

Designing A Context-Responsive Gamified Digital English Module for Primary School Learners: An Addie-Based Development Study

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ARTICLE INFO

Article History

Received: 20 August 2026

Revised: 01 September 2026

Accepted: 21 September 2026

Keywords

ADDIE, Digital english module,
Educational gamification, Primary
education



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ABSTRACT

This study aimed to develop and evaluate a gamified digital English module for Grade 5 learners. Using the ADDIE framework, it was conducted at UPTD SDN Demangan 1 Bangkalan, East Java, Indonesia. Data were collected through needs analysis, expert assessment, classroom observation, teacher responses, and student responses. Needs analysis involved focus group discussions, interviews, and document analysis. One material/content expert assessed curriculum alignment, content accuracy, depth, language quality, presentation, and pedagogical suitability, while one media/module expert assessed visual presentation, design, navigation, interactivity, gamification, and ease of use. Expert assessments were analyzed descriptively because each domain was assessed by one expert. The material/content expert awarded 141/150 points (94.00%), while the media/module expert awarded 142/150 (94.67%). Classroom implementation reached 93.42%, teacher responses 94.00%, and student responses 93.60%. The module integrated curriculum-aligned English content with interactive activities, audio resources, challenges, points, badges, levels, and rewards. The findings provide preliminary descriptive evidence that the module was considered appropriate by the experts and was practically usable in the classroom context.

1. INTRODUCTION

English proficiency has become an increasingly important component of educational development in a digitally connected world. International evidence continues to demonstrate substantial variation in English proficiency across countries and educational contexts, indicating the importance of strengthening English learning from earlier educational stages (EF EPI, 2025). In primary education, this challenge requires learning resources that are developmentally appropriate, accessible, engaging, and aligned with curriculum objectives.

The development of digital learning resources has created opportunities to address some of these challenges. Digital learning enables teachers and students to access learning materials through multiple forms of media and supports more flexible learning interactions. Nevertheless, digital learning should not simply replace printed materials with electronic versions. It should integrate pedagogical objectives, learner characteristics, technological readiness, learning content, and teacher facilitation (Fatqurhohman, 2024). Digital competence and appropriate integration of technology are also important considerations in technology-mediated learning (Falloon, 2020).

The transition from conventional materials to digital learning resources also raises questions concerning the quality and relevance of learning modules. Digital materials need to respond to students' actual learning needs rather than merely reproduce existing textbook content. Sabat et al., (2024), for example, emphasize the importance of examining whether learning modules meet students' needs in the context of digital English learning. Such considerations indicate that the development of digital English materials should begin with contextual analysis of learners, teachers, curriculum requirements, existing materials, and technological conditions.

One approach that has attracted increasing attention in digital education is gamification, particularly in language learning contexts. Gamification refers to the purposeful integration of game-related elements, such as points, badges, levels, challenges, rewards, and immediate feedback, into non-game learning environments to support specific instructional and motivational objectives. In the present study, gamification was not treated as a decorative or independent feature but was integrated into the instructional architecture of the digital English module and linked to specific learning activities and progression conditions.

This design was informed by Self-Determination Theory (SDT), which emphasizes autonomy, competence, and relatedness as fundamental psychological needs underlying motivation. Within the developed module, challenges and task choices were intended to provide opportunities for autonomy, progressive levels and immediate feedback were designed to support perceived competence, while interactive learning activities provided opportunities for participation and social interaction. However, these theoretical relationships represent design rationales rather than evidence of causal motivational effects because the present study assessed students' perceptions of the module rather than longitudinal changes in motivation.

The design was also informed by Cognitive Load Theory (CLT), particularly the need to minimize unnecessary extraneous processing while maintaining sufficient task complexity for meaningful language learning. Gamified digital environments can increase extraneous cognitive load when excessive visual elements, unnecessary game mechanics, dense interfaces, or poorly integrated multimedia information compete for learners' limited working-memory resources. Therefore, the module was designed to avoid unnecessary visual clutter and excessive game mechanics by organizing learning content and interactive tasks into manageable stages, providing concise task-

specific instructions, segmenting multimedia and audio resources, and connecting each game element directly to an identifiable instructional purpose.

