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How Gamification Motivates in Quranic Memorisation: A Method for Design and Suggestions for Future Research

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ABSTRACT

Building enthusiasm for memorising the Quran has become challenging, as interest and motivation have been found to decline. However, there is still no clear guideline on how to combine the different gamification components systematically within the environment of Quranic memorisation (Hifz), despite the significant role of gamification in the learning process. The proposed research employs the Design and Development Research (DDR) methodology, aiming to create a learning content prototype that ideally integrates gamification components and learning analytics into Quranic learning and evaluation activities. The study has four objectives structured within the three phases of the DDR method. The first phase, analysis, aims to achieve two research objectives: integrating different multimedia components within memorisation strategies and identifying the appropriate components of the gamified process. The second phase, design and development, involves designing a gamified learning application within the MDA framework. The third phase, evaluation, examines how gamification elements influence students' motivation and engagement. A survey was distributed to 46 undergraduates. The respondents' perceptions of using a gamified system yielded high overall mean scores ranging from 4.55 to 4.91 on a 5-point Likert scale. The standard deviations ranged from 0.29 to 0.66, indicating low variability and minimal disagreement. The reliability test revealed very high internal consistency of all the items, with Cronbach's alpha values ranging from 0.965 to 0.970. This research has contributed to the field of Islamic education by demonstrating

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the potential of gamification to make the memorisation of the subjects more interactive, engaging and effective.

Keywords: Engagement, gamification, learning analytics, motivation, Quranic memorisation

INTRODUCTION

The growing number of learning institutions offering educational services to learn the Quran through memorisation shows that the Muslim community's level of interest to memorise the Quran has escalated remarkably (Haryono et al., 2022). Hifz denotes the activity involved in learning 30 chapters or parts of the Quran. Memorising the Quran has challenges and difficulties that require a systematic, effective and continuous repetition technique to prevent the memoriser from forgetting (Ahmad et al., 2024). It has been acknowledged that memorising the Quran is not something that can be done easily by every Muslim (Aziz et al., 2019). According to Misnan et al., (2021), during the process of Quran memorisation, the students may experience different stages of learning, which include the acquisition stage, the retaining stage and the retrieval stage. The acquisition stage is where the students are supposed to devote all their attention to the stimulation by encoding it into their memory. The retaining stage is the process whereby the minds of the students can retain the stimulation. The retrieval stage is the process of obtaining stimulation from memory whenever needed.

Unfortunately, according to Misnan et al. (2021) as cited in Ahmad et al. (2024) not all Quran learners were able to retain their memorisation. Ambo and Mokhsein (2019) also reported that most of the Quran learners are unable to memorise all 30 chapters of the Quran within 3 years. Many complain about forgetting the memorised verses (Almosallam et al., 2016; Almosallam, 2015) and many of them find it difficult to maintain the quality of their memorisation once it is completed, despite having spent a great deal of time learning and repeating them. The daily routine of memorising different verses and the consistent repetition of the recitation of the verses resulted in the reciters feeling bored (Sabbri, 2016; Mustafa & Basri, 2014; Sevutra & Erlinda, 2019). Among the causes of students' failure to memorise and maintain good memorisation are the lack of motivation and the lack of effective learning style strategies (Abdullah et al., 2021; Ahmad et al., 2024; Rahman et al., 2022), as well as the lack of appropriate teaching strategies that can facilitate students' interest in the learning process (Musa et al., 2018). As mentioned by Misnan et al. (2021), the best memorisation method and technique should be developed to encourage students to memorise the Quran. These factors have been identified as the cause of weak Tahfiz achievements, which hinder students from directly engaging in the process of memorising the Quran, believed to harm students' memorisation.

Urh et al. (2015) introduced the model for the implementation of gamification in the e-learning domain for achieving a positive outcome on the process of learning, such as increased satisfaction, motivation and participation of the students. In the systematic literature review by Akbari et al. (2024), it is stated that there are three types of Quran application models, namely, voice technology-based model, gamification-based model and modular-based model. In terms of the model's effectiveness, it was revealed that the gamification-based model is effective for supporting the process of learning. The next section discusses the potential integration of gamification in the field of Quranic memorisation.

The Potential of Motivation and Engagement in Quranic Memorisation with Gamification

Gamification is essential for increasing students' motivation and engagement. It seeks to combine intrinsic motivation with extrinsic factors to enhance motivation and engagement (Noradzan et al., 2019). Motivation and engagement are key values in learning and among the most desired experiential qualities for memorising the Quran. Currently, gamification in mobile learning is increasing and becoming popular in response to the needs of Education 4.0 within the context of the Industrial 4.0 (IR4.0), as it aligns with the motivation and engagement of the younger generation in self-directed learning. One important trend in Education 4.0 that has been frequently discussed is students' preference for learning tools that adapt to their abilities and achievements (Hussin, 2018). This allows students who encounter difficulties with a particular subject to practice more until they reach the required level.

Gamification involves using game design elements in non-game contexts to stimulate and encourage individuals to pursue their goals. By integrating these strategies, memorisation of the Quran can be more participatory, motivational, and effective, enabling students not only to reach their memorisation goals but also to connect more deeply with the Quran. Various previous studies, such as the work by Shamsuddin et al. (2016), postulated a conceptual framework called e-Hafiz for modelling the memorisation process of the Quran using gaming components such as avatar, level, points, timing and awards. According to Moulana (2017), the conceptual framework aimed to provide a more engaging and motivational experience in the Quran memorisation process by implementing gaming components, such as points, levels, challenges, achievements, and narratives, in addition to traditional memorisation strategies. Senan et al. (2017) introduced an interactive Quran mobile app called iHafiz, incorporating gamification aspects such as levels, points and rewards to assist autistic children in reciting and memorising the Quran. Rosmansyah & Rosyid (2017) implemented gamification aspects such as badges, points, levels, leaderboard and progress bar in a mobile learning environment for memorising the Quran, aiming to

enhance the fun aspect. By applying the principle of gamification, such as levels, challenges, points, badges, leaderboard or ranking, Sevutra & Erlinda (2019) were able to make the task of memorising the Quran into interesting games. This would enable them to be monitored in memorising and earning points towards ranking for the motivation of memorising the Quran. To benefit students in memorising the Quran and enhancing their understanding in reading the Quran extensively, the iLearning Management System was designed by Pranata et al. (2020) with gamified quiz activities which include levels, challenges, points, awards, progress bar and narratives. The QuranLab mobile application was designed by Siregar et al. (2023) based on the Octalysis gamification framework. Anwar & Inayati (2025) studied the utilisation of Wordwall as a feasible tool for encouraging increased engagement of students in the study of Al-Quran Hadith. In a separate study, Ni'mah et al. (2025) highlighted the implementation of gamification technology learning using Wordwall and Gimkit platforms to aid the learning and assessment processes in the study of the Quran and Hadith. Zein & Syahrudin (2025) proposed the use of gamification elements such as points, badges, leaderboards, and interactive challenges in the traditional method of Quranic study to improve engagement, motivation and learning outcomes.

However, many students who attempt to memorise the Quran do not achieve the desired objectives due to non-compliance and a lack of user satisfaction with the learning experience, resulting in some users discontinuing using the learning application after their initial experience. The traditional "one size fits all" gamification approach fails to consider the variety of users' needs, talents, and preferences (Alomair & Hammami, 2020). Therefore, the authors of this study contend that gamification does not always produce predictable results. Another issue is that many studies treat gamification as a single, uniform concept, even though in practice, gamification environments can feature a wide range of individual designs and implementations. As gamification can incorporate game design components in various ways and take many distinct forms, it is inappropriate to study the motivational benefits of gamification as a general construct. Instead, research should focus on how specific game design components affect a particular setting. Gamification scholars argue that gamification is not simply a matter of adding PBL (points, badges, and leaderboards) to a product or service. Instead, gamification involves a broader discussion, including motivational theories, to foster intrinsic motivation as a task is carried out (Yahya & Salamun, 2021).

