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Balancing Student Engagement and Learning Outcomes: A Game-Based Arabic Language Evaluation Using Blooket at the Upper Elementary Level

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Abstract

Game-based learning platforms such as Blooket are increasingly utilized to enhance student engagement in language education. However, concerns remain that entertainment-oriented features may overshadow substantive content comprehension. This study investigates the implementation of Blooket as an interactive evaluation tool in Arabic language learning at the upper elementary level at Brainy Bunch International Islamic School Cyberjaya, Malaysia. A descriptive qualitative approach was employed, involving one month of participant observation, semi-structured interviews with four informants (teacher, vice principal, student, and practicum student), and documentation of quiz results and classroom activities.The findings indicate that Blooket was implemented across pre-, during-, and post-learning phases, successfully increasing student motivation and participation, as evidenced by high levels of active engagement both individually and collaboratively. However, a significant engagement–comprehension gap emerged: approximately 70% of students prioritized response speed over conceptual understanding, driven primarily by extrinsic motivators such as points and leaderboards. Additionally, technical constraints—including unstable internet connectivity, limited device availability, and login delays—contributed to unequal participation. Teacher facilitation, particularly through post-quiz reflection and differentiated grouping, was identified as the most critical factor in promoting meaningful learning outcomes; however, such pedagogical follow-up was not optimally implemented. The study concludes that while Blooket effectively enhances participatory engagement, it does not inherently improve substantive comprehension without intentional pedagogical scaffolding. Recommended optimization strategies include ensuring technical readiness, designing conceptually rigorous questions, facilitating structured error discussion, and utilizing quiz data for targeted instruction. These findings contribute to game-based learning theory and provide practical implications for educators seeking to balance engagement and academic rigor in digital language assessment.

Keywords: Blooket; game based learning; Arabic language education; student engagement; formative assessment; international Islamic school.

1. Introduction

The teaching of Arabic as a foreign language at the elementary level continues to face serious challenges related to student motivation, sustained attention, and meaningful learning outcomes. Arabic is often perceived as difficult due to its diglossic nature, complex morphological system, and grammatical structures that differ substantially from students' native languages (Almelhes, 2024). In international school settings where English serves as the primary medium of instruction, students receive limited exposure to Arabic outside the classroom, making conventional lecture-based and rote memorisation methods ineffective at maintaining engagement. As a result, many learners become easily bored, lose focus, and fail to achieve the intended communicative competencies (Cahyani & Nafi, 2024). This problem is particularly acute at the upper elementary level, where learners are expected to transition from basic vocabulary recognition to more complex grammatical understanding, including the correct use of demonstrative pronouns (*isim isyarah*) and noun-adjective agreement.

In response to these challenges, digital game-based learning (GBL) has emerged as a promising pedagogical innovation. Gamification elements (such as points, leaderboards, badges, and real-time feedback) are known to increase student engagement, foster positive emotional responses, and encourage active participation (Fodale, 2025; Jaramillo-Mediavilla et al., 2024). A recent meta-analysis reported a large positive effect of gamification on learning outcomes, though the effect depends heavily on thoughtful instructional design (Fodale, 2025; Sigala, 2015). Similarly, systematic reviews confirm that GBL significantly enhances motivation and engagement in K-12 settings, but effectiveness is contingent on careful alignment with curriculum objectives (Jun & Lucas, 2025; Mora et al., 2017). One widely used platform is Blooket, an interactive gamified response system that allows teachers to create or customise quizzes and students to compete in various game modes. Several studies have demonstrated Blooket's positive impact on vocabulary mastery and student participation in English as a Foreign Language (EFL) contexts (Sinaga et al., 2025; Zakaria & Zakaria, 2025). This is consistent with the statement of Adzkia, a practicum student at Brainy Bunch, who noted that the use of Blooket helps students become more active, as evidenced by an improvement in their understanding of the material compared to using conventional methods alone.