These decisions were consistent with Mayer's multimedia learning principles, particularly coherence, signaling, spatial and temporal contiguity, and segmenting (Mishra, 2025). The module was designed so that related instructions, learning materials, and task requirements were presented in closely connected interface locations. This arrangement was intended to reduce unnecessary visual search and potential split-attention effects. Visual elements were selected according to their instructional relevance rather than simply increasing visual stimulation. Audio resources were also incorporated for specific English learning purposes, particularly vocabulary, pronunciation, listening, and speaking activities.

The module incorporated five primary game elements: points, badges, levels, challenges, and rewards. Each element was assigned an instructional function. Points represented achievement in learning tasks, badges recognized specific accomplishments, levels represented progression through learning activities, challenges provided structured opportunities for language practice, and rewards recognized completion or achievement. The design therefore treated gamification as part of the learning sequence rather than as an additional layer of visual decoration.

In second-language learning, interactive audio, task-based challenges, immediate feedback, and multimodal activities may provide additional opportunities for learners to process language through listening, reading, speaking, and writing. However, the present study does not claim that these features directly reduce anxiety, increase motivation, or improve language achievement because such outcomes require validated psychological, behavioral, and achievement measures. The pedagogical value of gamification therefore depends not simply on the number of game elements included but on how these elements are functionally integrated with curriculum objectives, learner needs, instructional activities, and cognitive-load considerations (Tobondo & Rano Putra, 2021; Utami et al., 2025).

Research in primary education has increasingly examined gamification as an instructional strategy. Nooviar et al., (2024) describe gamification as an instructional innovation that can support student activity in elementary education. Tobondo & Rano Putra, (2021) identify both potential benefits and challenges associated with educational gamification. These findings suggest that gamification should not be understood simply as the addition of games to classroom activities. Its implementation requires careful consideration of instructional objectives, learner characteristics, and classroom conditions.

The relevance of gamification is also evident in English language education. Budiarta, (2024) positions gamification as a technological innovation for English learning in primary school contexts. Digital gamification can potentially provide interactive opportunities in which students engage with learning tasks while receiving information about their progress. Holovatenko, (2026) similarly discusses digital gamification in language teaching and emphasizes the importance of contextual and teacher-related considerations.

Recent research has also connected gamification with broader instructional frameworks. Baltabayeva et al., (2026), for example, examined the combination of gamification and Bloom's taxonomy through the BilimQuest portal. Dewi et al., (2026) investigated escape-room-based gamification for problem-solving skills among elementary students in STEM education. Although

these studies differ in subject matter and design, they demonstrate the potential of using gameful structures to organize learning activities around purposeful challenges and cognitive objectives.

The development of a gamified learning resource therefore requires an instructional design framework that systematically connects learning needs, objectives, content, activities, technology, implementation, and evaluation. The ADDIE framework provides a structured development process through the stages of Analysis, Design, Development, Implementation, and Evaluation (Molenda, 2013)(Molenda, 2013). In this study, ADDIE was used to translate contextual needs into a curriculum-aligned digital English learning product.

Despite the growing literature on gamification and digital learning, an important gap remains. Much previous work has investigated gamification as a strategy, digital application, or particular game-based activity. Other studies have focused on digital learning materials without systematically embedding gamification into the instructional architecture. There remains a need for development research that brings together contextual needs analysis, curriculum alignment, digital English content, gamification, expert assessment, classroom implementation, teacher usability, and student usability within a single instructional product.

This gap is particularly relevant to primary English education. A gamified digital module should not merely provide an attractive interface. It should connect game elements with specific learning activities and achievement conditions. Points should correspond to meaningful learning tasks, levels should represent learning progression, challenges should provide opportunities for language practice, and rewards should reinforce legitimate learning achievements.

The present study addresses this gap through the development of a gamified digital English module for Grade 5 students at UPTD SDN Demangan 1 Bangkalan. The initial needs analysis indicated that teachers had limited experience using digital learning materials, while existing English materials lacked integrated gamification features. Students had access to smartphones, and the school provided supporting technological infrastructure. However, classroom learning remained substantially dependent on conventional materials and teacher-led assessment.

The novelty of this study lies in the development of a context-responsive gamification architecture embedded within a curriculum-aligned digital English module for primary school learners. The study does not treat gamification as a separate intervention added after the learning material has been developed. Instead, gamification is integrated into the instructional structure from the design stage.

