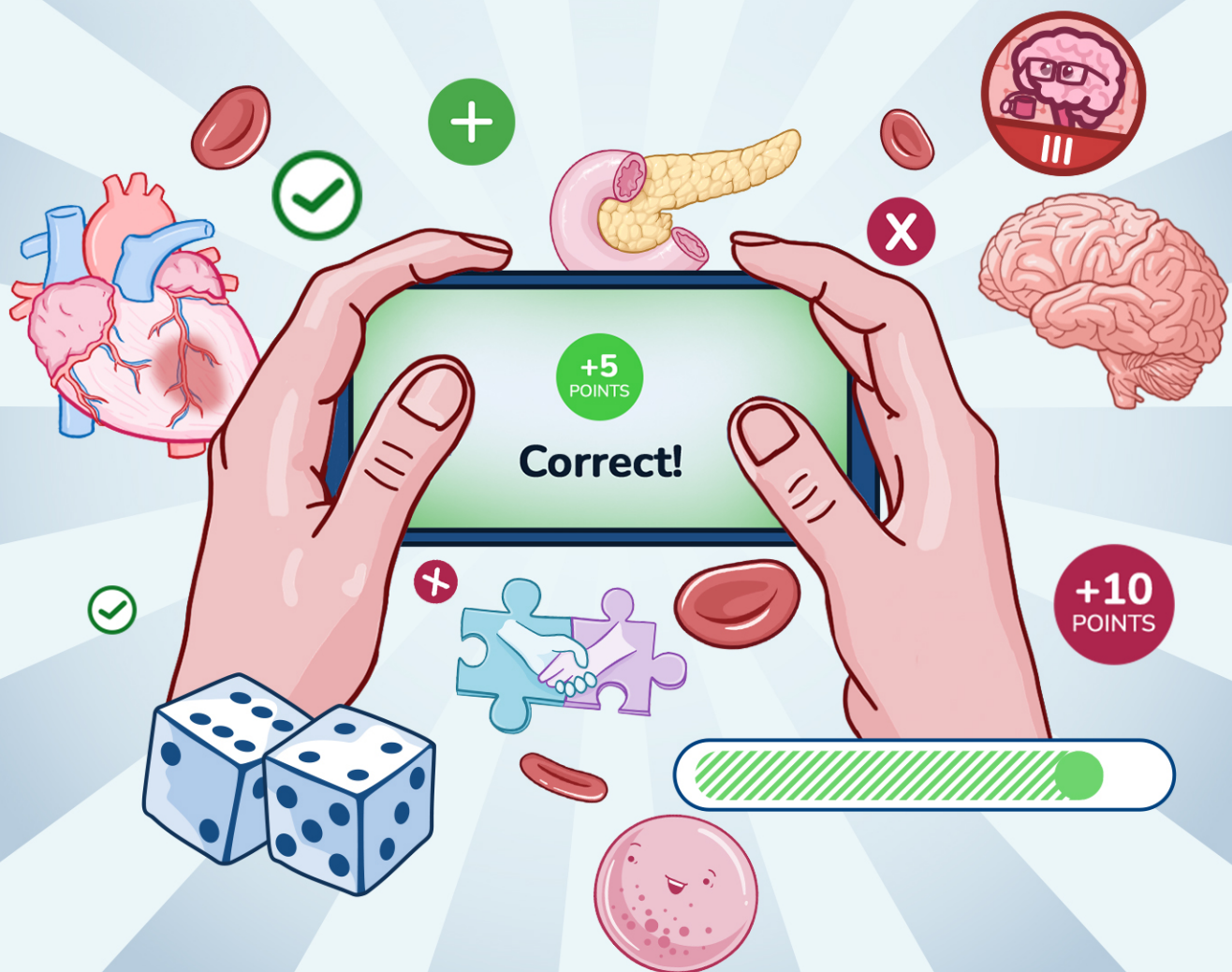




EDUCATORS' Ultimate Guide

Fundamentals of Gamification
in Healthcare Education



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Introduction

Gamification is a novel, fun, and engaging approach to teaching. In healthcare education, where curricula are often dense and the stakes are high, gamification offers a way to make learning more interactive, motivating, and fun. But what is gamification and how can faculty use it to improve student outcomes? This guide to gamification will explore the fundamentals of gamification, its theoretical underpinnings, the practical elements, and best practices for implementation in healthcare education.



Definition of Gamification

OK, so gamification is “the use of game design elements in non-game contexts” (Deterding et al., 2011, p. 1). Let’s break this definition down to help gain a clearer understanding.

“Game design elements” are those factors that make an activity feel more like a game. For instance, points, competition, teams, time pressure, and prizes are often used in games. Using these elements individually will likely not make the experience gamified, just like how grading using points does not make a gamified classroom. However, when placed in combinations and used intentionally, the experience can become gamified.

“Non-game contexts” refer to the intention and context of implementing the game. It is when game elements are used outside of their expected place of an entertainment game. For example, the context may be eating healthy, staying active, a group bonding activity, or learning (Deterding et al., 2011). You likely encounter forms of gamification in your everyday life without giving it much thought. Getting a loyalty card stamped with every purchase at your favorite dessert spot to earn a free ice cream cone is one example. Other examples include closing all the rings on your Apple® watch, competing on the leaderboard in Peloton®, and keeping your streak

going on Duolingo®. These examples illustrate how game elements can be embedded in daily routines to motivate and reward certain behaviors.

Now, gamification for learning and education is related to the concepts of serious gaming and game-based learning. Often these terms are used interchangeably. However, the literature suggests that while there are some overlapping characteristics, there are important distinctions as well. These related concepts are described in the table below.

TERM	DISTINGUISHING CHARACTERISTICS
Gamification	• Defined as "the use of game design elements in non-game contexts" (Deterding et al., 2011, p. 1) • Can be, but does not need to be an entire game (Al-Azawi et al., 2016) • Not specific to learning and can be used in other contexts (Al-Azawi et al., 2016)
Serious gaming	• Complete games created for non-entertainment purposes (Al-Azawi et al., 2016)
Game-based learning	• Uses a game as just part of the learning process (Al-Azawi et al., 2016) • Is specific to learning (Al-Azawi et al., 2016)

What is most important about the definition of gamification is that it is broad. It is not limited to particular elements or combinations of elements, or even contexts. Therefore, we as educators should also not limit how we consider implementing gamification for our students to certain activities or digital platforms.

Importance of Gamification in Healthcare Education

Healthcare education is among the most challenging fields to study for college students. This is because of the lengthy and complex curricula, high academic standards, rigorous clinical requirements, and the emotional demands associated with preparing for a career in medicine, nursing, pharmacy, and related health professions (Dyrbye et al., 2006; Rella et al., 2009; Reeve et al., 2013). These factors lead to high attrition rates, particularly in nursing where attrition can reach as high as 50% in some programs (AACN, 2023; Cameron et al., 2011; Harris et al., 2014; Yates, 2017). This

only worsens the current and expanding global shortage of healthcare professionals, with significant implications for patient care and healthcare delivery systems (WHO, 2020; AACN, 2023; AAMC, 2021).

This is why innovative teaching methods, like gamification, are important to leverage student engagement and motivation, promote active learning, and enhance student outcomes. These are just some of the benefits that will be detailed in the sections below.

