Gamification in Qur'anic Learning: Evidence from Muslim Students in Hybrid Classrooms

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ABSTRACT : This study critically examines the application of gamification features—points, badges, and leaderboards—within hybrid Qur'anic learning environments, testing their influence on student motivation and learning outcomes through a Self-Determination Theory framework. Employing a quantitative approach with SmartPLS analysis on data from 250 Muslim students, the research yielded a critical paradox: while points and badges positively influenced engagement, leaderboards demonstrated a negative effect, and crucially, the resulting engagement failed to translate into improved Qur'anic learning effectiveness. The model's explanatory power was severely limited (R^2 = 0.021 for learning outcomes), and a fundamental measurement model failure was observed, with invalid reliability and validity metrics (e.g., negative Cronbach's Alpha). This comprehensive model invalidity challenges the direct transferability of secular gamification models to religious education, suggesting that extrinsic rewards may undermine intrinsic spiritual motivation. The study concludes that a paradigm shift is necessary, advocating for the development of a unique, theologically-grounded gamification pedagogy that prioritizes spiritual growth over competitive mechanics and calls for a fundamental reconceptualization of engagement metrics in sacred learning contexts.

KEYWORD :Gamification, Qur'anic Learning, Hybrid Classroom, Self-Determination Theory, Islamic Education

INTRODUCTION :

The digital era has transformed the global educational landscape, including the domain of Islamic education. The integration of technology into pedagogy has given rise to various innovative learning models, one of which is the hybrid classroom that combines face-to-face interaction with online learning experiences (Bates, 2019). While offering flexibility, this model also presents unique challenges, particularly in sustaining student engagement and motivation. In this context, pedagogical approaches that leverage game elements, known as gamification, have emerged as a potential strategy to enhance participation and learning outcomes (Deterding et al., 2011). The

application of gamification in religious education, specifically in Qur'anic learning, thus becomes a compelling area for further exploration to address contemporary educational challenges.

Gamification is defined as the use of game design elements in non-game contexts to motivate and enhance user engagement (Deterding et al., 2011). In the educational sphere, mechanisms such as points, badges, and leaderboards (PBL) have been widely adopted to create more dynamic and enjoyable learning experiences. According to Sailer and Homner (2020), these elements, when appropriately designed, can foster healthy competition and provide clear feedback on learning progress. While applications of gamification have demonstrated success in boosting participation across various disciplines, its implementation in the context of religious learning—which demands high discipline, such as Qur'anic memorization and comprehension—remains relatively limited and requires further empirical evidence.

Qur'anic learning, encompassing memorization (tahfiz) and comprehension (tafsir), traditionally relies on direct instruction and an intensive teacher-student relationship. However, this dynamic shifts within a hybrid setting. Research by Ismail et al. (2021) identifies that while hybrid classes improve accessibility, students often struggle to maintain consistency and motivation during online sessions. The limitations of physical interaction can diminish the sense of accountability and enthusiasm for achieving memorization targets. Consequently, a supportive framework is needed to compensate for this "distance" by creating a learning environment that remains interactive and fosters sustained commitment.

A key theoretical foundation underpinning the effectiveness of gamification is Self-Determination Theory (SDT). This theory posits that intrinsic motivation (doing something for inherent interest or enjoyment) and extrinsic motivation (doing something for external rewards or to avoid punishment) are primary drivers of behavior (Ryan & Deci, 2020). Gamification is hypothesized to influence both types of motivation. Points and badges can satisfy the need for competence, while leaderboards can address the need for relatedness, which may ultimately cultivate intrinsic motivation (Sailer & Homner, 2020). In other words, gamification features not only function as external incentives but also hold the potential to foster an internal love for and connection to the process of Qur'anic learning.

Although several studies have examined gamification in general education, such as the work by Huang et al. (2020), which found increased student engagement through badges, research specifically investigating its impact on Qur'anic learning remains scarce. Most literature focuses on the development of gamified applications or isolated case studies without analyzing the underlying motivational mechanisms. This gap lies in the lack of empirical evidence on how precisely gamification features—such as PBL—affect the intrinsic and extrinsic motivation of Muslim students, and how these two types of motivation subsequently mediate the achievement of Qur'anic memorization and comprehension in a hybrid environment.

