development of nine assessment models based on the Wordwall application. This design was born from the need to present formative assessments that not only measure learning outcomes but also encourage active student engagement through a differentiated learning approach. Each designed assessment model, such as Open the Box, Match Up, Unjumble, Group sort, Gameshow Quiz, Hangman, Whack a mole, Watch and Memories, and Speaking Cards, is adapted to the characteristics of diverse content, so it can accommodate differences in learning styles and student ability levels. With this model, Wordwall does not merely function as a game medium, but also as a formative assessment instrument that is fun and relevant to students' needs. In addition, the design results were also validated by experts who

provided important input regarding content, presentation, language, and appearance, so that the resulting assessment model is valid for use with students. Through this validation, revisions were made to ensure that the developed formative assessment is truly able to support the achievement of learning objectives. Thus, the results of this study not only contribute innovation to formative assessment practices but also strengthen the integration between learning differentiation and the use of educational technology. Overall, this research is expected to accommodate the diverse needs and characteristics of students.

1. Design of the DIGA-FAM Model (Differentiation Instruction and Game-Based Formative Assessment Model)

The goal of designing the DIGA-FAM Model is to provide a game-based formative assessment system that can accommodate the diverse learning needs and characteristics of students through the principle of differentiation in learning content. This design seeks to address the challenges of traditional assessments, which often focus solely on final results without providing space for students to demonstrate their abilities according to their individual learning styles and levels of readiness. Through the use of Wordwalls, the assessment is designed to be more interactive and engaging, thereby increasing student engagement and motivation in the learning process. Furthermore, this assessment model provides teachers with the opportunity to obtain more authentic learning information because each student can demonstrate their achievements in a variety of ways. Another goal of this design is to create an enjoyable and meaningful assessment experience, so that evaluation is no longer viewed as a burden on students. The principle of differentiation used ensures that each assessment instrument is tailored to the material being studied. This way, the assessment can function as a diagnostic tool that helps teachers understand learning progress while providing constructive feedback.

To present a clearer and more systematic picture of the structure and working mechanisms of the DIGA-FAM model, the researchers developed an integrated conceptual framework visualized in diagram form. In Research and Development (R&D), this kind of visualization plays a crucial role in translating theoretical concepts into operational representations that are easily understood and implemented by educational practitioners. Considering that the DIGA-FAM model integrates three main components: differentiated learning, game-based learning syntax, and formative assessment cycles, the diagramming requires a systematic and informative visual representation. Therefore, the diagram was digitally reconstructed using generative artificial intelligence (AI) technology based on conceptual guidance and specifications designed by the researchers. This technology was utilized transparently to improve visual quality, flow clarity, and graphical presentation accuracy without altering the scientific substance or theoretical foundation of the developed model. A complete visualization of the integrated model is shown in Figure 1.

Figure 2. DIGA-FAM Integrated Framework

Figure 1 shows that the DIGA-FAM model is constructed through three integrated functional layers that form a continuous learning system. In the first layer (input), model implementation begins with the process of identifying student characteristics

based on the principles of Differentiated Instruction, which includes mapping learning profiles, readiness levels, and learning interests. The information obtained from this stage serves as the basis for teachers in designing learning experiences that are tailored to the needs and characteristics of individual students. Next, in the process layer, the mapping results are operationalized through a gamification syntax based on the Wordwall platform, which consists of three main stages: material orientation based on student ability or level, independent learning exploration through various interactive game mechanisms, and strengthening learning engagement and motivation through competitive features such as leaderboards. In the output/feedback layer, performance data generated during digital learning activities is utilized as a source of information in the formative assessment cycle. This data enables real-time evaluation and immediate feedback to students, while also providing empirical evidence for teachers to adjust learning strategies and interventions in subsequent sessions. Thus, these three layers form a mechanism that is interconnected and supports the creation of responsive learning that is centered on student needs.

To achieve this goal, this study designed various types of assessments. The selected formats were adapted to the characteristics of the learning content, specifically related to poetry texts. The game formats chosen for this material include Open the Box, Match Up, Unjumble, Group Sort, Gameshow Quiz, Hangman, Whack a Mole, Watch and Memories, and Speaking Cards, which are explained below.