Nevertheless, a growing body of evidence suggests that increased engagement does not automatically translate into deeper learning. Students may become absorbed in the competitive and entertaining aspects of gamified platforms, such as racing to answer quickly, accumulating points, and climbing leaderboards, without genuinely internalising the content being assessed. Quyen and Nguyen (2025) found that while Vietnamese non-English major students valued Blooket for enhancing engagement and motivation, they expressed significant concerns about its limited ability to reinforce knowledge and its varying effectiveness across different learning contexts. Likewise, a systematic literature review on digital game-based learning in language education concluded that there remains a pressing need to integrate specific curriculum goals into game mechanics to improve learning retention and achievement (The Nguyen et al., 2025; Zakaria & Zakaria, 2025). In the context of Arabic language learning, preliminary studies have shown that gamification improves motivation and vocabulary acquisition among university students (Almelhes, 2024; A. Fatoni et al., 2024), but they have not systematically examined the potential disconnect between engagement and conceptual understanding, especially at the elementary level. In the researcher's initial observation, many students were more attracted to the entertainment aspects of Blooket, leading to the impression that its implementation at Brainy Bunch functioned merely as a form of entertainment.

This study focuses on the implementation of Blooket as a formative evaluation medium for Arabic language learning at the upper elementary level (grades 4–6) at Brainy Bunch International Islamic School Cyberjaya, Malaysia. Brainy Bunch operates an internationally-

oriented curriculum that integrates Montessori pedagogical principles with Islamic values, providing a distinctive educational context where self-directed learning, visual structuring of materials, and student-paced progress are central to classroom practice. The Arabic content under investigation comprises *isim isyarah* (demonstrative pronouns)—specifically *haza, hazihi, zalika*, and *tilka*—a foundational grammatical concept requiring learners to distinguish between masculine and feminine nouns and apply correct demonstratives in context. The research object is examined through three interconnected dimensions: (a) the implementation process of Blooket across pre-, during-, and post-learning phases; (b) the pedagogical, technical, and social factors that influence whether students focus on substantive content versus superficial competition; and (c) the strategic adaptations that teachers can employ to align gamified evaluation with genuine learning outcomes.

A review of the existing literature reveals three notable gaps. First, most studies on Blooket and similar gamified platforms have been conducted in EFL or general science contexts, with comparatively little attention to Arabic language learning at the elementary level. While studies on Arabic gamification exist (Almelhes, 2024; A. Fatoni et al., 2024; M. H. Fatoni, 2024), they have predominantly focused on university students or adult learners, leaving a gap in understanding how gamified evaluation functions in upper elementary Arabic classrooms. Second, the majority of empirical studies have employed quantitative quasi-experimental designs measuring pre- and post-test score improvements. While these designs effectively demonstrate whether gamification works, they offer limited insight into how and why it works—or fails to work—in authentic classroom conditions. Qualitative investigations into the pedagogical, technical, and social dynamics that mediate the relationship between gamified engagement and substantive learning remain underrepresented (Rogers & Revesz, 2019; Stagnitti et al., 2016). Third, existing research has not systematically examined the misalignment between gamification mechanics and learning objectives identified by (Anh et al., 2022; Tran et al., 2023). The question of how teachers can strategically design, implement, and follow up on gamified evaluation to ensure that competition and entertainment support rather than undermine conceptual understanding has received insufficient empirical attention. This is particularly acute in international Islamic school contexts, where Montessori principles of self-directed learning intersect with digital gamification in distinctive ways. The primary research gap addressed in this study lies in the limited number of studies that examine in depth the discrepancy between student engagement and content comprehension in the use of Blooket, particularly in Arabic language learning at the elementary school level. Existing research has largely focused on increased engagement or improved scores, without critically investigating whether such engagement leads to meaningful and deep understanding. This study demonstrates that the two do not necessarily progress in tandem.

To address these gaps, this study makes three interconnected contributions. First, it provides a detailed qualitative account of Blooket implementation in an under-researched context: upper elementary Arabic language learning in an international Islamic Montessori school. By documenting actual classroom practices, challenges, and adaptations, the study offers contextualised knowledge that complements existing quantitative findings. Second, it identifies and analyses the specific factors that influence whether students focus on content comprehension versus superficial competition when using Blooket, including extrinsic versus intrinsic motivation, time pressure, technical infrastructure, classroom social dynamics, and teacher facilitation strategies. Third, the study formulates actionable strategies for optimising Blooket's use as a formative evaluation tool that balances engagement with learning outcomes, such as ensuring device readiness, designing conceptually demanding questions, facilitating post-quiz reflection, and using quiz data for differentiated instruction.