This research aims to create a learning content prototype that ideally integrates gamification components and learning analytics into Quranic learning and evaluation activities. The following objectives were formulated to investigate the relevant research questions, which are stated below:

RQ1 : What are the cognitive principles and multimedia elements that can improve memorisation strategies?

RO1 : To integrate the multimedia elements into memorisation strategies that can reduce the cognitive load in memorising the Quran.

RQ2 : What are the appropriate components of gamification that can be integrated to support sustainable motivational learning theory in memorising the Quran?

RO2 : To identify the appropriate gamification elements that can be integrated to facilitate sustainable motivational learning theory in memorising the Quran.

RQ3 : How can we design and develop a gamified Quranic memorisation application that influences students' motivation and engagement?

RO3 : To design and develop a gamified Quranic memorisation application that affects students' motivation and engagement.

RO4 : To evaluate the effects of gamification elements on the students' motivation and engagement in Quranic memorisation.

The remainder of this paper is structured as follows. Section 2 provides a brief literature review on the integration of multimedia elements in memorisation strategies, the adaptation of motivational theory in the context of gamification for Quranic memorisation, and the relevant studies in Quranic memorisation to identify potential behaviours that may be influenced when learning with appropriate gamification features. Section 3 discusses the design principles for the gamification of Quranic memorisation, along with the development of the proposed GLAM-Q application displays. Section 4 covers the findings from a survey on the applicability of the suggested game elements. Finally, Section 5 presents concluding remarks and highlights the research outcomes.

LITERATURE REVIEW

Integration of Multimedia Elements in Memorisation Strategies

Memorisation is a mental process used to recall and retain learning. Its success depends on an individual's ability to retrieve information from memory spontaneously, either with or without cues (Salehuddin et al., 2019). However, according to Schunk (2012), during cognitive load, a student can only memorise a limited amount of knowledge at one time. For example, it is commonly agreed that short-term memory (STM) holds information for a brief period, approximately 2 seconds (Saleem, 2015), if a systematic and effective rehearsal mechanism is not used to transfer the information to long-term memory (LTM). Additionally, individuals exposed to numerous simultaneous stimuli may miss most of them due to the limited attentional capacity of working memory (WM).

Cognitive load theory (CLT) accounts for these processing constraints in instructional design. CLT emphasises the idea of internal mental processes and tackles the problem of how information is received, organised, stored, and retrieved in one's mind (Schunk, 2012). In addition, it has been emphasised that the primary focus of CLT is to ensure that the vast

store of knowledge contained in LTM is optimally acquired. As a result, cognitive load theorists devote much of their attention to determining how knowledge should be organised when presented to learners and which activities learners should engage in when acquiring information. Therefore, ensuring that learners' working memory (WM) is not overburdened with the information presented is one goal of CLT-based instruction. Creating external supporting structures to facilitate the transfer of information into LTM through learning strategies can significantly impact learning outcomes, including enjoyment, engagement, motivation, results and achievements, satisfaction, and other positive attitudes towards learning, particularly in memorisation. Consequently, it can be inferred that from the viewpoint of Quranic memorisation, CLT focuses more on how knowledge can be encoded, stored, and retrieved. For example, in memorising the Quran, the cognitive approach will include step-by-step descriptions with strategies relevant to its approach, employing images or pictures relevant to the interpretation of verses, requiring the students to recite as many verses as they can, as well as providing continuous learning feedback from the formative and summative assessments to strengthen their memorisation progression. Likewise, the cognitive strategies for learning, for example, elaboration, organisation, and rehearsal, are essential in enhancing memorising tasks such as Quranic memorisation. Table 1 presents several cognitive principles associated with memorisation techniques or strategies that may alleviate cognitive load during Quran memorisation.

According to Umar & Aziz (2015), multimedia features assist in creating and storing information using different human senses, known as multisensory, for a long period of time and are quickly accessible to attract the attention of students and make them focus on acquiring knowledge. Mustafa et al. (2019) proposed in their research a VARK Quran memorisation model consisting of four main components, namely, VARK learning style

Table 1
Application of cognitive principles in Quranic memorisation

Cognitive principle	Application example in Quranic memorisation
Chunking	Breaking down long verses into smaller phrases for easier recall (Almosallam et al., 2016; Almosallam, 2015; Moulana, 2017; Mustafa et al., 2019; Shamsuddin et al., 2016)
Repetition and rehearsal	Regularly reviewing memorised verses previously will enhance memory retention (Almosallam et al., 2016; Almosallam, 2015; Moulana, 2017); Mustafa et al., 2019; Rosmansyah & Rosyid, 2017; Shamsuddin et al., 2016; Senan et al., 2017).
Use of mnemonics and imagery	Associating certain sounds or meanings with visual or auditory cues to aid recall (Moulana, 2017; Mustafa et al., 2019; Senan et al., 2017).
Scaffolding	Starting with shorter Surahs and gradually progressing to longer ones with support (Moulana, 2017; Mustafa et al., 2019).
Organising knowledge	Using mind maps or verse structures to show the relationship between themes in Surah (Almosallam et al., 2016; Almosallam, 2015; Mustafa et al., 2019).

modes, sensory memory, short-term memory and long-term memory. The VARK learning style model serves as an input that has four modes, namely, visual, aural, read/write and kinesthetic. These modes of input are sensed through sensors, such as the eye, ear, and body motion/gesture, in the sensory memory. These are eventually converted into image, audio, text and signal representations in the short-term memory. Finally, to retain memory in the long-term memory, there are several memorisation methods that must all be employed as mentioned in Mustafa et al. (2021), and in Table 1 above. Since the educational content should be interactive and engaging, all these combinations may well be attributed to the contribution of multimedia technology in the learning and memorising process of the Quran readings.

Adaptation of Motivational Theory in the Context of Gamification for Quranic Memorisation

Motivation is often considered a prerequisite for sustainable learning in Quranic memorisation. One promising approach shown to support learning and motivation in Quranic memorisation is the use of games and game elements. Gamification has been identified as an effective tool for encouraging students to participate enthusiastically in learning activities (Ishak et al., 2022). When games have an educational purpose and are not played primarily for amusement, they may be called serious games. The use of game design elements in non-game contexts, primarily to motivate desired user behaviour, is known as gamification. Students can remember 90% of the content if they engage with or participate in gamified educational materials or simulations (Noradzan et al., 2019).

Gamification has become a popular strategy in this new digital age to encourage specific behaviours and have a positive impact on learning outcomes in many ways, such as motivation (Noradzan et al., 2019; Nurtanto et al., 2021; Yildiz et al., 2021; Yushaa et al., 2021), engagement (Noradzan et al., 2019; Nurtanto et al., 2021; Yushaa et al., 2021), outcomes and achievements (Karamert & Vardar, 2021; Yushaa et al., 2021), enjoyment (Noradzan et al., 2019; Yushaa et al., 2021), and other positive attitudes. According to Rahman et al. (2018), achievement and engagement of students are the most common areas of research, whereas motivation ranks third. High frequency across the three components affirms that gamification can transform students into more motivated and engaged learners in class, thereby enabling them to perform at the highest possible level in the assessment of their learning. It also demonstrates that gamification can catalyse engagement and motivation (both intrinsic and extrinsic), which are indispensable for creating quality learning and are usually considered prerequisites for completing a task or encouraging specific behaviour, such as the time and effort learners invest in learning.

