
LEARNING
USER ENGAGEMENT
CHALLENGE
GAMIFICATION
MOTIVATION
REWARD
ACHIEVEMENT

APPLICATION OF GAMIFYING LEARNING ONLINE PLATFORMS AS FORMATIVE ASSESSMENT TOOLS IN HEALTH PROFESSIONS EDUCATION

OUTLINE

- Building Blocks
- Formative Assessment
- Gamified Assessments
- Gamified Assessment Platforms
- Key Benefits
- Challenges
- References

GAMIFICATION – BUILDING BLOCKS

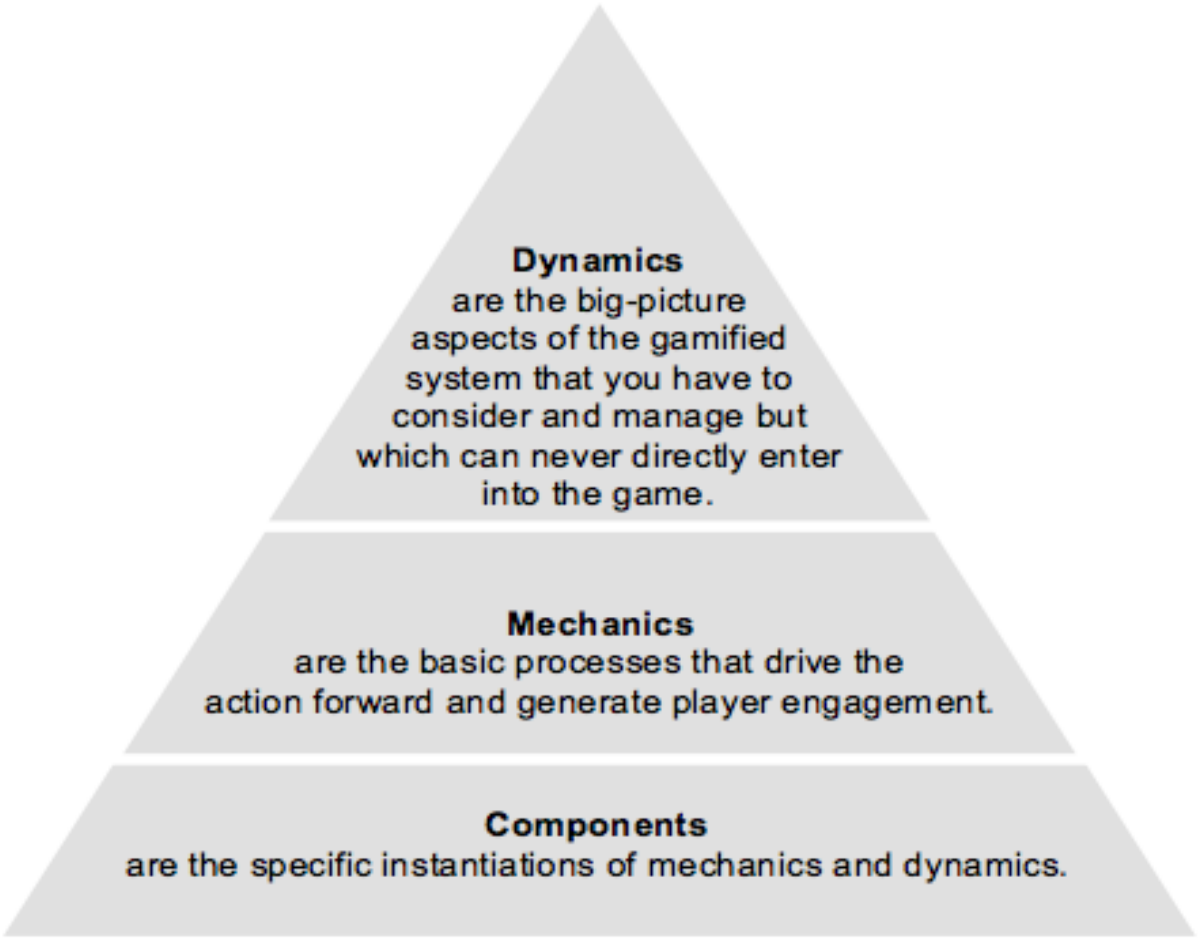
- Gamification: Gamification is applying game mechanics into non-game environments to increase participation.