Based on the problem statement, research gaps, and intended contributions outlined above, this study pursues the following specific objectives: (1) to describe the implementation of Blooket as an interactive evaluation medium in Arabic language learning at the upper elementary level at Brainy Bunch International Islamic School Cyberjaya, including the pre-, during-, and post-learning phases, the content taught (*isim isyarah*), and the patterns of student participation observed; (2) to identify the pedagogical, technical, and social factors that influence whether upper elementary students focus on content comprehension versus superficial competition when using Blooket for Arabic language evaluation; and (3) to formulate evidence-based strategies for optimising Blooket's use so that the gamified platform functions not merely as entertainment but as a meaningful formative evaluation tool that supports genuine Arabic language comprehension.

2. Methods

This study employed a descriptive qualitative approach to examine the implementation of Blooket as a gamified evaluation tool in Arabic language learning at the upper elementary level (grades 4–6) at Brainy Bunch International Islamic School Cyberjaya, Malaysia (Ellis & Hart, 2023). Data collection was conducted over one month (29 July – 28 August 2025) through three techniques: participant observation, semi-structured interviews, and documentation. Observations were carried out daily from Monday to Friday across three classes, systematically recording student participation patterns, using observation protocols adapted from (Bazán-Ramírez et al., 2022), technical issues (Wi-Fi instability, device unavailability, login delays), and social interactions during Blooket sessions. Subjects comprised upper elementary students and their Arabic teacher; informants included four individuals: one Arabic teacher, one vice principal, one student, and one teaching practicum student. Semi-structured interviews explored perceptions of Blooket's effectiveness, factors influencing learning focus, and pedagogical strategies (Thu Huong, 2023). Documentation included digital quiz results, classroom photographs, and field notes. Triangulation of sources and methods enhanced credibility and trustworthiness (Vivek et al., 2023). Data preprocessing involved transcribing audio recordings verbatim, cross-checking transcripts, and filtering irrelevant information. Field notes and interview transcripts were merged to create a holistic dataset.

The analytical method followed the interactive model of (Miles & Huberman, 1994; Utomo et al., 2020), comprising three concurrent stages: data reduction, data display, and conclusion drawing/verification. Fig. 1 shows the interactive components of data analysis. In this model, data reduction (selecting and summarising relevant information) and data display (organising findings into descriptive narratives and tables) occur simultaneously with data collection, and conclusion drawing/verification involves iterative interpretation of the data. Evaluation was conducted through source and method triangulation as well as member checking, whereby preliminary findings were confirmed with the Arabic teacher and vice principal to ensure interpretive accuracy (Mirza et al., 2023). Inferential statistical analysis was not employed, as this study adopted a qualitative approach. Observational data were analyzed descriptively to identify patterns of student participation during the learning process. The results (Table 1) indicate that the majority of students actively participated independently using

personal devices, while others engaged collaboratively in small groups, and only a small proportion of students remained passive as observers.

The primary research instrument was the researcher herself, supported by observation guidelines, semi-structured interview protocols, and documentation sheets, all developed based on game-based learning literature and validated through expert discussion (Romero-Rodriguez et al., 2024). Observation guidelines covered student device usage, technical constraints, and social dynamics; interview protocols addressed implementation stages, learning outcomes, challenges, and strategies. Following research ethics guidelines (Jaya, 2021), written institutional permission was obtained from the school principal. Informed consent was secured from adult participants; for minors, parental consent was obtained via the school. Participant identities were protected using pseudonyms (Ustazah Ainin, Ustaz Abdullah, Aysha, Adzkia), and raw data were stored in password-protected devices accessible only to the researcher (A. Fatoni et al., 2024; Zakaria & Zakaria, 2025). This ethical framework aligns with established principles of respect, confidentiality, and anonymity in qualitative educational research (Ezekwu, 2025; Mirza et al., 2023).

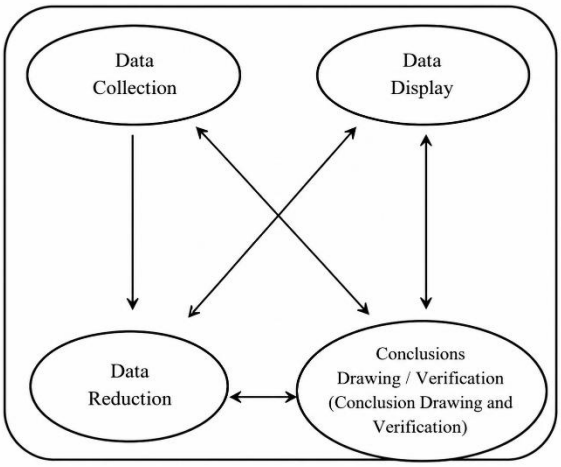

Figure. 1. Interactive components of data analysis (Miles et al., 2018; Miles & Huberman, 1994).