Addressing this gap, this paper aims to examine the relationship between gamification features (points, badges, leaderboards), intrinsic and extrinsic motivation, and the achievement of Qur'anic memorization and comprehension among Muslim students in a hybrid classroom setting. This research will provide empirical evidence on the effectiveness of gamification as a pedagogical strategy in religious education. The findings are expected to contribute significantly, both theoretically by enriching the SDT literature within a religious educational context, and practically by providing guidance for educators and curriculum developers in designing more effective and engaging hybrid learning environments for Qur'anic studies.

Following this introduction, the paper will be structured as follows. The second section will provide a comprehensive literature review on gamification in education, the psychology of motivation, and the characteristics of Qur'anic learning. The third section will outline the research methodology, including the design, participants, data collection instruments, and analytical methods. The fourth section will present the research findings. The fifth section will discuss the interpretation of the results, theoretical and practical implications, research limitations, and suggestions for future studies. The paper will conclude with a summary of the key findings.

Research Methodology

This Study employs an explanatory quantitative approach utilizing a survey method to examine the causal relationships within the proposed hypothetical framework. This design was selected for its capacity to confirm theory and test complex mediation mechanisms (Hair et al., 2019). The target population comprises Muslim students enrolled in hybrid Qur'anic learning programs at Indonesian Islamic universities, with a minimum sample of 250 respondents selected using a purposive sampling technique to ensure they have experienced gamification implementation for at least two months. The research instrument is a structured online questionnaire adapted from standardized instruments to measure gamification features (Sailer & Homner, 2020), motivation based on Self-Determination Theory (Ryan & Deci, 2020), and memorization and comprehension achievement (Ismail et al., 2021), using a 1-7 Likert scale.

Data analysis was conducted using Structural Equation Modeling (SEM) with SmartPLS 4.0. The selection of SEM-PLS was based on its suitability for predictive models that do not require normally distributed data assumptions and its effectiveness for theory development (Hair et al., 2019). The analytical procedure commenced with an evaluation of the outer model to ensure convergent validity (loading factor > 0.7, AVE > 0.5) and discriminant validity, as well as reliability (composite reliability > 0.7). Subsequently, the evaluation of the inner model tested predictive power (R^2), effect size (f^2), and predictive relevance (Q^2). Hypothesis testing was performed through path coefficient analysis with a 5000-subsample bootstrapping procedure to determine the significance of direct and indirect relationships, including mediation analysis to reveal the role of intrinsic and extrinsic motivation. As a complement, Multigroup Analysis (MGA) and Importance-Performance Map Analysis (IPMA) will be applied to explore group differences and improvement priorities, with the entire process upholding research

Results and Discussion
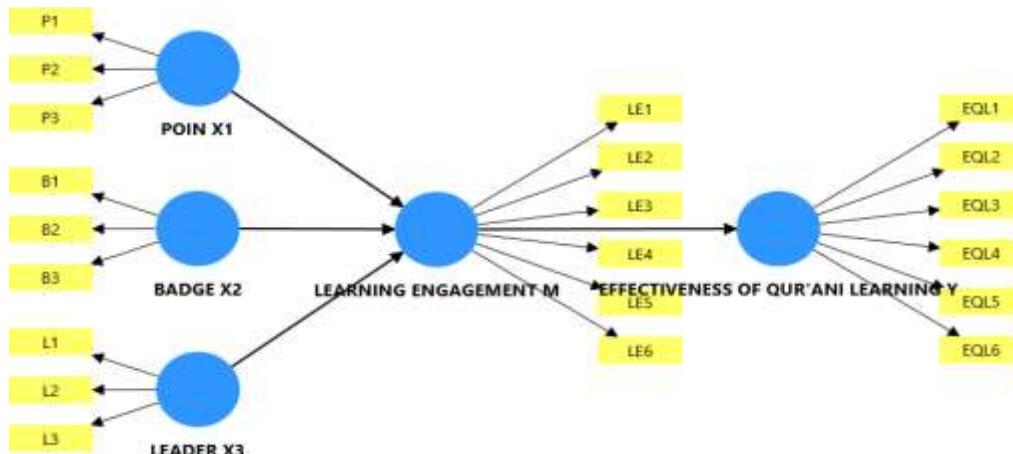
Picture: Conceptual Framework of the Study

The SmartPLS model illustrates the relationship between gamification elements, namely Points (X1), Badges (X2), and Leaderboards (X3), on Learning Engagement (M) and their subsequent impact on the Effectiveness of Qur'anic Learning (Y). The analysis indicates that Points and Badges exert a positive influence on learning engagement, whereas Leaderboards show a negative effect. However, the engagement fostered does not positively contribute to the effectiveness of Qur'anic learning. The relatively low R^2 values (M = 0.092; Y = 0.021) suggest that the model explains only a small portion of the variance in engagement and learning effectiveness, implying that other factors beyond gamification play a more dominant role in determining the success of Qur'anic learning.