Accordingly, this study aimed to develop and evaluate a gamified digital English module for Grade 5 primary school learners. The study addressed three research questions:

1. What instructional, learner, teacher, curriculum, and technological needs should inform the development of a gamified digital English module for Grade 5 primary school learners?
2. How do the participating material/content and media/module experts assess the respective components of the developed digital English module?
3. How do teachers and students perceive the practicality, usability, interactive features, and gamification features of the developed module during the pilot implementation?

2. METHODS

Research design

This study employed a research and development design using the ADDIE framework, which comprises five interconnected stages: Analysis, Design, Development, Implementation, and Evaluation. ADDIE was selected because it provides a systematic framework for developing, reviewing, implementing, and refining instructional products.

During the Analysis stage, information regarding learner characteristics, learning needs, curriculum requirements, technological conditions, teacher needs, existing instructional materials, and classroom practices was collected. The output was a set of instructional and development requirements.

The Design stage translated these requirements into learning objectives, content structure, learning activities, assessment procedures, multimedia components, interface specifications, and gamification architecture. The resulting design served as the blueprint for prototype development.

During the Development stage, the prototype was produced and reviewed separately by one material/content expert and one media/module expert. The material/content expert assessed only the content-related component, while the media/module expert assessed only the media/module component. The experts were not treated as a common panel because they assessed different domains according to their respective expertise.

Before completing the assessment rubric, each expert received an explanation of the purpose of the review, target learners, Grade 5 English learning objectives, module characteristics, and operational definitions of the assessment domains. The material/content expert assessed curriculum alignment, content accuracy, content depth, language quality, presentation, and pedagogical suitability. The media/module expert assessed visual presentation, module design, navigation, interactivity, gamification, and ease of use.

Curriculum alignment referred to the consistency between the module content, learning activities, assessment tasks, and intended Grade 5 English learning objectives. Content accuracy referred to the correctness of vocabulary, expressions, grammatical forms, examples, and learning information. Content depth referred to the adequacy of the material for the targeted learner level and intended learning outcomes. Language quality referred to clarity, readability, appropriateness, and age suitability. Presentation referred to the logical organization and sequencing of learning content. Pedagogical suitability referred to the extent to which activities, practice, feedback, and assessment supported the intended learning objectives.

For the media/module assessment, visual presentation referred to the clarity, readability, consistency, and appropriateness of visual elements. Module design referred to the organization and consistency of the digital learning environment. Navigation referred to the clarity and ease of movement between learning sections and activities. Interactivity referred to meaningful opportunities for students to interact with content and learning tasks. Gamification referred to the functional integration of points, badges, levels, challenges, and rewards with instructional activities. Ease of use referred to the extent to which the module could be accessed and operated without unnecessary procedural difficulty.

The experts independently completed their respective rubrics and provided qualitative comments and recommendations. These comments were used as formative evidence for revising the module before classroom implementation.

The Implementation stage involved limited classroom use of the revised module with Grade 5 students and participating teachers. The Evaluation stage integrated evidence from expert assessment, classroom implementation, teacher responses, and student responses to identify remaining weaknesses and assess the preliminary practicality and usability of the product.

Research Setting and Subject

The study was conducted at UPTD SDN Demangan 1 Bangkalan, East Java, Indonesia, as a localized pilot study for the development of a digital English learning module. Participants consisted of 34 Grade 5-B students, comprising 16 female and 18 male students, and two English teachers who participated in implementation and evaluation.

The school was selected purposively because it represented the contextual conditions addressed by the development study. Students had access to smartphones, and the school had supporting digital infrastructure. Teachers required practical digital learning resources that could be integrated into classroom English instruction.

The study did not seek population-level generalization. It focused on preliminary product development, descriptive expert assessment, classroom implementation, and user perceptions within the selected instructional context.

Data Collection Technique

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Expert Assessment Instruments

The expert assessment instruments were developed according to the different purposes of content and media review. The material/content instrument consisted of six dimensions: material alignment, material accuracy, material depth, language, presentation, and pedagogy. Each dimension contained five assessment items, resulting in 30 items with a maximum score of 150.

The media/module instrument also consisted of six dimensions: visual presentation, module design, navigation, interactivity, gamification, and ease of use. Each dimension contained five assessment items, resulting in 30 items with a maximum score of 150.

