



Implementing Gamification in LMS

Adina COCU

University "Dunarea de Jos" of Galați,
Romania

GAMIFICATION IN EDUCATION



- The use of game design elements in non-game contexts.
- Enhance engagement, motivation, and participation.
- Gamification $\neq$ transform learning into a game.
- Gamification = use game mechanics to support the learning process.



GAMIFICATION



- **Game** → primarily designed for playing
- **Game-Based Learning** → learning through a game
- **Gamification** → adding game-design elements to the learning process



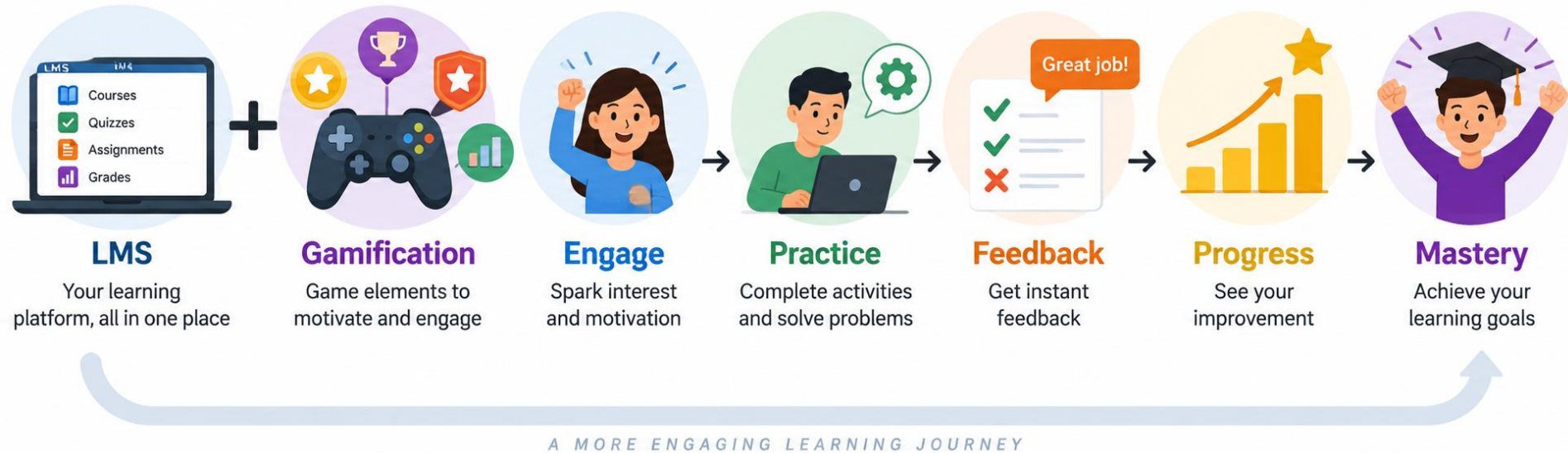
WHY GAMIFY



- an LMS instead of simply adding games to a course?
- Using **gamification inside an LMS** is useful because the LMS already contains:
 - the learning activities,
 - assessment data,
 - student progress.
- Gamification can become part of the **learning process**, rather than an isolated game.



LMS + Gamification → Engage → Practice → Feedback → Progress → Mastery



- The gamification itself does not guarantee better learning.
- Educational value comes from aligning game mechanics with learning outcomes and activities.

AIM OF GAMIFICATION



- Which of these are simply game elements, and which actually contribute to learning?
 - 🎮 **Mainly engagement** — makes the experience more attractive or motivating
 - 🎓 **Mainly learning** — directly supports understanding, practice, feedback, or mastery
 - 🔄 **Both** — can support both engagement and learning





Examples of gamification

The LMS controlled:

1

Progression

Conditional quiz, lesson, prerequisites, levels, narrative missions

2

Practice

Randomised questions, multiple attempts, remedial paths

3

Rewards

Points, badges, milestones, grade bonus, achievement levels

4

Feedback

Immediate / formative feedback, automated tests, penalties

5

Narrative

Lessons/pages used as missions, episodes, battle or detective paths

6

Analytics

Completion, attempts, scores, access logs, progression and participation

**Cross-course
pattern**

**Content → challenge → feedback → retry →
unlock → reward → visible progress**





How LMS elements were used

Different subjects used the same LMS building blocks in different pedagogical configurations.

C1 Object-Oriented Programming



- **Activities:** Conditional + adaptive timed quizzes: next activities unlocked after passing the previous stage + Competitive coding challenges.
- Random question pools >200 questions.
- Multiple attempts.
- Immediate formative feedback: fast response plus an explanation, hint, or guidance for improvement.
- Badges mark module completion.
- **Dynamic:** achievement, gradual difficulty, competition, revisit the online tools to gain points.
- **Storyline:** CodeTasks: The OOP Chronicles: In a futuristic world, students use OOP skills, solve theoretical questions and practical puzzles, against battle WarriorAI.



C1: repeat + mastery



How LMS elements were used

Different subjects used the same LMS building blocks in different pedagogical configurations.

C2 Artificial Intelligence



- **Activities:** Book / lessons : text, video, summary + Self-assessment + Timed quizzes
- Random question pools. Multiple attempts.
- Immediate feedback.
- Points, activity tracking and progress monitoring made advancement visible.
- **Dynamic:** read and watch through increasingly advanced levels, ending with a quiz-based challenge.
- **Storyline:** AI Agent Quest: developing AI agents undertaking a progressive quest towards greater autonomy and intelligence



C2: progressive pathway + mastery



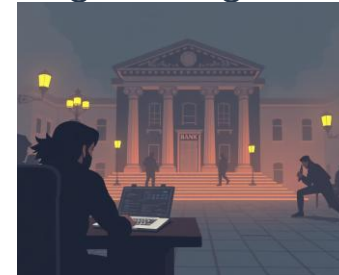
How LMS elements were used

Different subjects used the same LMS building blocks in different pedagogical configurations.