Purpose of the Guide

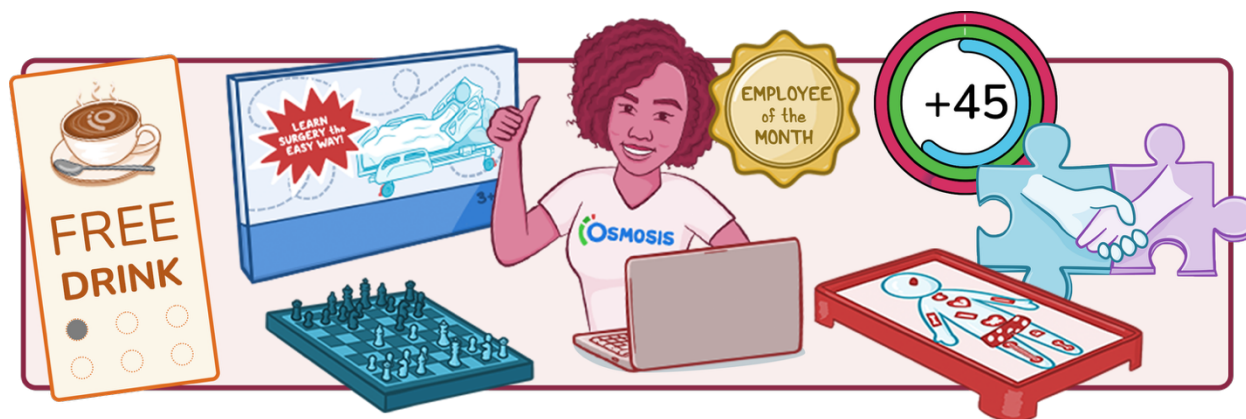
This guide will equip you with an understanding of gamification, including theoretical frameworks, practical strategies, and real-world examples. It will allow you to make better-informed decisions related to designing or selecting a game that works for your course goals, as well as providing best practices and pitfalls to avoid. Whether you are new to gamification or seeking to deepen your expertise, this guide is designed to support your journey.

Understanding Gamification

Before diving into practical strategies, let's first explore the evolution and context of gamification in education.

Historical Context

The term gamification was first used by a British computer programmer named Nick Pelling in 2002. However, using game elements in non-game contexts pre-dates the term. Some early documented examples include sales competitions and frequent flyer programs in the 1980s. Similarly, early forms of gamification for the purposes of education included spelling bees and educational board games.



Gamification became more prominent in the 2010s, and use has expanded to digital platforms and tools that include elements like leaderboards and badges. This has progressed into more advanced forms of digital gamification that include quizzing platforms and simulation-based games (Deterding, et al., 2011; Kapp, 2012).

Game Classifications

Gamification takes many forms and there are several ways to classify gamification in learning. Gaining a better understanding of these classifications can help educators choose what works best for their learning environment and students.

Structural vs. Content

In structural gamification, game elements are added to existing classroom content without changing the content itself. Some examples of this are awarding badges to signify accomplishments or ranking scores on a leaderboard for a collaborative quiz.

In content gamification, the material is changed in some way. For example, the educator may turn a lecture about medication errors into a story with scenarios and characters.

Intrinsic vs. Extrinsic

Gamified learning can serve to either intrinsically or extrinsically motivate students. Intrinsic gamification utilizes elements that pique internal motivators like autonomy and mastery. Some examples for intrinsic gamification include case-based learning games with realistic scenarios or games that allow the students to choose their own paths.

Extrinsic gamification focuses on external rewards to ignite motivation. Examples include points, trophies, badges, or candy.

Social vs. Individual

Social gamification centers on student collaboration and social interaction with potential aspects of competition or teamwork. One example is having teams compete for the quickest time in an escape room.

Conversely, individual gamification focuses on each individual separately with aspects like self-paced progress and personal achievement. One way to implement individual gamification is through solo digital learning game play where the learner progresses through levels.

Digital vs. Analog

Digital gamification takes advantage of software, applications, and online platforms for the gamified experience. These include online quizzing platforms or virtual patient simulations.

On the other hand, analog gamification uses non-digital, physical, or face-to-face elements like dice, card, or board games or role-playing (Kapp, 2012).

Serious Games vs. Gamification

The last categorization is serious games or gamification. Serious games involve a learning experience that is designed from start to finish as a game, having a primary purpose other than entertainment. One example is a tabletop game called [Friday Night at the ER®](#) that challenges teams to improve their organization's performance and develop systems thinking.

Alternatively, gamification uses chosen elements of a game, without necessarily designing or using an entire game experience. An example of this is having students role dice to determine what lab station to go to and earn points as they progress through the lab session.

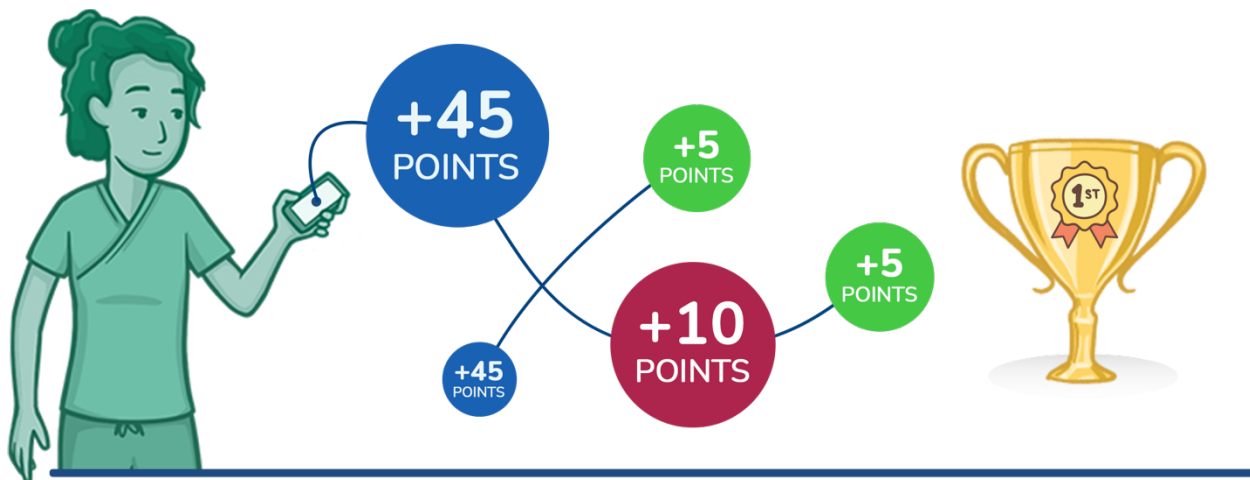
Elements of Gamification

Gamification is built on a foundation of key elements – features borrowed from games – that can be thoughtfully integrated into educational experiences. It is important to remember that simply adding an element or two does not automatically gamify a learning experience. Rather, these elements must be selected and combined intentionally to create a cohesive, engaging, and game-like atmosphere for learners.

Below are some of the most commonly used elements in educational gamification, along with a description of how they can impact student motivation, engagement, or learning.

Points

Points are one of the most familiar gamification elements. Points can be awarded for answering questions correctly or completing a task. Points provide a sense of achievement for the learner. These points are often not used in actual course grades, but rather to allow an opportunity for immediate feedback and can be used to increase a friendly sense of competition.



Badges

Badges are markers of accomplishment, awarded when learners reach specific milestones or demonstrate particular skills. These visual tokens can be powerful motivators and are often delivered in a digital format. They serve as external motivation and can be displayed on social platforms like LinkedIn.

Leaderboards

Leaderboards display rankings based on learners' points, progress, or achievements. By allowing students to see how they compare with their peers, leaderboards encourage healthy competition and can motivate learners to push themselves further. When used thoughtfully, they can also foster a sense of comradery and shared goals.

