Section: Medical Education

Original Research Article

GAMIFICATION IN MEDICAL TRAINING: REVOLUTION OR REINFORCEMENT? EDUCATORS' PERSPECTIVES UNVEILED

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Abstract

Background: Medical education is continuously evolving to incorporate innovative teaching methodologies that enhance student engagement and learning outcomes. Gamification, which integrates game-based elements such as rewards, competition, and interactive simulations, has emerged as a promising pedagogical tool. By promoting active learning and knowledge retention, gamification aligns with modern, student-centered educational paradigms. However, its successful implementation depends on faculty perceptions, as educators play a critical role in integrating and evaluating gamified learning. This study aims to assess medical educators' perspectives on gamification, identifying both the challenges they face and the strategies needed for effective implementation in medical training. **Materials and Methods:** This cross-sectional study included 40 medical educators from accredited medical colleges in South India. A structured questionnaire was distributed online via Google Forms, ensuring voluntary participation and anonymity. The questionnaire covered four key areas: perceived benefits of gamification, challenges in its implementation, strategies for integration, and future directions in medical education. Data analysis was performed using descriptive statistics to summarize faculty responses regarding engagement, knowledge retention, technological barriers, and institutional support. Ethical approval was obtained, and informed consent was secured before participation. **Result:** Among the 40 respondents, 60% were male, and 40% were female. Teaching experience varied, with 30% having 1–5 years of experience, 40% having 6–10 years, and 30% having over 10 years. Most educators acknowledged gamification's benefits, with 85% agreeing that it enhances student engagement, 78% recognizing its role in improving knowledge retention, and 89% emphasizing its ability to encourage active learning. Despite these advantages, faculty members reported significant challenges, including time constraints (67.5%), technological limitations (45%), and difficulties in assessment standardization (50%). Strategies for effective implementation identified by educators included faculty training (90%), institutional support (80%), and a hybrid teaching approach that blends traditional and gamified methods (86%). **Conclusion:** This study highlights the positive perceptions of medical educators regarding gamification while also identifying key challenges that hinder its widespread adoption. Faculty training, institutional support, and curriculum alignment are crucial for effective integration. Addressing technological and time-related barriers will be essential for maximizing gamification's potential in medical education. Future research should explore long-term impacts and assess structured frameworks for standardizing gamified learning in medical curricula.

INTRODUCTION

Medical education is always advancing to integrate novel pedagogical approaches that improve student involvement and educational results.[1] Conventional didactic lectures, although fundamental, frequently struggle to sustain student engagement and may inadequately cater to the varied learning requirements of medical trainees. Consequently, educators are investigating innovative methods that use interactive and technology-based strategies to enhance information retention and skill development. One option is gamification, which is the incorporation of game elements—such as

competition, incentives, and simulations—into educational environments to augment motivation and engagement.[2-4]

Gamification in medical training includes many tactics such as interactive quizzes, simulation-based learning, case-based role-playing, and experiences utilising virtual or augmented reality.[5] These strategies aim to cultivate a more engaging and immersive educational environment, enabling students to apply theoretical knowledge in practical contexts. Gamification integrates challenge and reward aspects, cultivating a sense of accomplishment and motivating students to engage actively in the learning process. Moreover, the interactive characteristics of gamified learning correspond with contemporary educational paradigms that prioritise student-centered approaches, problem-solving, and critical thinking.[6-8]

The effective adoption of gamification in medical education relies on the viewpoints and acceptance of educators, notwithstanding its potential benefits.3 Faculty members are integral to the design, implementation, and evaluation of gamified learning experiences, rendering their views vital for comprehending its viability and effects.[7] Although students frequently demonstrate excitement for game-based learning methods, instructors may face obstacles like curricular restrictions, resource deficiencies, and apprehensions over the preservation of academic rigour. Consequently, assessing faculty views is essential for recognising both the advantages and the practical obstacles related to gamification in medical education.[9-12]

Challenges associated with the use of gamification in medical education encompass technology infrastructure, time limitations, and faculty opposition to change.[9] Some educators may view gamification as an ancillary tool rather than a fundamental teaching technique, while others may have difficulties in incorporating it into established curriculum.[15] Moreover, apprehensions about the reliability and validity of gamified evaluations persist as a crucial factor. Confronting these issues necessitates a systematic strategy, encompassing faculty development initiatives, institutional backing, and evidence-based frameworks that facilitate the integration of gamification in medical education.[13-15]

Comprehending educators' viewpoints on gamification can yield significant insights on the effective integration of this methodology into medical education. By evaluating faculty perspectives, obstacles, and suggestions, institutions may formulate focused strategies that promote the integration of game-based learning while maintaining coherence with educational goals. Furthermore, examining faculty experiences with gamification helps elucidate best practices and enhance the development of gamified teaching techniques that maximise student learning results.

