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Empowering Higher Education in Oman through Gamification

Dr. Kumaresan Chandrasekaran[1]; Shrikant Taware[2];
Dr. Ghouse Mohiyaddin Sharif G. M. [3]; Aatif Abdulsamed Mureed Albalushi[4]

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Abstract: Gamification is increasingly transforming learning experiences in universities worldwide, and Oman is beginning to explore its full potential. Although significant opportunities exist, many remain underutilized. In Alignment with Oman Vision 2040's goal of fostering a skilled, innovative, and digitally literate workforce, this research brings together recent empirical evidence, case studies, and insights from educators to highlight the opportunities and challenges of implementing gamification in Omani higher education. After critically reviewing the literature and examining local realities, findings reveal clear promise gamification can boost engagement and support crucial skill development. However, real obstacles persist infrastructure gaps, entrenched cultural perceptions, and policy misalignments. This paper clarifies what works, what challenges exist, and what strategic steps are needed to advance gamification in higher education across Oman.

Keywords: *Gamification, Higher Education, Oman, Vision 2040, Digital Engagement, Motivation, Educational Innovation.*

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I. INTRODUCTION

Oman's Vision 2040 sets out an ambitious roadmap for educational reform: building a diversified, knowledge-driven society shaped by innovation and digital fluency (MOHERI, 2025). Higher education is central to this vision, responsible for cultivating graduates equipped to navigate rapid technological change and global competition. In this context, gamification using game mechanics like points, leaderboards, digital badges, and collaborative challenges has caught the attention of Omani educators as a promising strategy for re-engaging students burned out by traditional, exam-centered methods (Al Wahaybi, 2025; Shaukat et al., 2025).

Gamification is more than a global trend it's rapidly altering the fabric of classroom experience in Oman. Teachers report a newfound vibrancy: once-silent learners now compete to solve problems, collaborate in teams, and celebrate digital achievements. As one instructor noted, "The moment I introduced Kahoot! I saw students' eyes light up they wanted to learn and win together." In foundation English and STEM programs especially, technology-driven games have helped transform passive learning into interactive, achievement-driven participation (Shaukat et al., 2025).

Yet, beneath these early successes, systemic barriers remain variable infrastructure, uneven professional development, curriculum rigidity, and cultural hesitation. Many teachers still operate without reliable internet or robust device access; others feel unprepared to move beyond superficial quiz games. Deep-rooted beliefs sometimes portray games as less "serious" than conventional study, slowing institutional adoption. For gamification to be sustainably integrated into Omani higher education, these barriers must be addressed through strategic alignment with Vision 2040 backed by policy reform, institutional support, and evidence-driven practice. Capacity building, and empowered student voices.

This paper systematically explores both the opportunities and barriers for gamifying higher education in Oman, its objectives are to: gamification in Omani higher education, aiming to:

- Highlight the motivational and educational impacts of gamification in Oman higher education Map the motivational and learning impacts of gamification in Oman.
- Investigate challenges impeding large-scale, sustainable adoption.
- Provide evidence-base Synthesize evidence and local testimony to guide effective practice and future research.

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II. LITERATURE REVIEW

Gamification applies core game design elements points, badges, leaderboards, levels, quests, storytelling, and collaboration to non-game settings to drive engagement, persistence, and achievement (Sailer et al., 2021). In higher education, mechanics work best when carefully integrated with course outcomes, providing students with tangible goals, rapid feedback, and meaningful competition or cooperation. Studies in motivational psychology (Self-Determination Theory) show that autonomy, competence, and related key motivational needs can be supported by game mechanics, strengthening both enjoyment and effort in learning (Ryan & Deci, 2017; Chan & Lo, 2022).

➢ *Global Trends*

International meta-analyses present consistently positive effects: gamification boosts engagement and learning, especially in domains requiring repeated practice, collaboration, and feedback (Hung, 2017; Zainuddin et al., 2020). The literature highlights several effects:

- Improved Motivation: Students respond well to points and digital rewards as short-term motivators (Cheong et al., 2019).
- Increased Retention: Regular formative assessment and instant feedback help students monitor progress, improving knowledge retention (de-Marcos et al., 2014).
- Social Learning: Leaderboards and team-based quests foster healthy competition and peer learning (Dicheva et al., 2015).
- Personalization: Platforms using AI adapt difficulty and content, supporting differentiated instruction (IEEE Xplore, 2024).

However, critics warn that gamification's impact can decline if used superficially without curricular alignment, teacher support, and cultural resonance (Buckley et al., 2017).