Levels

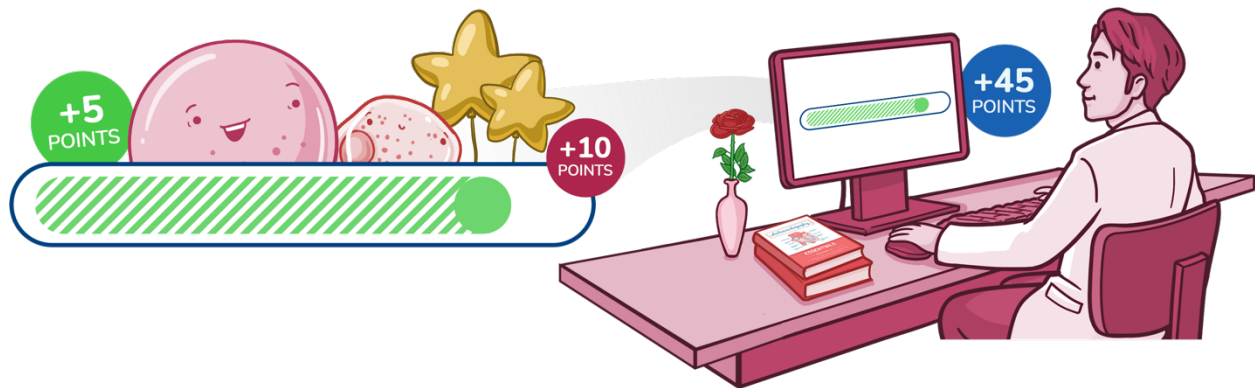
Levels break down the learning journey into structured stages, each representing a step toward mastery. As students progress through increasingly challenging levels, they build confidence and competence. This scaffolding approach helps learners see their growth over time and provides clear goals to work toward.

Challenges or Quests

Challenges or quests are specific tasks or missions designed to give learners a clear goal and a sense of purpose. These can range from solving a complex case study to completing a series of related activities. By framing learning as a quest, educators can make content more engaging and meaningful, motivating students to persist until they achieve success.

Progress Bars

Progress bars offer a visual representation of how much a learner has accomplished and how much remains. This simple tool can be highly motivating, as it helps students track their advancement and manage their time effectively. Watching the progress bar fill up can provide a satisfying sense of momentum.



Feedback and Hints

Timely feedback and helpful hints are useful components of effective gamification. Just as in digital games, where players receive clues and guidance, educational gamification should provide learners with formative feedback to help them correct mistakes and stay on track. This supports learning and reduces frustration.

Rewards

Rewards can be both tangible (like small prizes or treats) and intangible (such as points, badges, or verbal praise). By recognizing effort and achievement, rewards reinforce positive behaviors and keep students motivated to continue participating.

Avatars

Avatars are customizable digital representations of learners within a gamified platform. Allowing students to create and personalize avatars can foster a sense of identity and ownership in the learning process, mirroring the immersive experience of many popular digital games.

Storytelling/Narrative

Integrating storytelling or narrative elements can make learning experiences more immersive and memorable. By contextualizing content within a story, educators can

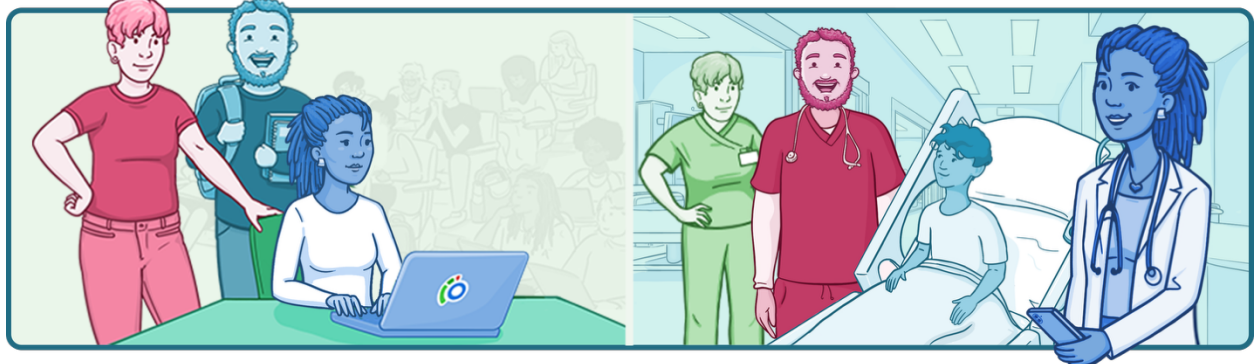
help students see the real-world relevance of what they're learning and keep them engaged from start to finish.

Competition

Competition can take the form of individual or team-based challenges, where learners strive to “win” or outperform others. When managed well, competition raises the stakes and increases engagement, tapping into external motivation and making learning exciting.

Collaboration

Collaboration is a critical element in both games and real-world healthcare. Gamified activities that require students to work together to solve problems or achieve shared goals not only build teamwork skills but also reflect the collaborative nature of clinical practice.



Theoretical Frameworks for Gamification

When considering gamification, it is also important to understand the theoretical frameworks that underpin this methodology. This can help you select or design a more effective experience for your students. Here are some of the most relevant frameworks.

Self-Determination Theory

According to self-determination theory (SDT), there are three psychological needs that impact self-motivation. The first is autonomy, which is control over one's own actions. Next is competency which describes mastery and achievement. Lastly, there is relatedness which is the connection one makes with others (Deci & Ryan, 2000).

To select or design and gamified experience using the three psychological needs of SDT, consider:

1. **Autonomy** : Experiences that allow the learners to select how, when, or at what pace to work through the game provide autonomy.
2. **Competence** : Elements that increase the feeling of competence are badges, levels, and challenges.
3. **Relatedness** : Games that use teamwork or collaboration to achieve success will increase relatedness.

Behaviorism

According to behaviorism, learning takes place through a series of stimuli and responses using rewards and punishments to achieve an observable behavior change in the learner (Skinner, 1953).

To select or design a gamified experience reflective of behaviorism, consider:

1. **Clear objectives**: Tasks that are broken down into small and measurable components.
2. **Drills and practice**: Games that offer immediate feedback and repetition.
3. **Reinforcement**: Elements such as points, badges, and rewards provide positive reinforcement for changed behavior.

Social Learning Theory

Social learning theory (SLT) is an expansion of behaviorism which describes that learning occurs not only with direct experience but also through observation, imitation, and modeling others (Bandura, 1977).

To select or design a gamified experience reflective of SLT, consider:

1. Games that create the opportunity for comparison such competition, leaderboards, and badges
2. Collaborative experiences with teams or quests that must be completed in groups
3. Opportunities for group sharing and reflection

Additional Frameworks

Other frameworks can also be used when considering gamification. These include Experiential Learning Theory which emphasizes learning through concrete experience, reflection, and experimentation (Kolb, 1984), Goal-Setting Theory which highlights the motivational power of setting clear, challenging goals (Locke & Lathan, 1990), and Reinforcement Learning Theory that focuses on learning through repeated feedback and reward cycles (Sutton & Barto, 1998).

Benefits of Gamification in Healthcare Education

Gamification is more than just a novel approach to teaching; it offers a range of well-documented benefits, particularly for healthcare students navigating rigorous and content-heavy curricula. Below, we explore how gamification can transform the learning experience and drive meaningful educational outcomes.

Increases Engagement and Motivation

One of the most significant advantages of gamification is its ability to boost both engagement and motivation among learners. Research has shown that incorporating game elements, such as digital badges, points, and challenges, can make learning more enjoyable and rewarding. For example, Garnett and Button (2018) found that the use of digital badges on a learning management platform led to increased motivation in students.