3. Results

a. Implementation of Blooket in Arabic Language Learning

The implementation of Blooket as an interactive evaluation medium for Arabic language learning at the upper elementary level at Brainy Bunch International Islamic School Cyberjaya followed a three-phase structure: pre-learning, during-learning, and post-learning. Based on interviews with the Arabic teacher (Ustazah Ainin), in the pre-learning phase, students were introduced to the topic (*isim isyarah*: demonstrative pronouns *haza*, *hazihi*, *zalika*, *tilka*) to build initial conceptual understanding. During the learning phase, students actively participated in Blooket quizzes, selecting answers based

on the material previously taught. In the post-learning phase, the teacher used the quiz results to identify students' comprehension levels and grouped them into weak, intermediate, and advanced categories for further instructional follow-up.

Observation data collected over one month (29 July – 28 August 2025) across three upper elementary classes revealed distinct participation patterns. Table 1 summarises the quantitative distribution of student engagement based on field notes and digital attendance records.

Table 1. Student Participation Patterns During Blooket Sessions

No.	Aspect of Participation	Analytical Indicators	Description
1	Students actively using personal iPads to enter and answer Blooket quizzes independently	**Behavioral:** high task engagement, rapid response rate, consistent participation **Cognitive:** active recall, independent decision-making, surface-to-moderate conceptual processing	The majority of students demonstrated a high level of active and independent participation by using their personal iPads to access and respond to quiz questions. They showed strong initiative, quick responsiveness, and sustained engagement throughout the activity, reflecting strong behavioral engagement. Cognitively, students were able to recall information and make independent choices, although responses were often driven by speed, indicating that deeper conceptual processing was not always fully achieved.
2	Students joining peers who have iPads (forming pairs or small groups to contribute answers)	**Behavioral:** collaborative participation, shared task involvement, peer interaction **Cognitive:** discussion-based reasoning, negotiated understanding, peer-assisted comprehension	A number of students participated through collaborative interaction by joining peers who had access to iPads. They formed pairs or small groups, actively discussing questions, exchanging ideas, and jointly deciding on answers. This pattern reflects strong behavioral engagement through social interaction, while cognitively it indicates the presence of peer-supported understanding and negotiated meaning construction.
3	Students only watching or being passive (not actively contributing to answers)	**Behavioral:** low participation, minimal interaction, off-task tendency **Cognitive:** limited processing, low engagement with content, passive reception	A small proportion of students exhibited passive participation, primarily acting as observers without actively contributing to answering the quiz questions. These students tended to rely on others or remained disengaged from the task. This reflects low behavioral engagement and minimal cognitive involvement, potentially influenced by limited device access, lower confidence, or reduced motivation, thereby highlighting participation inequality within the classroom.

Note. Data were derived from field notes and digital attendance records collected over one month of observation (29 July–28 August 2025) across three upper elementary classes.

The majority of students were actively engaged, independently using their personal iPads to participate in Blooket activities. A proportion of students participated by joining peers who had device access, thereby forming informal pairs or small groups. In contrast, only a small number of students tended to remain passive observers and did not actively contribute responses. Social interaction patterns varied across groups. In some cases, collaborative pairs engaged in brief discussions prior to answering, indicating the presence of peer scaffolding. However, in other instances, participation was dominated by a single student who made decisions independently, resulting in minimal involvement from their partner.

Figure. 2. Implementation of Blooket in the classroom.

The teacher reported that the targeted learning outcome was not merely memorising the meanings of "this" and "that" but enabling students to correctly distinguish demonstrative pronouns according to noun gender (*muzakkar* and *muannas*). Quiz results indicated that the majority of students could correctly match demonstrative pronouns with objects at the reinforcement stage. However, the teacher noted that this achievement remained at the recognition and concept reinforcement level; consistent repetition was still required for application in daily conversation. The gamification elements in Blooket helped students learn from their mistakes independently and without pressure, facilitating gradual and more natural concept mastery.

b. Factors Influencing Student Focus During Blooket Use

A significant gap was observed between student motivation and genuine content comprehension. Many students prioritised competition speed and obtaining the highest scores over understanding Arabic vocabulary or grammatical structures. Some students admitted to clicking answers randomly to stay in the game. An upper elementary student (Aysha) stated, "I answer quickly to get many points." The Arabic teacher confirmed this tendency, as shown in Table 2.

