Gamification & Learning in Higher Ed
Core Elements & Tools for Gamification

4 March 2025

Gamifying Classroom Components

Designing & Implementing a Gamified Class

Core Elements & Tools

Implementation Work Day

What is gamification?

Using the MakerLab

Your Gamified Class

Login Streak Bonus!

Core Elements

Gaming Elements

- Points, Badges, Leaderboards, or Levels – How is progress measured and communicated?

- Quests: The meat of the course

- Rewards: Extrinsic motivation

- Social Components: Competitive or collaborative

- Rules: Every games has guardrails

- Narratives: The fun, this makes the game memorable and immersive

Closest Course Analogs

- Grades

- Assignments and Assessments

- Grades?

- Group work, discussion, grades?

- Course policies, Syllabus

- Application
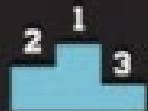
Points, Badges, Leaderboards, & Levels

How is progress measured and communicated?

How to represent progress:

- Things to consider:
  - What is your goal?
  - What are you aiming to communicate?
  - How can you share this information with students?
  - What kind of motivation are you hoping to tap into?

Last Name	Student Name	Rank		Total XP	AdVENTURER	Blog Level	Geologic Time	Evolution	Charity Fair
Last name 1	Name 1		Trapper	15330	●				●
Last name 2	Name 2		Apprentice	1291	●				
Last name 3	Name 3		Ranger	59350		●	●	●	
Last name 4	Name 4		Guardian	126994	●	●			
Last name 5	Name 5		Ultimate survivor	785610	●		●		
Last name 6	Name 6		Ranger	70222	●	●	●		

Let's Discuss:

- What progress communication strategy might work best for your course?

- What strategy do you find the most motivating?

- Which strategy do you think communicates best with students?

Chat Bubble Achievement!

Quests

The **stuff** of a gamified course

What is a quest?

An activity

Viral Diversity Activity Worksheet

Case Title: *The Case of the Mysterious Viral Outbreak*

Objective:

The goal of this activity is to explore the diversity of viruses, including their classification, structure, replication cycles, and host interactions. You will learn how different viral families contribute to outbreaks and adapt to their hosts.

Instructions:

1. **Read the Case Brief** below and investigate the possible viral suspects using the tools provided.
2. Complete the **Analysis Questions** as you work through the case.
3. Use your knowledge of **viral classification**, **genetics**, and **host interactions** to form a conclusion and propose strategies for controlling the outbreak.

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An assignment

Title: "Journey Through Space: Mastering Proportions and Rates"

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This worksheet will help you practice solving problems involving proportions and rates, using the theme of space travel and exploration.

1. Rocket Speed and Distance

Problem:
A rocket travels 400 kilometers in 5 hours. At the same rate, how far will the rocket travel in 8 hours?

Equation:

Distance 1Time 1=Distance 2Time 2$\frac{\text{Distance 1}}{\text{Time 1}} = \frac{\text{Distance 2}}{\text{Time 2}}$

Solve:
Set up a proportion and solve for the unknown distance.

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If a sail is 10 meters by 15 meters, and the wind speed is 20 m/s, how would you calculate the force exerted by the wind on the sail? Use the formula for aerodynamic force:
F=12×Cd×ρ×A×v2$F = \frac{1}{2} \times C_d \times \rho \times A \times v^2$

Where:

- CdC_d C_d is the drag coefficient (assumed to be 1.2 for simplicity)
- ρ\rho ρ is the air density (1.225 kg/m³)
- AA A is the area of the sail
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Keep it on theme

Link to specific objectives

Clear, consistent, language

Want to link to the theme, key objectives, course content, and consistent verbiage

The narrative

But it is still course content

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What is the force acting on the sail?

Journey Through Space: Mastering Proportion & Rates

Objective: This worksheet will help you practice solving problems involving proportions and rate, using the theme of space travel & exploration

Keep it on theme, but link to specific objectives

1. Rocket Speed and Distance

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Practice & Repetition

Solve:

Set up a proportion and solve for the unknown distance.