Now, when it comes to student engagement, it can be understood through three primary components: affective (emotional), behavioral, and cognitive (Kahu & Nelson, 2018). Gamification positively impacts all three. Verkuyl et al. (2016) demonstrated that virtual game-based simulation fostered feelings of satisfaction and immersion, supporting affective engagement. Davidson and Candy (2016) found that students continued to complete additional learning quests even after achieving an “A” in the course, reflecting strong cognitive engagement. For behavioral engagement, Moritz (2017) observed a significant increase in the number of HESI case studies completed when digital badges were used. Lucas (2023) further reinforced these findings, showing that faculty perceived gamification as positively influencing all three aspects of student engagement.



Promotes Active Learning

Unlike traditional lecture-based approaches, gamification inherently encourages active participation. Whether students are working individually or in groups, gamified activities, such as solving puzzles, answering questions, or embarking on quests,

require learners to engage directly with the material. This hands-on approach fosters deeper understanding and retention of complex healthcare concepts.

Provides Immediate Feedback

Gamification also excels at delivering timely, formative feedback. Game elements like points and badges offer instant recognition for achievements, while leaderboards and social features enable learners to compare their progress with peers. Embedded hints and clues further support students by helping them gauge their understanding and make adjustments in real time.

Encourages Repetition and Mastery

Games are often designed for replayability, allowing players to attempt challenges multiple times to achieve mastery. Similarly, educational gamification provides learners with opportunities for repeated practice, enabling them to refine their knowledge and skills through multiple attempts until they reach proficiency.

Fosters Healthy Competition and Collaboration

Gamification can engage a wide range of learners by tapping into both internal and external motivators. Healthy competition, whether among individuals or teams, can drive motivation, while collaborative challenges encourage teamwork and peer learning. This mirrors the collaborative nature of healthcare practice and helps students develop essential interpersonal skills.



Supports Learner Autonomy

Another key benefit is the promotion of learner autonomy. Gamified environments often provide multiple pathways to success, allowing students to choose how they approach challenges, set their own pace, and take responsibility for their learning. For example, a student might elect to start at a station they feel most confident in during a skills laboratory game, or choose to submit answers via audio rather than video recording for a gamified case study.

Improves Attitudes Toward Learning

Gamification has also been linked to improved attitudes toward learning. Zurek (2017) found that narrative gamification, incorporating avatars, goals, challenges, rewards, feedback, and leaderboards, enhanced students' self-efficacy. Similarly, Sanz-Martos et al. (2024) reported higher student satisfaction when gamification was used.

Bridges Theory and Practice

Healthcare education isn't just about memorizing facts; it's about applying knowledge in real-world clinical scenarios. Gamification, especially when it includes interactive cases, simulations, or scenario-based learning, helps bridge this gap. Lucas (2023) noted that even when clinical-based scenarios are not used, faculty can intentionally design gamified experiences to mimic some aspects of clinical practice, incorporating elements like time pressure and fine motor coordination to better prepare students for the demands of patient care.

Improved Performance and Retention

Evidence supports that gamification can lead to better performance and knowledge retention. For instance, Chang et al. (2020) found that students who participated in game-based electrocardiogram training exhibited greater motivation, critical thinking, and performance compared to those in traditional learning environments. Çalik et al. (2022) demonstrated that serious gaming improved knowledge of infection prevention and safety. Mackavey and Cron (2019) observed significant improvements in HESI exam scores among nurse practitioner students when gamified elements were integrated into the course. Tan et al. (2017) showed that gamification improved knowledge and confidence in blood transfusion training, though both gamified and traditional groups performed similarly on simulation-based assessments.

Development of Critical Thinking

Finally, gamification supports the development of critical thinking and clinical reasoning. Koivisto et al. (2016) reported that nursing students successfully enhanced their clinical reasoning skills through the use of a 3D simulation game, highlighting the potential for gamified approaches to deepen higher-order thinking.

Best Practices for Implementing Gamification

Once you've decided to bring gamification into your classroom, the next step is to design or select a gamified learning experience that best fits your goals and resources. Whether you choose to create your own game or use an existing one, following best practices will help ensure that your students have a meaningful and engaging experience.

Choosing Between Designing Your Own Game and Using an Existing Game

A key decision is whether to design a custom game tailored to your course or to adopt an existing game that's already been developed. Each approach has its own set of advantages and challenges.

DESIGNING A LEARNING GAME	
Advantages	Challenges
1. Highly customizable to your specific content, learning objectives, and classroom needs 2. Can be closely aligned with your course goals and outcomes 3. May be implemented using minimal resources, making it a potentially low-cost option 4. Flexible and can be improved or adapted over time based on feedback 5. Easier to integrate into your existing learning management system or teaching workflow	1. Can be time-consuming to design, develop, and test 2. May require purchasing materials or technology 3. Integrating technology not originally intended for gaming can be frustrating 4. Requires creativity and a willingness to experiment 5. May lack immediate technical support or troubleshooting resources

USING AN EXISTING LEARNING GAME	
Advantages	Challenges
1. Quick and easy to implement, saving valuable preparation time 2. Immediately available for use in your classroom 3. Often has proven effectiveness, with evidence or reviews to support its use 4. Students may already be familiar with the game's format or rules 5. Access to resources, best practices, and sometimes technical support from the developer	1. Limited customization options 2. May not align perfectly with your course content or objectives 3. May involve costs for faculty or students (e.g., licensing fees or subscriptions) 4. Can present challenges when integrating with your learning management system or analytics platforms

Regardless of whether you design your own game or use an existing one, consider the who, what, where, when, and how of implementing gamification to improve the student experience.

The Who: Understanding Your Learners

While it might seem straightforward, considering “who” your students are is a crucial first step in implementing gamification effectively. Understanding your learners’ backgrounds, preferences, and needs can help you design experiences that are both engaging and inclusive. Here are several important questions to guide your planning:

Can I test this with non-students?

Before rolling out your gamified activity to your class, consider piloting it with family, friends, or colleagues. This trial run can help you identify unclear instructions, technical issues, or components that don’t work as intended. Use the feedback from this group to refine and improve the game before introducing it to your students.

What are the learning preferences of my students or cohorts?

The more you know about your students, the better you can tailor your gamification strategies. Consider starting the semester with a learning styles survey or a short questionnaire about teaching and learning preferences. Informal observations are also valuable—pay attention to students’ verbal cues (such as asking questions or expressing excitement) and non-verbal cues (like posture, attentiveness, and participation). Additionally, be mindful of factors like the time of day; for example,

students may be less energetic for an 8 a.m. class, which could influence how they respond to gamified activities.

Can I offer gamification as one of several learning options?

Recognizing that students have diverse learning preferences, and that factors like fatigue or stress can impact engagement, it's beneficial to provide multiple pathways for learning. For instance, you might allow students to choose between collaborating on a gamified case study in teams or working individually on a virtual simulation. This not only accommodates different learning styles but also fosters a sense of autonomy, which is a key principle of adult learning (andragogy).

Should I have a non-gamified control group?

Gamification presents rich opportunities for educational research. Even if you're not conducting formal research, including a non-gamified comparison group can yield valuable insights. Comparing outcomes between groups can help you assess the effectiveness of your gamification efforts and identify areas for improvement or expansion.