a. Open The Box

The Open the Box assessment uses the DIGA-FAM Model, designed to provide a fun and challenging formative assessment experience through a differentiated approach. This model is divided into three difficulty levels: easy, medium, and difficult, allowing students with varying levels of learning readiness to participate optimally. At the easy level, questions focus on recalling and recognizing information related to the concept of poetic texts and examples, such as identifying the characteristics of poetry, etymological meaning, authors of poetic works, and basic concepts of diction. The medium level is directed at understanding and application, where students are asked to explain the differences in poetic elements, interpret lines, and create simple poetic stanzas with certain figures of speech. Meanwhile, the difficult level emphasizes analysis and evaluation, such as comparing the meaning of two poetic texts, analyzing symbols, and assessing strategies for using imagery and diction in creating atmosphere in poetic texts. With this tiered structure, Open the Box not only assesses comprehension but also fosters higher-order thinking skills relevant to current learning. Furthermore, the interactive game format and engaging visuals encourage learning motivation and engage students more fully in the assessment process, maximizing the formative assessment's feedback function.

b. Match Up

The Match Up assessment uses the DIGA-FAM Model, developed to train students' abilities in recognizing, understanding, and analyzing the relationship between the content of poetry and the titles of literary works, particularly Chairil Anwar's poems. At the easy level, questions are designed to hone basic memory skills by matching iconic lines such as "Aku ini hewan liar" (I am a stray animal) with the title Aku, or stanzas from the strongly patriotic poem Karawang–Bekasi. The medium level requires students to understand the context, meaning, and situation within the stanzas, for example, recognizing the poems "Pelarian" (Escape from Law) through their characteristic moods. Meanwhile, at the difficult level, students are challenged to analyze more complex stanzas, such as the flower symbolism in Sia-sia (Sia-sia) or the emotional nuances in “Dendam dan Kenangan” (Revenge and Memories). With this stratification of difficulty levels, Match Up not only provides a variety of

questions but also represents the principle of differentiated learning, where students can learn according to their readiness and level of understanding. The interactive matching game format on the Wordwall makes the assessment process feel like a playful activity, thereby increasing student engagement and motivation.

c. Unjumble

The Unjumble assessment uses the DIGA-FAM Model, applied to hone skills in understanding the structure of lines and stanzas in Amir Hamzah's poem “Buah Rindu 2” through the activity of rearranging jumbled line fragments. At the easy level, students are asked to compose one line of poetry, focusing on recognizing diction and the basic flow that builds the whole meaning. The medium level challenges students to compose two lines of poetry, requiring them to pay attention to the continuity of rhyme, meaning, and style so that the lines can be coherent again. Meanwhile, the difficult level tests analytical skills more deeply because students must compose three to four lines at once, so they are required to understand the relationship between lines in creating the rhythm, atmosphere, and message of the poem. With this tiered design, Unjumble facilitates the principle of differentiated learning, as students can learn according to their initial abilities while gradually developing their poetry literacy skills. The interactive Wordwall format makes the activity of composing complex lines more enjoyable, thereby encouraging active engagement and fostering students' confidence in understanding literary works.

d. Group Short

The Group Sort assessment uses the DIGA-FAM Model, designed to train critical thinking skills and classify literary concepts based on varying levels of difficulty. At the easy level, students are asked to group concrete and abstract words from Taufik Ismail's poem " Kita adalah Pemilik Sah Republik Ini," thus learning to distinguish between concrete and imaginary or conceptual meanings. At the medium level, students are guided to group imagery appearing in the poem, such as visual and auditory imagery, which helps them understand the power of imagery in constructing meaning. Next, at the difficult level, students are challenged to group various types of figurative language or figures of speech, with a minimum of five examples from the categories of comparison, affirmation, satire, and opposition. With these stages, Group Sort provides a learning experience that aligns with the principles of differentiated learning, as the content and process of the activity can be tailored to students' cognitive readiness. In addition, interactive activities in the Wordwall make grouping concepts that are usually abstract more concrete.

e. Gameshow Quiz

The Gameshow Quiz assessment uses the DIGA-FAM Model, designed to provide a fun and challenging evaluation atmosphere through a television quiz-like format. The uniqueness of this format lies in its competitive yet educational gameplay, thereby increasing students' motivation to learn. At the easy level, questions focus on recognizing the basic elements of poetry such as words, lines, stanzas, rhyme, and the poet's freedom in choosing diction. The medium level then expands students' understanding of the role of rhyme, rhythm, and the function of diction in accurately conveying the poet's feelings. Meanwhile, at the difficult level, students are directed to analyze the relationship between rhyme, rhythm, and the meaning of the poem, as well as the impact of weak diction on the poem's expressive power. With this tiered pattern, Gameshow Quiz aligns with the principles of differentiated learning, as it provides opportunities for students of varying abilities to engage at their own level. Furthermore, the formative nature of the quiz provides teachers with immediate feedback on the extent to which students understand the structure and meaning of the poem, allowing them to adjust subsequent learning strategies.