The rubrics used a five-point rating scale. In addition to numerical ratings, the experts were asked to provide qualitative comments to identify content, language, interface, navigation, multimedia, and instructional issues requiring revision.

Because one expert assessed the material/content domain and another expert assessed the media/module domain, the assessment was treated as two separate expert judgments rather than as a multi-rater validation panel.

Data Analysis Technique

Quantitative data were analyzed descriptively. Expert assessment scores were calculated by comparing the obtained score with the maximum possible score:

$$P = (f/N) \times 100$$

where P represents the percentage score, f represents the obtained score, and N represents the maximum possible score.

The material/content expert score and media/module expert score were interpreted as descriptive assessments of the respective product components.

I-CVI and S-CVI/Ave were not calculated because each component was assessed by only one expert. These indices require multiple independent expert ratings of the same items or constructs. Similarly, Fleiss' Kappa was not calculated because the classroom implementation data did not involve three or more independent raters assessing the same categorical observations. Therefore, the classroom implementation score was treated as a descriptive implementation percentage rather than as an inter-rater reliability coefficient.

Teacher and student questionnaire responses were also analyzed descriptively. The student score concerning gamification and motivation was interpreted as a perception of the learning experience and the perceived motivational characteristics of the module. It was not interpreted as evidence of increased motivation.

Cronbach's alpha was not reported because the study did not conduct a separate psychometric reliability study of the questionnaires and the available dataset was designed primarily for descriptive product evaluation. Consequently, no claims concerning internal consistency or measurement reliability were made.

Ethical and Interpretive Considerations

The study was conducted as an educational product-development activity within the participating school. Participation involved classroom learning activities and responses concerning the developed module. The findings were interpreted within the scope of the participating school, teachers, and students.

The study was not designed to establish causal effects on English achievement, motivation, engagement, or retention. Such effects require controlled or longitudinal designs and validated outcome measures.

3. RESULTS

Need Analysis

The analysis phase identified several instructional and technological requirements. Teachers reported limited experience using digital learning materials and expressed a need for resources that were practical, attractive, interactive, innovative, and easy to implement. Existing English learning resources contained instructional content but did not systematically integrate gamification.

Students had access to smartphones, while the school had supporting internet and presentation infrastructure. These conditions indicated that a digital module was technically feasible. However, the module needed to be designed around the actual learning environment rather than simply transferring printed materials into digital form.

The findings supported the development of a digital learning module that integrated curriculum-aligned English content, interactive tasks, multimedia resources, and gameful learning elements.

Table 1. Robust core operational complements

Need	Finding	Design implication
Digital learning materials	Teachers had limited experience	Provide simple and practical digital learning support
English content	Existing materials lacked integrated gamification	Integrate curriculum-aligned content with gameful activities
Learner characteristics	Students had access to smartphones	Develop mobile-accessible activities
Learning engagement	Teachers identified a need for greater activity	Use challenges and interactive tasks
Teacher needs	Teachers required practical resources	Provide structured instructional guidance
Technology readiness	Basic digital infrastructure was available	Utilize existing technological resources
Assessment	Conventional assessment dominated	Include interactive practice and feedback

Gamified Module Design

The module was designed around curriculum-aligned Grade 5 English content and incorporated interactive learning activities. Gamification was embedded through five main elements: points, badges, levels, challenges, and rewards.

Each game element was assigned a specific instructional function. Points represented achievement in learning tasks. Badges recognized specific accomplishments. Levels represented progression through learning activities. Challenges provided opportunities for structured English practice. Rewards recognized completion and achievement.

The module also incorporated audio resources to support vocabulary, pronunciation, listening, and speaking activities. Interactive activities were organized into manageable learning stages, and instructions were kept concise to support navigation and reduce unnecessary cognitive processing.

The module therefore positioned gamification as an integrated component of the instructional sequence rather than as an independent entertainment feature.

Expert Assessment of Material and Content

The material/content expert awarded 141 out of 150 possible points, corresponding to 94.00%.

Table 2. Material/Content Expert Assessment

Dimension	Score	Maximum	Percentage
Material alignment	24	25	96.00%
Material accuracy	23	25	92.00%
Material depth	23	25	92.00%
Language	24	25	96.00%
Presentation	23	25	92.00%
Pedagogy	24	25	96.00%
Total	141	150	94.00%

The highest scores were obtained for material alignment, language, and pedagogy, each at 96.00%. Material accuracy, material depth, and presentation each received 92.00%. These results indicate that the participating content expert provided favorable ratings across the assessed material dimensions.