➢ *Regional and Local Evidence*

Studies from the Gulf region emphasize the need for the Gulf, research reveals the importance of cultural and institutional adaptation. (Baah et al. 2023) demonstrate that collective challenges and public recognition are more powerful motivators than solitary play provided student and family values align. Alqahtani (2022) Stressed that effective implementation hinges on teacher facilitation and respect for local expectations.

Omani scholarship is Limited but growing. Shaukat et al. (2025) document robust engagement and achievement gains among foundation English students using Kahoot, Quizizz, and similar gamified approaches. Notably, the effect is strongest when mechanics are matched to curriculum objectives and when feedback is timely, specific, and supportive. In classroom surveys, students reported greater confidence, willingness to participate, and sense of achievement.

Al Wahaybi (2025) emphasizes that the best results arise when gamification is adapted to discipline, culture, and learner profile—not simply copied from international models. "In Oman, engagement increases, but sustainability depends on buy-in from both staff and families and sustained professional development." She notes persistent barriers: patchy internet, old devices, and lack of time for teachers to plan and experiment.

Case studies from Oman's vocational colleges and STEM classrooms echo these themes. Mansour & Vadell (2024) attribute stalled innovation partly to policy lag: Vision 2040 is forward-looking, but many academic regulations remain tied to rote curriculum and final examinations. Creating a disconnect between aspiration and practice.

Despite these challenges, the literature underscores Oman's unique readiness for digital transformation. Widespread adoption of smartphones, growing public enthusiasm for technology, and ministry support signal fertile ground for scaling gamification, if lessons from pilot projects and practitioner feedback are fully realized. However, literature still calls for more large-scale, longitudinal research, especially examining equity, local customization, and faculty/student perspectives.

III. RESEARCH METHODOLOGY

This paper adopts a systematic qualitative review and policy analysis approach to understand gamification's role in Oman higher education. The methodology included:

- Selection of Sources: Research articles, policy papers, and practitioner case studies published between 2019 and 2025 were identified using Scopus, Web of Science, and Oman's MOHERI archives, with a focus on "gamification," "higher education," and "Vision 2040."
- Inclusion Criteria: The review included studies on Omani HEIs, empirical and quasi-experimental reports, regional comparisons, ministry white papers, and faculty/student testimonies. Excluded were studies confined to primary/secondary education or non-Omani contexts.
- Thematic Analysis: Data was coded thematically to identify recurring patterns of opportunity (engagement, skill-building), challenge (infrastructure, policy, culture), and strategic solutions.
- Contextual Triangulation: Evidence was triangulated across academic, policy, and practitioner sources to ensure local relevance and reliability.
- Validation: A small group of Omani educators reviewed the consolidated findings for contextual relevance.
- This approach ensures that, the study balances empirical rigor with local insight, aiming to produce recommendations that are both evidence-based and authentically grounded in Oman's educational realities.

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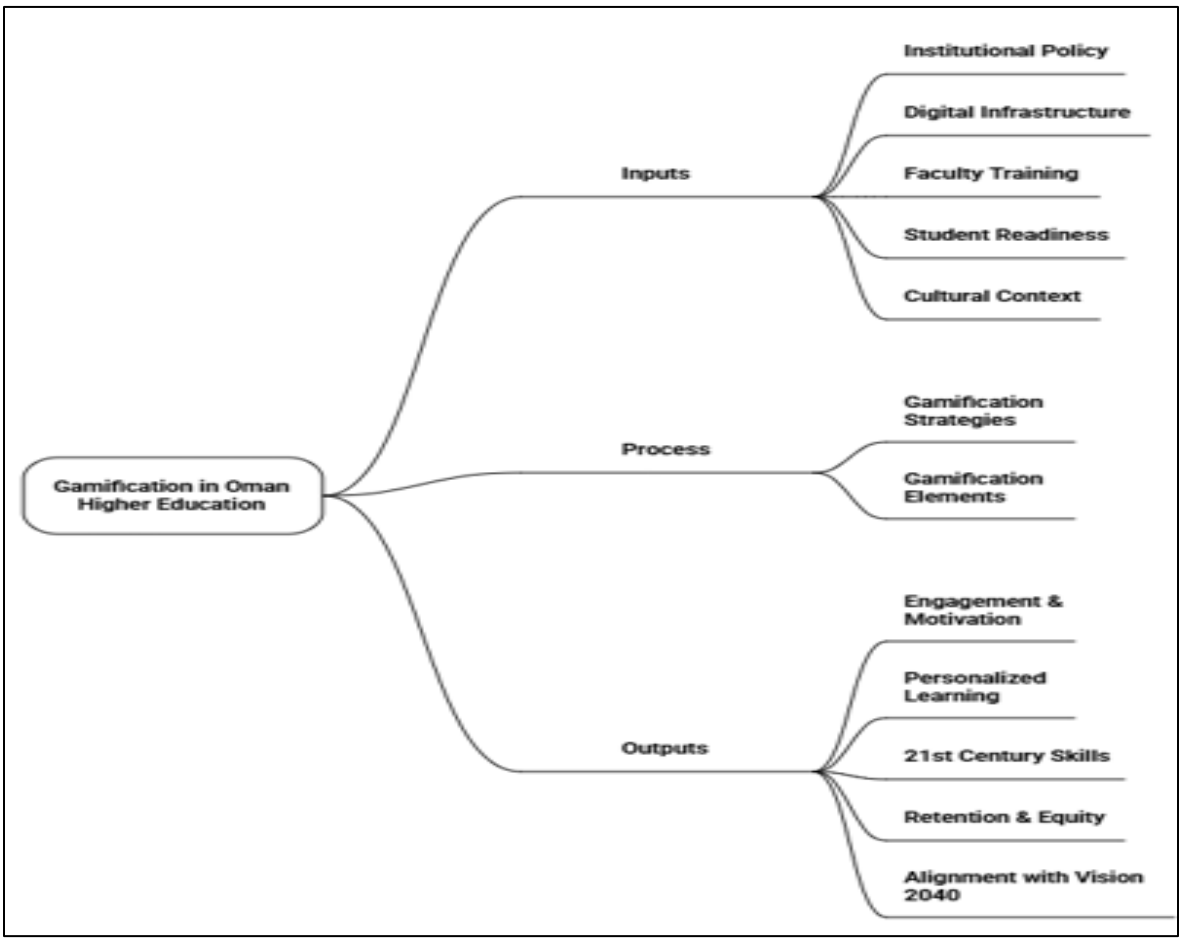