f. Hangman

The Hangman assessment uses the DIGA-FAM Model, utilized as a creative strategy to strengthen students' understanding of the concept of figurative language. This model is exemplified in poetry learning. This assessment tests students' understanding and skills in analyzing figurative language in poetry, exemplified in the poem "Ayo" by Sutardji Calzoum Bachri. The uniqueness of the Hangman format lies in the game mechanism of guessing letters one by one to find the secret word, which in this context is a type of figurative language such as repetition, metaphor, hyperbole, personification, and others. This activity not only trains memory and thinking speed but also encourages students to connect the lines of poetry with the style of language used by the poet. At the easy level, students guess keywords from figurative language that are clearly visible in the lines, while the medium level demands an understanding of the context of the meaning of the figurative language, and the difficult level directs them to critically interpret the use of figurative language in conveying social and political messages. In this way, Hangman supports the principle of differentiation in both content and process aspects because students participate according to their cognitive level. Furthermore, the interactive and competitive nature of Hangman fosters high learning motivation while creating a lively classroom atmosphere. As a formative assessment, teachers can monitor students' ability to recognize, understand, and analyze figurative language and provide appropriate feedback. Thus, Hangman in the DIGA-FAM Model presents a unique combination of a traditional game and interactive Wordwall technology.

g. Whack-a-Mole

The Whack-a-Mole assessment uses the DIGA-FAM Model, a formative evaluation tool that provides an interactive learning experience for students. It allows teachers to design games where students must quickly select the correct answer from a variety of randomly generated options, similar to the classic game Whack-a-Mole. Whack-a-Mole's uniqueness lies in its speed, accuracy, and focus, enabling students to rely not only on their knowledge but also on their cognitive reflexes. In the context of learning poetry, for example, Whack-a-Mole can be used to identify figures of speech, determine appropriate diction, or distinguish between true and false statements in poetry readings. This design encourages students to think critically and respond quickly, supporting the principle of differentiated instruction because activities can be adjusted to varying levels of difficulty. Furthermore, this game format provides immediate feedback in the form of scores, allowing teachers to monitor student achievement in real time and adjust teaching strategies accordingly.

h. Speaking Card

Based on the Speaking Cards quiz, which uses poetry texts such as Chairil Anwar's "Kawanku dan Aku," Amir Hamzah's "Buah Rindu 2," and Sapardi Djoko Damono's "Yang Fana adalah Waktu," this model is highly suitable for inclusion in the DIGA-FAM Model because it incorporates the unique characteristics of auditory learning styles. The uniqueness of this test is that students are given "speaking cards" with open-ended prompts that encourage them to speak or discuss aspects of the poem—story, theme, figures of speech—rather than simply writing multiple-choice or fill-in-the-blank answers. Because there is no leaderboard or automatic numerical scoring, the focus shifts from competition to reflection and in-depth understanding, which is ideal for students who tend to learn through listening and speaking. For visual learners, although the poem text and prompts are visible, this activity provides visual triggers in the form of text and perhaps card illustrations, so visual learners also receive support, they can "see" the poem's stanzas and the card's visuals before delivering their answers. This speaking cards activity also supports differentiation in the DIGA-FAM Model because teachers can customize the cards based on the level of difficulty, the theme, or

aspect of the poem they wish to focus on (content), and the delivery method, discussion, presentation, or small group (process). As a formative assessment, this activity allows teachers to directly hear how students understand the poem, capture their difficulties in interpretation or pronunciation, and provide in-depth verbal feedback.

i. Watch and Memorize

Based on the Watch and Memorize quiz, this activity is highly suitable for inclusion in the DIGA-FAM Model because it emphasizes visual learning styles and memory reinforcement through visualization of poetic texts and images. The unique feature of this test is that students are shown texts or excerpts of poetry accompanied by visual elements (e.g., fonts, layouts, or supporting images) and then asked to recall or focus on the visual aesthetics and content of the poem. Because the Watch and Memorize template is open-ended and not score-based (leaderboards are disabled), the focus is more on visual comprehension and reflection than on competition alone, making it suitable for students who are more comfortable learning through observing images, visual texts, and aesthetics. This model allows for content differentiation because teachers can choose different poetry excerpts and visuals according to students' skill levels; the process aspect can vary with the time spent observing or discussing the visuals; while the product can be a visual re-presentation of the text or imagery that students have memorized. As a formative assessment, this activity provides a concrete picture of how effectively students pay attention to the visual and aesthetic aspects of a poetic text, helping teachers assess which areas need strengthening, for example, details of diction, imagery, or the effective use of figurative language to build atmosphere. Furthermore, for visual learners, this method strengthens memory through visual repetition and enriches the experience of reading poetry as a work of art, not just a verbal text.