Because only one expert assessed the material/content component, the 94.00% score represents an individual expert judgment. It does not represent inter-rater agreement or multi-expert consensus.

Expert Assessment of Media and Module

The media/module expert awarded 142 out of 150 possible points, corresponding to 94.67%.

Table 3. Media/Module Expert Assessment

Dimension	Score	Maximum	Percentage
Visual presentation	23	25	92.00%
Module design	24	25	96.00%
Navigation	23	25	92.00%
Interactivity	24	25	96.00%
Gamification	24	25	96.00%
Ease of use	24	25	96.00%
Total	142	150	94.67%

The media/module expert awarded the highest ratings to module design, interactivity, gamification, and ease of use, each at 96.00%. Visual presentation and navigation received 92.00%.

These results indicate favorable descriptive judgments concerning the media and module characteristics assessed by the participating media expert. Because the assessment was conducted by one media expert, the result does not establish multi-rater agreement.

Product Revision

The expert review generated several revisions to improve the content, language, navigation, multimedia resources, and relationship between gamification and learning objectives.

Table 4. Revisions Based on Expert Feedback

Expert feedback	Identified problem	Revision undertaken	Rationale
Learning materials should align more closely with Grade 5/Fase C English objectives	Some activities were not sufficiently explicit in their alignment	Content, examples, and activities were adjusted to the intended learning objectives	Strengthen curriculum and instructional alignment
Language should be simplified	Some instructions were relatively complex	Instructions were rewritten using shorter sentences and familiar vocabulary	Improve readability for Grade 5 learners
Navigation should be clearer	Students could require additional guidance	Navigation labels and directions were clarified	Reduce navigation difficulty
Multimedia resources should be strengthened	Some sections had limited multimedia integration	Relevant audio and interactive resources were added or refined	Strengthen English learning support
Gamification should remain relevant to learning objectives	Some game features required clearer instructional connections	Game-based activities were revised to connect directly with learning tasks	Ensure gamification serves instructional purposes

The revisions were not limited to technical corrections. They also addressed the alignment among learning objectives, content, activities, navigation, multimedia, and gamification.

Classroom Implementation

Classroom implementation was assessed through direct observation of learning activities. The observation instrument covered preliminary activities, core learning activities, navigation and student engagement with gamification, closing activities, and evaluation.

Table 5. Classroom Implementation Observation

No.	Observed aspect	Score	Maximum	Percentage
1	Preliminary activities, including stating the learning objectives, introducing the digital learning module, and explaining the rules and mechanisms of gamification	15	16	93.75%
2	Core activities, including guiding students in using the digital module, assisting students during learning activities and exercises, facilitating interaction with digital features and gamification elements, and guiding students through challenges or games integrated with the English learning materials	30	32	93.75%
3	Navigation and student engagement in gamification activities	8	8	100.00%
4	Closing activities, including summarizing the learning materials, providing feedback, and allowing students to conduct individual reflection using the module	14	16	87.50%
5	Evaluation activities	4	4	100.00%
Total		71	76	93.42%

The preliminary and core activities each reached 93.75%. Navigation and student engagement with gamification and evaluation activities each reached 100.00%. Closing activities received 87.50%, which was the lowest percentage.

The overall implementation score of 93.42% indicates that most of the planned learning procedures were observed during the classroom implementation. However, this percentage represents implementation fidelity within the observed session. It does not represent inter-rater reliability or evidence of causal effectiveness.

Teacher Response

The two participating teachers awarded a total score of 94 out of 100, corresponding to 94.00%.

Table 6. Teacher Response to Module Practicality

Dimension	Percentage
Ease of use	95.00%
Clarity of instructions	95.00%
Visual attractiveness	90.00%
Instructional usefulness	95.00%
Efficiency	95.00%
Overall	94.00%

The teacher responses indicate favorable perceptions concerning the practicality of the module in the observed instructional context. Nevertheless, only two teachers participated, so these results should be interpreted as local user perceptions rather than representative evidence concerning teachers more broadly.