- Game Mechanics: Rules, interactions, systems that guide rules and dynamics of a video game.

DESIGN

- According to the goal setting theory (Locke in the 80s) goals should be specific, measurable and challenging.

GAMIFICATION – BUILDING BLOCKS



GAMIFICATION – BUILDING BLOCKS

Dynamics

resulting behaviors and interactions between users that are being incentivized by the components (Wood & Reiners 2015).

- **Emotions** include curiosity or competitiveness - can be harnessed/designed to achieve the desired outcomes of the system.
- **Relationships** include interactions that lead to emotional attachments in users; e.g., comradeship and status.
- **Narratives** and **storylines** - elements imported directly from successful video games. Provide an ongoing and compelling storyline (Reiners, Wood, & Dron, in press).

GAMIFICATION – BUILDING BLOCKS

Mechanics

concepts that define potential actions by and states of the user; especially guidelines that are defining how the game progresses, what are the possible reactions on an occurring event, and what influences the behaviour of the user in what kind.

- **Achievements** are the objectives for the user and represent milestones in the storyline.
- **Challenges** that require user effort to complete, such as puzzles or other tasks. Challenges are described by a list of objectives to be fulfilled.
- **Cooperation** between users to reach an objective that is not possible alone; e.g., assembling heavy machinery.
- **Feedback**, provided through leaderboards, messages, or other visual or informational displays, to allow a user to recognize how they are doing and to initiate further activities.
- **Ownership** of resources that can be acquired, used, and traded.
- **Progression** in the storyline; including a visualization for the user to see their progress in an activity. **Transactions** between users allowing trading of resources.
- **Stochastic** elements, where randomness and chance provide a sense of uncertainty and fun.

GAMIFICATION – BUILDING BLOCKS

Components

The selection of components is related to the intention and purpose of the system, the target user group, and involved (software) tools.

- **Points** to measure and provide a tally of success.
- **Badges** to represent success and pre-defined achievements,
- **Leaderboards** to display progression of users and relative success
- **Quests/ Levels** where a user moves through a challenge towards a defined objective, with the intention of being rewarded.
- **Competition/challenge** between two users as they strive to outdo another.
- **Virtual goods, assets** that are perceived to be valuable, often as they confer an advantage to a user, or serve to distinguish the user in some way, providing a sense of individuality.
- **Gifting/sharing** of resources between users, allowing users to enjoy the benefits of gifting, helping, and altruism.

GAMIFICATION – BUILDING BLOCKS

FORMATIVE ASSESSMENT

- Sadler (1989),
  - FA crucial aspect of instructional systems design. holds relevance across various subjects and educational levels
  - focuses on evaluating the quality of student work, examining who makes judgments

GAMIFIED FORMATIVE ASESSMENTS

- To utilize gamification in assessment, design needs associate game elements, game mechanic and game dynamic into one constituent
- Example Werbach and Hunter (2012) design

GAMIFIED FORMATIVE ASSESSMENTS

- Ang et al. (2018) found that gamification can enhance the motivation of first-year medical students in self-directed learning of human anatomy, ultimately leading to improved academic performance
- Cameron et al. (2019) indicated Kahoot did not directly boost grades, it significantly increased engagement, making learning enjoyable and competitive.
- Ismail et al. (2019) examined the benefits of using Kahoot! as a formative assessment tool in medical education

GAMIFIED FORMATIVE ASSESSMENTS

- Pham et al. (2021) introduced an approach to tackle the challenge of examining theoretical links across progressions.
- University of Central Florida (2024)
  - Use virtual reality simulations to gauge their students' ability to treat patients, allowing them to practice certain skills in a realistic and high-pressure environment, but without the need to involve actual patients.

GAMIFIED ASSESSMENT PLATFORMS

Kickstarter

An American crowdfunding platform has launched a campaign on Canny bot - a robot toy that can be controlled remotely via a programme and is used to teach children practical coding skills.

Quizlet

A web and mobile application to study Math, Science, Languages, Arts quicker via games and flashcards for free. It's used by half of the universities of the USA and is said to help with progress a lot.