The What: Choosing the Right Type of Game

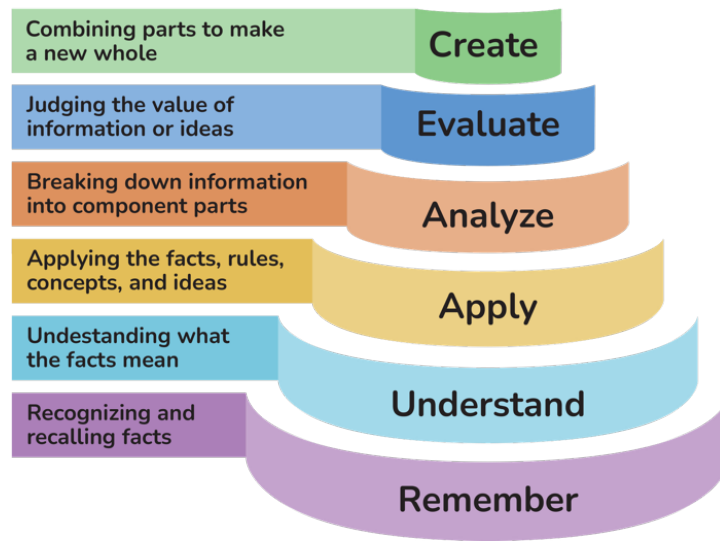
The “what” of gamification refers to the specific type of game or activity you choose to implement, whether it's a virtual escape room, a board game, a trivia competition, or a role-playing scenario. This decision forms the foundation of your gamified learning experience, as all other details that will be built around the game format you select.

Start with Your Learning Objectives

As with any effective lesson plan, begin by reviewing your learning objectives. These objectives should guide your choice of game and ensure that your gamified activity aligns with your educational goals.

- **Cognitive Objectives:** First consider cognitive objectives (Bloom et al., 1956) which range from basic recall and understanding to higher-order skills like applying, analyzing, evaluating, and creating.

Blooms Taxonomy



- For objectives focused on remembering and understanding, games such as quizzes, flashcards, or points-based challenges can make repetition and recall more engaging. Allow time for students to discuss answers and rationales, deepening their understanding through dialogue.
- For objectives that require students to apply knowledge, consider simulation or case-based games. These formats put learners in the role of the clinician or decision-maker, closely mimicking real-world clinical scenarios.
- When your goals involve analysis, evaluation, or creation, use games that present evolving situations. These scenarios require students to prioritize actions, reflect on outcomes, and even design their own cases. Incorporating peer evaluation can further enrich the experience.
- **Psychomotor Objectives:** For hands-on skills, opt for games that focus on skill mastery. Timed skills lab stations or awarding points for maintaining a sterile field can make skill practice enjoyable and provide immediate feedback, while also reducing the anxiety often associated with skill assessments.
- **Affective Objectives:** To address attitudes, values, or professional behaviors, role-playing games are particularly effective. These activities help students practice empathy, professionalism, and ethical decision-making in realistic contexts.

Assess Your Resources: Time, Equipment, Tools, Systems, and Personnel

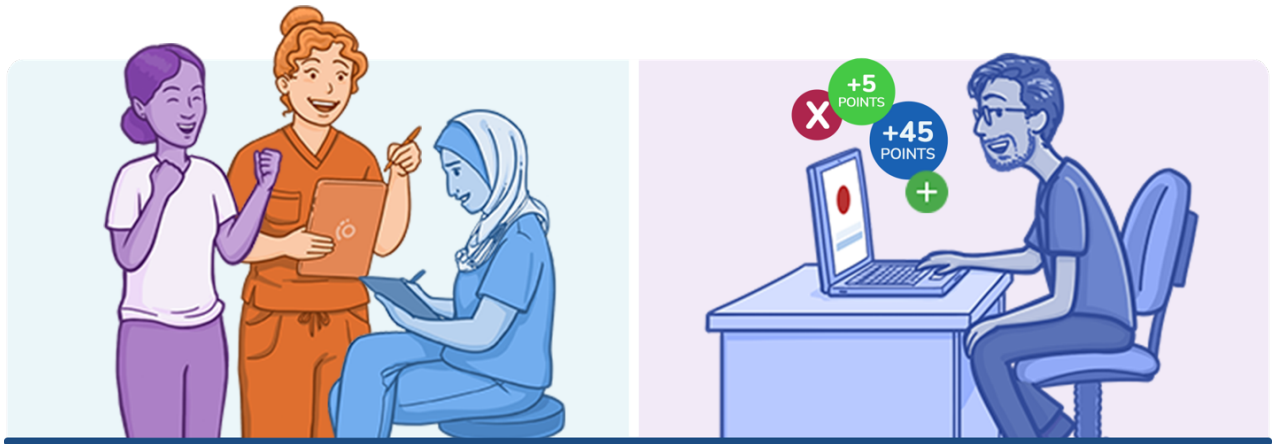
Once you've identified your objectives and chosen a game format, take stock of the resources available to you. In an ideal world with unlimited time, equipment, and support, you could design the most elaborate and immersive gamified experiences. However, most faculty operate within certain constraints, so it's important to be realistic and strategic.

- **Time:** Allocate sufficient time for both the planning and implementation stages. Some games can be set up quickly, while others require more extensive preparation.
- **Equipment and Tools:** Consider what materials you already have and what you may need to acquire. Some games require only simple items like dice or cards, while others may need personal digital devices, virtual reality headsets, or subscriptions to specialized platforms.
- **Systems:** Think about the digital infrastructure required. Will you need a cloud-based system for collaborative work, or a learning management system (LMS) that allows you to unlock content as students progress?
- **Personnel:** Finally, assess the support you have available. Some games may require multiple facilitators, such as faculty at different lab stations or teaching assistants to help monitor progress. Choose a game that matches your available personnel, whether that's a solo instructor or a larger support team.

By thoughtfully aligning your game choice with your learning objectives and available resources, you'll set the stage for a successful and impactful gamified learning experience.

The Where: Selecting the Right Space for Gamification

After deciding your game type and aligning it with your learning objectives and resources, the next step is to determine the most suitable space for implementing your gamified activity. This could be a physical classroom, a digital environment, or a blend of both.



Physical Spaces

When planning in-person gamified experiences, carefully consider the physical environment required for your chosen game. Some activities, like quizzes or board games, can be played with students seated at their desks. However, games that involve teamwork, collaboration, or movement (such as escape rooms or skills stations) may need students to move around or require rearranging furniture to create open spaces or separate stations.

For more elaborate setups, such as simulation games or stations requiring equipment, you might need a larger classroom, a skills lab, or even a computer lab for digital components. To ensure a smooth experience, be proactive in reserving the appropriate space on campus well ahead of your scheduled game day. Consider conducting a walkthrough of the space beforehand to identify any logistical challenges and make necessary adjustments.

Digital Spaces

Many gamified activities can also be conducted in digital environments. These might include cloud-based collaborative documents, specialized gamified learning platforms, or modules within your learning management system (LMS). Digital spaces offer flexibility, allowing games to be completed either synchronously (live) or asynchronously, accommodating different schedules and learning preferences.

When planning a digital gamification experience, ensure that all students and faculty have access to the required technology and platforms. Keep in mind that some participants may be less familiar with digital tools, so providing clear instructions, tutorials, or a brief orientation session can help everyone feel confident and included.

By thoughtfully selecting the physical or digital space that best supports your gamified activity, you'll create an environment where students can fully engage, collaborate, and succeed.

The When: Timing Your Gamification Activities

Determining “when” to incorporate gamification into your course is just as important as deciding what type of game to use or where to implement it. Thoughtful timing can maximize engagement and ensure your gamified activities have the greatest impact.

Getting the Timing Right

There isn't a single “perfect” time to use gamification, but certain moments during the semester may be more effective than others. For instance, the very beginning of the semester can be overwhelming for students as they are adjusting to new schedules and absorbing a lot of information. Similarly, the days leading up to final exams are often stressful, and students may not have the bandwidth for cognitively demanding games.