Table 2. Interview Results with the Arabic Teacher (Ustazah Ainin)

No.	Aspect	Percentage
1	Students demonstrating focus on question comprehension	30%
2	Students demonstrating focus on answering speed	70%

Thus, 70% of students were observed to prioritise speed over understanding, driven largely by extrinsic motivation (points, leaderboard position) rather than intrinsic desire to master the material.

Technical problems repeatedly disrupted the smooth conduct of evaluations. The most frequent obstacles were: (1) unstable Wi-Fi connection or insufficient mobile data; (2) delayed entry of quiz codes and names, causing the system to "kick" students because the teacher required real names to avoid score fraud; (3) students' iPads running out of battery, preventing full participation. Consequently, some students lost the opportunity to answer all questions, making assessment results inconsistent.

Additionally, students without personal devices had to share with classmates. This created two possible scenarios: positive collaboration (discussing answers together) or passive observation (one student dominating, the other merely watching). According to the teacher, this uneven access to devices led to participation inequality, even though the gamified platform was designed to increase engagement.

c. Pedagogical and Social Dynamics

The Montessori approach applied at Brainy Bunch influenced how Blooket was integrated. The teacher prepared visual, structured materials so students could grasp language patterns independently. Automatic feedback from Blooket allowed students to recognise their own errors without direct teacher pressure, aligning with Montessori's self-directed learning principles. The vice principal (Ustaz Abdullah) confirmed that game-based learning can align with Montessori principles when designed with clear objectives and focused on building understanding and values.

Socially, competition fostered both positive and negative effects. Some students were highly motivated to reach the top of the leaderboard, while others felt discouraged when consistently at the bottom, losing motivation. Moreover, excessive teasing or mockery among students due to score differences sometimes reduced classroom conduciveness.

d. Observed Improvements in Vocabulary Mastery

Despite technical and engagement challenges, repeated Blooket quizzes led to measurable progress in Arabic vocabulary recognition. Basic vocabulary such as *kitab* (book), *madrasah* (school), and *qalamun* (pen) were recognised more quickly compared to traditional lecture-based or written exercise methods. The repetitive nature of the quizzes forced students to recall correct answers repeatedly, which teachers noted as a key factor in vocabulary retention.

4. Discussion

This study aimed to describe the implementation of Blooket as an interactive evaluation medium for Arabic language learning at the upper elementary level, identify factors influencing student focus, and formulate strategies for optimising its use. The findings reveal a complex interplay between gamified engagement and substantive learning outcomes, consistent with but also extending existing literature on game-based learning (GBL) in language education.

a. Blooket Implementation and the Engagement–Comprehension Gap

The three-phase implementation (pre-, during-, and post-learning) observed at Brainy Bunch aligns with recommended practices for integrating GBL into formative assessment (Zakaria & Zakaria, 2025). The teacher's role in preparing materials, facilitating quizzes, and using data for differentiated grouping reflects a structured pedagogical design. However, the finding that 70% of students prioritised answering speed over content comprehension (Table 2) confirms the engagement–comprehension gap documented in previous studies (The Nguyen et al., 2025). Although Blooket has been shown to enhance student motivation and participation—as reflected in the predominance of active engagement both independently and collaboratively—such engagement is largely extrinsic in nature, driven more by the pursuit of points, leaderboards, and competitive elements than by an intrinsic desire to master Arabic grammar concepts.

This finding aligns with the theory proposed by (Plass et al., 2015a), which suggests that game-based learning (GBL) elements are effective in enhancing behavioral engagement but do not automatically ensure cognitive or affective engagement. In this study, a critical distinction emerged between participatory engagement (students' involvement in activities) and substantive engagement (the depth of cognitive processing and internalization of content).

From the perspective of Benjamin Bloom's cognitive taxonomy, students' learning outcomes predominantly remained at the lower levels, particularly understanding and recognition, rather than progressing to higher-order skills such as application. In the context of Arabic demonstrative pronouns (*isim isyarah*), students were generally able to correctly match words with corresponding objects in Blooket quizzes. However, they experienced difficulty applying these forms spontaneously in everyday communication. This indicates that gamified recognition tasks do not necessarily transfer into productive language use without structured instructional scaffolding.