To elucidate motivation and engagement, researchers have drawn on motivation theory (proposed by Thomas Malone in 1981) and the game flow model (Sweetser & Wyeth, 2005)

to guide the design and development of gamification for Quranic memorisation. In simple terms, the concept of flow describes the mental state of a person who is fully immersed, engaged, and enjoying an activity. However, the activity must be regular and match the learner's abilities; that is, the perceived challenge should balance the actual level of difficulty. Previous studies have shown that when challenges are too easy or too difficult for the user's skill level, they can lead to frustration and anxiety during the activity. Second, regarding the learning goal, the game should provide immediate feedback on what must be completed and on the learner's progress. Intrinsic motivation is essential to ensure that users enjoy the game and remain engaged and immersed while interacting with it, which can affect all phases of learning and performance.

Game Element-affected Behaviours

These relevant studies on the memorisation of the Quran are reviewed in this section to determine the possible outcomes of gamification features that may affect learning. Possible behaviours include engagement, achievement, and motivation. The gamification components used to influence learning outcomes are shown in Table 2.

Based on the studies discussed, the majority of the gamified Quranic memorisation apps have employed the main components of gamification such as points, badges, levels, challenges, achievements, progress bar and leaderboard. However, they are not considering structured learning activities incorporated with formative and summative assessments. Employing gamification elements in assessments ensures that students remain actively engaged while being tested, thus reducing the usual pressure caused during the process of traditional assessment (Zulkefli & Jamil, 2025).

Table 2
List of recent articles related to gamification in Quranic memorisation from 2016 to 2025

Researcher(s)	Research focus	Gamification elements	Affected learning outcome
Zein & Syahrudin (2025)	To examine the concept of gamification for the learning of the Quran. The research proposed integrating gamification elements such as points, badges, leaderboards, and challenges with the traditional learning process. Nevertheless, the development of gamification-based applications has yet to be digitised.	Points, Badges, Leaderboard, Challenge	Engagement Motivation
Ni'mah et al. (2025)	To explore the effectiveness of gamification in engaging students' interest and motivation in learning the Quran Hadith through two applications, namely Wordwall and Gimkit. Both applications are based on gamification, to enable teachers to develop different learning games such as quizzes, puzzles and other interactive learning exercises.	Points, Levels, Awards, Challenges, Competition	Engagement Motivation

Table 2 (*continued*)

Researcher(s)	Research focus	Gamification elements	Affected learning outcome
Anwar & Inayati (2025)	To investigate Wordwall's effectiveness as a means of encouraging student engagement in learning the Al-Quran Hadith. This non-monotonous and interactive game-based learning platform provides 18 various game features, including pairing questions with definitions, guessing questions in boxes, dragging images to identify labels, grouping objects into categories, multiple-choice in quiz format, matching images with descriptions, dragging words into blank spaces and so on.	Challenges Feedback	Engagement Motivation
Ahmad et al. (2024)	In this study, the learning approach for the revision of the Quranic text involves the use of a fun-learning gamification board (which is not a digital application).	Levels, Points, Awards, Challenges, Status (similar as progress bar)	Achievement
(Siregar et al. 2023)	This study explored the effects of gamification on learning the Quran by using the QuranLab application. The application is based on the Waterfall model and incorporates gamification based on Octalysis framework. The effectiveness of the application has been tested through a descriptive analysis of 40 people between the ages of 12 and 22 years by purposive sampling techniques, by using the Hedonic-Motivation System Adoption Model (HMSAM) questionnaire.	Levels, Rewards / Missions, Badges, Points, Coins, Leaderboard Progress bar, Progress tracker, Feedback, Share button Timer	Engagement Motivation
Rahman et al. (2022)	This research aimed at assessing the effectiveness of the Global Tahfiz Game (GTG) in enhancing the students' comprehension of Tajwid and Tahfiz, comprising three sets of questions with differing levels of difficulty based on the 30 Juzuk of the Quran.	Levels	Achievement Motivation
Pranata et al. (2020)	To support students in memorising the Quran and improving their reading comprehension, the iLearning Management System has been developed, offering a range of information, including learning resources, tasks, and quiz activities (with gamification elements).	Levels, Challenges, Points, Awards, Narratives	Motivation Achievement Engagement
Fanani et al. (2019)	Evaluation of usability aspects (usefulness, ease of use, ease of learning, and satisfaction) of a mobile-based application for Al-Quran writing learning with gamification.	Levels, Challenges, Points, Leaderboard	Engagement Achievement

Table 2 (*continued*)

Researcher(s)	Research focus	Gamification elements	Affected learning outcome
Sevutra & Erlinda (2019)	By adhering to the principle of Gamification – turning activities into engaging games – makes it easier to monitor memorisation and accumulate points for ranking, thereby driving enthusiasm and motivation to memorise the Quran.	Levels, Challenges, Points, Badges, Ranking	Motivation
Noor et al. (2019)	To utilise the gamification and augmented reality as an attempt to attract children to learn Tajweed.	Challenges, Points, Badges, Leaderboard, Progression, Immersion, Feedback	Engagement
Rosmansyah & Rosyid (2017)	This study applied gamification in mobile learning to increase the fun factor in memorising the Quran. The results showed good performance in terms of usability, fun, and ease of use.	Badges, Points, Levels, Leaderboard, Progress bar	Achievement Motivation
Moulana (2017)	The goal of this research was to create a more engaging and motivational Quran memorisation experience by combining game design principles with existing memorisation strategies.	Points, Levels, Challenges, Achievement, Narratives	Engagement Motivation
Senan et al. (2017)	This research proposed an interactive Quran mobile application called iHafaz. This consists of three main modules: Hafaz (memorising 10 Surahs), Latihan (exercises with three difficulty levels), and Audit (monitoring progress) to facilitate autistic children in reciting and memorising the Quran.	Levels, Points, Awards	Engagement Motivation
Shamsuddin et al. (2016)	This research proposed a conceptual framework, e-Hafiz, for modelling mobile Quranic memorisation by applying learning theories such as game-based learning, chunking, and rote learning. Three essential modules were designed: recitation (Talaqqi), memorisation and evaluation, to help young learners memorise the Quran.	Avatar, Levels, Points, Timing, Awards	Engagement Motivation

Summative assessment provides students' overall achievement, such as grading or certification. The formative assessment, however, includes learning activities where students interact during lessons, such as answering questions and receiving feedback on the level of efficacy of their interaction. In developing and applying technical enjoyment in a gamified learning system, as illustrated in Table 3, gamification is achievable in Quranic memorisation, where all features in the game were adapted from the previous works.