Instead, consider using low-stakes, lighthearted games such as ice breakers or introductory quizzes during the first class session to help students get comfortable and build rapport. Likewise, a fun trivia game right before a big exam can help diffuse anxiety, provide a mental break, and reinforce key concepts in an engaging way.

How Much and How Often

The frequency and duration of gamification in your course can vary based on your goals, content, and student needs. Some faculty choose to gamify their entire course, weaving game elements throughout every module. Others prefer to use gamification strategically, perhaps a few times each semester, to break up long lectures, review challenging topics, or inject energy into the classroom.

Remember, gamification is just one tool in your active learning toolbox. Using a mix of teaching strategies ensures you can meet the diverse needs and preferences of your students, keeping your course dynamic and inclusive.

The How: Establishing Rules and Mechanics

The “how” of gamification focuses on the rules and mechanics that shape your game. This is a critical component of successful gamification, as clear and consistent rules ensure a smooth, engaging, and fair experience for all participants. Think back to a time when you played a game with confusing instructions or shifting rules. Such

experiences can quickly lead to frustration and detract from the intended goals of learning and fun. Careful planning and communication of mechanics are essential, especially when introducing a new or unfamiliar game.



Timing and Time Pressure

First, decide on the duration of your gamified activity. Will the game span a single class period, a week, or the entire semester? Consider whether to incorporate elements of time pressure, such as giving students 30 seconds to answer a question or five minutes to solve a puzzle. Clearly communicate how time will be tracked, like using a stopwatch, timer, or visible countdown to keep everyone on the same page and add excitement or urgency as appropriate.

Scoring, Points, and Prizes

Next, establish how points, scoring, or prizes will work. Make sure students understand how winners will be determined. If some achievements are worth more than others, clarify the scoring system in advance. Decide how scores will be tracked, perhaps through a learning management system, a leaderboard, or self-reporting, and how progress will be communicated, whether through real-time updates or periodic announcements. Also, define what is at stake: Will winners receive a tangible prize, bonus points, or simply the satisfaction of victory?

Individuals or Teams

Consider whether your game will involve individual or team-based competition. Individual play can provide valuable formative feedback and ensure all students are actively engaged, as quieter students can't rely on more vocal peers. However, it may limit opportunities for peer learning and collaboration. Team-based games foster communication and teamwork, mirroring real-world healthcare environments, but can make it harder to assess each student's individual learning. If you choose teams,

decide whether you'll assign them or let students self-select, and determine the optimal team size for your activity.

Feedback or Hints

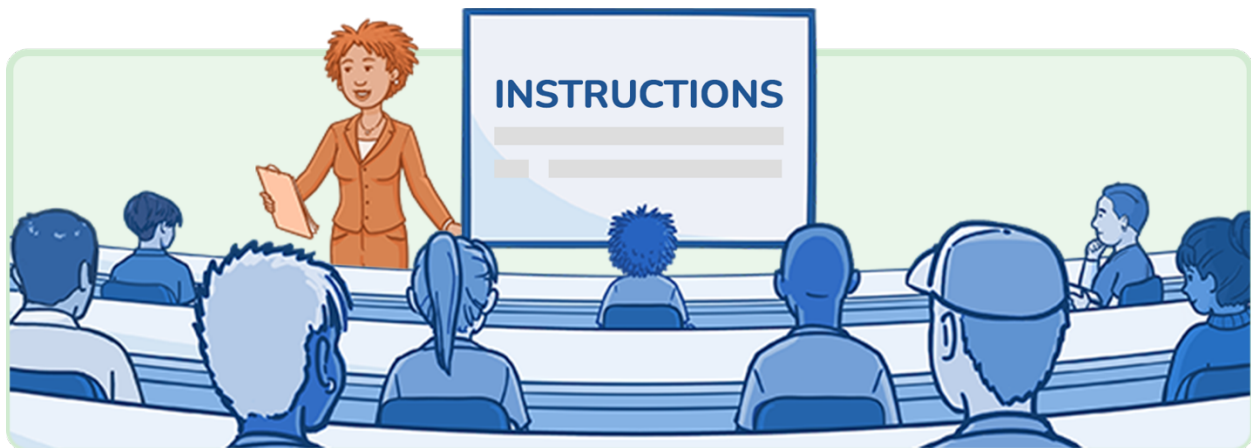
Effective games provide feedback and hints to keep players motivated and prevent frustration. Decide how and when you'll offer feedback: Will it be immediate, after each round, or at the end of the game? Consider incorporating hints, clues, or scaffolding to support students who may get stuck. This approach helps maintain momentum and ensures all learners can benefit from the experience.

Multiple Attempts

Allowing for multiple attempts can be a powerful way to promote mastery and reduce anxiety. Decide if students can retry challenges, revisit questions, or replay the game. This flexibility encourages persistence and supports a growth mindset.

Communicating the Rules

Finally, be intentional about how you communicate the rules and mechanics to your students. Provide clear, concise instructions, both in writing and verbally if possible. Don't assume that everyone is familiar with the game format; take time to explain the basics and answer any questions. Consider providing a brief demonstration or practice round to ensure everyone feels comfortable before the real game begins.



Carefully considering the “who, what, where, when, and how” of gamification is essential for successful implementation in healthcare education. Start by understanding your learners' preferences, needs, and backgrounds to ensure your gamified activities are inclusive and engaging. Select the type of game that best aligns with your learning objectives and available resources. Choose an appropriate setting, whether physical or digital, that supports active participation. Thoughtfully time your

gamified experiences for maximum impact, balancing frequency and duration to fit your course structure. Finally, establish clear rules and mechanics so students know how to participate, succeed, and benefit from the experience. By intentionally addressing each of these elements, you'll create a motivating and effective gamified learning environment.

Examples of Gamification in Healthcare Education

Now that we have explored the fundamentals of gamification, let's look at how these principles come to life in real educational settings. The following examples illustrate a variety of gamified activities and platforms used in healthcare education. Use these as inspiration to design or adapt games that align with your specific teaching goals and learner needs.

Timed Quizzes

Timed quizzes challenge students to answer questions within a set period, fostering quick thinking, recall, and decision-making under pressure. These can be delivered using classroom response systems, apps, or online platforms, and often include leaderboards to add a competitive edge.

Available tools:

- [Kahoot!](#): A widely used platform for creating live, timed quizzes with instant feedback and rankings.
- [Wayground](#): Allows for both live and self-paced quizzes with gamified elements like points and power-ups.
- [Mentimeter](#): Enables educators to create interactive timed polls and quizzes that engage students in real time, with instant visual feedback and competitive scoring.

Learning-Based Escape Rooms

Educational escape rooms immerse students in a scenario where teams solve medical puzzles or complete clinical tasks to “escape” within a time limit. This format promotes collaboration, communication, and critical thinking, all while making learning memorable and fun. Escape rooms are often created by a single faculty member or group of faculty using tools like Google Forms or the Microsoft Suite and are built to meet the needs of their students and with available resources in mind.

With that being said, there are some resources available that can help you develop an escape room that works for you.

