Open Access

EURASIAN EXPERIMENT JOURNAL OF HUMANITIES ANDSOCIAL SCIENCES (EEJHSS)ISSN: 2992-4111

©EEJHSS Publications

Volume 6 Issue 2 2025

Page | 30

# Gamification in Health Education: Engaging Patients through Play

## Fumbiro Akiriza O.

#### School of Applied Health Sciences Kampala International University Uganda

#### ABSTRACT

Gamification, the application of game design elements in non-game contexts, has emerged as a promising approach in health education to enhance patient engagement, motivation, and learning retention. This paper examines the theoretical foundations of gamification, focusing on motivation theories such as selfdetermination and flow theory, which underpin its effectiveness in educational settings. The benefits of gamification in health education include increased patient participation, improved knowledge acquisition, and sustained behavioral change. Additionally, best practices and case studies highlight successful implementations of gamified strategies, such as virtual reality-based training for healthcare providers and interactive mobile applications for patient self-management. The study further discusses design principles essential for effective gamified learning experiences, emphasizing user-centered design, adaptive challenges, and immediate feedback. While gamification offers significant advantages, its successful integration into health education requires careful consideration of learner needs, motivation, and longterm engagement strategies.

Keywords: Gamification, Health Education, Patient Engagement, Game Design, Learning Theories, Motivation in Education.

## INTRODUCTION

Currently, a trend can be observed in both academia and industry that centers on incorporating elements of games and play into non-game contexts to create more engaging and entertaining experiences. In educational contexts, this set of techniques called 'gamification' is gaining traction due to its potential for encouraging learners' motivation towards educational activities or objects. Gamification's primary objective is for learners to perceive educational systems as fun and interesting, which will help them not only achieve educational success in their learning but also create positive learning experiences, improve even more, and achieve their expected goals. The advantage of employing gamification in health education is that educational games with a purpose can effectively shape the behavior of your target audience. If they experience the learning games as new, fun, and interactive, then they will be motivated to play. The game mechanics will also involve setting and achieving objectives and defining and adapting one's strategies to achieve those objectives. Gamification in health education is therefore not only fun and interactive; it can be successful in shortening the learning curve [1, 2]. Several theories and work in gamification and education communities are being carried out in this respect. Some people have revealed a need to integrate both theories, while in contrast, others still question the relationship between gaming and learning theories. Some practitioners have also questioned how applied or effective games for education are and how to ensure that learners meet their learning goals. Studies that debate this issue should be addressed to complement the research that has been done to identify the theoretical framework or applied strategies for integrating gamification into health education. Gamification is a concept that specifically refers to the use of game design elements in non-game contexts. This concept started modestly in 2002 and matured over time, achieving its momentum and popularity around 2010. Ten principles of effective gamification provide useful guidelines for creating appealing and successful game-

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

#### **Open Access**

education results. Gamification motivates participants to achieve already established fields of behavior and must be combined with education in order to achieve the intended learning objectives [3, 4].

#### Theoretical Frameworks for Gamification in Health Education

Gamification theory in recent studies depicts a fusion of various theories from the fields of gameplay design, learning, technology, and educational research. The two main sources of theory in the literature are game design theories and learning theories. Game design theories are the theoretical foundations from which useful techniques can be extrapolated to create gamified systems. A theory-driven gamified approach can be adapted and evaluated for health education. Learning theories view purposeful course content, peer-to-peer interaction, educational feedback, learning curves, and incentives/motivations as the primary components of any teaching/learning model. Academics have recently begun to use game design methods in the creation of educational media that can bring better learning experiences. To design games that novice game players find engaging and that effectively support learning, it is important to understand the principles and theories of good game design. The motivational part of game engagement has a standalone theoretical foundation of frameworks and theories that can be used as a benchmark for good gamified approaches in health education [5, 6]. Most theoretical readings on gamified systems have used motivation as an important empirical issue in the field of gamification practice and research in all gamified applications, particularly in various sectors. Psychological motivation theories of learning and gaming have been the mainstream concepts in gamification theories that are widely coupled in gamification practices. In the specific case of health education, using motivation theories can guide the designer through a more accurate and effective gamified system that assuredly increases the nonoverestimated acceptance. Self-determination theory is mostly used in educational games research as a reference for a benchmark to determine the desired level of motivation from the player. Flow theory has abundant credibility as a motivation theory, yet in educational games, the researcher claims that extrinsic motivation must be an initial tool to involve the student in any games, showing traces of that theory in many game design papers. Consequently, educators can embed educational content in designs that support specific self-determination, flow, and other regular in-game feelings, but more research should address the effect of game channeling rather than direct learning retention  $\lceil 7, 8 \rceil$ .