2. Validation of Formative Assessment Using Wordwall

After the assessment model is developed using the Wordwall application, the product is then validated to assess its validity before being piloted. Validation is a crucial stage in development research and development because it ensures that the resulting product aligns with learning objectives and student needs. This process involves experts or practitioners competent in assessment, so that the feedback provided can be used as a reference for improvement. In the context of formative assessment using Wordwall, validation not only assesses the suitability of the question indicators but also aspects of presentation, language, and graphics that support learning. Furthermore, it is necessary to assess the differentiation aspect of the assessment. With validation, weaknesses in instructions, question wording, language, and presentation can be identified early on before implementation in schools. Validation results also serve as the basis for determining revisions, both in content and technical aspects, to improve the quality of the assessment. Furthermore, validation plays a role in ensuring that the assessment can accommodate diverse learning styles, including visual, auditory, and kinesthetic.

Expert validation in this study was conducted by four experts with different areas of expertise to ensure the quality of the developed assessment instrument. Two assessment experts were involved to assess the content (suitability of indicators, accuracy of question construction, and integration of the assessment with learning objectives); two language experts (use of diction, clarity of instructions, and readability) and two graphics experts (visual appearance aspects, design regularity, and media interactivity). The validation results obtained provide a general overview of the product's strengths and weaknesses, thus serving as an important basis for revisions to produce a usable formative assessment based on the DIGA-FAM Model using the Wordwall application. A summary of the validation results can be seen in the following table 1.

Table 1. Validity Value of DIGA-FAM Model Based

Aspect	Indicators	Validation Achievement (%)		Average	Criteria
		V1	V2		
Content	Suitability of Question Indicators Accuracy of Question Instructions Suitability to Learning Objectives	93.3	86.7	90.0	Very Valid
Language	Use of Diction Clarity of Instructions Readability	92.0	90.0	91.0	Very Valid
Graphic	Visual Appearance Design Regularity Media Interactivity	85.0	80.0	82.50	Very Valid

The validation results of the DIGA-FAM Model with Wordwall showed excellent quality in all assessed aspects. In the content aspect, the indicators of question suitability, instruction accuracy, and suitability with learning objectives obtained an average of 90%, which confirms that the content of the assessment instrument is relevant to the objectives of differentiated learning. This means that the assessment instrument is able to adapt to the needs, interests, and readiness of students as per the principle of differentiation. Furthermore, the language aspect obtained an average score of 91%, which indicates that the use of diction, clarity of instructions, and readability of the instrument strongly support student understanding. The clarity of the language used makes it easier for students to participate in the Wordwall game as an interactive formative assessment tool. In the graphics aspect, the indicators of visual appearance, design regularity, and media interactivity obtained an average of 82.5%, which indicates that the visual quality and media interactivity are classified as very valid. The design regularity integrated with the interactive elements of Wordwall makes the assessment more interesting and easier for students to use. These results confirm that the game-based assessment in DIGA-FAM is able to accommodate students' learning needs more optimally. Thus, Wordwall as an interactive media supports formative assessment that is both fun and effective in developing students' knowledge.

The DIGA-FAM model validation results demonstrate a strong correlation with previous research on the effectiveness of digital game-based formative assessment. (Zhyhadlo, 2022) explained that interactive game media can increase student engagement in foreign language learning because it provides a more meaningful assessment experience. This aligns with the validation results in this study, which prove that the assessment was designed with attention to indicator suitability, instructional clarity, and readability, which supports instructional differentiation. High validity in these aspects reinforces the findings of (Grier, Lindt, S. F., & Miller, 2021) that game-based assessments can function not only as evaluation tools but also as learning tools that foster students' intrinsic motivation. Meanwhile, (Obery et al., 2021) showed that the use of competitive games in informal assessments can increase engagement, although it needs to be balanced with clear instructional design to avoid confusion. These data also explain why students tend to focus more when assessments are presented with interactive displays that support instructional comprehension. Thus, the high validity of the content and language aspects of DIGA-FAM provides an answer to the question of why game-based assessments can create more enjoyable and relevant learning experiences for students. This also confirms that assessments that align with learning objectives and student needs are key to the success of game-based formative evaluations.

Furthermore, validation of the graphics aspect showed that the visual appearance and interactivity of the Wordwall in DIGA-FAM were good but still needed improvement for greater consistency. This finding aligns with research by (Tsai et al., 2020), which

emphasized that game-based assessments have advantages over conventional computer-based assessments in maintaining long-term student engagement. (Cadet, 2023) also added that the use of game-based platforms like Kahoot is effective in increasing classroom interactivity because attractive visual designs encourage students to participate more actively. The same was emphasized by (Lv et al., 2022), who found that interactivity in game-based assessments supports the development of children's analogical reasoning skills through communicative media design. Although the graphics score was lower than the content and language aspects, this finding confirmed that there is room for improvement in the layout, color selection, and design navigation. These factors have been shown to influence the learning experience of students, especially those with visual learning styles. In other words, the quality of graphics and media interactivity not only strengthens the appeal but also plays a role in maintaining motivation and consistent student engagement. This data also confirms the research findings of (Mdlalose et al., 2021), which found that communicative visual design can increase student engagement in Kahoot-based science assessments. Therefore, the graphical aspect of DIGA-FAM is a crucial element that needs to be refined to optimize the model's support for differentiated learning.