Available resources:

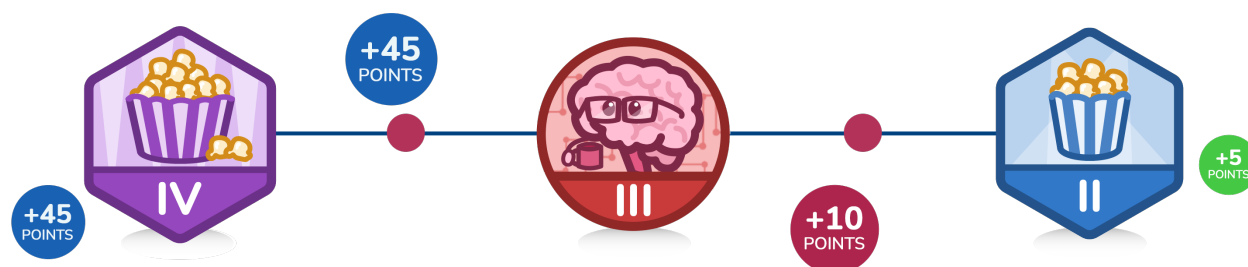
- [Laerdal](#): Provides webinars, workbooks, and checklists designed to help you create a simulation-based escape room.
- [CanSim](#): Canadian Alliance of Nurse Educators Using Simulation has a downloadable sepsis scenario
- [The University of Kansas Health System](#) – Provides an escape room guide
- [Sim2grow](#): Has several downloadable escape room scenarios
- Faculty: Faculty members often enthusiastically share escape room challenges that they've built. Reach out to colleagues or email authors of escape room journal articles to help build your own library of resources

Digital Badges

Digital badges are awarded for achievements such as completing quizzes, mastering topics, or reaching learning milestones. These badges provide tangible recognition, motivate continued effort, and can be shared on platforms like LinkedIn.

Available platforms:

- [Osmosis](#): Awards badges for engagement milestones
- [Accedible](#): Provides secure, shareable digital badges and certificates for education achievements



Board and Card Games

Custom or commercially available board games can make learning about anatomy, pharmacology, or disease processes interactive and enjoyable. These games often involve answering questions, solving case scenarios, or competing to reach a goal.

Examples:

- [Friday Night at the ER®](#): A simulation board game where players work as a team to manage a hospital, make critical decisions, and develop systems thinking skills under realistic constraints.
- [Critical Care: The Game](#): A cooperative board game where players take on the roles of healthcare providers in an ICU, managing patient care and resources to save lives.
- [Level Up Nurse Squad](#): An educational card and board game designed specifically for nursing students, helping them review concepts, medications, and clinical scenarios through play and friendly competition.

Avatars and Progression Systems

Some advanced gamification platforms allow students to create avatars and progress through levels as they master course content. This personalization increases engagement and provides a clear sense of growth.

Examples:

- [Shadow Health](#): Uses digital avatars and interactive virtual patients for clinical scenario training.
- [Body Interact](#): Lets students manage virtual patients and progress through increasingly complex medical cases.

Case-Based Learning

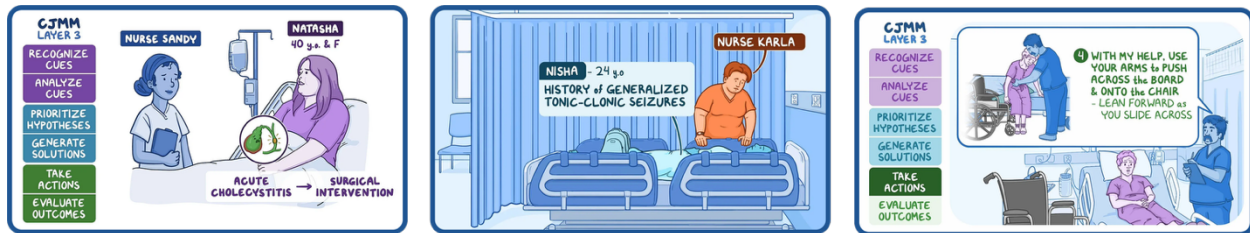
Case-based learning presents learners with realistic clinical scenarios where they must gather information, make decisions, and see the outcomes of their actions. This approach bridges theory and practice and supports the development of clinical reasoning skills. Though not all gamified, individual faculty can add elements of gamification to increase student engagement.

Available platforms:

- [Elsevier's Clinical Cases](#): Offers a wide range of interactive, evidence-based clinical scenarios designed to enhance decision-making and critical thinking in healthcare students.
- [Prognosis: Your Diagnosis](#): A mobile app offering hundreds of clinical case scenarios.
- [Level Ex](#): Provides specialty-specific simulation games for medical professionals.

- [Osmosis](#) : Video case studies can be played live in class and paused at strategic moments to discuss how they should move forward in the case, promoting clinical decision making.

By thoughtfully selecting and adapting these gamified experiences, educators can create dynamic and motivating learning environments that better prepare students for real-world healthcare practice.



Challenges and Considerations

While gamification can transform healthcare education by increasing engagement and motivation, it also comes with important challenges and considerations. Thoughtful planning and ongoing reflection are essential to ensure that gamification enhances learning rather than detracting from it. Below are some key areas to keep in mind as you design and implement gamified experiences.

Potential Pitfalls

Despite its many benefits, gamification is not without drawbacks. Some common pitfalls include the time and resources required for implementation, the risk of overemphasizing external motivation, gamification fatigue, and mismatched learning preferences.

Time and Resources

Developing and launching a new gamified learning experience can be time-consuming and, at times, costly. Faculty must balance this investment with other teaching responsibilities and budget constraints. Consider starting small or adapting existing games before committing to more elaborate projects.

Overemphasis on External Motivation

A frequent critique of gamification is that it can place too much emphasis on external rewards, such as points, prizes, or winning, at the expense of deeper, intrinsic learning. When the focus shifts too heavily toward competition or superficial engagement, some students may lose sight of the underlying educational objectives.

Gamification Fatigue

Like any teaching strategy, overusing gamification can lead to diminishing returns. If every activity is gamified, the novelty may wear off, resulting in decreased excitement, motivation, and participation over time. Use gamification strategically, mixing it with other active learning methods to maintain interest.

Mismatched Learning Preferences

Not all students thrive in a gamified environment. Introverted learners, those who dislike competition, or students who prefer more traditional or reflective learning methods may not engage as fully or benefit as much from gamified activities. Providing multiple learning pathways and opportunities for choice can help accommodate diverse preferences.

Balancing Gamification with Learning Goals

It's crucial to ensure that gamification serves your learning objectives rather than overshadowing them. The excitement of a game should never come at the expense of meaningful content mastery or critical thinking. Regularly revisit your course goals and assess whether your gamified activities are truly supporting student learning outcomes.

Inclusivity and Accessibility

Inclusivity and accessibility should be at the forefront of your planning. Some students may require accommodations due to hearing or visual impairments, neurodivergence, or other needs. Additionally, technology-based games require equitable access to devices and reliable internet. Always check that your chosen gamified activities are accessible to all and provide alternative options or support as needed.

Cultural and Language Considerations

Cultural background and language proficiency can also affect students' ability to participate fully in gamified activities. For example, games like Jeopardy!™ may be second nature to some students but entirely unfamiliar to others, especially those from different

countries or backgrounds. Take time to explain the rules, provide examples, and allow space for questions. For non-native speakers, be mindful of games that require rapid language processing and consider ways to slow the pace or offer additional support.

Measuring Success and Effectiveness

To ensure your gamification efforts are making a positive impact, it is important to assess their effectiveness. Use a combination of assessment techniques—such as quizzes, reflective assignments, or practical demonstrations—to measure learning outcomes. Gather feedback from students through surveys or informal discussions to understand their experiences and perceptions. Analyze performance data to see if gamified activities are leading to improved engagement, knowledge retention, or skill development. Use this information to refine your approach and make data-driven decisions about future gamification initiatives.