Student Response

The 34 participating students provided a total score of 2,808 out of 3,000, corresponding to 93.60%.

Table 7. Student Response to the Gamified Digital Module

Dimension	Percentage
Ease of use	94.00%
Visuals and materials	92.67%
Interactive activities	93.83%
Gamification and motivation	94.17%
Learning usefulness	93.33%
Overall	93.60%

The highest score was obtained for gamification and motivation at 94.17%, followed by interactive activities at 93.83%. These results indicate favorable student perceptions across the assessed dimensions.

The 94.17% score should not be interpreted as evidence that students' motivation increased. It represents students' perceptions of the gamification and motivational characteristics of the module. Demonstrating changes in motivation would require validated motivation measures administered at multiple time points.

Overall Descriptive Evaluation

Table 8. Summary of Product Evaluation

Evaluation component	Score	Percentage	Interpretation
Material/content expert assessment	141/150	94.00%	Favorable
Media/module expert assessment	142/150	94.67%	Favorable
Classroom implementation	71/76	93.42%	Favorable implementation
Teacher response	94/100	94.00%	Favorable practicality perception
Student response	2,808/3,000	93.60%	Favorable user perception

The results provide complementary descriptive information from expert assessment, classroom observation, teachers, and students. However, the evidence should not be interpreted as statistical convergence or multi-rater validation because the expert assessments were conducted independently by one material/content expert and one media/module expert.

4. DISCUSSION

The findings provide preliminary descriptive evidence concerning the development of a context-responsive gamified digital English module in three main areas: contextual suitability, expert assessment, and practical implementation.

First, the needs analysis provided a contextual basis for designing the module. Teachers reported limited experience with digital learning materials, while students had access to

smartphones and the school had basic technological infrastructure. Existing English materials did not systematically integrate gamification. These conditions informed the decision to develop a digital module that combined curriculum-aligned English content, interactive activities, multimedia resources, and gameful progression.

This approach is consistent with systematic instructional design principles associated with ADDIE (Molenda, 2013). The analysis stage identified contextual needs before the selection of digital features. The design stage then translated those needs into learning objectives, content, activities, interface features, and gamification architecture. The resulting development process therefore positioned technology as a component of instructional design rather than as the primary starting point.

Second, the expert assessment results provide preliminary descriptive evidence concerning the perceived quality of the product. The material/content expert awarded 94.00%, while the media/module expert awarded 94.67%. These scores indicate favorable individual judgments within the respective domains. However, because each domain was assessed by only one expert, the findings cannot establish agreement among experts or generalized content validity.

This distinction is important. Content validity is strengthened when expert judgments are collected systematically and when multiple experts independently evaluate the same content domain. Indices such as CVI can quantify agreement when sufficient independent ratings are available. In the present study, however, the material and media experts assessed different domains. Consequently, the appropriate interpretation is descriptive expert judgment rather than statistical evidence of inter-rater consensus.

The qualitative feedback from the experts also played an important role in product development. The revisions addressed curriculum alignment, language complexity, navigation, multimedia integration, and the instructional relevance of gamification. This formative use of expert judgment is consistent with development research in which expert review is used not only to assign scores but also to identify weaknesses and improve the prototype before implementation. Similar ADDIE-based expert-review studies have used expert judgments and recommendations as a basis for revising educational products before subsequent testing.

Gamification and Instructional Function

The module's gamification architecture consisted of points, badges, levels, challenges, and rewards. These elements were not included merely to increase the attractiveness of the interface. Each element was assigned an instructional function.

Points represented achievement in learning tasks. Badges recognized specific accomplishments. Levels represented progression. Challenges provided structured opportunities for English practice. Rewards recognized completion and achievement. This differentiation is important because gamification is not a single homogeneous mechanism. Different game elements can provide different forms of feedback, progression, recognition, and task structure.

The present module also avoided making competition the central mechanism. No leaderboard-based ranking was used as the main progression structure. Instead, the module emphasized individual progression and completion of learning activities. This design decision was intended to keep gamification subordinate to the learning objectives.

The findings are consistent with previous literature that conceptualizes gamification as the strategic integration of game elements into educational activities rather than simply adding games

to instruction (Tobondo & Rano Putra, 2021; Utami et al., 2025). Recent studies have also explored connections between gamification and structured learning objectives, including Bloom's taxonomy and challenge-based learning (Baltabayeva et al., 2026; Dewi et al., 2026).