Fig 1. Analytical Framework for Gamification in Omani Higher Education

A. Opportunities for Gamification in Omani Higher Education

Gamification resonates strongly with Vision 2040's priorities: innovative, flexible, and digitally skilled graduates (MOHERI, 2025). Its practical benefits, clearly documented in research and classroom testimony, Key opportunities include:

B. Enhanced Engagement & Motivation

Gamified activities transform traditional learning into dynamic, interactive experiences. In both foundation English and STEM classes, gamified quizzes, challenges, and game-inspired projects re-activate participation among students who previously disengaged (Al Wahaybi, 2025; Shaukat et al., 2025; Baah et al., 2023). As one Omani teacher recounted, "Even shy learners will compete if points and feedback feel achievable and fair." The effect spans disciplines: team-based science projects, language listening games, and digital math competitions all report higher attendance and persistent effort.

➢ *Personalized, Adaptive Learning*

Advances in AI-powered gamification allow teachers to tailor questions, rewards, and challenges to individual learner profiles, supporting inclusivity and personalized intervention (IEEE Xplore, 2024; Ajrsp, 2025). Systems diagnose strengths and weaknesses in real time, enabling scaffolding, targeted review sessions, or differentiated homework. In Omani classrooms where mixed language and skill levels are common adaptive tools help to ensure equitable access to learning. Dev

➢ *Developoment of 21st Century skills*

Gamification is uniquely suited to develop crucial soft skills including critical thinking, problem-solving, communication, and teamwork. Collaborative quests and cross-disciplinary "missions" require students to articulate, plan, and reflect with peers, simulating real workplace dynamics (Sotirov et al., 2023; Mansour & Vadell, 2024). In vocational colleges, simulation games and project-based competitions prepare students for entrepreneurial and STEM careers, directly supporting Vision 2040's economic diversification goals.

➢ *Formative Assessment*

Continuous, formative feedback is a major advantage over traditional, summative-only assessment. With gamified platforms, students receive actionable data on progress, errors, and strengths before final grading, helping reduce test anxiety and promoting a growth mindset (Rodrigues et al., 2022). Teachers benefit from instant diagnostics, enabling early support for struggling learners and meaningful differentiation.

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➢ *Digital Literacy*

Regular use of gamification tools builds technology skills among both educators and students. Familiarity with digital platforms, apps, and LMSs is increasingly viewed as essential for professional and lifelong learning. In Oman, where classroom technology adoption varies widely, gamification provides a natural on-ramp to digital literacy (MOHERI, 2025; Shaukat et al., 2025).

➢ *Retention & Equity*

Studies show higher levels of persistence and lower dropout rates among students who experience recognition, progress, and academic belonging in gamified classrooms (Al Wahaybi, 2025; Sotirov et al., 2023). Adaptive platforms can help close gaps for marginalized or underperforming groups, making learning more inclusive and supportive.