Table 2. Matrix of Product Revision Based on Expert Validation Indicators

Assessment Aspects	Indicator	Comment	Revision Action
Content	Accuracy of Question Instructions; Suitability to Learning Objectives	Some of the question instructions in the Wordwall application are not specific enough, thus potentially biasing students in achieving the differentiation learning objectives.	Rewrite the quiz instructions on the Wordwall opening menu to make them more operational and appropriate to students' level of readiness.
Language	Use of Diction; Clarity of Instructions	The diction used in some interactive questions is too formal. Adjust it to students' language readability level.	Simplify the choice of words (diction) in the Wordwall question text to make it more communicative without reducing the essence of the substance of the material.
Graphic	Visual Appearance; Media Interactivity	The layout of the interactive buttons and the background color combination on certain Wordwall templates slightly interfere with visual readability.	Changes Wordwall's default theme template to a high-contrast visual mode and ensures image/text layouts do not overlap.

The product revision matrix shows that expert input not only serves as technical corrections but also leads to strengthening the alignment between media design and the pedagogical principles underlying the DIGA-FAM model. Revisions to the content aspect confirm that clarity of instructions is a crucial prerequisite for implementing Differentiated Instruction, as ambiguous instructions can reduce students' accuracy in responding to tasks according to their level of readiness and needs. Regarding the language aspect, simplification of diction indicates the importance of adjusting the level of linguistic complexity to the characteristics of the target readers so that the cognitive load that arises does not originate from difficulty understanding

instructions, but rather from the process of interpreting the material being studied. Meanwhile, improvements to the graphic aspect indicate that the effectiveness of gamification media is determined not only by the presence of game elements but also by the quality of the visual design that is able to support attention focus and readability of information. Thus, the revision process undertaken reflects an effort to improve coherence between the content, language, and visual dimensions so that the developed product is not only technically feasible but also more optimal in facilitating a learning experience oriented to the needs of learners.

The novelty of this research lies in the integration of differentiated learning principles with digital game-based formative assessment, a topic rarely discussed in previous research. (Guan et al., 2024) in their systematic review demonstrated that game-based assessments are effective in measuring students' knowledge, skills, and affect, but few have linked them to instructional differentiation. This research broadens the scope by combining individual student needs, media interactivity, and instrument validity into one integrated assessment model, the DIGA-FAM. This aligns with (Minton & Bligh, 2021) suggestion that using Kahoot as a digital formative assessment can increase motivation and facilitate active engagement, but needs to be tailored to the characteristics of the learners. (Udeozor et al., 2024) also emphasized that game-based assessment frameworks should be designed to truly measure learning outcomes, not simply provide entertainment.

CONCLUSIONS

This research successfully developed and validated the DIGA-FAM (Differentiated Instruction and Game-Based Formative Assessment Model), a game-based formative assessment model that integrates the principles of Differentiated Instruction, formative assessment, and gamification through the Wordwall platform. Expert validation results showed that this model has a very high level of validity in the aspects of content (90%), language (91%), and graphics (82.5%). These findings indicate that the DIGA-FAM Model has met the eligibility criteria in terms of material substance, language clarity, and visual quality, making it suitable for use in Indonesian language learning at the high school level. Overall, the validation results prove that the developed model has a strong conceptual basis as well as adequate instruments to support the implementation of formative assessment that is able to accommodate the diversity of student characteristics in a gamified digital learning environment.

The findings of this study also provide important theoretical, methodological, and practical contributions. From a theoretical perspective, the DIGA-FAM Model enriches the study of adaptive digital assessment by offering a framework that systematically integrates differentiated learning and gamification, two approaches widely recommended in the literature but rarely implemented in an integrated manner. This model demonstrates that formative assessment can function not only as a learning evaluation tool but also as a tool that is adaptive to student needs, interactive in its implementation, and remains grounded in strong educational theory. The main advantage of this model lies in the implementation of tiered tasks tailored to students' readiness, learning processes, and learning products, thus providing a more personalized and meaningful assessment experience.

From a methodological perspective, this research produces a multidimensional validation instrument that can be used to assess the quality of game-based formative assessment models. This instrument can serve as a reference for further development research because it provides a systematic and replicable evaluation procedure in various contexts. Meanwhile, from a practical perspective, the DIGA-FAM Model offers a more inclusive and technology-enabled assessment design alternative compared to conventional formative assessment practices.