Table 3
Suggestion on applying game elements in Quranic memorisation

No.	Game element	Suggestion of innovation
1.	Points and rewards system (Al Rumaisa et al., 2025; Pranata et al., 2020; Rosmansyah & Rosyid, 2017; Senan et al., 2017; Shamsuddin et al., 2016)	• Points for progress: Students earn points for each verse or page they memorise. This creates a sense of achievement and progress. • Badges and certificates: Award badges for milestones (e.g., completion of a Juz) and certificates for even bigger accomplishments (e.g., completion of half of the Quran), displaying concrete evidence of effort.
2.	Levels and challenges (Al Rumaisa et al., 2025; Moulana, 2017; Pranata et al., 2020; Sevutra & Erlinda, 2019; Shamsuddin et al., 2016)	• Progressive levels: The more the students memorise, the more they can move to higher levels of difficulty. This maintains the challenge at their skill level. • Daily or weekly challenges: Having short-term targets, such as memorising several verses in a week, may make the students active all the time.
3.	Leaderboards (Al Rumaisa et al., 2025; Rosmansyah & Rosyid, 2017; Sevutra & Erlinda, 2019)	• Healthy competition: Healthy competition among students can be encouraged by displaying leaderboards. Special care needs to be taken so that this does not lead to negative feelings, but compels everyone to perform better. • Group leaderboards: Creating group or class leaderboards can promote teamwork and collective motivation.
4.	Interactive learning tools (Khaleel et al., 2020)	• Mobile Apps: Apps that have gamification elements can be used to make Quran memorisation interesting and fun. Tools such as audio playback, practice reminders, and tracking progress can be an immense help • Virtual rewards: Virtual rewards, such as gifts or unlocking new features, might help in sustaining students' motivation.
6.	Feedback and reflection (Siregar et al., 2023)	• Prompt feedback: Giving prompt responses on the precision retention or memorisation of the Quran assists learners in amending their errors fast and gaining a sense of achievement. • Reflection time: Providing time to reflect on the lessons and meanings of the verses consolidates the religious bond and increases motivation.
7.	Personalised learning paths (Adhoni et al., 2014)	• Specification of learning goals: Allow students to set their goals on the Surah and the number of verses they will memorise, and enable them to modify these goals at any time, to permit students to feel proficient in their learning. This will also be useful because it is important to track the learning goals based on the targeted verses to be memorised. • It then tests the memorised verses of the student by providing questions to be answered by the students based on the level of difficulty. This is centred on the pace of the student and thus can ease the process by making it less cumbersome.
8.	Incorporating stories and context (Moulana, 2017; Pranata et al., 2020)	• Historical context: Sharing stories and historical background related to the verses being memorised can make the content more engaging and meaningful. • Moral lessons: Highlighting the moral and ethical lessons within the verses can inspire students to connect more deeply with the material.

METHODOLOGY

This study used a design and development research (DDR) method to incorporate gamification principles in memorising the Quran. The DDR method that provides orderly procedures for developmental research is divided into three phases: 1) analysis, 2) design and development, and 3) evaluation. Table 4 summarises the mapping of DDR stages according to the research objectives.

The following is the step-by-step description involved in this research methodology.

Table 4
The mapping of DDR stages according to research objectives

DDR Stage	Research Objective (RO)
1. Analysis	RO1: To integrate the multimedia elements into memorisation strategies that can reduce the cognitive load in memorising the Quran. RO2: To determine the appropriate gamification elements that can be integrated to facilitate sustainable motivational learning theory in memorising the Quran.
2. Design and Development	RO3: To design and develop a gamified learning application that can improve students' motivation and engagement in memorising the Quran.
3. Evaluation	RO4: To assess the effects of gamification elements on the students' motivation and engagement in Quranic memorisation.

Step 1: Analysis (Awareness of the Problems)

Analysis is the first step, where the most important issues and challenges faced by students in memorising the Quran were identified. Although Quranic memorisation is a well-established tradition in Malaysia, contemporary memorisation methods and initiatives among Malaysian teenagers in tertiary education encounter numerous problems and challenges, such as:

1. Insufficient pedagogical diversity, reflecting the absence of multiple learning styles (Mustafa et al., 2019), refers to an overreliance on a narrow set of teaching and learning methods, often focusing on traditional, teacher-centred, and rote-based techniques, without incorporating varied, learner-centred, and adaptive strategies that address different learning needs and preferences. Learners have different cognitive profiles: some are auditory, some visual, and others kinaesthetic. A strictly verbal, memorisation-heavy method may not be effective for everyone, especially for students with learning difficulties or attention issues. Repetitive routines without variation can lead to boredom, disengagement, and fatigue. Teenagers and university students, especially digital natives, are more responsive to interactive, visual, or technology-based learning methods.
2. Lack of interest and consistent motivation (Purbohadi et al., 2019; Rosmansyah & Rosyid, 2017; Shukri et al., 2020): Lack of sustained motivation is among the most

significant challenges in Quranic memorisation, particularly among adolescents and university students who are prone to academic and emotional pressures. Motivation is the force that stimulates, sustains, and directs learning activities. Quran memorisation is not a single task but a continuous process requiring daily, consistent effort, self-discipline, and a spiritual connection. Though most students begin with great zeal, research and field studies show that motivation gradually dwindles. The memorisation process is tiresome and monotonous, and without frequent internal or external reinforcement, students risk getting bored, skipping revision classes, experiencing memorisation exhaustion, or eventually abandoning their Hifz goals altogether. This is particularly noticeable in teens and university students, who are balancing hectic academic schedules, studies, personal responsibilities, pressure, and emotional development. One reason motivation wavers is the lack of specific goals and performance measures: without observable progress, motivation fades. In other words, without specific progress monitoring, active learning activities, or strong identification with the verses, numerous learners experience memorisation weariness and withdrawal.

3. Difficulty in memory retention (Khafidah et al., 2020; Radina et al., 2020; Shukri et al., 2020; Yusuf et al., 2019): Retention in Quranic memorisation is the ability to recall, remember, and recite memorised verses with accuracy over time. Effective *huffaz* are not so many people who memorise the Quran, but rather, and most importantly, people who maintain the accuracy and fluency of memorisation through regular revision. Most students have poor retention rates due to various factors, especially when they move to new verses too quickly without reviewing the earlier verses. Low retention remains one of the most pressing challenges in Quranic memorisation, as learners often forget previously memorised material for reasons such as:

    a. Ineffective revision practices
       Many learners focus on memorising new verses but neglect consistent Muraja'ah (a proper, systematic revision process). In addition, without planned revision cycles, older memorisation fades rapidly.
    b. Lack of feedback and self-monitoring
       Learners often do not realise they are forgetting until they are asked to recite after a long interval. Thus, without self-monitoring tools, forgetting goes unnoticed and uncorrected.
    c. Surface-level memorisation or rote learning without deep processing.
       Memorisation through mechanical repetition (rote) without understanding meaning, structure, or connections results in surface-level encoding, which fades quickly.

From the identified problems above, a solution was designed in the next stage.

Step 2: Designing and Developing a Gamified System

The second phase involves planning a prototype solution (artefact design) that uses gamification elements to help learners memorise the Quran and achieve the desired learning outcome. The gamification elements were adapted from the previous research that has been discussed in the Literature Review section. In this study, the MDA gamification model proposed by Hunicke et al. (2004) was used to plan and design the necessary game elements to be implemented. MDA is a formal approach for understanding and analysing game design into three distinct components: Mechanics, Dynamics and Aesthetics. This framework is employed as a model of the main structural components of gamification, as it has been seen as a common framework in game system design and gamification (Sezgin & Yüzer, 2020). Mechanics refers to the rules and systems that define how the game operates. Dynamics describes how players interact with the game and with each other. Aesthetics focuses on the players' emotional and sensory experiences created by the game. At this stage, several criteria for game activity must be carefully selected, and the design must align with the learning content, for example, by asking the player or memoriser to set their goals (such as the target verse to memorise within a certain period or milestone). In addition, incorporate tokens of appreciation (such as rewards and points) into the game design so that students earn points for the activities they complete. Concurrently, the meta-reward for continuous effort is represented by badges, levels, social points, and bonus points. Table 5 illustrates several aspects of gaming incorporated into the Quranic memorisation process.