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Instructions but with narrative

This might be questionable, I would probably adjust this language...

The narrative does double duty by helping students thinking about how they might apply principles in "the real world"

Importantly, the actual question can make sense independent of the narrative.

Side Quest:

How do you think incorporating a narrative or theme might impact student motivation?
Would they think its cheesy?
Would it help them think about content different?
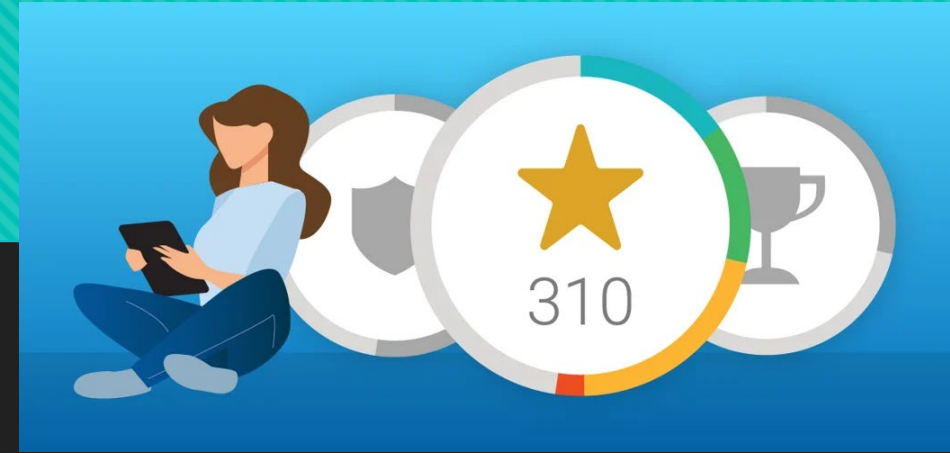
Thinking about Themes

Rewards

Grading and other learning acheivements

Grading in Gamified Classes

- Could be graded the normal way you've always done it
  - What if these were labeled "XP"?
- Could label the accumulation of points with "levels" (a mystery/detective themed course: Gumshoe, Private Investigator, Sergeant Investigator, Detective, Chief)
- Could link tasks, assignments, and assessments to standards (see Standards-Based Grading)
- Could be other types of "rewards"
  - "Item drops" – opportunities for students to practice that must be unlocked by action
  - Institution of time limits or time bonuses – turn your homework in early and get early access to the quiz

You're making GREAT progress!
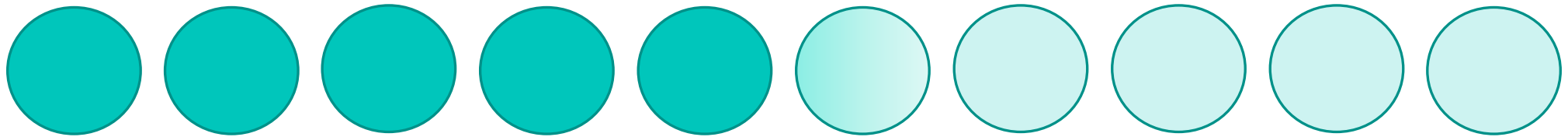
Social Components

Every person for themselves or Better together?

The Social Aspect

Competitive Set-Up

Some students are very motivated by competition:

- Competitive Perfectionists
- Risk-Takers & Challenge-Seekers
- Social Status Seekers
- High Achievers

The Social Aspect

Collaborative Set-Up

Some students are very motivated by competition:

- Community-Oriented Students

- Constructivist Thinkers

- Empathetic & Inclusive Students

- Accountability-Driven Students

How have these student types shown up in your class in its current format?

Striking the Balance

- **Individual Mastery-Based Grading Strategy:** Use a grading scale that rewards personal improvement rather than ranking against peers.