As noted by Ustazah Ainin, students may have successfully achieved the learning objective at the level of "identifying" concepts. However, reaching the level of "applying" these concepts in daily speech requires consistent practice and reinforcement over time.

Despite this limitation, the current instructional approach demonstrates notable strengths. The integration of gamification reduces students' anxiety and performance pressure, creating a more supportive learning environment. Through the gamified features of Blooket, students are encouraged to learn autonomously from their mistakes, which fosters independent learning. Over time, this process can contribute to deeper mastery of knowledge compared to traditional rote memorization methods, provided it is supported by deliberate pedagogical guidance.

b. Factors Mediating Effective Gamified Evaluation

Five factors were identified that mediated whether Blooket use led to meaningful learning: (a) technical infrastructure readiness, (b) alignment with student learning styles, (c) active teacher facilitation, (d) suitability of content type (vocabulary vs. grammar), and (e) competition management. These factors resonate with systematic review findings by (Jun & Lucas, 2025) and (Romero-Rodriguez et al., 2024).

Technical constraints emerged as a highly prominent factor affecting the implementation of the learning activities. Unstable Wi-Fi connectivity, limited data quotas, lack of device availability, and battery-related issues prevented some students from fully participating. In addition, several students were required to share devices with peers, leading to unequal access and consequently affecting the quality and consistency of participation in Blooket-based learning activities. This digital divide within a single classroom mirrors observations by (Sulistyanto & Asyhar, 2024) that Blooket's effectiveness depends heavily on equitable technological access. The requirement to use real names for login, while pedagogically sound for assessment integrity, inadvertently created additional barriers when students were "kicked" due to delays. This tension between procedural rigour and inclusive participation suggests that gamification platforms must be accompanied by flexible entry protocols and backup connectivity solutions (Amalia & Sujarwati, 2025).

Teacher facilitation emerged as the most critical factor distinguishing superficial entertainment from meaningful learning. The teacher at Brainy Bunch acted as a "guide on the side," consistent with Montessori principles, by preparing tiered question sets, monitoring real-time data, and planning post-quiz reflection. However, the teacher herself acknowledged that follow-up discussions and error analysis were not yet optimal. This finding aligns with (A. Fatoni et al., 2024), who noted that Blooket's educational value is realised only when teachers actively debrief and connect game content to learning objectives. Without such pedagogical bridging, gamified quizzes risk becoming isolated fun activities rather than integrated assessment tools.

Content type also mattered. Vocabulary recognition improved noticeably after repeated Blooket sessions, whereas grammatical distinctions (e.g., haza vs. hazihi based on noun gender) required more sustained practice. This supports (Sartika[1] et al., 2023) and (Amalia & Sujarwati, 2025), who found that Blooket is more effective for vocabulary drilling than for complex grammatical rule application. The repetitive, pattern-recognition nature of multiple-choice quizzes lends itself well to lexical acquisition but less so to deeper syntactic or morphological understanding.

Competition had dual effects. While leaderboards motivated many students, they also discouraged lower-performing students, causing some to disengage. This ambivalence is well documented in GBL literature (Barokah et al., 2024). At Brainy Bunch, occasional teasing and excessive joking due to score differences sometimes reduced classroom conduciveness, suggesting that teachers need to establish norms for respectful competition and recognise effort as well as achievement.

c. Integration with Montessori and Islamic School Context

A distinctive contribution of this study is its examination of Blooket within a Montessori-informed, international Islamic school. The alignment between gamification and Montessori principles—self-paced learning, error correction through feedback, and

the teacher as facilitator—was evident. The vice principal confirmed that GBL can harmonise with Montessori when objectives are clear and values (e.g., honesty in competition, collaboration) are emphasised. This finding extends the work of (Fahmi & Purnawan, 2025), who argued that gamification in Islamic education can internalise religious values if content is contextually designed. At Brainy Bunch, Arabic vocabulary about daily worship and moral conduct could potentially be integrated into Blooket quizzes, thereby serving both linguistic and spiritual goals.