C3 Programming Language



- **Activities:** Lessons + Standard and adaptive quizzes unlocked progressively.
- Immediate feedback could include penalties
- XP/points to unlock faster coding paths, badges used to progress.
- **Dynamic:** coding challenges (write-or-complete-code-snippet questions), questions with different feedback behaviors (including immediate feedback with penalties).
- **Storyline:** HeistCode: Break the Bank with Algorithms: heist narrative inspired by La Casa de Papel: the student plays a recruit in a team of cyber-criminal masterminds led by "El Profesor," tasked with breaking into a highly secure bank using coding and algorithmic skills.



C3: progress + coding

How LMS elements were used



Different subjects used the same LMS building blocks in different pedagogical configurations.

C4 Imperative Programming



- **Activities:** Conditional lessons + Quizzes (code) + Wiki supported collaborative exercises
- Limited time and availability of quizzes.
- Points/badges and Gradebook.
- **Dynamic:** Conditional progression, mastery thresholds and multiple attempts controlled advancement.
- **Storyline:** Valhala Battle – Breaking the Data: the Digital Palace of Valhalla (DiVa), a virtual world located in the cyber cloud and populated by AI entities. Access to the DiVa required learners to acquire the knowledge and skills associated with competences.



C4: structured pathway + code



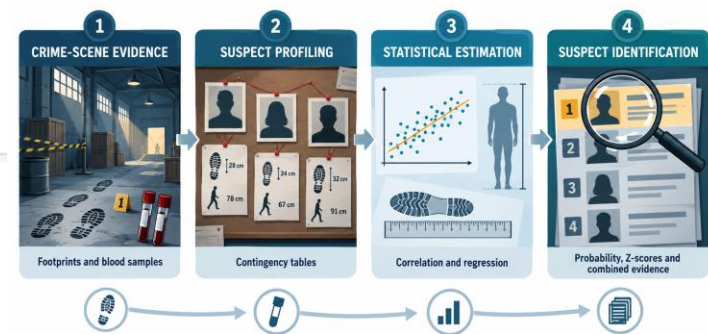
How LMS elements were used

Different subjects used the same LMS building blocks in different pedagogical configurations.

C5 Mathematics

- **Activities:** Lessons + Timed conditional questions.
- Immediate and formative feedback.
- Badges, points.
- **Dynamic:** branching structure directed students towards different pages or additional explanations when necessary, allowing to reconsider incorrect responses before progressing. The activities gradually increased in complexity. Active participation, reflection and evidence-based reasoning.
- **Storyline:** Detective Superhero: Students act as detectives, receive a crime scenario and a dataset, apply the statistical method introduced in the lesson, and use the resulting evidence to make an investigative deduction.

Detective Superhero Game: Storyline



C5: structured pathway + mastery

LMS - GAME ELEMENTS



ENGAGEMENT

Points / XP
Leaderboards
Avatars
Rewards
Narrative
Streaks
Competition
Surprises



LEARNING

Immediate feedback
Hints / Scaffolding
Practice & repetition
Mastery requirements
Randomized questions
Increasing difficulty



BOTH

Badges
Levels
Challenges
Progress
Conditional unlocking
Retries
Adaptive quiz
Choice
Collaboration
Milestones



Steps



1. 🎯 Learning Outcome
↓
2. 🧠 Learning Activity
↓
3. 🎮 Dynamic
↓
4. 💬 Storyline
↓
5. 📊 Feedback + Evidence of Learning

Every game dynamic should have a learning purpose.

Don't gamify the activity. Gamify the learning journey.

LEARNING ACTIVITIES



- **Lesson** - branching paths, choices, adaptive progression
- **Wiki** - knowledge collection
- **Quiz (simple, adaptive)** - Challenges, XP, multiple attempts, levels
- **Conditional quizzes** - modules
- **Assignment** - missions / quests
- **H5P** - interactive challenges
- **Forum** - collaboration, peer challenges
- **Workshop** – collaboration, peer assessment



DYNAMICS



-  **Points / XP** – points earned for completing activities
-  **Badges** – rewards for achievements or competencies
-  **Levels** – progression from beginner to advanced stages
-  **Progress** – visual representation of learning progress
-  **Unlocking** – access to new content after meeting conditions
-  **Conditional progression** – advancement based on performance or completion
-  **Retries / Multiple attempts** – repeated opportunities to improve
-  **Immediate feedback** – instant response to learner actions
-  **Branching paths** – different routes based on answers or choices
-  **Adaptive difficulty** – difficulty changes according to performance
-  **Randomization** – randomized questions, tasks, or scenarios
-  **Time challenges** – activities completed within a time limit





Limitations of Gamification

- ✓ **Overemphasis on rewards** may shift attention away from learning.
- ✓ **Competition and leaderboards** may discourage some learners.
- ✓ **Poorly designed dynamics** can become distracting rather than motivating.
- ✓ **Repetitive activities** may reduce engagement over time.
- ✓ **Different learners respond differently.**
- ✓ Gamification cannot compensate for **weak learning activities or unclear learning outcomes.**
- ✓ Design and implementation require **time and effort.**



KEY MESSAGE



- Gamification should support pedagogy — not replace it.
- Don't gamify the activity. Gamify the learning journey.
- Rewards may get learners started.
- Meaningful challenges can keep them learning.