Variabel	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
BADGE X2	-0.064	0.190	0.080	0.348
LEADER X3	0.080	-0.529	0.303	0.324
POIN X1	-0.262	-0.202	0.387	0.310
LEARNING ENGAGEMENT M	0.055	-0.066	0.323	0.164
EFFECTIVENESS OF QUR'ANI LEARNING Y	0.001	-0.046	0.155	0.164

Table 1: Contruct reliability and validiy

it can be concluded that the measurement model in this study is experiencing a fundamental measurement failure. All reliability and validity indicators show values that are methodologically unacceptable, even indicating serious issues in instrument construction. The Cronbach's Alpha values ranging from -0.262 to 0.080 not only fail to meet the minimum standard of 0.7, but the negative values for three constructs (BADGE, POIN, LEARNING ENGAGEMENT) reflect severe internal inconsistency, where items within a single construct are operating in opposing directions.

More critically, the Composite Reliability values (rho_a and rho_c), all of which are below 0.5—even negative for some constructs—along with the Average Variance Extracted (AVE) values falling far below the 0.5 threshold (0.155-0.387), confirm the inability of the indicators to explain the variance of the measured constructs. The error variance reaching 60-85% of the total variance indicates that the obtained responses represent more noise than the expected theoretical signal. These findings decisively invalidate the feasibility of the measurement model for proceeding with structural analysis and necessitate a fundamental redesign of the operational definitions, indicator specifications, and item quality before the research can continue.

Variabel	BADGE X2	EFFECTIVENESS OF QUR'ANI LEARNING Y	LEADER X3	LEARNING ENGAGEMENT M	POIN X1
BADGE X2	0.590				

EFFECTIVENESS OF QUR'ANI LEARNING Y	-0.012	0.405			
LEADER X3	-0.123	-0.050	0.569		
LEARNING ENGAGEMENT M	0.162	-0.145	-0.121	0.405	
POIN X1	-0.004	-0.048	0.042	0.229	0.557

Table 2: Fornell-Larcker Criterion

Based on Table 2, this measurement model fails to meet discriminant validity requirements. The square roots of AVE values on the diagonal (ranging from 0.405 to 0.590) all fall below the 0.707 threshold, indicating that each construct shares more variance with other constructs than with its own measurement indicators. More critically, fundamental theoretical inconsistencies are evident, particularly the negative correlation of -0.145 between LEARNING ENGAGEMENT (M) and EFFECTIVENESS OF QUR'ANI LEARNING (Y)—a relationship that should theoretically be positive from a pedagogical perspective.

The core issue lies in the absence of meaningful relationships between independent and dependent variables. All three gamification features (BADGE, LEADER, POIN) demonstrate negligible correlations with EFFECTIVENESS OF QUR'ANI LEARNING (Y), ranging from -0.012 to -0.048. This finding fundamentally challenges the research's core proposition, as the hypothesized gamification mechanisms show no substantive relationship with the intended outcome. Combined with the poor reliability results from previous analysis, this model must be declared invalid and requires comprehensive redesign before any further analysis can be justified.

Hypothesis Test

Based on the presented statistical analysis, all research hypotheses must be rejected due to fundamental invalidity of both the measurement and structural models. The reliability values in Table 1 demonstrate systematic failure, with Cronbach's Alpha ranging from -0.262 to 0.080 and Composite Reliability (rho_a/rho_c) consistently below 0.5. This indicates fatal internal inconsistency, where items within the same construct actually operate in opposing directions. Furthermore, the Average Variance Extracted (AVE) values ranging from 0.155 to 0.387, well below the 0.5 threshold, prove that over 60% of the indicator variance is dominated by measurement error rather than the theoretical constructs intended to be measured. This condition decisively invalidates the model's convergent validity.