This study aims to evaluate medical educators' perceptions of gamification in medical training, with a focus on its benefits, challenges, and strategies for effective implementation. By identifying key facilitators and barriers, this research seeks to provide evidence-based recommendations for incorporating gamification into medical curricula. The findings of this study will contribute to the growing body of literature on game-based learning and offer practical insights for educators and policymakers seeking to enhance medical education through innovative teaching strategies.

Objectives

The objectives of the study are to assess medical educators' perceptions of gamification in medical training and to find out the challenges and strategies for effective implementation of gamification in medical education.

MATERIALS AND METHODS

This study employed a cross-sectional survey-based design, including 40 medical educators from accredited medical colleges in South India. A pretested semi structured questionnaire was used for data collection. Participants were required to meet specific inclusion criteria, including a minimum of two years of teaching experience and prior exposure to gamification techniques in medical education. Educators without prior knowledge or experience in gamification were excluded from the study.

Data were collected using an online survey distributed via Google Forms, ensuring voluntary participation and maintaining respondent anonymity. The questionnaire comprised 10 items covering key themes such as the perceived benefits of gamification, challenges in its implementation, strategies for effective integration, and the future outlook on its role in medical education. The survey explored educators' views on engagement, knowledge retention, technological limitations, institutional support, and the long-term sustainability of gamification. Participants provided responses in multiple-choice and Likert-scale formats, allowing for a structured analysis of their perspectives.

Ethical approval was obtained, and informed consent was secured before participation. The study adhered to institutional ethical guidelines, ensuring the confidentiality of responses. Data analysis was conducted using descriptive statistics to summarize the responses, providing insights into faculty attitudes toward gamification, the barriers to its adoption, and recommendations for its effective implementation in medical curricula. Appropriate tables and charts were used to present the data.

RESULTS

A total of 40 respondents participated in the study. The gender distribution among the educators comprised 60% males and 40% females. Regarding

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teaching experience, 30% of the participants had been teaching for 1 to 5 years, while 40% had between 6 to 10 years of experience. The remaining 30% had more than 10 years of teaching experience. (Figure 1) (Figure 2).

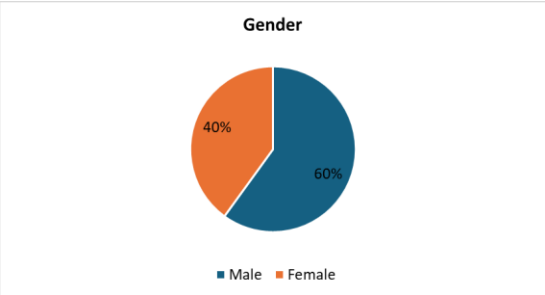

Figure 1. Gender of the participants

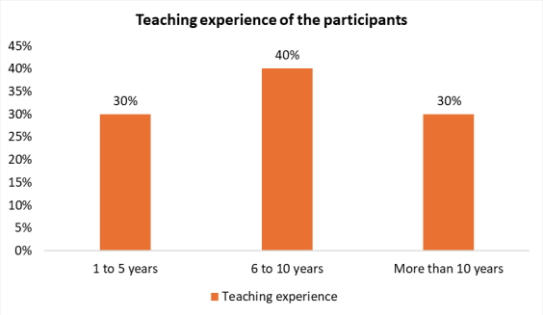

Figure 2. Teaching experience of the participants

The majority of educators acknowledged the advantages of gamification in medical training. Specifically, 85% of respondents agreed that gamification increases student engagement, while 78% believed it improves knowledge retention. Additionally, 89% of educators indicated that gamification encourages active learning and participation, highlighting its potential to enhance the overall learning experience. (Table 1).

Table 1: Educators' perspective on Benefits of gamification

Benefit of gamification	Frequency (n)	Percentage (%)
Increases student engagement	34	85.0
Improves knowledge retention	31	77.5
Encourages active learning and participation	36	90.0

Despite its perceived benefits, several challenges were identified in the integration of gamification within medical education. Time constraints for faculty members were the most frequently reported challenge, cited by 67% of respondents. Issues related to internet availability were highlighted by 40% of educators, while 45% noted technological resource limitations as a barrier. Furthermore, 50% of participants expressed concerns regarding difficulties in assessment and standardization of gamified learning approaches. (Table 2)

Table 2. Educators' perspective on Challenges in implementing gamification

Challenges	Frequency (n)	Percentage (%)
Time constraints for the faculty	27	67.5%
Internet availability	16	40.0%
Technological resource limitations	18	45.0%
Difficulty in assessment and standardization	20	50.0%