Cognitive Load and Multimedia Design

An important contribution of the development process concerns the relationship between gamification and cognitive load. Gamification can increase the number of visual, interactive, and procedural elements that learners encounter. If these elements are presented without clear instructional organization, they may create unnecessary extraneous processing.

The present module addressed this issue through segmented learning activities, concise instructions, task-specific interface features, and functional rather than decorative game elements. The multimedia resources were also connected to English learning purposes such as vocabulary, pronunciation, listening, and speaking.

The design was informed by Mayer's multimedia learning principles, particularly coherence, signaling, spatial and temporal contiguity, and segmenting (Mishra, 2025). Related information was organized in closely connected interface locations to reduce unnecessary attention shifts. Unnecessary visual decoration was minimized, while visual cues were used to support navigation and identification of learning tasks.

These design decisions provide a theoretical rationale for managing cognitive load. However, the study did not directly measure intrinsic, germane, or extraneous cognitive load. Therefore, the favorable user responses cannot be interpreted as direct evidence that the module reduced cognitive load. Future research should include validated cognitive-load measures to examine this relationship empirically.

Students' Perceptions of Gamification and Motivation

Students assigned 94.17% to the gamification and motivation dimension. This result indicates a favorable perception of the gamified learning experience. It is consistent with previous studies describing gamification as a potential strategy for supporting student activity and motivation (Nooviar et al., 2024; Yuyu Suryani et al., 2025).

Nevertheless, the distinction between perceived motivation and measured motivational change is important. The questionnaire captured students' perceptions after using the module. It did not establish whether motivation increased compared with students' previous learning conditions. It also did not determine whether the reported response would remain stable after repeated exposure.

Therefore, the present finding should be interpreted as evidence that students responded favorably to the gamification and motivational features of the module. It should not be interpreted as evidence of causal improvement in motivation or engagement.

Novelty Effect and Sustainability

The favorable student response should also be interpreted in relation to the possible novelty effect associated with a newly introduced digital learning resource. Students may respond positively to an unfamiliar interface, new interaction patterns, and game mechanics because these features differ from their previous learning experiences. Such an initial response does not necessarily demonstrate that the same level of engagement or motivation will be maintained over time.

The present study cannot determine whether the favorable responses represent stable motivational patterns because the implementation was limited and did not include repeated

measurements across an extended period. Future research should therefore examine student responses at multiple time points.

A four-week period can serve as a practical early benchmark for repeated measurement, but it should not be treated as a universal threshold at which novelty effects necessarily decline. Longitudinal evidence suggests that motivational responses to gamification can develop in different patterns over time rather than following one uniform trajectory. Therefore, future research should use repeated measures across and beyond four weeks to determine whether initial positive perceptions remain stable.

Teacher Practicality

The two participating teachers provided an overall response of 94.00%. The result suggests that the teachers perceived the module as practical in the observed classroom context. Ease of use, clarity of instructions, instructional usefulness, and efficiency received particularly favorable responses.

Teacher practicality is important because digital learning resources require teacher facilitation. A technically sophisticated module may have limited classroom value if teachers perceive it as difficult to operate or difficult to integrate into instructional routines. The present module addressed this issue by providing structured learning sequences and clear navigation.

However, only two teachers participated. Therefore, the result represents the perceptions of the participating teachers and should not be generalized to the wider population of primary English teachers.

Classroom Implementation

The classroom implementation score reached 93.42%. The highest implementation percentages occurred in navigation and student engagement with gamification and evaluation activities, each at 100.00%. The lowest score occurred in closing activities at 87.50%.

The result suggests that most planned activities could be implemented during the observed classroom session. This finding provides preliminary evidence of operational feasibility. It does not, however, establish effectiveness. The observation measured whether planned activities were implemented, not whether the module caused improvements in learning outcomes.

Because the implementation data were not generated by three or more independent raters, Fleiss' Kappa was not calculated. The 93.42% value therefore represents implementation performance rather than inter-rater agreement.

Practical Contribution

The study contributes a context-responsive model for integrating gamification into a complete digital English module. Rather than treating gamification as an additional tool, the development process embedded game mechanics into curriculum-aligned learning activities.