When designing a game, it is important to incorporate both external and internal motivation to achieve its goals and align with players' personalities. Therefore, this research adopts the three key intrinsic motivation elements from Malone's model challenge, curiosity, and control, as well as findings from studies by Shute and Ke (2012) , Noor et al. (2018) and Noor et al. (2019) as shown in Table 6. By incorporating features such as challenges, points, levels, badges, and rankings into a Quranic memorisation gamification application, a new model can be developed to make memorisation more enjoyable and engaging.

To design the Gamification Learning for Al-Quran Memorisation (GLAM-Q) application, each game element was applied particularly during the system registration, recitation of verses, quiz evaluation and learning analysis, as stated in Table 7.

Step 3: Evaluation of Gamified System

The process involves assessing the extent to which gamification components affect the motivation and engagement of students towards memorising the Quran. Performance or measurement after each game activity should be evaluated and visualised on an interactive dashboard to track Quran memorisation progress. This formative feedback should be supportive, timely, and specific. The integration of learning analytics parameters in a

Table 5
Integration of game elements into Quranic memorisation

Game elements	Integration into Quranic memorisation
Progression systems	Levels and Stages: Divide the memorising process into levels. Completing a level unlocks the next, providing a sense of achievement. Milestones: Celebrate milestones, such as memorising a certain number of verses, completing a Surah, or mastering the ability to recall many or all verses in a particular Surah.
Points and rewards	**Earning Points**: Reward points for good recitation of the Quran verses, participating in memorisation classes, or performing tasks independently. **Virtual or Physical Rewards**: Award prizes such as certificates, medals, or small gifts for the achievement of some goals.
Badges and achievements	**Skill Badges**: Merit recognition, such as skill badges, for mastering memorising skills or answering questions quickly. **Achievement Tiers**: Create tiers such as "Beginner", "Intermediate", and "Advanced" to motivate learners to progress.
Leaderboards	**Healthy Competition**: Use leaderboards to track progress among peers and encourage friendly competition.
Challenges or Quests	**Daily/Weekly Challenges: Make tiny, attainable tasks, such as memorising a couple of verses or reciting a Surah.**
Feedback and Progress Tracking	**Visual Progress Bars**: Visualise progress, such as a progress-tracking bar for each verse memorised. **Instant Feedback**: Give prompt responses on the recitation and memorisation progress.
Storytelling and Theme	**Narrative Integration**: Apply Quran narratives to place memorisation in context, more interesting with pleasant and vivid visuals. **Thematic Memorisation:** Practise memorising verses or Surahs of a similar theme, i.e., patience, faith, or gratitude.
Time-based Elements	**Timed Challenges**: Set deadlines on memorising certain parts to create urgency and concentration. **Daily Streaks**: Promote regular practice by rewarding daily progress-tracking streaks of memorisation.
Personalisation	**Custom Goals**: Enable learners to establish personal memorisation goals and monitor progress. **Adaptive Learning**: Tune the challenge according to the learner's speed and skill.

gamified Quran memorisation application aims to measure motivation and engagement. The measurement of learning analytics for each evaluation criterion is summarised in Table 8.

The analysis of students' perceptions towards elements of gamification which affect motivation as well as engagement of memorising the Quran through gamification and learning analytics has already been explained in the Results and Discussion section.

Proposed GLAM-Q Prototype Application

The screens of the Gamification Learning for Al-Quran Memorisation (GLAM-Q) application were designed based on four main menus: register, memorisation, interactive

Table 6
The adaptation of Malone's motivational theory, Noor et al. (2018) and Noor et al. (2019) *in the proposed approach*

Elements	Characteristics	Adoption in the proposed GLAM-Q prototype
Challenge	i. Set specific and clear goals and rules	• Games should present clear overall and intermediate goals; the goal here is to master Quran memorisation according to the location (numbers/ pages) of the verses. • Games have rules that guide players on what to do and when. For example: a. Memorisers must repeat the memorisation at least 10 times before continuing with the next verses (Nafi et al., 2019). b. The formula for calculating the score is determined not only by the number of correct answers, but also by the deductions if the player asks for a clue.
	iii. Provides adaptive challenges	• Good games balance the difficulty of challenges at appropriate levels (easy, medium, complicated) to match players' abilities. • The challenges should match the player's skill level, increase as the player progresses through the game, and allow for player-centred pacing.
	iv. Uncertain outcomes	• The variety of the Quran verses makes testing difficult. • Some hidden information is provided as clues but is selectively revealed by players when needed. • Players will be asked to guess the location of the verses at random.
	v. Performance feedback	• Provides clear, frequent, constructive and positive feedback to promote competence and self-esteem relevant to memorisers. • Rapid feedback also stimulates motivation and engagement in the Quranic memorisation process.
Curiosity	i. Sensory curiosity	• Uses a combination of graphics and visual elements to stimulate the senses of players.
	ii. Cognitive sensory - incompleteness of competence	• Players cannot proceed to other levels and modules if they do not achieve the specified target.
Control	i. Contingency - responsive environment	• Provides timely information about their performance, such as score status, number of repetitions, and number of clue buttons clicked.
	ii. Choice	• Players can control the process by themselves to collect points, badges and participate in other activities. • Games should have an easy, user-friendly interface that provides tutorials or help to enable players' skill development as they progress through the game and should reward players for developing their skills.

Table 7
The application of game elements in the memorisation stages

Memorisation Stage	Game Elements Applied	Parameter of Learning Analytics
Registration	Avatar	• Date and time log into the system • The frequency of access to the system
	Progress bar	• The completion of a particular Surah • The number of verses memorised
Memorisation (recitation of the verses)	Points	• The number of repetitions for each verse contributes some points. If memorised more than ten times, addition points will be rewarded.
	Badges (or trophy)	• The completion of Surah
	Narratives (storylines of the Surah help to describe the meaning of the verses)	
Quiz Assessment	Level Challenges	• Type of Quiz including fill- in-the-blanks (easy level), sorting the verses in the correct sequence (medium level), and guessing the location number of a verse (difficult level)
	Points Scores Badges Timer	• The number of correct answers • The duration for recalling the verses • The number of corrections • The number of hints or clues clicked
	Avatar (meta-reward to change the preferred avatar)	
Learning Analysis	Leaderboard	• Ranking (based on the highest aggregate scores and the shortest duration of quiz assessment).

quiz, and learning analysis, which includes formative assessment and summative assessment. For usability testing, the prototype was developed only for Surah Al-Baqarah (verses 1 to 5), Surah Az-Zalzalah (verses 1 to 8), and Surah As-Syams (verses 1 to 15). The application was designed according to several stages, as follows:

1. Registration: Students must log in to their personal account, and they can choose an avatar for their personal profile to enhance the gamification environment. Details for the registration screen are shown in Figure 1.
2. Memorisation: The memorisation of verses must be done page by page (Figure 2), with the number of verses, the number of repetitions and the duration for recalling the verses recorded accordingly, as shown in Figure 3. This approach is considered goal-oriented chunking (deliberately under strategic control) and perceptual chunking (a more automatic and continuous process of chunking during perception). Gobet et al. (2001), in their work, suggested integrating the

Table 8
The measurement of learning analytics for motivation and engagement criteria