To facilitate the successful adoption of gamification, educators identified key strategies for effective implementation. Faculty training was regarded as essential by 90% of respondents, while 80% emphasized the need for institutional support. A hybrid teaching approach, incorporating both traditional and gamified methods, was favored by 86% of participants. Additionally, 78% of educators stressed the importance of integrating gamification strategies into the existing curriculum to ensure their seamless incorporation into medical education. (Table 3)

Table 3. Educators' perspective on Strategies for effective implementation

Strategies	Frequency (n)	Percentage (%)
Faculty training required	36	90.0
Institutional support	32	80.0
Hybrid teaching approach	34	86.0
Integration with curriculum	31	78.0

DISCUSSION

In our study, the majority of pyelonephritis cases The majority of educators in this study acknowledged gamification's potential to enhance student engagement (85%), improve knowledge retention (78%), and encourage active learning participation (89%). These findings align with those of Perumal et al2 who observed that 95% of students found gamification enjoyable, while 97% reported that it

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assisted in their anatomy learning. Similarly, Yadav et al[3] found that students engaged in Kahoot-based MCQ assessments scored significantly higher and perceived gamification as a useful tool for knowledge retention and simplification of complex topics. Moreover, Baviskar et al8 demonstrated that 91% of students felt gamification improved their learning experience during the COVID-19 pandemic, emphasizing its ability to maintain student engagement even in remote learning settings. Beltran et al6 further supported these findings, reporting that gamification enhanced motivation, critical thinking, and knowledge retention in medical training. The alignment of the present study with these prior studies underscores gamification's broad applicability across various medical disciplines and learning environments.

Despite its benefits, educators in this study reported significant challenges in adopting gamification. The most commonly cited barriers included faculty time constraints (67.5%), technological resource limitations (45%), and difficulties in assessment standardization (50%). These concerns are consistent with those noted in Banerjee et al1 who found that only 25% of medical faculty in India were oriented toward gamification, with a significant portion lacking exposure to its applications. The study highlighted regional variations in gamification adoption, suggesting that access to technological resources and institutional infrastructure may influence implementation. Similarly, Shrivastava et al4 emphasized that while gamification promotes learner-centered teaching, its integration into medical curricula remains limited due to faculty resistance and concerns over maintaining academic rigor. Sundareswaran et al5 further identified challenges in developing user-friendly gamified platforms, highlighting the need for accessible tools that facilitate solo and collaborative gameplay for medical learning. Additionally, Beltran et al6 pointed out that resistance to change among educators remains a critical barrier, necessitating structured training programs to increase faculty familiarity with gamification tools. The present study's findings reinforce these concerns, emphasizing that without adequate time, resources, and standardized evaluation methods, widespread gamification adoption may be hindered.

To overcome these challenges, educators in the present study identified several key strategies for successful gamification integration, including faculty training (90%), institutional support (80%), a hybrid teaching approach (86%), and curriculum alignment (78%). These recommendations align closely with those proposed in previous studies. Sundareswaran et al5 advocated for the inclusion of gamification and AI-based learning tools as electives in medical school curricula to familiarize educators with digital teaching methodologies. Similarly, Sivasankari et al7 demonstrated that structured game-based assessments, such as Quizizz and Kahoot, significantly improved student engagement and memory retention when implemented with faculty guidance and iterative refinements. Banerjee et al1 emphasized the need for proactive promotion of gamification tools, suggesting that faculty training workshops could enhance educators' comfort with incorporating game-based learning. Lastly, Baviskar et al8 highlighted that gamification strategies should complement traditional teaching rather than replace it, a sentiment reflected in this study's findings that support a hybrid teaching model. The convergence of these studies with the present findings suggests that targeted faculty training, institutional investment, and curriculum integration are critical to optimizing gamification in medical education.

The study is limited by its small sample size of 40 educators, which may not fully represent the diverse perspectives of medical faculty across different institutions. Additionally, the study relies on self-reported data, which may introduce response bias in assessing perceptions of gamification.

Future studies should explore the long-term effectiveness of gamification in medical education, particularly its impact on knowledge retention and clinical decision-making skills. Research should also focus on developing standardized assessment frameworks to evaluate gamification outcomes and ensure academic rigor. Additionally, institutional policies should support faculty training programs and technological advancements to facilitate the seamless integration of gamification into medical curricula.

CONCLUSION

This study highlights the positive perceptions of medical educators toward gamification, emphasizing its role in enhancing student engagement, knowledge retention, and active participation. However, significant challenges such as faculty time constraints, technological limitations, and assessment difficulties hinder its widespread adoption. Effective implementation strategies, including faculty training, institutional support, and curriculum integration, were identified as key facilitators for gamification in medical education. Future research should explore long-term outcomes and the scalability of gamification across various medical disciplines.

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