However, the study also revealed tensions. Montessori emphasises individual, self-directed learning, but Blooket's competitive, time-pressured format may privilege faster students and marginalise those who need more reflective pacing. Future implementations might explore "practice modes" without time limits or collaborative team-based games that align better with Montessori's collaborative ethos.

d. Theoretical and Practical Implications

Theoretically, this study refines GBL theory by distinguishing between *participatory engagement* (observable activity) and *substantive engagement* (cognitive processing and knowledge internalisation). Blooket reliably generates the former but requires intentional pedagogical design to achieve the latter. This distinction has been implicit in the literature (Plass et al., 2015a; Rahmatika et al., 2025) but is made explicit here through empirical classroom data.

Practically, the study offers actionable strategies for optimising Blooket: (a) ensure device readiness and provide technical accommodations (e.g., hotspot backup, extended login windows); (b) design questions that demand conceptual understanding, not just rote recall; (c) facilitate post-quiz reflection and error discussion; (d) use quiz data for differentiated grouping; (e) balance competition with recognition of effort and collaboration; (f) integrate gamified evaluation into a coherent pedagogical sequence that includes pre-instruction, instruction, evaluation, and follow-up. These strategies address the engagement–comprehension gap and are applicable beyond Arabic language learning to other subjects and contexts.

Theoretically, this study refines game-based learning (GBL) theory by distinguishing between participatory engagement (observable activity) and substantive engagement (cognitive processing and knowledge internalisation). Blooket reliably generates the former but requires intentional pedagogical design to achieve the latter. This distinction has been implicit in the literature (Plass et al., 2015b; Rahmatika et al., 2025) but is made explicit here through empirical classroom data.

This refinement can also be understood through the lens of Benjamin Bloom's cognitive taxonomy, where most gamified activities tend to operate at the lower-order levels (remembering and understanding), while higher-order processes such as applying, analysing, and creating require structured scaffolding and deliberate instructional support. Thus, the engagement–comprehension gap identified in this study reflects a misalignment between behavioral participation and higher-level cognitive outcomes.

Practically, the study offers actionable strategies for optimising Blooket: (a) ensuring device readiness and providing technical accommodations (e.g., hotspot backup, extended login windows); (b) designing questions that demand conceptual understanding rather than rote recall, thereby targeting higher levels of cognitive processing; (c) facilitating post-quiz reflection and structured error discussion to promote deeper

learning; (d) using quiz data for differentiated grouping based on students' performance levels; (e) balancing competitive elements with recognition of effort and collaboration; and (f) integrating gamified evaluation into a coherent pedagogical sequence that includes pre-instruction, instruction, evaluation, and follow-up activities.

By aligning these strategies with Bloom's taxonomy, educators can intentionally move students from lower-order thinking skills toward higher-order application and meaningful language use. These strategies directly address the engagement–comprehension gap and are applicable beyond Arabic language learning to a wider range of subjects and educational contexts.

5. Conclusions

This study concludes that the implementation of Blooket in Arabic language learning at the upper elementary level is effective in enhancing student motivation and participatory engagement, particularly through active individual and collaborative involvement. However, such engagement does not automatically lead to substantive comprehension. A clear engagement–comprehension gap was identified, as many students prioritised response speed over conceptual understanding, indicating that learning outcomes often remained at a surface level. The findings highlight that meaningful learning is strongly influenced by mediating factors, including technical infrastructure, device accessibility, teacher facilitation, content design, competition dynamics, and alignment with students' learning styles. Among these, teacher facilitation, especially through post-quiz reflection, error discussion, and differentiated instructional strategies, emerged as the most critical determinant in transforming engagement into deeper understanding.

Theoretically, this study contributes to game-based learning (GBL) literature by explicitly distinguishing between participatory engagement and substantive engagement, emphasising that observable activity must be supported by cognitive processing to achieve meaningful learning outcomes. Practically, the study underscores the necessity of intentional pedagogical scaffolding, including ensuring technical readiness, designing conceptually oriented tasks, and integrating gamified evaluation within a structured instructional sequence. Overall, while Blooket offers significant potential as an engaging assessment tool, its effectiveness in fostering deep learning depends on how it is pedagogically designed and implemented.

6. CRediT Authorship Contribution Statement

Muhammad Fadhli Abdillah: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Writing – original draft, and Writing – review & editing. **Muhammad Musfiatul Wardi**: Supervision, validation, and writing – review and editing.

7. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

8. Data Availability

Data will be made available on request.

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