This model helps teachers overcome challenges often encountered in learning, such as diverse student abilities, limited individual feedback, and low student engagement in assessment activities.

The implications of this research include the development of learning practices and future research agendas. For teachers, the DIGA-FAM Model provides a flexible assessment design that can be applied to various types of materials and language skills, not limited to learning poetry texts, which is the focus of this research. This model also has the potential to be integrated with various Learning Management System (LMS) platforms to strengthen the implementation of formative assessment on an ongoing basis. For researchers, this validated model and instrument can serve as a foundation for further research, such as individual trials, small group trials, or field trials on a larger scale. Future research should also examine the effectiveness of the DIGA-FAM Model in improving learning outcomes, student engagement, and self-regulation skills, as well as explore the integration of new technologies, such as artificial intelligence-based adaptive assessment, to enhance the model's ability to respond to the learning needs of each student. Thus, the DIGA-FAM Model serves not only as an alternative digital assessment but also as a conceptual and practical framework that can be used as a reference in the development of differentiated, game-based formative assessment in the digital education era.

ACKNOWLEDGMENTS

The authors would like to thank the validators who assisted in assessing the validity of the developed product. We also extend our gratitude to Universitas Negeri Padang for its support through the RKAT research grant for the Beginner Lecturer Research scheme based on UNP Rector's Decree Number 350/UN35/LT/2025 and Research Contract Number 1629/UN35.15/LT/2025.

REFERENCES

Acar-Erdol, T., & Yildizli, H. (2018). Classroom Assessment Practices of Teachers in Turkey. *International Journal of Instruction*, *11*(3), 587–602. https://doi.org/https://doi.org/10.12973/iji.2018.11340a

Aust, L., Schütze, B., Hochweber, J., & Souvignier, E. (2024). Effects of formative assessment on intrinsic motivation in primary school mathematics instruction. *European Journal of Psychology of Education*, *39*(3), 2177–2200. https://doi.org/10.1007/s10212-023-00768-4

Baleni, Z. G. (2015). Online formative assessment in higher education: Its pros and cons. *The Electronic Journal of E-Learning*, *13*(4), 228–236.

Beebe, R., Vonderwell, S., & Boboc, M. (2010). Emerging patterns in transferring assessment practices from F2f to online environments. *Electronic Journal of E-Learning*, *8*(1), 1–12.

Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi delta kappan*, 92(1), 81-90. https://www.jstor.org/stable/20439383

Cadet, M. J. (2023). Application of game-based online learning platform: Kahoot a formative evaluation tool to assess learning. *Teaching and Learning in Nursing*, *18*(3), 419–422. https://doi.org/https://doi.org/10.1016/j.teln.2023.03.009

Costa Akoyt, M. (2024). Formative assessment in Timor-Leste: teachers' perception and practice. *International Journal of Educational Innovation and Research*, *3*(1), 75–85. https://doi.org/10.31949/ijeir.v3i1.72

43

Darliani, Y., & Agustina, C. F. (2019). The implementation of word wall strategy in teaching writing descriptive text. *JELA (Journal of English Language Teaching, Literature and Applied Linguistics)*, *1*(2), 61–67.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining gamification. In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments* (pp. 9–15). ACM. https://doi.org/10.1145/2181037.2181040

Deunk, M. I., Smale-Jacobse, A. E., de Boer, H., Doolaard, S., & Bosker, R. J. (2018). Effective differentiation Practices:A systematic review and meta-analysis of studies on the cognitive effects of differentiation practices in primary education. *Educational Research Review*, *24*, 31–54. https://doi.org/10.1016/j.edurev.2018.02.002

Dichev, C., & Dicheva, D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education*, *14*(1), 9. https://doi.org/https://doi.org/10.1186/s41239-017-0042-5

Grier, D., Lindt, S. F., & Miller, S. C. (2021). Formative assessment with game-based technology. *International Journal of Technology in Education and Science (IJTES)*, *5*(2), 193-202. https://doi.org/193-202. https://doi.org/10.46328/ijtes.97

Guan, X., Sun, C., Hwang, G. jen, Xue, K., & Wang, Z. (2024). Applying game-based learning in primary education: a systematic review of journal publications from 2010 to 2020. *Interactive Learning Environments*, *32*(2), 534–556. https://doi.org/10.1080/10494820.2022.2091611

Haudek, K. C., Kaplan, J. J., Knight, J., Long, T., Merrill, J., Munn, A., Nehm, R., Smith, M., & Urban-Lurain, M. (2011). Harnessing technology to improve formative assessment of student conceptions in STEM: forging a national network. *CBE—Life Sciences Education*, *10*(2), 149–155.