No.	Evaluation criteria	Gamification elements	Learning analytics (parameters)
1.	Motivation	1. Reward: Incorporate tokens of appreciation as rewards or points when designing the game. Students receive points based on the activities they perform or complete. Meanwhile, the meta-reward for continuous effort is represented by badges, levels, social points, and bonus points. 2. Score: The formula for calculating the score is determined not only by the number of correct answers, but also by deductions if the player asks for a clue or if a correction is made. 3. Achievement: Over a certain status, such as badges, medals, and/or trophies that praise the players' specific actions. 4. Progression: Allows players to determine their position in a game based on their progress. Examples and synonyms include progress bars, maps, and steps. 5. Levels: Players cannot proceed to other levels or modules if they do not achieve the determined target. 6. Stats: Visible information such as results, indicators, or data from the game presented to the user and related to their outcomes within the game. For example, it provides timely information about their performance, such as score status, number of repetitions, and number of clue buttons clicked. 7. Time pressure: Countdown, clock, or/ and/or timers	• Memorisation time • Response period • Scores / points collected
2.	Engagement	1. Number of repetitions and period in memorising verses. 2. The number of clue buttons is clicked. 3. Chance: to have a second chance to repeat the assessment, allowing players to redo or restart the action. 4. Players can control the process by themselves to collect points, badges, and other rewards for skill development. 5. Feedback from the formative and summative assessments.	• The number of times the hint is pressed. • The number of corrections is made. • Response period.

goal-oriented and perceptual forms of chunking for more comprehensive learning, which can also be used to predict typical errors in capturing details of the learning process. Memorisation will begin with the first selected verse. The number of repetitions and the duration will be recorded. A saturated red text is used to highlight the verse from left to right, following the reading flow. A clue picture will be displayed as the cursor moves over the verse. After the verse has been memorised several times, the next verse will be displayed only after the previous verse has been fully memorised. A notification message will inform the user whether the number of memorisations is sufficient. If it is fewer than 10 times, the user will be prompted to repeat the process, and the next verse (Figure 4) will not be displayed. Otherwise, the next verse will be shown.

3. Assessment (with interactive quizzes): Gamification elements were implemented in both formative and summative assessments. Formative assessment is implemented as soon as the student has finished memorising a page of Surah, while summative assessment is carried out after all the pages have been memorised. Quiz assessments wwill be provided at three levels of difficulty (easy, intermediate, and difficult) and distributed in each session, as shown in Figures 5 to 7 below. The first level (easy) is a fill-in-the-blank task in which students drag the answer options provided below. The second level (intermediate) requires students to arrange the verses in the correct sequence. Finally, the third level (difficult) asks students to identify the location number of a verse. The quizzes were designed with game elements such as levels/challenges, points/scores/badges, and a timer (Table 9). During these assessments, relevant data will be captured (Table 10), including the total points or scores collected, time spent answering the questions, the number of corrections, the number of verses successfully memorised, and the number of mistakes. Examples are shown in Figure 8.
4. Learning analysis: The progression of an individual's learning performance is analysed as a summative assessment. The data captured (Table 11) will be summarised and displayed on a dashboard. In Figure 9, the overall score obtained will determine each student's ranking and will be displayed on a scoreboard.

RESULT AND DISCUSSION (A GLAM-Q APPLICATION)

Merging gamification into usability testing paves the way for an integrated, interactive, and effective means of study. This section outlines students' perceptions of gamification elements that influence motivation and engagement in Quranic memorisation through gamification and learning analytics. All items in the questionnaire were adapted from established instruments, namely the Student Engagement Scale (SES) and the Intrinsic Motivation Inventory (IMI). Before distributing the questionnaire to respondents, ten experts with a minimum of five years of experience in teaching and/or research in

Figure 1. Registration screen interface with avatar selection

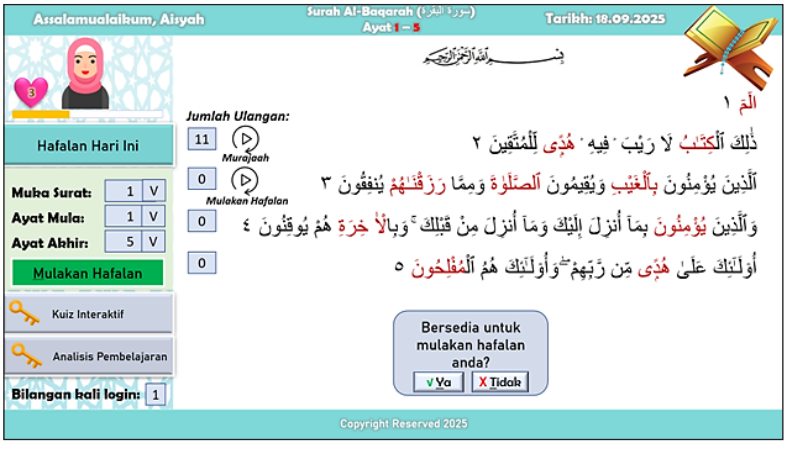

Figure 2. Memorisation screen interface

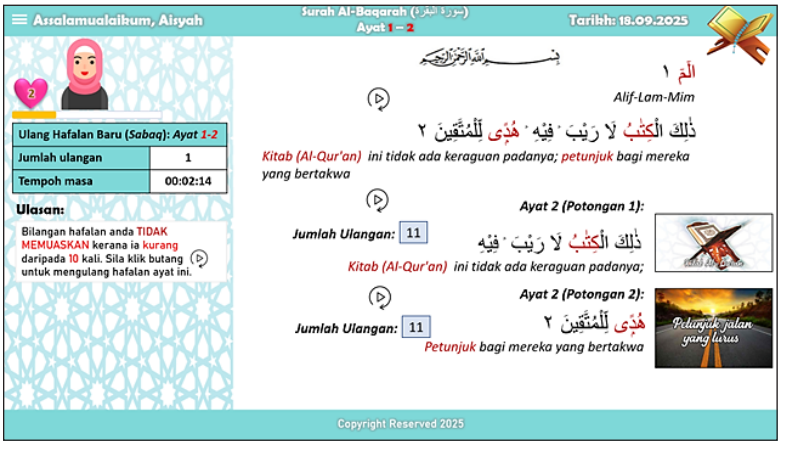

Figure 3. The verse is highlighted by segments (with certain chunks)

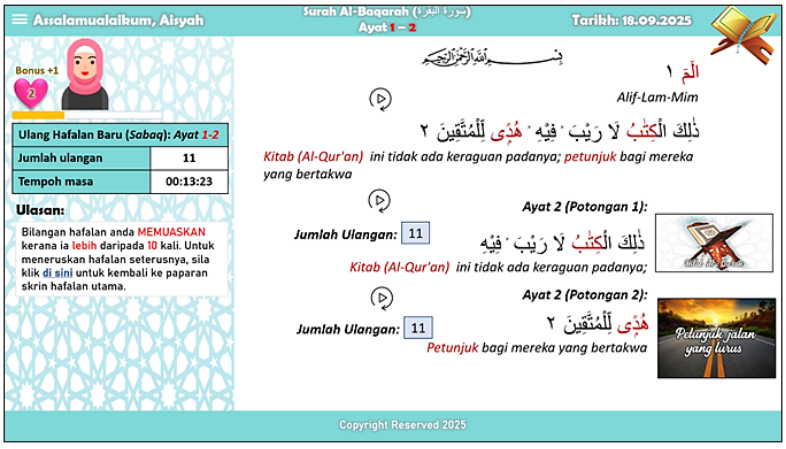

Figure 4. Example of a screen that informs the user whether the number of memorisations is enough or not