- **Example:** A biology class allows students to **reattempt quizzes** and improve scores, rewarding persistence and self-competition rather than just raw performance.

- **Who Benefits Most?**

  - *High Achievers* – Motivated to push for top scores.

  - *Goal-Oriented Students* – Encouraged to track their own progress.

  - *Competitive Perfectionists* – Have a chance to refine their work without fear of failure.

- **Team-Based Assessments Strategy:** Use **group projects** where students collectively solve problems, submit reports, or create presentations.

- **Example:** In a computer science course, students work in teams to **develop an app**, with each member assigned a role. The project is graded on both individual contributions and overall team effectiveness.

- **Who Benefits Most?**

  - *Community-Oriented Students* – Thrive in cooperative learning.

  - *Constructivist Thinkers* – Prefer co-creating knowledge.

  - *Accountability-Driven Students* – Feel responsible for their team's success.

Striking the Balance

○ **Competitive Collaboration: Team vs. Team Challenges (Supports Both)**

• **Strategy:** Create **inter-team competitions**, where collaboration is required but there is still a winning outcome.

• **Example:** In a physics course, students participate in an **engineering challenge**, designing and testing structures against other teams. The best design wins, but all teams receive credit for participation and effort.

• **Who Benefits Most?**

  • *Team-Oriented Competitors* – Engage in friendly rivalry while working together.

  • *Team-Oriented Problem-Solvers* – Enjoy working together toward a goal.

  • *Competitive Perfectionists* --Strive for excellence within a high-stakes team environment where both individual contributions and collective success matter

○ **Balanced Grade Distribution (Supports All)**

A well-structured grade breakdown might look like this:

• **50% Individual Mastery** (quizzes, exams, personal improvement opportunities)

• **30% Group Work** (projects, discussions, team-based assessments)

• **10% Peer Review & Teaching** (critiques, mentoring)

• **10% Optional Competitive Challenges** (extra credit or bonus assignments)

• **Who Benefits Most?**

  • *Everyone* –There is something for each type of student here and it combines the strengths and weaknesses of each type of student for a well-rounded class.

Rules

Making the Class Make Sense and Keeping the Guardrails Up

Rules for a Gamified Course

- Define the objective for the game/course
  - Link learning objectives to game components
- Be clear how students progress through the game/course and what kinds of activities contribute directly vs. indirectly to that progress
  - Set milestones
  - Be transparent
- Explain rewards and be sure that they're attainable for all learners
- Delineate collaborative and independent work
- Set expectations about participation or engagement
- Specify how competition impacts student grades

🏆 Gamified Course: "Power & Progress: The Quest for Gender Equity in Politics"

Students advance through **political ranks** by earning XP (experience points) through challenges, debates, and policy-making exercises. **Collaboration, competition, and individual mastery** all play a role in their success.

📝 Gamified Learning Objectives & Assignments

1. Feminist Theory Quest (Independent | 100 XP) 🎓

📌 *Objective:* Analyze key feminist political theories and their impact.
◆ **Task:** Complete a **digital scavenger hunt** (independent) where students connect key theorists to real-world policies.
⚀ **Bonus XP (20 XP):** Top 3 most creative historical-to-modern connections win extra points.

---

2. Representation Challenge (Collaborative | 150 XP) 🏛

📌 *Objective:* Evaluate gender barriers in political representation.
◆ **Task: Mock election simulation**—students take on roles as candidates, campaign managers, and analysts.
⚀ **Bonus XP (25 XP):** Winning candidates receive extra XP, but **all team members** earn XP for participation.

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3. Policy Puzzle (Collaborative | 120 XP) 🔎

📌 *Objective:* Examine how institutions shape gender roles.
◆ **Task:** Work in **small teams** to complete a **Policy Escape Room**, decoding legal documents and passing reforms.
⚀ **Bonus XP (15 XP):** Fastest team earns extra points, but all teams receive full XP upon completion.