Hibatulloh, M. F., & Aini, N. (2024). Using podcasts as listening formative assessment materials in EFL flipped classroom instruction. *Science and Education*, *3*, 531–537.

Ilahiyati, N., Rohmah, Z., & Hamamah, H. (2023). The Implementation of Wordwall Games in Vocabulary Learning. *IJEE (Indonesian Journal of English Education)*, *10*(1), 144–159.

Indriasari, T. D., Luxton-Reilly, A., & Denny, P. (2020). Indriasari, T. D., Luxton-Reilly, A., & Denny, P. (2020). Gamification of student peer review in education: A systematic literature review. *Education and Information Technologies*, *25*(6), 5205–5234. https://doi.org/https://doi.org/10.1007/s10639-020-10228-x

Indriyani, V., Ramadhan, A., Nurjanah, A., & Helda, T. (2025). DIGA-FAM model (differentiation instruction and game-based formative assessment model): Teacher needs analysis. *Jurnal Humanitas: Katalisator Perubahan dan Inovator Pendidikan*, 11(4), 962–978. https://doi.org/10.29408/jhm.v11i4.32214

Indriyani, V., Triana, H., Haron, R., & Zakarya, Z. (2026). DIGA-FAM

model (differentiation instruction and game-based formative assessment model): students' needs analysis. E*ducenter: Jurnal Ilmiah Pendidikan*, 5(1), 39-50. https://doi.org/10.55904/educenter.v5i1.1737

Kamaluddin, K., Husna, L. A., Nurlaila, N., Amelia, A., Musthafa, I., & Elwarfali, S. H. S. (2022). Development of hots-based e-worksheets for arabic grammar course in Department of Arabic Language Education. *Ta'dib*, 25(2), 177–186. https://doi.org/10.31958/jt.v25i2.6902

Karadag, N., Yuksekdag, B. B., Akyildiz, M., & Ibileme, A. I. (2020). Assessment and evaluation in open education system: Students' opinions about open-ended question (OEQ) practice. *Turkish Online Journal of Distance Education*, *22*(1), 179–193. https://doi.org/https://doi.org/10.17718/tojde.849903

Kristiawan, M., Jumeldi, A., Ahmad, S., & Asvio, N. (2016). The implementation of affective assessment for Islamic education in High School 1 Pariangan. *Research Journal of Social Sciences*, *9*(4), 1–8. https://doi.org/https://doi.org/10.31219/OSF.IO/A76Y4

Kurniaman, O., Noviana, E., Kurniawan, K., Mulyani, E. A., Permana, D., & Sari, I. K. (2022). Development of WELIA (website linguistic intelligence assessment) for class II students of elementary school. *Ta'dib,* 25(1), 59–70. https://doi.org/10.31958/jt.v25i1.5840

Kusumawati, A. J. (2020). Redesigning face-to-face into online learning for speaking competence during COVID-19: ESP for higher education in Indonesia. *International Journal of Language Education*, *4*(2), 276–288. https://doi.org/https://doi.org/10.26858/ijole.v4i2.14745

Landers, R. N., Collmus, A. B., & Williams, H. (2019). The greatest battle is within ourselves: An experiment on the effects of competition alone on task performance. *International Journal of Human-Computer Studies*, *127*, 51–61. https://doi.org/https://doi.org/10.1016/j.ijhcs.2018.09.011

Lee, H., Feldman, A., & Beatty, I. D. (2012). Factors that affect science and mathematics teachers "initial implementation of technology-enhanced formative assessment using a classroom response system. *Journal of Science Education and Technology*, *21*(5), 523–539. https://doi.org/https://doi.org/10.1007/s10956- 011-9344-x

Lv, X., Li, L., Guo, L., He, T., & Liu, S. (2022). Game-Based Formative Assessment of Analogical Reasoning in Preschool Children: Support from the Internet of Things Technology. *Sustainability (Switzerland)*, *14*(21), 13830. https://doi.org/10.3390/su142113830

Mdlalose, N., Ramaila, S., & Ramnarain, U. (2021). Using Kahoot! As A Formative Assessment Tool in Science Teacher Education. *International Journal of Higher Education*, *11*(2), 43. https://doi.org/10.5430/ijhe.v11n2p43

Minton, M., & Bligh, B. (2021). Examining the use of Kahoot to support digital game-based formative assessments in UAE higher education. *Studies in Technology Enhanced Learning*, *1*(2), 445–462. https://doi.org/10.21428/8c225f6e.32b8666f

Ndlovu, B. B. (2025). Exploring teachers' practices when using formative

assessment in improving quality education. *Cogent Education*, *12*(1), 2451489. https://doi.org/10.1080/2331186X.2025.2451489

Njagi, M. W. (2015). The effects of differentiated instruction on students achievement in mathematics by gender in secondary schools in Meru county in Kenya. *International Journal of Education and Research*, *3*(3), 377–386.