Conclusion

Gamification offers healthcare educators a powerful set of tools to transform learning from a passive experience into an active, engaging, and motivating journey. By thoughtfully integrating game elements, such as points, badges, leaderboards, and simulations, into your teaching, you can foster deeper engagement, promote active learning, and help students bridge the gap between theory and real-world clinical practice.

As this guide has explored, successful gamification requires more than simply adding a game or two to your curriculum. It involves aligning your strategies with clear learning objectives, considering the unique needs and preferences of your students, and thoughtfully planning the who, what, where, when, and how of each activity. It also means being mindful of potential challenges, such as resource demands, inclusivity, and maintaining a balance between fun and meaningful learning.

By drawing on evidence-based frameworks and best practices, and by continuously reflecting on and refining your approach, you can create gamified experiences that not only enhance knowledge and skills, but also inspire a lifelong love of learning. Whether you are new to gamification or seeking to expand your expertise, embracing this innovative approach can help you prepare the next generation of healthcare professionals to succeed in an ever-evolving field.

We hope the information in this guide helps you develop and administer gamified elements for your institution or course. If you have questions about how Osmosis can be used to boost student engagement, let's connect!



References

- Al-Azawi, R., Al-Faliti, F., & Al-Blushi, M. (2016). Educational gamification vs. game based learning: Comparative study. *International Journal of Innovation, Management and Technology*, 7(4), 131-136. <https://doi.org/10.18178/ijimt.2016.7.4.659>
- American Association of Colleges of Nursing. (2023). Nursing shortage fact sheet. <https://www.aacnnursing.org/news-data/fact-sheets/nursing-shortage>
- Association of American Medical Colleges. (2021). The complexities of physician supply and demand: Projections from 2019 to 2034. <https://digirepo.nlm.nih.gov/master/borndig/9918417887306676/9918417887306676.pdf>
- Bandura, A. (1977). *Social Learning Theory*. Prentice-Hall
- Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. David McKay Company
- Calik A, Cakmak B, Kapucu S, Inkaya B. The effectiveness of serious games designed for infection prevention and promotion of safe behaviors of senior nursing students during the COVID-19 pandemic. *Am J Infect Control*. 2022 Dec;50(12):1360-1367. doi: 10.1016/j.ajic.2022.02.025.
- Cameron J, Roxburgh M, Taylor J, Lauder W. An integrative literature review of student retention in programmes of nursing and midwifery education: why do students stay? *J Clin Nurs*. 2011 May;20(9-10):1372-82. doi: 10.1111/j.1365-2702.2010.03336.x.
- Chang, CY., Kao, CH., Hwang, Fu-Huang, L. From experiencing to critical thinking: a contextual game-based learning approach to improving nursing students' performance in Electrocardiogram training. *Education Tech Research Dev* 68, 1225–1245 (2020). <https://doi.org/10.1007/s11423-019-09723-x>
- Davidson, S. J., & Candy, L. (2016). Teaching EBP using game-based learning: Improving the student experience. *Worldviews on Evidence-Based Nursing*, 13(4), 285-293. <https://doi.org/10.1111/wvn.12152>
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Deterding, S., Khaled, R., Nacke, L. E., & Dixon, D. (2011, May 7-12). Gamification: Toward a definition. CHI 2011, Vancouver, BC, Canada. ACM 978-1-4503-0268-5/11/05

- Dyrbye, L. N., Thomas, M. R., & Shanafelt, T. D. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Academic Medicine*, 81(4), 354–373. <https://doi.org/10.1097/00001888-200604000-00009>
- Garnett T, Button D. The use of digital badges by undergraduate nursing students: A three-year study. *Nurse Educ Pract*. 2018 Sep;32:1-8. <https://doi.org/10.1016/j.nepr.2018.06.013>
- Harris, R. C., Rosenberg, L., & O'Rourke, M. E. G. (2014). Addressing the challenges of nursing student attrition. *Journal of Nursing Education*, 53(1), 31–37. <https://doi.org/10.3928/01484834-20131218-03>
- Kahu, E. R., & Nelson, K. (2018). Student engagement in the educational interface: Understanding the mechanisms of student success. *Higher Education Research and Development*, 37(1), 58–71. <https://doi.org/10.1080/07294360.2017.1344197>
- Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. John Wiley & Sons.
- Koivisto, J. M., Multisilta, J., Niemi, H., Katajavuori, N., & Eriksson, E. (2016). Learning by playing: A cross-sectional descriptive study of nursing students' experiences of learning clinical skills through a digital game. *Nurse Education Today*, 45, 22–28. <https://doi.org/10.1016/j.nedt.2016.06.009>
- Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall.
- Locke, E. A., & Latham, G. P. (1990). *A Theory of Goal Setting & Task Performance*. Prentice-Hall.
- Lucas, E. A. (2023). Impact of gamification on engagement of prelicensure nursing students: Faculty perceptions (Publication No. 30423110) [Doctoral dissertation, Bryan College of Health Sciences]. ProQuest. <https://www.proquest.com/openview/a96634baf569ae43707f6dbdbf317b8f/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Mackavey C, Cron S. Innovative strategies: Increased engagement and synthesis in online advanced practice nursing education. *Nurse Educ Today*. 2019 May;76:85-88. <https://doi.org/10.1016/j.nedt.2019.01.010>.
- Reeve, K. L., Shumaker, C. J., Yearwood, E. L., Crowell, N. A., & Riley, J. B. (2013). Perceived stress and social support in undergraduate nursing students' educational experiences. *Nurse Education Today*, 33(4), 419–424. <https://doi.org/10.1016/j.nedt.2012.11.009>
- Rella S, Winwood PC, Lushington K. When does nursing burnout begin? An investigation of the fatigue experience of Australian nursing students. *J Nurs Manag*. 2009 Nov;17(7):886-97. <https://doi.org/10.1111/j.1365-2834.2008.00883.x>.
- Sanz-Martos, S., Álvarez-García, C., Álvarez-Nieto, C., López-Medina, I. M., López-Franco, M. D., Fernandez-Martinez, M. E., & Ortega-Donaire, L. (2024). Effectiveness of gamification in nursing degree education. *PeerJ*, 12, e17167. <https://doi.org/10.7717/peerj.17167>
- Skinner, B. F. (1953). *Science and Human Behavior*. Macmillan.

- Sutton, R. S., & Barto, A. G. (1998). Reinforcement Learning: An Introduction. MIT Press.
- Tan AJQ, Lee CCS, Lin PY, Cooper S, Lau LST, Chua WL, Liaw SY. Designing and evaluating the effectiveness of a serious game for safe administration of blood transfusion: A randomized controlled trial. Nurse Educ Today. 2017 Aug;55:38-44. <https://doi.org/10.1016/j.nedt.2017.04.027>.
- Verkuyt, M., Atack, L., Mastrilli, P., & Romaniuk, D. (2016). Virtual gaming to develop students' pediatric nursing skills: A usability test. Nurse Education Today, 46, 81-85. <https://doi.org/10.1016/j.nedt.2016.08.024>
- World Health Organization. (2020). State of the world's nursing 2020: Investing in education, jobs and leadership. <https://www.who.int/publications/i/item/9789240003279>
- Yates, J. When did they leave, and why? A retrospective case study of attrition on the Nottingham undergraduate medical course. BMC Med Educ 12, 43 (2012). <https://doi.org/10.1186/1472-6920-12-43>
- McEnroe-Petitte, D., & Farris, C. (2020). Using gaming as an active teaching strategy in nursing education. Teaching and Learning in Nursing, 15(1), 61–65. <https://doi.org/10.1016/j.teln.2019.09.002>