➢ *Unique Local Opportunities*

In Oman, gamification also aligns with:

- Public enthusiasm for technology: Young Omanis are eager adopters of smartphones, social media, and gaming.
- Cross-sector partnerships: Recent ministry initiatives are connecting universities with local EdTech firms and international platforms.
- Cultural appetite for teamwork and recognition: Omani students often thrive in group challenges and value visible achievements—both supported by well-designed gamified learning.

IV. CHALLENGES TO GAMIFICATION IMPLEMENTATION

Despite its promise, bringing gamification up to scale in Omani higher education faces several persistent hurdles:

➢ *Digital Infrastructure Inequality*

Internet access and device availability are uneven, especially between urban and rural campuses or across public/private institutions. Many students report frustration accessing online apps, and some faculty have limited experience with digital platforms (MOHERI, 2025; Mansour & Vadell, 2024). Structural gaps inhibit consistent participation and can inadvertently widen achievement disparities.

➢ *Faculty Training & Development*

Teacher preparation in gamification and EdTech is highly variable. While a handful of staff act as "innovation leaders," most have had only sporadic exposure to effective use, risking superficial adoption (Aguiar-Castillo et al., 2022; Shaukat et al., 2025). Professional development is often fragmented, without sustained mentoring, peer coaching, or time for experimentation. Some instructors express concern about losing classroom control or facing technical difficulties.

➢ *Curricular Rigidity & Assessment*

National curriculum frameworks and university policies still favor summative, high-stakes assessment and rote memorization (Al Sakiti et al., 2025). Innovative, formative approaches—central to gamification struggle for legitimacy or adequate weighting. Teachers sometimes feel constrained, noting, "If it won't count for grades, students just won't take it seriously."

➢ *Socio-Cultural Attitudes*

Perceptions among educators, students, and families matter greatly. Some view gamification skeptically, associating playfulness with distraction, informal learning, or a lack of rigor (Rincon-Flores & Santos-Guevara, 2021; Baah et al., 2023). Others worry about Western models not fitting local values. To succeed, gamification must be culturally responsive and actively involve stakeholders in design.

➢ *Sustainability Beyond Novelty*

Enthusiasm for new tools can quickly fade if not refreshed or strategically embedded within curriculum (Rodrigues et al., 2022; Wahaybi, 2025). Sustainability requires regular updates to game design, ongoing teacher support, and alignment with broader goals otherwise, engagement may spike briefly and decline.

➢ *Policy & Research Gaps*

Systematic research especially long-term, equity-focused, and locally rooted studies is still limited in Oman. Many pilot projects lack policy support or clear pathways for scaling successful models. Ministry guidelines remain aspirational, trailing behind actual classroom innovation (Mansour & Vadell, 2024).

Table 1. Opportunities and Challenges for Gamification in Oman Higher Education

Opportunities	Challenges
Boosts student engagement and motivation	Digital infrastructure gaps
Enables personalized/adaptive learning	Limited faculty training and PD
Builds 21st-century workforce skills	Curricular rigidity, summative exam focus
Facilitate formative assessment and feedback	Socio-cultural perceptions of gaming
Promotes digital literacy, Edtech fluency	Sustainability beyond novelty effect
Reduces dropout, fosters retention	Limited policy support and large-scale evidence

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V. CONCLUSION

Gamification represents a strategic opportunity for higher education in Oman to make Vision 2040's goals tangible in every classroom fueling engagement, skill development, and digital transformation. Yet, realizing its promise demands collective effort: investment in infrastructure, rigorous teacher preparation, curricular reform, and policy change. Gamification's true value emerges when adapted to local context, co-created with learners, and sustained by ongoing research and refinement.

Oman's educators are already innovating, sharing practical insights, testing new approaches, and advocating for student-centered learning. Their voices are crucial. The future belongs to institutions brave enough to pair policy with practice to experiment, measure, adapt, and scale what works. With thoughtful implementation, gamification can become a key driver in achieving Oman vision 2040's educational aspirations.

RECOMMENDATIONS

- Expand the AI-driven, gamified learning pilots: Fund and evaluate these initiatives across both urban and rural institutions. Ensure adaptivity and inclusiveness.
- Institutionalize widespread teacher PD in gamification: Integrate digital pedgogy and gamification training into faculty development programs
- Reform assessment and curriculum: Shift the balance toward formative, creative, and collaborative evaluation. Reward educators who pioneer effective models.
- Engage students in co-design: Build participatory platforms where learners shape, test, and improve gamified lessons—boosting relevance and ownership.
- Support longitudinal, locally led research: Sponsor mixed-methods studies tracking impact, equity, and sustainability across contexts; build evidence for best practices.
- Update policy frameworks: Developing the flexible ministry guidelines that support innovation and regular review of emerging gamification practices.

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