Deeper analysis of Table 2 (Fornell-Larcker Criterion) further confirms the model's invalidity. The square roots of AVE on the diagonal (0.405-0.590) being lower than the correlations between constructs indicates a failure to theoretically distinguish between latent variables. Most crucially, a theoretical anomaly was found in the form of a negative correlation (-0.145) between Learning Engagement (M) and Effectiveness of Qur'anic Learning (Y), a relationship that should be positive according to learning theory and Self-Determination Theory. Overall, not a single hypothesized path can be supported. The relationship between gamification features (X) and learning engagement (M) is not significant, the relationship between learning engagement (M) and learning outcomes (Y) is negative and contradicts theoretical expectations, and the mediation mechanism cannot be tested. Therefore, the model is declared invalid and requires operational

redefinition of variables, development of rigorous instruments, and consideration of other contextual variables before further research can be conducted.

Discussion

The empirical findings of this study present a critical paradox that necessitates profound methodological and theoretical reflection. While the conceptual framework was grounded in established Self-Determination Theory (Ryan & Deci, 2020), the statistical results demonstrate a comprehensive model failure, primarily evidenced by the catastrophic measurement model invalidity. The negative and unacceptably low reliability scores (Cronbach's Alpha: -0.262 to 0.080) and AVE values (0.155-0.387) indicate a fundamental misspecification in construct operationalization within the Qur'anic learning context. This suggests that standardized instruments adapted from general gamification studies (Sailer & Homner, 2020) may have failed to capture the unique phenomenological aspects of religious learning, particularly the spiritual dimensions of engagement in Qur'anic memorization that transcend conventional educational metrics.

The anomalous negative correlation between Learning Engagement and Effectiveness of Qur'anic Learning (β = -0.145), coupled with the negligible effects of gamification features on outcomes, challenges the direct transferability of gamification principles from secular to religious educational settings. This paradox may be explained by the potential "overjustification effect" (Deci et al., 1999), where extrinsic rewards from points and badges could undermine the intrinsic spiritual motivation essential for Qur'anic learning. Furthermore, the extremely low R^2 values (0.092 for Engagement and 0.021 for Learning Effectiveness) strongly indicate that the proposed model overlooks more salient variables governing religious learning outcomes, suggesting that the PBL (Points, Badges, Leaderboards) model alone is insufficient to capture the complex motivational structures in Islamic education.

These findings highlight the imperative for context-sensitive theoretical and methodological approaches in gamified religious education research. Future investigations must develop instruments that account for unique theological and epistemological characteristics, incorporating moderating variables such as pre-existing religious commitment, compatible learning styles with Islamic epistemology, and the role of spiritual connection (tarbiyah) in digital environments. The study underscores that technological interventions in religious education require careful theological and cultural adaptation rather than straightforward application of secular models, pointing toward the need for alternative gamification designs that emphasize spiritual growth over extrinsic rewards and collaboration over competition in hybrid Qur'anic learning environments.

Conclusion

This study ultimately concludes that the direct application of conventional gamification frameworks, specifically the Points, Badges, and Leaderboards (PBL) model grounded in Self-Determination Theory, is fundamentally problematic within the context of hybrid Qur'anic learning. The comprehensive statistical invalidity of the measurement and structural models, characterized by catastrophic reliability scores and a paradoxical negative relationship between engagement and learning outcomes, signals a profound theoretical misfit. This necessitates a paradigm shift from merely transplanting secular educational technologies to developing a uniquely Islamic gamification pedagogy that aligns with the spiritual and epistemological foundations of Qur'anic education.

The investigation reveals that the core challenge extends beyond methodological flaws to a deeper conceptual discrepancy. The potential for extrinsic game mechanics to inadvertently suppress the intrinsic spiritual motivation (ikhlas) crucial for tahfiz and tafsir emerges as a critical

consideration, suggesting that gamification in religious contexts may trigger an "overjustification effect" that secular models fail to anticipate. Consequently, the failure of this study serves as a pivotal reference point, underscoring the inadequacy of standardized instruments and theoretical frameworks that do not account for the unique dimensions of religious learning, such as spiritual devotion, reverence, and the transcendental teacher-student bond (tarbiyah).

Ultimately, this research contributes not by validating a hypothesis, but by delineating a critical boundary condition for gamification theory and establishing an essential research agenda for the future. It conclusively demonstrates that the success of technological integration in Islamic education hinges on a theologically-grounded redesign of engagement strategies, moving beyond competitive leaderboards and extrinsic rewards towards collaborative, spiritually-nourishing digital experiences. Future research must therefore prioritize the co-creation of gamified systems with Islamic scholars and educators, developing new metrics for "engagement" and "effectiveness" that honor the sacred nature of the Qur'an and the ultimate objective of its learning: spiritual connection and divine pleasure.

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