

Letter to the Editor

Gamification As a Learning Modality in Clinical Chemistry – Breaking the Glass Ceiling

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Keywords

Gamification, learning, Clinical Chemistry

Gamification is the use of game-like elements, mechanics, and design principles in non-game contexts to engage and motivate individuals [1]. It involves applying elements commonly found in games, such as competition, rewards, challenges, and interactive features, to activities that traditionally may not have a game structure. The goal is to enhance engagement, motivation, and learning outcomes in various fields [2]. Gamification in the field of Clinical Chemistry, which is a branch of pathology that deals with the study of biochemical and molecular changes in the body associated with diseases, can have both benefits and limitations.

Gamification can make learning more engaging by incorporating game-like elements, such as quizzes, challenges, and interactive scenarios, which can capture the interest of learners. Games often provide rewards and achievements, motivating individuals to actively participate in learning activities and stay committed to the learning process. Games can incorporate repetition in a fun and engaging way, aiding in the reinforcement of key concepts and helping learners to remember important information. Interactive elements in games can help users actively apply their knowledge, leading to better retention compared to traditional learning methods [3]. Gamification can provide simulated scenarios that mimic real-world situations in Clinical Chemistry, allowing learners to apply their knowledge in practical contexts and develop problem-solving skills. Including leaderboards and challenges can introduce a competitive element, fostering a sense of achievement and encouraging learners to strive for excellence in their understanding of Clinical Chemistry [4]. Some learners may focus on earning rewards rather than truly understanding the material. This can result in superficial learning, where individuals memorize information only to achieve rewards rather than internalizing the knowledge [5]. Certain complex topics in Clinical Chemistry may not lend themselves well to gamification, as simplifying them for the sake of game mechanics could lead to a loss of accuracy or depth in understanding. Gamification often relies on technology, and not all learners may have access

to the required devices or internet connectivity. This can create disparities in learning opportunities. Gamification may not cater to all learning styles. Some individuals may prefer traditional methods and forcing a game-based approach might not be effective for everyone. Creating high-quality gamified content can be resource-intensive in terms of development time and costs. Institutions or educators may face challenges in implementing gamification due to budget constraints or time limitations [6]. In conclusion, while gamification has the potential to enhance the learning experience in Clinical Chemistry, it's essential to carefully consider the specific context, target audience, and learning objectives to leverage its benefits effectively. Integrating gamification as part of a diverse learning strategy rather than relying solely on it can help address some of the limitations. However, keeping in perspective the evolution of Clinical Chemistry gamification can improve knowledge retention, problem-solving skills, and overall learner motivation by applying principles inspired by the mechanics of games for the learners ranging from technicians to laboratory physicians.

Author's Disclosures

None.

Ethical Approval

Not applicable.

References

1. Krishnamurthy K, Selvaraj N, Gupta P, Cyriac B, Dhurairaj P, Abdullah A, Krishnapillai A, Lugova H, Haque M, Xie S, Ang ET. Benefits of gamification in medical education. *Clin. Anat.* 2022;35(6):795-807. <https://doi.org/10.1002/ca.23916>
2. Nevin CR, Westfall AO, Rodriguez JM, Dempsey DM, Cherrington A, Roy B, Patel M, Willig JH. Gamification as a tool for enhancing graduate medical education. *Postgrad. Med. J.* 2014;90(1070):685-693. <https://doi.org/10.1136/postgradmedj-2013-132486>
3. Rutledge C, Walsh CM, Swinger N, Auerbach M, Castro D, Dewan M, Khattab M, Rake A, Harwayne-Gidansky I, Raymond TT, Maa T. Gamification in action: theoretical and practical considerations for medical educators. *Acad. Med.* 2018;93(7):1014-1020. <https://doi.org/10.1097/ACM.0000000000002183>
4. Singhal S, Hough J, Cripps D. Twelve tips for incorporating gamification into medical education. *Med. Ed. Publish.* 2019;8. DOI: 10.15694/mep.2019.000216.1
5. Wang YF, Hsu YF, Fang KT, Kuo LT. Gamification in medical education: identifying and prioritizing key elements through Delphi method. *Med. Educ. Online.* 2024;29(1):2302231. <https://doi.org/10.1080/10872981.2024.2302231>
6. Yunyongying P. Gamification: implications for curricular design. *J Grad Med Educ.* 2014;6(3):410-412. <https://doi.org/10.4300/JGME-D-13-00406.1>