Khan Academy

Designs interactive video short lessons and supplies users with practice exercises and additional materials for creative learning of different subjects at their own pace.

Duolingo

Language-learning game with more than 8 millions downloads on Google Play. The social app encourages to level app earning points, get virtual currency and learn with friends.

ClassDojo

An interactive, funny and practical solution that connects children with teachers and helps create and manage better learning via virtual classes, sharing media and messaging.

Kahoot

A solution to use at school and at work for e-learning. While playing, anyone feels more comfortable and confident in vocabulary quizzes, multiplication, geography and more.

WASHBACK EFFECT

- Washback Effect: Positive and Negative Washback - defined as the influence of testing on teaching and learning (Turner, 2001)
- Gamification with Quizizz for assessment gave positive washback effect on students' learning (Muhammad D., Sumardi, & Abdul A., 2020)

KEY BENEFITS IN MEDICAL ASSESSMENT

1. Increased Engagement

- learning becomes enjoyable and engaging. Game elements eg points, badges, and leaderboards, motivates medical students to actively participate in the learning process.

2. Enhanced Learning Retention

- Interactive and immersive experiences in gamified medical education can enhance memory retention. The use of scenarios, simulations, and case studies in a game format allows students to apply theoretical knowledge to practical situations, reinforcing learning outcomes.

KEY BENEFITS IN MEDICAL ASSESSMENT

3. Realistic Simulations

- Allows for the creation of realistic medical scenarios in a safe and controlled environment. Simulations to complex medical situations, surgeries, or patient interactions

4. Effective Problem-Solving Skills

- Games often require players to solve problems, make decisions, and think critically.

KEY BENEFITS IN MEDICAL ASSESSMENT

5. Team Collaboration

- Many medical scenarios require collaboration among healthcare professionals. This is particularly valuable in preparing them for real-world healthcare environments.

6. **Instant Feedback And Progress Tracking**

- Gamified platforms can provide instant feedback on performance, allowing students to understand their strengths and areas for improvement. Progress tracking and performance analytics help both students and educators monitor individual and group achievements, allowing for targeted interventions when necessary.

KEY BENEFITS IN MEDICAL ASSESSMENT

7. Promotes Behavior Change

- In areas like health and wellness, gamification has been used to encourage positive behavior changes.

8. Adaptive Learning

- Ato the individual learning styles /pace of students. Personalized learning paths, based on the student's performance, ensure each learner receives content and challenges suited to their proficiency level, optimizing the learning experience.

KEY BENEFITS IN MEDICAL ASSESSMENT

9. Motivation And Goal Achievement

- By incorporating elements such as rewards, achievements, and progression levels, gamification taps into intrinsic motivation, encouraging students to set and achieve learning goals.

10. Continued Professional Development

- Gamification can extend beyond medical school into continued professional development for healthcare professionals. Ongoing gamified training modules can help doctors, nurses, and other healthcare workers stay updated on the latest medical advancements and procedures throughout their careers.

KEY BENEFITS IN MEDICAL ASSESSMENT

11. Medical Quiz Apps

- Medical quiz apps offer questions on various specialties.
  - Anki
  - Firecracker
  - UWorld
  - Prognosis: Your Diagnosis

CHALLENGES

- **Design and implementation.**
  - To create effective gamified educational content, **rigorous preparation** and consideration of learning objectives are required.
  - A badly planned gamification strategy can lead to **distractions or superficial engagement**, which defeats the objective of improving learning.
- **Evaluation and assessment.**
  - **Measuring the efficiency of gamified learning experiences** can be difficult. Traditional assessment methods may not always capture the entire breadth of skills and information acquired by pupils through gamified activities.
- **Accessibility and inclusivity.**
  - It is critical that gamified educational platforms be available to all students, especially those with **impairments** or **limited access to technology**.

TAKE HOME POINTS

- Research provides compelling evidence that integrating gamified elements into assessment methodologies significantly impacts motivation for learning, memory retention, recognition, and relearning, particularly in corporate training, (Sudsom & Phongsatha 2024)
- Landscape is changing – delivery has to change
- Gamified Assessment can be of the agents of change
- Gamification has inherent benefits (Positive washback, retention, increased participation, etc)
- Need for more R&D to address the challenges

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