Obery, A., Lux, N., Cornish, J., Grimberg, B. I., & Hartshorn, A. (2021). Competitive games as formative assessment in informal science learning: Improvement or hindrance? *TechTrends*, *6*(4), 454–463.

Oo, C. Z., Alonzo, D., & Asih, R. (2022). Acquisition of teacher assessment literacy by pre-service teachers: A review of practices and program designs. Issues in Educational Research. *Issues in Educational Research*, *32*(1), 352–373.

Özer Özkan, Y., & Ozkan, M. (2025). Decoding teachers' dilemma: Unveiling the real obstacles to implementing formative assessment in the classroom. *Journal of Qualitative Research in Education*, *41*, 95–118. https://doi.org/10.14689/enad.41.2062

Plomp, T., & Nieveen, N. (2013). *Educational design research*. Educational design research-Part A: An Introduction. Enschede, the Netherlands: SLO, 10–51.

Prasetyarini, A., Hikmat, M. H., & Thoyibi, M. (2021). Strategies to cope with students' Discipline problems in Senior high school. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *3*(1), 40–41. https://doi.org/https://doi.org/10.23917/ijolae.v3i1.9474

Rahman, M. H. (2015). Learning assessment in a self-learning material. *International Journal on New Trends in Education and Their Implications*, *6*(2), 95–101.

Rahmawati, A. P., & Wijayanti, P. R. (2022). Implementing joyful learning strategy using Wordwall in order to improve reading comprehension skills. *Proceedings Series on Physical & Formal Sciences*, *3*, 32–35.

Şaban, C., & Atay, D. (2023). Differentiated Instruction in Higher Education EFL Classrooms: Instructors' Perceived Practices in a Turkish Context. *Mextesol Journal*, *47*(2), 0–2.

Slamet, J., & Mukminatien, N. (2024). Developing an Online Formative Assessment Instrument for Listening Skill through LMS. *LEARN Journal: Language Education and Acquisition Research Network*, *17*(1), 188–211.

Syam, R. (2015). The effectiveness of using word wall in teaching simple present tense at the first year students of Junior High School 1 Parigi. *ETERNAL (English, Teaching, Learning, and Research Journal)*, *1*(2), 285–298.

Tanewong, S. (2019). Metacognitive pedagogical sequence for less-proficient Thai EFL listeners: A comparative investigation. *RELC Journal*, *50*(1), 86–103. https://doi.org/https://doi.org/10.1177/0033688218754942

Téllez, N. R., Villela, P. R., & Bautista, R. B. (2024). Evaluating ChatGPT-Generated Linear Algebra Formative Assessments. *International Journal of Interactive Multimedia and Artificial Intelligence*, *8*(5), 75–82. https://doi.org/10.9781/ijimai.2024.02.004

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*. Ascd.

Tsai, C.-Y., Lin, H.-S., & Liu, S.-C. (2020). The effects of pedagogical GAME model on students' PISA scientific competencies. *Journal of Computer Assisted Learning*, *36*(3), 59–369. https://doi.org/https://doi.org/10.1111/jcal.12406

Tu, M. M., Nazarudin, M. N., Noordin, Z., Tawan, A., & Watinin, N. (2020). Investigating the relationship between teacher attitude, readiness, integrity, and school-based assessment. *International Journal of Education, Psychology and Counseling*, *5*(35), 306–320.

Udeozor, C., Abegão, F. R., & Glassey, J. (2024). Measuring learning in digital games: Applying a game-based assessment framework. *British Journal of Educational Technology*, *55*(3), 957–991. https://doi.org/https://doi.org/10.1111/bjet.13407

Walton, E. (2017). Inclusive education in initial teacher education: Practical or professional knowledge? Knowledge and practice standards in South Africa View project Teacher Education for Inclusion View project. *Journal of Education*, *67*. https://www.researchgate.net/publication/318455869

Widiastuti, I. A. M. S., & Saukah, A. (2017). Formative Assessment in Efl Classroom Practices. *Bahasa Dan Seni: Jurnal Bahasa, Sastra, Seni Dan Pengajarannya*, *45*(1), 050–063. https://doi.org/10.17977/um015v45i12017p050

Zhyhadlo, O. Y. (2022). Application of digital game-based tools for formative assessment at foreign language lessons. *Information Technologies and Learning Tools*, *87*(1), 139–150. https://doi.org/10.33407/itlt.v87i1.4703