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4. Global Gender Politics Leaderboard (Independent | 100 XP) 🌐

📌 *Objective:* Compare gendered political participation across countries.
◆ **Task:** Create an **infographic or mini-podcast** analyzing gender representation globally.
⚀ **Bonus XP (20 XP):** Peers vote on the most insightful case study (top 3 receive extra XP).

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5. Intersectionality Arena (Collaborative | 130 XP) ⚖

📌 *Objective:* Assess intersectionality in policymaking.
◆ **Task: Debate Tournament**—students defend policies from diverse perspectives.

🏆 Important Rules Takeaways

✅ **Clear progression system**—students understand exactly what they need to pass.

✅ **No one "fails" just because they didn't win competitions**—everyone can progress by engaging.

✅ **Flexibility for different learning styles**—students can focus on **individual mastery, teamwork, or a mix of both.**

✅ **Engagement-driven motivation**—students are incentivized to **push beyond the minimum.**

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The Narrative

- Points, Badges, Leaderboards, or Levels: Gumshoe, Private Investigator, Sergeant Investigator, Detective, Chief

- Quests: Investigate the cause of death of a victim wherein the suspects are pathogenic microbes; Clues are the characteristics of the infection, symptoms of the victim prior to death; Interrogation of "known accomplices" aka closely related organisms

- Rewards: Item/Clue Drops, New Abilities, Time Limits/Bonuses, Level Advancement

- Social Components: In class discussions/investigation comparisons, reveal of clues, mixed level groups, etc.

- Rules: Follow the process, Preserve the chain of custody, Avoid random guessing, Use the scientific method,

🏴‍☠️ Engineering the High Seas: A Pirate's Guide to Innovation

🌊 Course Description

Set sail on an **engineering adventure** where students become pirate-engineers, solving real-world engineering challenges inspired by the high seas! This junior-level course combines **mechanical, structural, and fluid dynamics principles** with immersive **team-based roleplay** and a **gamified XP-based grading system**. Students will work in pirate crews, taking on specialized roles as **Navigators, Shipwrights, Canoneers, Boatswains, and Engineer's Mates** to design, test, and optimize ships, weapons, and survival systems.

The course culminates in an **interactive mini ship-building project**, where teams construct, test, and refine scale-model ships to compete in a **final fleet battle**—a test of speed, stability, and combat resilience!

🏛️ Course Topics & Activities (Aligned with Junior Engineering Level)

Topic	Mission (Assignment)	Concepts Covered	Type (Indiv/Collab)	XP
Naval Architecture	Ship Design & Buoyancy Challenge 🚢	Fluid mechanics, stability, center of gravity	Individual	100 XP
Projectile Motion & Ballistics	Cannonball Trajectory Simulation 🎯	Kinematics, aerodynamics, impact physics	Collaborative	150 XP
Navigation & GPS Systems	Treasure Map Navigation 🗺️	Bearings, GPS coordinates, error analysis	Individual	120 XP
Aerodynamics & Wind Energy	Sail Efficiency Optimization 🪂	Lift, drag, mechanical energy	Collaborative	100 XP
Materials Science & Structures	Hull Strength Stress Test ⚓	Shear force, bending moments, corrosion	Individual	130 XP
Resilience & Safety Engineering	Stormproofing Pirate Ships 🌩️	Structural reinforcement, hydrodynamics	Collaborative	140 XP
Ethics & Engineering Judgment	The Pirate's Code: Ethics Dilemmas ⚖️	Engineering ethics, sustainability	Individual	80 XP
Capstone Project	Fleet Battle: Design, Build, Compete ⚔️	Systems engineering, teamwork, optimization	Collaborative	180 XP

Bonus XP is earned through "duels" (challenges), "raids" (competitions), and "legendary feats" (extra credit projects).

📊 Rank Progression & Grading System

Students earn **gold (XP)** by completing **missions** (assignments), **duels** (competitions), and **voyages** (projects). Their **pirate rank** determines their standing:

Rank	Gold (XP) Required	Grade Equivalent
Landlubber	0 XP	F (Failing)
Deckhand	300 XP	D (Needs Improvement)
Gunner	600 XP	C (Passing)
Quartermaster	800 XP	B (Good)
Captain	1000 XP	A- (Strong)
Pirate King/Queen	1200 XP	A (Excellent)

➡️ 600 XP required to pass (Gunner rank).

➡️ 1200 XP (Pirate King/Queen) is the ultimate honor!

What kind of narrative would be fun to explore for your course?

Game Designer

Tools

Tools & Apps for Gamification

📊 XP & Progress Tracking

- **Google Sheets / Excel** – Create a custom XP tracking system with formulas for automatic leveling up.
- **Gradecraft** – A gamified LMS that helps track XP, leaderboards, and progress-based learning. (Limited free trial)

🏅 Badges & Achievements

- **Blackboard** — LMS platforms allow badge creation and distribution. Here's how: https://youtu.be/EDXfewsV4DA
- **Canva** – Design custom digital badges for achievements. (Free with some limits on design features)
- **Canvas Badges (Badgr)** – Issue verifiable digital badges for skill-based achievements. (Free tier available) https://www.youtube.com/watch?v=q3dkGupx0ac

📖 Interactive Quizzes & Engagement

- **Kahoot / Quizizz / Blooket** – Gamify assessments with real-time, competitive quizzes. (All have free basic versions)
- **Socrative** – A tool for interactive quizzes and formative assessments. (Free version has limited quizzes; only app-based no web version)
- **H5P** – Create interactive content like branching scenarios, quizzes, and games. (Free for basic content creation, requires HTML)

🗺️ Collaboration & Storytelling

- **Miro / Trello / Notion** – Organize quests, track progress, and structure gamified lesson plans. (All have free versions with some limitation on storage; Some learning curve)
- **Twine** – Build interactive, choose-your-own-adventure style learning activities. (Free & Open Source; Some learning curve)) https://www.youtube.com/watch?v=iKFZhlHD7Xk&list=PLklITFhXtPCCKadv-0Gcbqoj3OCev695D
- **Deck of Cards** – Create challenge decks or randomized rewards. (You can do this is Powerpoint!)

🎲 Roleplay & Immersive Learning

- **Dungeons & Dragons (D&D Beyond / Roll20)** – Use role-playing elements for storytelling-based lessons. (Literally limitless options; Some game books available through the library and tons of content online)
- **Scenario-based Learning (Branched Learning Paths)** – Tools like Articulate Storyline (Free Trial) or Forms allow for branching scenarios. (Free!)

🎮 Full Gamification Platforms

- **Breakout EDU** – Classroom escape-room style games that challenge students through puzzles. (Many free games, full library requires a subscription) https://www.youtube.com/watch?v=oH1Tmhhy6mg
- **GameLab** – A flexible platform for creating fully gamified courses. (Free for individuals, some limit on use) https://code.org/educate/gamelab

📚 Books on Gamification in Education

- **"The Gamification of Learning and Instruction" – Karl M. Kapp** – A foundational book on gamification strategies for educators.
- **"Reality Is Broken" – Jane McGonigal** – Explores how game mechanics can improve education and real-world engagement.
- **"For the Win: How Game Thinking Can Revolutionize Your Business" – Kevin Werbach & Dan Hunter** – Covers game-based learning principles applicable to teaching.
- **"Play to Learn: Everything You Need to Know About Designing Effective Learning Games" – Sharon Boller & Karl M. Kapp** – A practical guide to implementing game-based learning.
- **"Level Up Your Classroom: The Quest to Gamify Your Lessons and Engage Your Students" – Jonathan Cassie** – Focuses on gamification techniques for classroom instruction.

You should have received an email with these links!

Congratulations! You have completed Level 2: *Core Elements & Tools for Gamification*

Questions? Submit them here!

Join us March 18th at 3:30pm