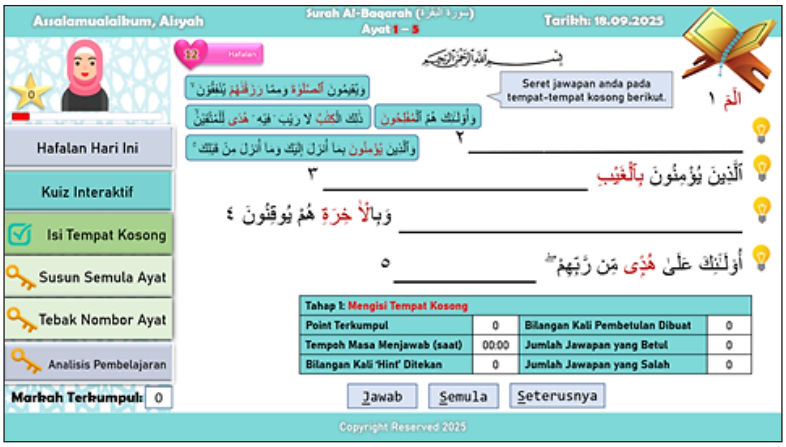

Figure 5. Screen of quiz level 1

Figure 6. Screen of quiz level 2

Figure 7. Screen of quiz level 3

Figure 8 (i-ii). Example of screens that provide feedback in student assessment

Figure 9. Dashboard screens that summarise the formative and summative memorisation performances

Computer Science, Information Technology, Multimedia, Human-Computer Interaction (including gamification or game design), Islamic Studies, Quranic memorisation, or a related discipline have reviewed the content validity of the questionnaire. The modified questionnaire consisted of 31 items, with engagement and motivation as the two major constructs. Engagement was evaluated based on three aspects: behaviour, emotion and

Table 9
Integrated game design elements in the challenge-based gamified quizzing

No.	Game elements	Description	Purpose
1.	Points/scores/ badges	Numeric measure of memoriser's performance (answer corrected).	An indicator of explicit reward.
2.	Levels/challenges	The difficulty level of quizzing provides a sense of progression.	Indicator of progression and difficulty.
3.	Timer	Numeric measure of memoriser's performance (time used).	An indicator of time pressure.

Note. Adapted from Anunpattana et al. (2021)

Table 10
Learning analysis during formative assessment

No.	Analysis data (while answering the quiz)	Analysis data (after answering the quiz)
1.	Verse number.	1. Verse number.
2.	The accumulated points.	2. The number of memorisation repetitions.
3.	The duration of answering each quiz question.	3. The duration of learning (during memorisation and answering quizzes).
4.	The number of times the 'Hint' button is pressed.	4. The number of sentences successfully memorised.
5.	The number of times corrections are made.	5. The total score accumulated.
6.	The correct number of sentences answered.	6. How many times has the system been accessed
7.	The number of wrongly answered sentences.	

Note. Formative assessment is conducted when learners answer the quizzes for each part of memorisation

Table 11
Learning analysis during summative assessment

No.	Analysis data (for summative assessment)
1.	Verse number
2.	The number of memorisation repetitions (for each sentence)
3.	The duration of memorisation repetition (for each sentence)
4.	Total learning time (during memorisation and answering quizzes)
5.	Total accumulated score (for each formative assessment)
6.	Total cumulative score (overall) – in per cent
7.	The number of times the system was accessed
8.	Ranking on the scoreboard, which is based on the highest total (overall) score and the shortest (overall) period

Note. The information collected during the summative assessment is based on a student's overall progression

cognition perspectives. Motivation was assessed using self-determination theory (SDT), namely, autonomy, competence, and relatedness, and the ARCS model, which includes attention, relevance, confidence and satisfaction.

The GLAM-Q application was tested through a descriptive analysis using a random sampling technique on purposively selected participants. A summary of responses from 46 respondents among students in higher education —male: 20 (43.5%), female: 26 (56.5%), aged 19 to 27— is provided in Table 12. The analysis of questionnaire items measuring respondents' views on Quranic memorisation in a game-based system yielded extremely high overall mean scores on a 5-point Likert scale, ranging from 4.55 to 4.91. The highest mean score of 4.91 was obtained by statements assessing *feeling a deep sense of fulfilment when memorising a new Surah*, and *increased motivation after successfully answering a quiz assessment*. The lowest mean score of 4.55 was for statements assessing *seeking additional resources*, though this comes under the category "agree to strongly agree".

Table 12
The analysis of results

No.	Question item	Mean	SD	Cronbach's Alpha
1.	I memorise the Quran because I truly enjoy learning and reciting its verses.	4.76	0.44	0.966
2.	I enjoy challenging myself to improve my recitation and memorisation skills.	4.82	0.39	0.967
3.	I seek additional resources (e.g., verse translations) to deepen my understanding of the verses I memorise.	4.55	0.62	0.969
4.	I feel a deep sense of fulfilment when I successfully memorise a new surah.	4.91	0.29	0.966
5.	I put a lot of effort into my Quranic memorisation because I believe it is important in obtaining the blessings of Allah SWT.	4.82	0.39	0.966
6.	I follow the rules for memorising the Quran using this gamified system: I repeat the recitation of verses several times before proceeding to the next.	4.82	0.39	0.97
7.	I follow the rules in this gamified system by memorising all the verses of the Surah before taking the quiz.	4.79	0.48	0.967
8.	I actively participate in Quranic recitation activities through this gamified system.	4.82	0.39	0.966
9.	I actively participate in quiz challenges through this gamified system.	4.76	0.50	0.966
10.	I consistently repeat previously memorised Quranic verses using this gamified system.	4.76	0.44	0.966
11.	I use this gamified system to improve my progress in Quranic memorisation.	4.70	0.47	0.966
12.	I persist in memorising Quran verses because I receive immediate feedback from the learning analysis in this gamified system.	4.58	0.56	0.965

Table 12 (*continued*)

No.	Question item	Mean	SD	Cronbach's Alpha
13.	I try to complete my memorisation goals using this gamified system, even when it is difficult.	4.58	0.61	0.967
14.	I use gamification features (e.g., levels, points, trophies, and leaderboards) to track my progress in Quranic memorisation.	4.67	0.54	0.965
15.	I am more likely to persist in memorising difficult or longer verses when I receive rewards (incentives) from memorisation activities through this gamified system.	4.67	0.60	0.967
16.	I am committed to my memorisation goal regardless of external rewards.	4.64	0.49	0.967
17.	I enjoy memorising the Quran when using this gamified system.	4.82	0.39	0.97
18.	I feel more excited to continue my Quranic memorisation when I receive rewards (e.g., unlocking new levels, earning points, and receiving virtual trophies) through this gamified system.	4.67	0.54	0.965
19.	I feel fun to memorise the Quran when competing with others on the leaderboard (through the challenge).	4.58	0.66	0.967
20.	I feel supported when I receive feedback or encouragement from this gamified system.	4.70	0.47	0.966
21.	I feel confident in my ability to memorise the Quran effectively using this gamified system.	4.79	0.42	0.966
22.	I believe this gamified system helps me improve my memorisation skills over time.	4.79	0.42	0.965
23.	I feel a sense of accomplishment when I unlock new milestones (e.g., completing a new Surah and/or reaching a new level in the assessment).	4.82	0.39	0.966
24.	I feel my motivation increased when I managed to answer the memorisation quiz assessment well.	4.91	0.29	0.966
25.	I think gamification features in this system (e.g., progress tracking bar) help me stay focused on my memorisation goals.	4.76	0.44	0.97
26.	I think the use of gamification elements (e.g., levels, points, and trophies) encouraged me to set specific goals for the Quran memorisation challenge.	4.79	0.42	0.966
27.	I am more likely to use memorisation techniques (e.g., chunking into short verses, repetition during recitation, visualisation, and association via text and pictures) when they are incorporated into a structured, gamified learning environment.	4.67	0.54	0.967
28.	I plan my memorisation strategy based on my progress and performance in this gamified challenge system.	4.70	0.53	0.966
29.	I actively reflect on the meaning of the verses I memorise (with pictures), not just their pronunciation, when using this gamified system.	4.76	0.44	0.966
30.	I think that multimedia elements in this gamified system, such as text, visuals (images), and/or audio, help enhance the memorisation of Quranic verses.	4.85	0.36	0.966
31.	I find it easier to memorise the Quran when interactive learning tools (e.g., audio and visual cues) are included in this gamified system.	4.85	0.36	0.965