#### **Benefits of Gamification in Health Education**

In the field of health education, gamification, an approach to using game elements in non-game contexts to engage users, has demonstrated diversified benefits for patients. The primary and common benefit observed across the reviewed studies is increased patient motivation, engagement, and information retention. In health education, such improvements in patients' acquisition of knowledge were proven to effectively advance health behavior change. Research studies verify the great potential for gamification to create enjoyable intervention sessions, ameliorate patient satisfaction, and engender favorable attitudes toward the management of health issues. Gamified approaches illustrate the capability to provide accessible and personalized interventions reaching diverse populations. Such diversified targets with play are efficiently attained through different engaging methods. Competitive elements were found to be amenable in prompting individuals to get actively involved and motivated, committing themselves entirely to the learning process. Nevertheless, it should be noted that both intrinsically motivated and extrinsically rewarded dimensions are needed to stimulate and sustain patient participation and engagement in diverse user groups. Most critically, in the field of health education, the intrinsic benefit of acquiring health knowledge, behavioral control, and well-being for a better life in the long term is truly powerful and highly cherished by patients. Eventually, the gamified approach would then simultaneously delve into and tackle the root causes of patient default, allowing the gamified approach to subsequently deliver better health outcomes for the patients [9, 10]. Various studies confirmed that educational games outrank traditional teaching methods in producing superior educational outcomes for knowledge acquisition, lasting retention, transfer of skills, and more positive attitudes toward the teaching method. A meta-analysis strongly corroborated that surgical skills training by game-related medical education produced positive effects in changing participants' basic knowledge and skills, as well as learning retention and knowledge transfer. The effectiveness of games in promoting knowledge acquisition was also documented in undergraduate nursing education. These educational benefits of using games for knowledge acquisition are of paramount importance in contexts where patient knowledge deficit is a priority issue, and where patients' poor knowledge is a determinant of health outcomes related to COVID-19 [11, 12].

Page | 31

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

#### **Design Principles for Gamification in Health Education**

Design principles for gamification in e-learning are important because they provide evidence-based guidelines for the creation of effective and engaging learning experiences. The first principle is clarity, as game mechanics and assignments should be clear, predictable, and intuitive to enhance learning. The "scaffolding and fading" principle refers to gradually increasing task difficulty. Feedback is fundamental in any learning activity, and this extends to gamified activities, which should include immediate feedback and progress tracking to motivate players. The principle of user-centered design suggests game mechanics that align with educational objectives; for example, if a course aims to develop decision-making skills, then gamified elements should allow students to make decisions or problem-solve. The more closely the environment and activities within the game simulate scenarios related to the educational objective, the more engaging and relevant the gamification. The narrative principle suggests providing some kind of story world or narrative; storytelling can forge emotional connections and make learning memorable. Finally, educators must balance intrinsic and extrinsic motivation. Games' sensory, aesthetic, and fun elements are inherently appealing, but they should ideally provide opportunities to gain social status and elective representation for additional motivation. The principle of choice and competency suggests that educators should ensure game mechanics are flexible and allow adaptive responses from learners. For health, this implies varied levels and activities to cater to patients with differing levels of health literacy and numeracy. Socioconstructivism highlights the importance of interaction, negotiation, and collaboration; therefore, educators should design games that allow group collaboration, social engagement, and peer learning. In summary, the design principles suggested by gamification and elearning literature provide a practical guide to support the design, development, and implementation of the use of game-like and motivational ideas that can be incorporated into health education activities for patients [13, 14].

#### Case Studies and Best Practices in Gamification for Patient Engagement

Case studies and detailed demonstrations of successful implementation of gamified strategies in health care may provide valuable best practices for new applications as the field of gamification in health care continues to evolve. The following case studies are a selection of studies and projects testing the use of virtual reality and game devices in health education for mental health patients and correctional facility residents and employees, as well as students at the post-secondary level. These studies range in content, target audience, degree obtained, and outcome measurement. Furthermore, a completed chart of challenges and successes gathered from the implementation of gamified strategies is found at the bottom of this paper. These challenges and successes are derived from the following case studies and also from the growth in the field of game programming and design [15, 16]. This case study aims to illustrate the qualitative and quantitative results from a project that utilized VR, educational games, and gamification in concert to provide occupational health education for mental health care providers. The project utilized a VR immersive experience that created a realistic mental health emergency scenario for on-duty mental health staff to experience firsthand, similar to a professional development tool for first responders. This VR experience serves to relate the physical and emotional impact of the stress response to job-specific occupational hazards in a professional work environment while also providing practice utilizing behavioral and psychological de-escalation techniques to manage client behavior in a low-traffic environment. Methods implementing virtual reality, educational gaming, and game devices such as braincomputer interface, heart rate variable feedback, galvanic skin response, and eye tracking technology as gamification strategies have become an increasingly valuable strategy for engaging the public, correctional facility residents and staff, university students, and healthcare providers including counseling staff [17, 18].

### CONCLUSION

Gamification represents a transformative approach to health education, offering engaging, interactive, and effective learning experiences for patients and healthcare professionals alike. By leveraging motivational theories and game design principles, gamification fosters better knowledge retention, behavior modification, and patient empowerment. Research has demonstrated that well-designed gamified interventions can surpass traditional learning methods in effectiveness, particularly in improving health literacy and adherence to medical guidelines. However, the success of gamification in health education depends on thoughtful implementation, ensuring that game mechanics align with educational objectives and address diverse patient needs. Future research should continue to explore innovative gamification strategies and assess their long-term impact on health outcomes. As technology advances, the integration

Page | 32

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

Open Access

of gamification in health education will likely expand, further enhancing the accessibility and effectiveness of healthcare interventions.