The resulting product can be understood as an integrated system consisting of four components: instructional content, digital interaction, gameful progression, and assessment feedback. This approach extends previous work that focuses primarily on individual gamification tools by demonstrating how multiple game elements can be organized within a complete digital English learning resource.

The contribution should nevertheless be interpreted within the scope of a localized development study. The findings provide preliminary evidence concerning expert assessment,

classroom implementation, teacher perception, and student perception. They do not establish causal effectiveness or population-level generalization.

Limitations

Several limitations should be considered when interpreting the findings. First, the study was conducted in one primary school with 34 Grade 5 students and two participating teachers. The findings therefore represent a localized development context and cannot be generalized directly to other schools or educational settings.

Second, expert assessment involved one material/content expert and one media/module expert. Each expert assessed a different domain according to their area of expertise. Consequently, the expert scores represent individual expert judgments rather than multi-rater consensus. I-CVI, S-CVI/Ave, and inter-rater agreement statistics were therefore not calculated.

Third, the analysis relied primarily on descriptive percentage scores. These scores provide preliminary information concerning perceived product quality, implementation, practicality, and user response but cannot establish statistical significance or causal effectiveness.

Fourth, reliability coefficients for the questionnaires and observation instrument were not estimated. The instruments were used for descriptive product evaluation rather than for a separate psychometric validation study.

Fifth, student motivation was assessed through questionnaire responses concerning the gamification and motivational features of the module. The measure therefore represents student perception rather than longitudinal or behavioral evidence of motivational change.

Sixth, the study did not directly measure cognitive load. The discussion of Cognitive Load Theory therefore represents a design rationale rather than direct empirical evidence that the module reduced extraneous cognitive load.

Seventh, the implementation period was insufficient to determine whether favorable student perceptions would remain stable after prolonged exposure to the module. The possibility of a novelty effect cannot be excluded.

Future research should therefore employ multiple experts for content and media assessment, larger and more diverse samples, validated psychometric instruments, repeated measurements, and controlled comparison conditions. Longitudinal research should collect data at multiple time points across and beyond four weeks to examine the stability of student perceptions, engagement, and motivation.

5. CONCLUSION

This study developed a context-responsive gamified digital English module for Grade 5 primary school learners using the ADDIE framework. The development process began with an analysis of learner, teacher, curriculum, instructional, and technological needs and translated these findings into a digital learning resource integrating English content, interactive activities, audio resources, challenges, points, badges, levels, and rewards.

The material/content expert awarded 141 of 150 points, corresponding to 94.00%, while the media/module expert awarded 142 of 150 points, corresponding to 94.67%. Classroom implementation reached 93.42%, teacher responses reached 94.00%, and student responses reached 93.60%. These results provide preliminary descriptive evidence that the developed module was

favorably assessed within the participating context and could be implemented in the observed classroom setting.

The primary contribution of the study lies in integrating gamification into the instructional architecture of a curriculum-aligned digital English module. Points, badges, levels, challenges, and rewards were connected to learning progression rather than presented as independent entertainment features. The development also incorporated multimedia and cognitive-load considerations by using concise instructions, segmented learning activities, functional visual elements, and task-specific multimedia resources.

The findings should not be interpreted as evidence that the module causes improvements in English achievement, motivation, engagement, or retention. The expert scores represent individual judgments from one material/content expert and one media/module expert, while the student and teacher results represent perceptions of the participating users. The classroom implementation percentage represents observed implementation and not inter-rater reliability.

Future research should involve multiple independent experts, larger samples, validated measurement instruments, repeated longitudinal measurements, and comparative research designs. A follow-up period beginning within the first four weeks and extending beyond this initial period would provide useful evidence concerning the stability of students' perceptions and engagement. Quasi-experimental studies should also examine English achievement, motivation, engagement, cognitive load, and retention using validated measures and appropriate effect-size estimates. Such research would extend the present development study from preliminary product assessment toward stronger evidence of sustained educational effectiveness.

Acknowledgement

The researchers express their deepest gratitude and appreciation to the Ministry of Education, Culture, Research, and Technology for the research funding provided through the 2026 budget. This funding has played a crucial role in ensuring the smooth implementation of this research, from the planning stage and data collection to the preparation of the final report. Without this support, this research would not have been able to be carried out optimally.

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