Standard deviations (SDs) from 0.29 to 0.66 suggest a low response variation, i.e., most respondents kept high ratings for statements on the same scale side. This proves that the gamified system functions well across the group of respondents. Reliability analysis also showed very high internal consistency of all the statements, having a Cronbach's alpha of 0.965 to 0.970. The standard criterion (Taber, 2018) clarifies that a value above 0.9 indicates exceptional reliability. This provides confidence that the questionnaire items are reliable and consistently measure engagement, motivation, and support for memorisation.

Table 13 shows that the gamification learning application has a positive impact on learner engagement in three dimensions, namely, behaviour (96.83%), emotion (99.13%) and cognitive (97.55%). Behavioural analysis clearly indicates an increased level of active participation in improving Quranic memorisation, not only in the recitation task but also in the quiz assessment, as reflected in higher interaction rates, task completion rates and the amount of memorisation. In terms of emotional engagement, learners exhibited favourable affective responses toward the gamified application, such as truly enjoying and feeling excited reciting the verses when receiving rewards, feeling a deep sense of fulfilment after successfully memorising a new Surah, feeling supported when they receive feedback or encouragement from this gamified application, feeling a sense of accomplishment when they unlock new milestones and compete with others on the leaderboard, among others. Cognitive engagement also improves, as reflected in learners' sustained attention, effort, and interaction with complex tasks. The structure of the gamified activities appears to facilitate deeper processing, problem-solving, and strategic thinking rather than superficial interaction. This suggests that gamification is supportive of meaningful learning by

Table 13
The variable measurement scale results

Construct	Variable	Question Item	Result		
			Strongly Agree	**Agree**	**Total**
Engagement	Behaviour (BE)	2, 5 – 16	68.90%	27.93%	96.83%
	Emotion (EE)	1, 4, 17 – 24	73.26%	25.87%	99.13%
	Cognitive (CE)	3, 25 – 31	67.12%	30.43%	97.55%
Motivation	Autonomy (AU)	2, 5 – 13, 15 – 16, 28	68.73%	28.26%	96.99%
	Competence (CM)	13, 21 – 24	72.17%	25.65%	97.82%
	Relatedness (RE)	19 – 20, 28	66.67%	30.43%	97.10%
	Attention (AT)	25 – 26, 29 – 31	70.87%	28.70%	99.57%
	Relevance (RV)	3, 14, 27, 29 – 31	66.67%	29.71%	96.38%
	Confidence (CF)	21 – 24	76.09%	23.91%	100.00%
	Satisfaction (SA)	1, 4, 15 – 18, 23 – 24	72.83%	25.82%	98.65%

encouraging active knowledge construction among learners on the condition that it is aligned with an instructional objective.

In addition, gamification, when used in conjunction with Quranic memorisation, can significantly enhance learner motivation, particularly in terms of autonomy (96.99%), competence (97.82%), relatedness (97.10%), attention (99.57%), relevance (96.38%), confidence (100%), and satisfaction (98.65%). In terms of autonomy, learners demonstrated more self-regulation in behaviour; repeated interactions with the application were also depicted. Regarding competence, performance achievement mechanisms such as points, levels, and progress appear to improve learners' perceptions about the development and mastery of skills. This aspect of competence is important to maintaining motivation, since learners are more likely to be motivated when they see that their efforts are effective. The dimension of relatedness was reinforced through application-embedded social or comparative elements, such as leaderboards. This feature fostered a sense of connection and belonging, motivating learners to participate consistently and align their efforts with those of others. The ARCS model states that the application successfully captured learners' attention through interactive tasks, game mechanics, and dynamic feedback. In terms of relevance, learners' continuous participation in the application may indicate that the content and challenges were perceived as meaningful and aligned with their learning needs and objectives, thereby strengthening motivational commitment. Learners' confidence is built through incremental challenges and immediate feedback, which helps students monitor progress to estimate upcoming success. Finally, satisfaction is reflected in the learners' steady involvement and willingness to continue using the application, suggesting that the rewards, achievements, and overall learning experience have met or exceeded learner expectations.

Consequently, it can be inferred that GLAM-Q triumphantly created an entertaining learning environment that motivates students to use the application continuously. The findings emphasise that gamification applications have immense potential in boosting learning quality in religious content exploration using digital platforms.

CONCLUSION

Most studies treat gamification as a stable phenomenon, whereas in practice, the gamification world can be designed in almost any form. Despite researchers' efforts to assess the impact of gamification in educational contexts, several methodological shortcomings remain. In fact, the number of research studies with high methodological rigour is decreasing, and consequently so is the reliability of the outcomes. In this study, we identified the fundamental elements that define the methodological approach to implementing gamification in Quranic memorisation. As gamification can incorporate game design components in various ways and take many distinct forms, it is inappropriate to study the motivational effects of gamification as a generic construct. This is because gamified

learning will have a substantial impact on students' subject knowledge and attitudes towards continuous learning if they are highly motivated to participate.

This article reviews previous research on current methods of teaching and learning that incorporate gamification into Quranic memorisation. This study has also identified gamification features to consider when determining whether gamified activities and applications are appropriate for use in existing Quranic memorisation environments. To keep students motivated to memorise Quranic verses consistently, several gamification elements were incorporated to enhance engagement throughout lessons and assessments. We have access to data that directly reflects engagement, such as total learning time and the number of system accesses. The general consensus is that a user who connects more frequently and for a longer period is considered more engaged in the activity than one who connects less frequently or for a shorter period. However, this does not allow us to compare engagement levels at two different times; it only allows us to compare the overall level of engagement. Therefore, we require a different method to monitor engagement in real time. To gauge engagement, we must monitor how the user interacts with both the gamification layer and the learning environment by capturing the duration of learning, specifically while memorising and answering the quizzes.

The main contribution of this study is the suggestion that future gamification designs should incorporate components that may sustain students' motivation for longer by addressing issues that could cause them to lose enthusiasm for memorising the Quran. In addition, it is important to carefully apply gamification features such as points, progression, levels, acknowledgement, sensation, and others, so that students remain focused on learning rather than merely accumulating rewards. Future research on gamification should also examine whether applying gameplay activities would be beneficial, as it may otherwise leave students bored and waste a significant amount of their time. Future gamification programmes should also be made with utmost consideration for demographic characteristics so that the gamification aspects can properly enhance students' motivation and interest in memorising the Quran. Further research on the implementation of gamification and psychological concepts can be conducted, integrating future developments and innovations, based on the positive impact observed after the implementation of such innovations. Additionally, it is believed that this study has helped the students memorise the Quran better and aided teachers in evaluating their students more conveniently.

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