#### REFERENCES

- Khoshnoodifar M, Ashouri A, Taheri M. Effectiveness of gamification in enhancing learning and attitudes: a study of statistics education for health school students. Journal of Advances in Medical Education & Professionalism. 2023 Oct;11(4):230. <u>nih.gov</u>
- 2. Epstein DS, Zemski A, Enticott J, Barton C. Tabletop board game elements and gamification interventions for health behavior change: realist review and proposal of a game design framework. JMIR serious games. 2021 Mar 31;9(1):e23302.
- 3. Mulcahy RF, McAndrew R, Russell-Bennett R, Iacobucci D. "Game on!" Pushing consumer buttons to change sustainable behavior: a gamification field study. European Journal of Marketing. 2021 Oct 6;55(10):2593-619. [HTML]
- Riar M, Morschheuser B, Zarnekow R, Hamari J. Gamification of cooperation: A framework, literature review and future research agenda. International Journal of Information Management. 2022 Dec 1;67:102549. <u>sciencedirect.com</u>
- 5. Qiu Y, Tan TH, Vun CH, Shen Z. The Impact of Playfulness Trait on Attitude and Intention Towards Gamified Health Behavior. InInternational Conference on Human-Computer Interaction 2024 Jun 1 (pp. 81-97). Cham: Springer Nature Switzerland.
- 6. Aster A, Laupichler MC, Zimmer S, Raupach T. Game design elements of serious games in the education of medical and healthcare professions: a mixed-methods systematic review of underlying theories and teaching effectiveness. Advances in Health Sciences Education. 2024 Apr 2:1-24.
- 7. Park S, Kim S. Leaderboard design principles to enhance learning and motivation in a gamified educational environment: Development study. JMIR serious games. 2021 Apr 20;9(2):e14746.
- Vagianou M, Paraskeva F, Karampa V, Bouta H. Applying motivational techniques and gamified elements on instructional design models for effective instruction in secondary education. InLearning Technology for Education Challenges: 9th International Workshop, LTEC 2021, Kaohsiung, Taiwan, July 20-22, 2021, Proceedings 9 2021 (pp. 111-123). Springer International Publishing. <u>[HTML]</u>
- 9. Davis K, Gowda AS, Thompson-Newell N, Maloney C, Fayyaz J, Chang T. Gamification, Serious Games, and Simulation in Health Professions Education. Pediatric Annals. 2024 Nov 1;53(11):e401-7. [HTML]
- 10. Lin PY, Chen TC, Lin CJ, Huang CC, Tsai YH, Tsai YL, Wang CY. The use of augmented reality (AR) and virtual reality (VR) in dental surgery education and practice: A narrative review. Journal of Dental Sciences. 2024 Oct 28.
- 11. Orman R, Şimşek E, Çakır MA. Micro-credentials and reflections on higher education. Higher Education Evaluation and Development. 2023 May 2;17(2):96-112.
- 12. Başaran S, Ighagbon OA. Enhanced FMEA methodology for evaluating mobile learning platforms using grey relational analysis and fuzzy AHP. Applied Sciences. 2024 Oct 1;14(19):8844.
- 13. Walaszczyk L, Arnab S. Open-Source Gamification Plug-Ins: A Study on Usability and User Preferences. Electronic Journal of e-Learning. 2025 Jan 10;23(1).
- 14. Smirani L, Yamani H. Analysing the Impact of Gamification Techniques on Enhancing Learner Engagement, Motivation, and Knowledge Retention: A Structural Equation Modelling Approach. Electronic Journal of e-Learning. 2024 Nov 5;22(9):111-24.
- 15. Xu X, Mangina E, Campbell AG. HMD-based virtual and augmented reality in medical education: a systematic review. Frontiers in Virtual Reality. 2021 Jul 6;2:692103.
- 16. Jiang H, Vimalesvaran S, Wang JK, Lim KB, Mogali SR, Car LT. Virtual reality in medical students' education: scoping review. JMIR medical Education. 2022 Feb 2;8(1):e34860. jmir.org
- 17. Fitrianto I, Saif A. The role of virtual reality in enhancing Experiential Learning: a comparative study of traditional and immersive learning environments. International Journal of Post Axial: Futuristic Teaching and Learning. 2024 Jun 27:97-110. amorfati.id
- 18. Makransky G, Andreasen NK, Baceviciute S, Mayer RE. Immersive virtual reality increases liking but not learning with a science simulation and generative learning strategies promote

Page | 33

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited

learning in immersive virtual reality. Journal of Educational Psychology. 2021 May;113(4):719. <u>[HTML]</u>

CITE AS: Fumbiro Akiriza O. (2025). Gamification in Health Education: Engaging Patients through Play. EURASIAN EXPERIMENT JOURNAL OF HUMANITIES AND SOCIAL SCIENCES 6(2):30-34.

Page | 34

**Open Access** 

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited