

Shifting to digital: Gamification in course design

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9:00 am - 1:00 pm (CEST)

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CYENS Research Center - EdMedia group

Shifting to Digital: Gamification in course design

Tutors...



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Research Interests: Learning Technologies,
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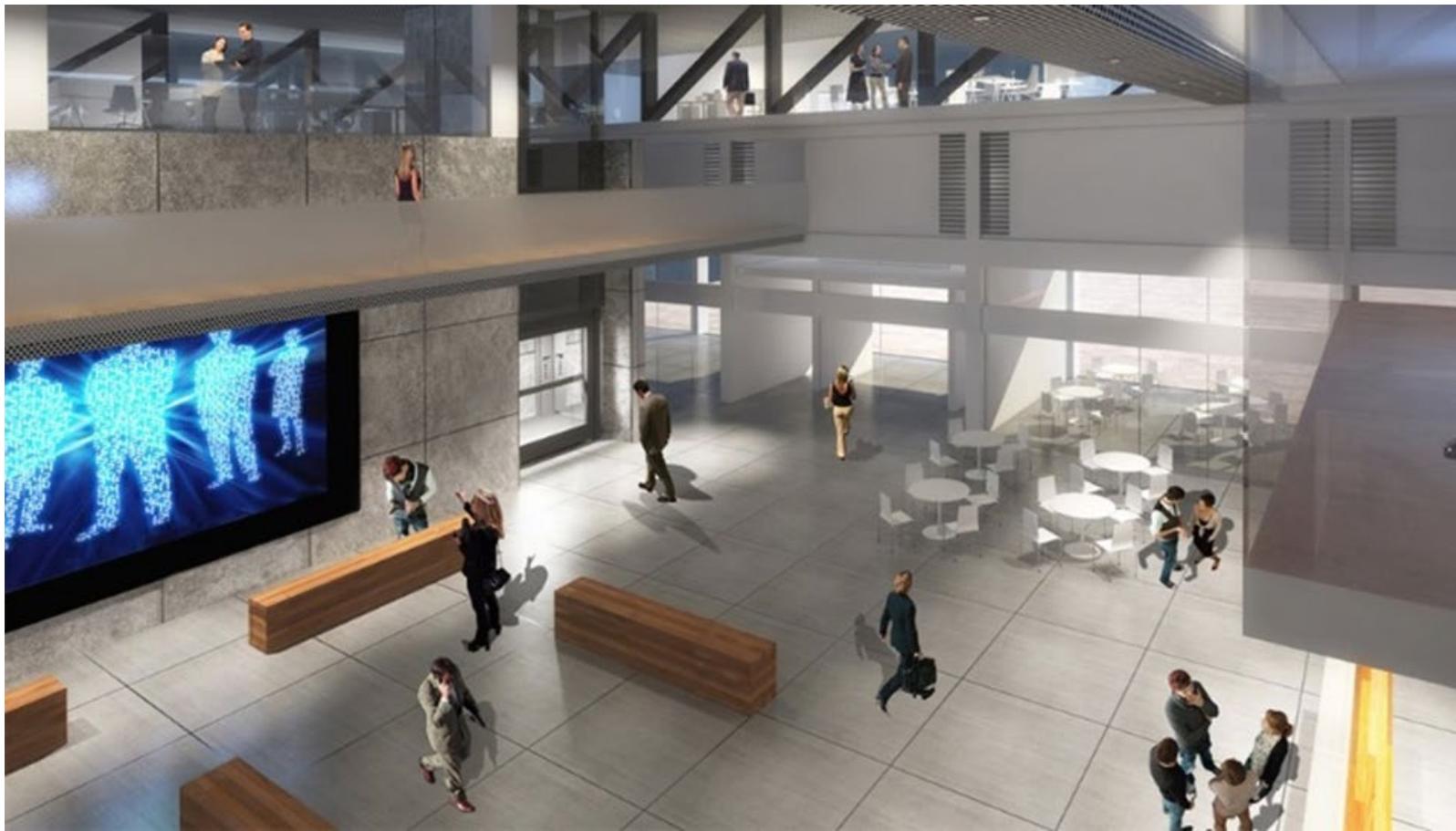


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CYENS: RESEARCH CENTRE OF INTERACTIVE MEDIA SMART SYSTEMS AND EMERGING TECHNOLOGIES



The Interactive Media, Education and Edutainment MRG (EdMedia)

<http://edmedia.cyens.org.cy/>

The EdMedia Group of CYENS aims to conduct applied research and innovation in the field of Interactive Media for Education and Edutainment.

Areas of expertise: learning experience (LX) design, UX design, technology-enhanced learning, training and pedagogy, technology integration (formal and informal), assessment and evaluation.

The group is a natural extension of the Cyprus Interaction Lab Group of the Cyprus University of Technology (<https://www.cyprusinteractionlab.com/>)



CYPRUS INTERACTION LAB, <https://www.cyprusinteractionlab.com/>



Cyprus Interaction Lab (CIL)

Pillars of research

Embodied and Gameful Learning

Learning Design and Learning Spaces

Design for Social Change

CIL research draws on:

Constructivist and constructionist pedagogy

Co-design with educators and stakeholders

Human-centered design



We would like to know more about you!

Kahoot time!

<https://kahoot.it/> Game PIN: xxx

Miro time!

<https://miro.com/>

Shifting to digital: Gamification in course design

Nowadays, teaching and training faces new challenges as the audience is less self-disciplined, living in overwhelming environments and losing attention and/or interest very quickly. Our job, as educators and trainers and technologists is to address these challenges.

Applying **fun and engaging elements** found in games to non-leisure contexts, known as gamification, aims to motivate the learners to complete specific tasks, and thus, increase user retention with content, products or services. Education and training can also gain from this approach.

Gamification makes the learning experience **more enjoyable and engaging**. It's a powerful tool for engaging learners with the content and is relatively cheap to implement, feeds into the user's sense of accomplishment while it allows the teacher/trainer to gather performance data for the learner.

Through this workshop, the participants will be able to see how teaching material is built for gamification, by exploiting the possibilities provided by the **Moodle** e-learning platform but also other tools.

Shifting to Digital: Gamification in course design

Introduction 10'

Introduction to Gamification and Moodle Gamification Tools (60 min)

- Gamification (game) thinking
- The Moodle Open-source learning platform
- Game Components (general tools that can be added on the learning platform)
- Using Moodle tools as game elements (certificates, badges, progress indicator, simple games e.g., hidden picture, hangman)
- Other tools for gamification

Course Design with Gamification Elements (60 min)

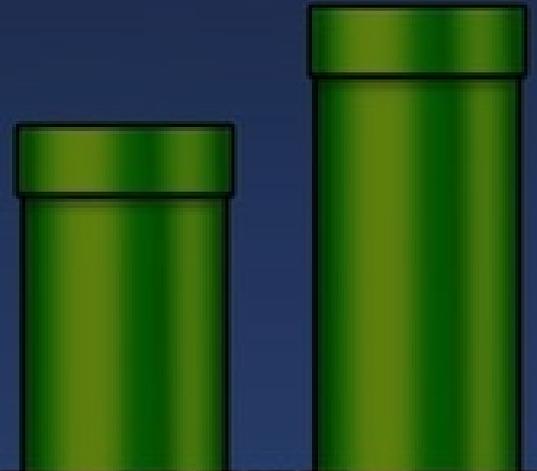
- Teaching and learning goals
- Overall course design

Hands on with Gamification in Course Design (60 min)

- Experiencing the development of teaching materials using gamification

Reflection 20'

What is Gamification?





It's the application of game-playing elements to another type of activity

Gamification is applied to many aspects in life: business, marketing and education

What is Gamification or Gameful Design?

“Broadly defined, gamification is the application of game features and game mechanics to a non-game context (Deterding, Dixon, Khaled, & Nacke, 2011). Gamification, or gameful design, comprises design for gameful experiences, that is, experiences which **incorporate the qualities of gaming, particularly play**, which is structured by rules and competing towards a goal. Therefore, gamified applications or activities do not typically include playing an actual game; they only **incorporate game mechanisms.**”

What is Gamification?

Gamification, according to Kapp (2012) can be separated in two main types:

- Structural gamification - This is the application of game-elements to **motivate the learner** through content with **no alteration or changes to the content itself**. The content does not become game-like, only the structure around the content. The primary focus is to engage the learner in the process of **learning through rewards** (for example using of avatars, leaderboards, awarding with badges, passing different levels).
- Content gamification - This is the application of game elements and **game thinking to alter content** to make it more game-like. For example, **adding story elements to a course or starting a course with a challenge** instead of a list of objectives.



Gamification is a term related to serious games...



- Game-based learning - uses video and electronic games for achieving educational goals;
- **Gamification of learning - integrates game elements and techniques with the learning process;**
- Organizational-dynamic games - they teach and reflect the dynamics of organizations at 3 levels: individual behavior, group behavior and culture dynamic;
- Simulation games - games, used for the acquisition or training of different skills, teaching effective behaviors in the context of simulated conditions or situations;
- Edutainment - presents content, designated simultaneously for education and enjoyment (the term is a combination of the words education and entertainment).

Gamification

game mechanics +
game thinking

	Game Thinking	Game Elements	Game Play	Just for Fun
Game Inspired Design				
Gamification				
Serious Game / Simulation				
Game				

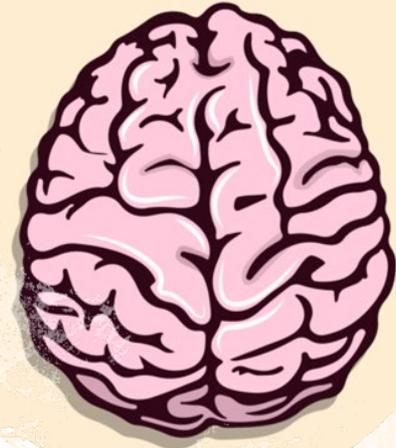


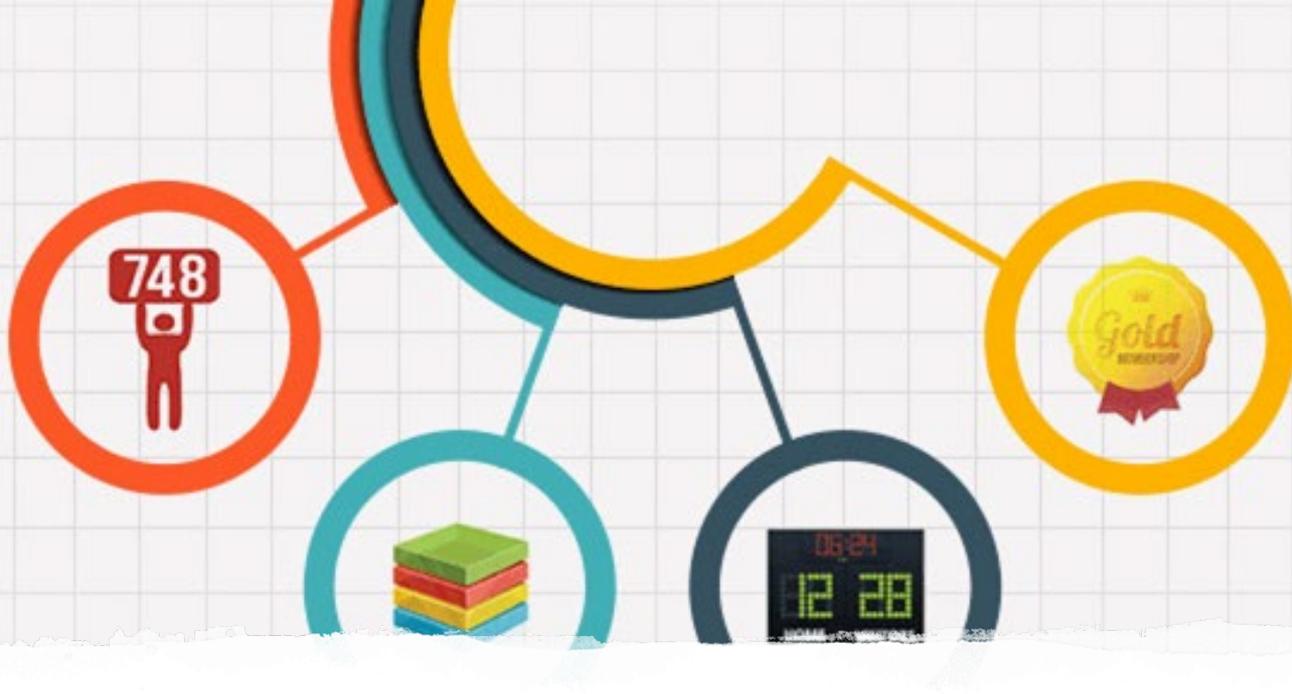
But why?

Exploiting our natural affinity for achievement and competition!

Effects of Gamification in education

- Gamification in education can improve motivation and engagement.
- Gamification modifies the brain's reward and pleasure center and ameliorates learning.





What are some aspects of gamification?



Achievement
(progression)



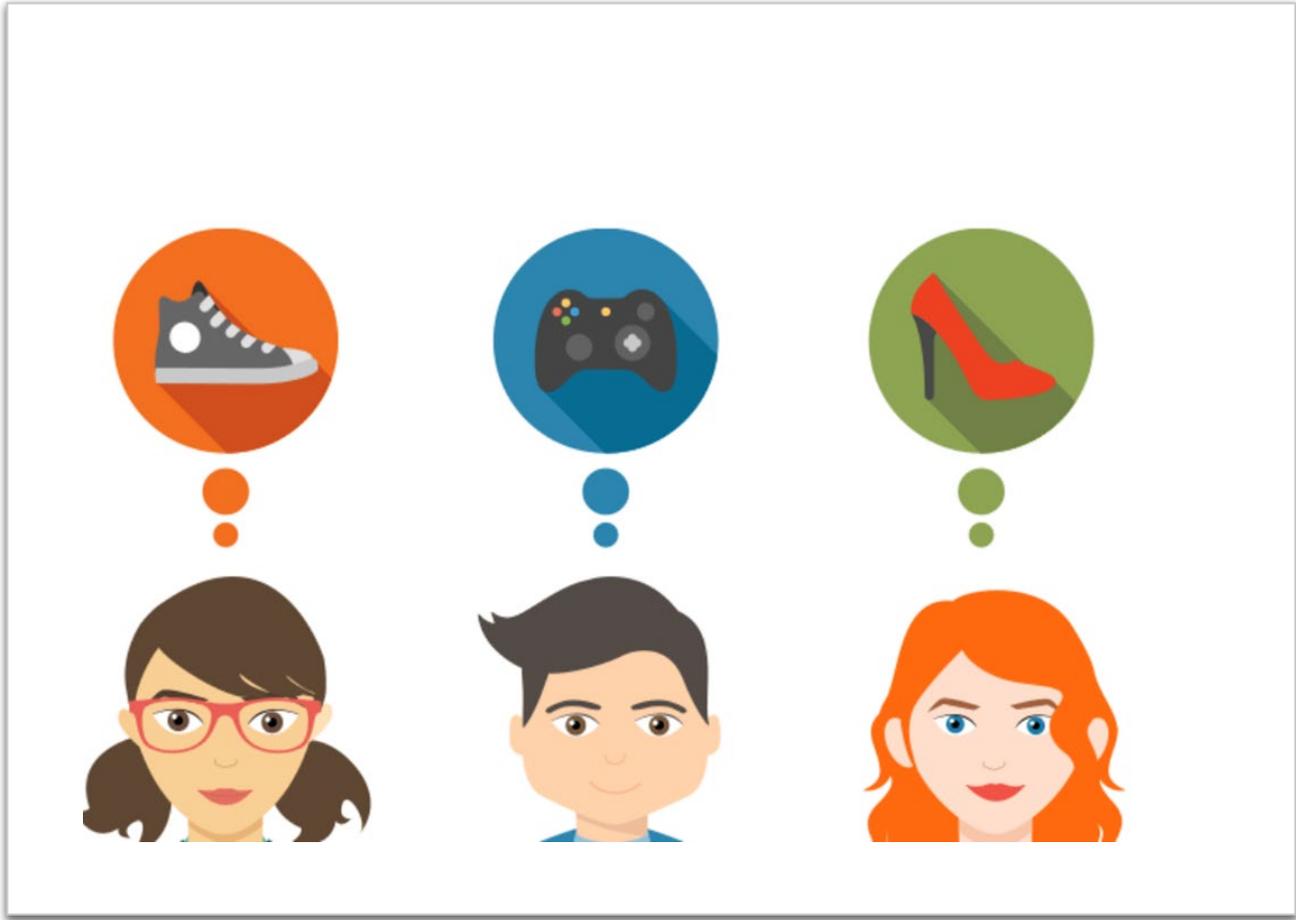
Rewards



Story



Time



Personalization



Micro interactions

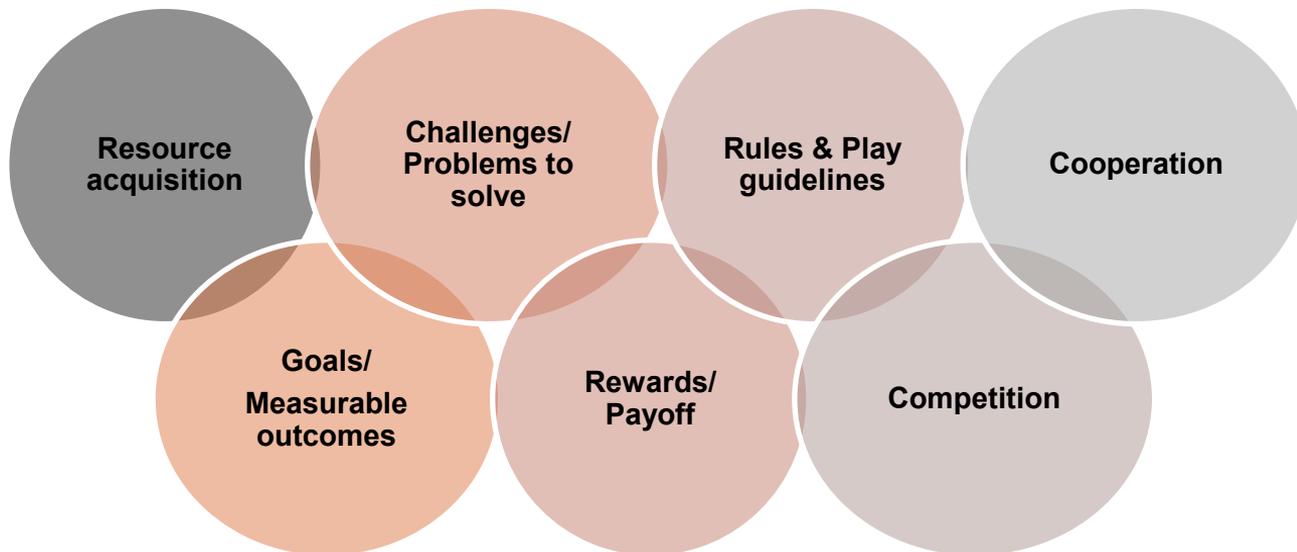
Overall...

- A long list of game mechanisms & variety of tools and techniques
- Badges, levels, achievements and game points and a lot of **creativity** on how to apply them!
- Students are **rewarded** with these concepts when they succeed, but are **not penalized** when they don't.

Top 10	My Rank
8th	 Jason Rahm ★ 298
9th	 Steven Mo ★ 265
10th	 Joe Pruitt ★ 241
11th	 Jeff Browning ★ 235
12th	 April Spence ★ 232



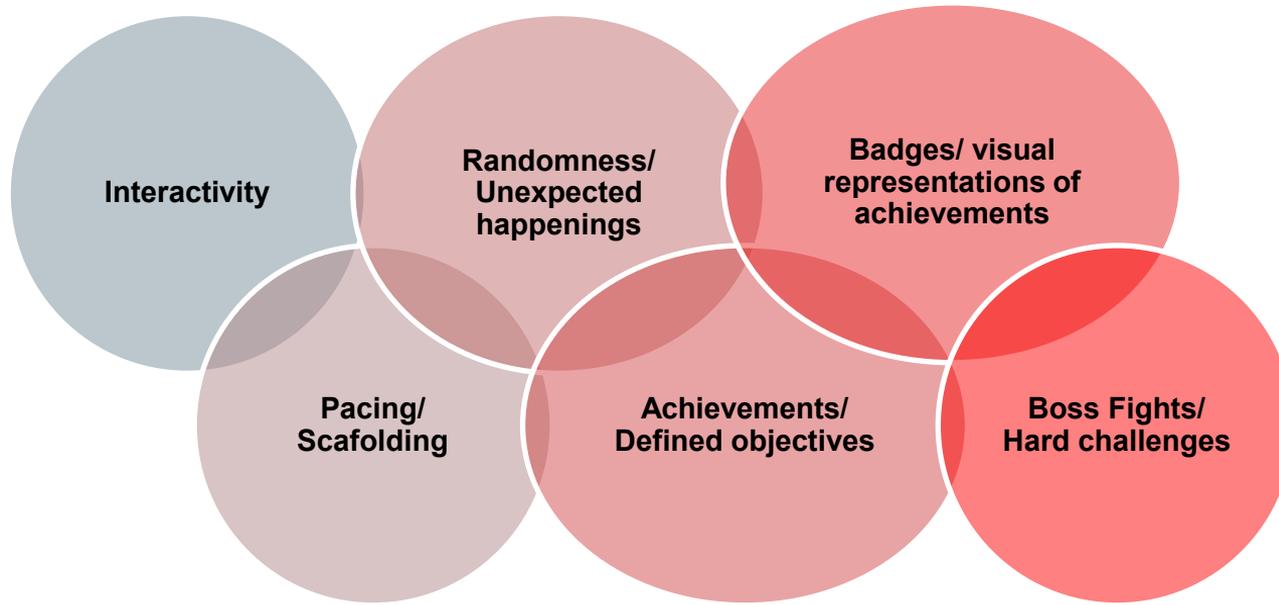
Gamification Mechanics & Design Elements



*Use of **game mechanics** and **game thinking** in non-game environments requires **creativity!**
How do you create competition?*



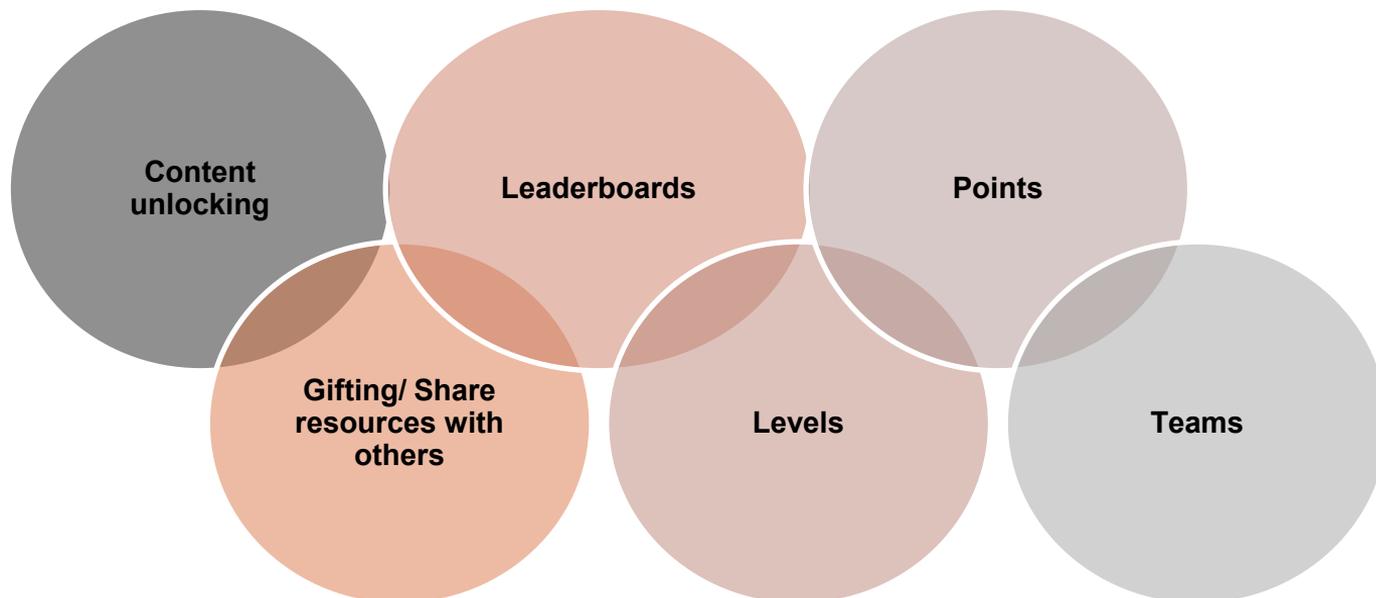
Gamification Mechanics & Design Elements



*Use of **game mechanics** and **game thinking** in non-game environments requires **creativity!**
How do you create interactivity?*



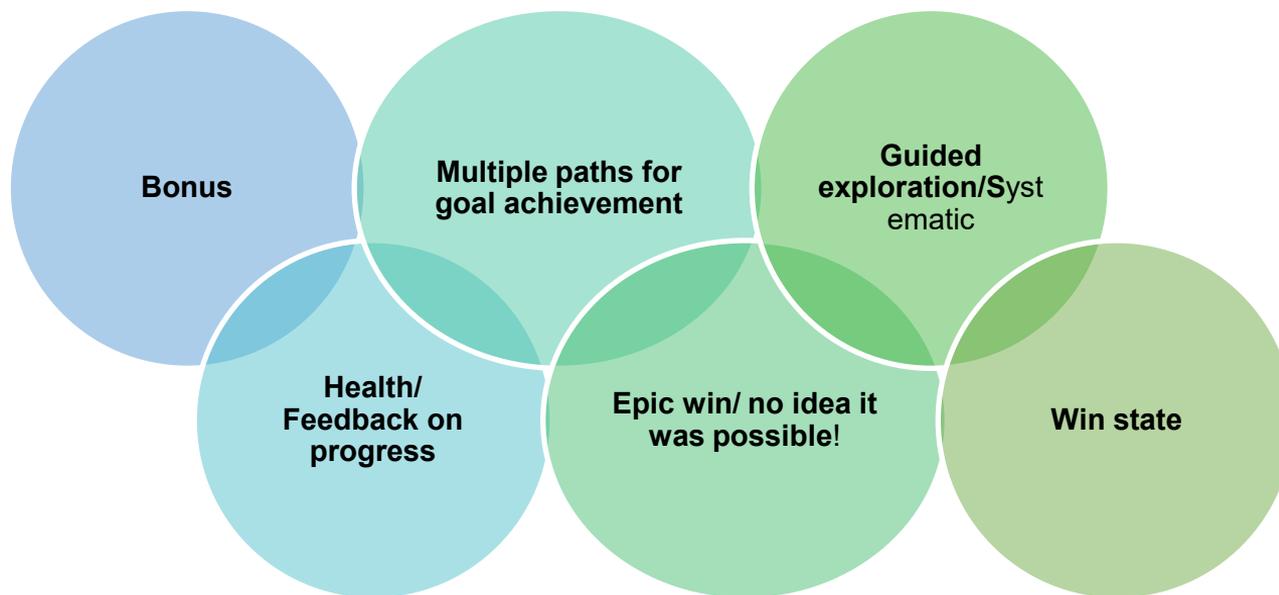
Gamification Mechanics & Design Elements



*Use of **game mechanics** and **game thinking** in non-game environments requires **creativity!**
How do you plan for aspects available only when players reach objectives (content unlocking)?*



Gamification Mechanics & Design Elements



*Use of **game mechanics** and **game thinking** in non-game environments requires **creativity!**
What would be an epic win in your course?*

Success stories...

habitica

- A productivity mobile application that turns your to-do list and everyday life into a game.
- Completing successfully your everyday tasks (going to work, doing exercise, etc.) wins you points where procrastinating or waking up late will not.
- It simply turns your life into a Role Playing Game giving you motivation on your everyday life.



<https://www.youtube.com/watch?v=MNr7HHVuE6I>

Success stories...

duolingo

- A language learning mobile application that motivates you to learn new languages.
- Answering correctly multiple-answer questions grants you points, motivating you to continue learning.
- Additionally Duolingo offers a rewards system granting you badges with every successful course taken.

<https://www.youtube.com/watch?v=8wc83qX6oNM>



duolingo

Success stories...

Coursera: Interactive Education in Your Home, MOOCs (massive online open courses)

- **Progress can be measured by completing assignments and tests** online where machine grading and evaluation can be used.
- In good education gamification spirit, the results are **immediately reported to the student**, as well as the instructional staff, providing feedback and reinforcement to the student.
- In some cases, **leveling up, badges and other rewards systems are implemented**.
- **Interactivity among the students** is emphasized to encourage engagement and assist in long-term retention of concepts.

This also provides frequent feedback which enables the student to monitor their progress and self-evaluate their understanding of the material.



One of the most popular courses on Coursera is the Gamification course!

<https://www.coursera.org/lecture/gamification/1-1-introduction-4h5k1>



Gamification in many recent Citizen Science Projects

....to encourage public participation in scientific research.

Scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions...

Gamification is an important tool to engage non-traditional audiences to the scientific process



Become a
**Citizen
Scientist**





QuestaGame: Can you recognize the gamification Mechanics?

Has been shown to add a stratum of purpose to a sustainability education goal!

In your field...could it be Citizen Science for Living Soils and Growing Food?

How gamification can be applied to food science and technology ?

Break into rooms...

Have you experienced any gamification in your field of study as learner or as an instructor or as user of any app in personal life.



5' min break



What is Moodle

For the creation of e-courses we can use the already existing e-resources like the e-learning environment called Moodle.

Moodle is a learning management platform which provides the possibilities of extensive customization.

Moodle provides incorporates important gamification approaches such as instant grading, progress visualization and feedback, the possibility to reuse the question bank, the ability to randomize questions in quizzes, possibility to track user activity completion for distributing badges, etc.

How many of you are users?



WHAT IS MOODLE?

Moodle is a free, online Learning Management system that allows lecturers and educators to create their dynamic courses that extend learning anytime and anywhere.





Scoreboards



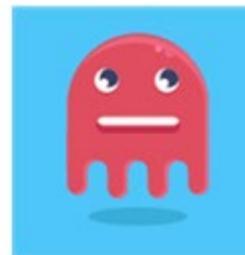
Dependencies



Achievements
Rewards



Ladders
Progress indicators



Avatars



Instant
feedback



Social interaction



Flexible
Dynamic
rules



Interactivity



Time-based
rules



Levels
Repetition



Challenges
&
competition

Have you ever used Moodle
in your syllabus?

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Course Design with Gamification Elements (60 min)

- Teaching and learning goals
- Overall course design

Hands on with Gamification in Course Design (60 min)

- **Experiencing the development of teaching materials using gamification**

Reflection 20'

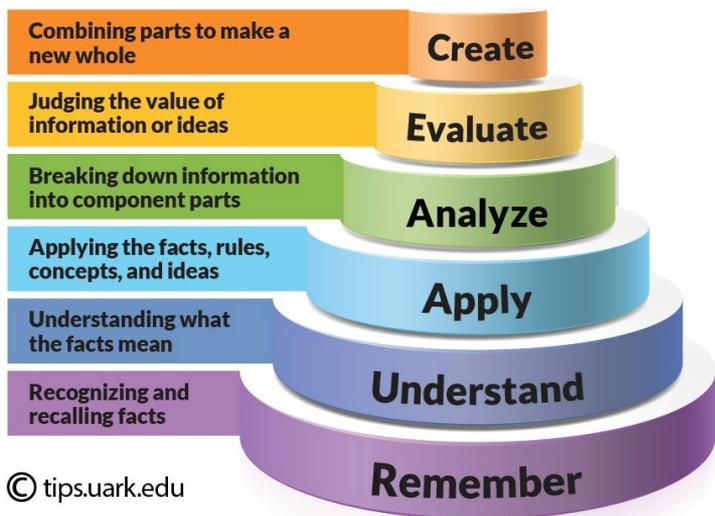
1. Consider theory and pedagogy first

- **Cognitive theory** emphasizes that learners should **master basic skills** before they acquire higher-level knowledge. It emphasizes that learning processes are progressive and move **from simplicity to complexity**; moreover, cognitive theory emphasizes on **students' motivation, self-efficacy, interest, and attitudes**.
- **Situated learning theory** states that learners should **enter learning scenarios** to acquire knowledge. The knowledge that is actively gained through a scenarios should should also be analogical to the reality. A rich learning scenario enables learners to gain practical problem-solving abilities via observation and behavioral exploration.

Useful resource: Read 50 Instructional Methods

(shared at: <https://drive.google.com/drive/u/0/folders/1OzTDdx8ckptQ-fCjTn4DWpnugJEz8657>)

2. Draft your teaching and learning goals



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Anderson, L. W. and Krathwohl, D. R., et al (Eds.) (2001). A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. Allyn & Bacon. Boston, MA (Pearson Education Group).

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Apply	Analyze	Agree	Adapt
Define	Compare	Build	Assume	Appraise	Build
Find	Contrast	Choose	Categorize	Assess	Change
How	Demonstrate	Construct	Classify	Award	Choose
Label	Explain	Develop	Compare	Choose	Combine
List	Extend	Experiment	Conclusion	Compare	Compile
Match	Illustrate	with	Contrast	Conclude	Compose
Name	Infer	Identify	Discover	Criteria	Construct
Omit	Interpret	Interview	Dissect	Criticize	Create
Recall	Outline	Make use of	Distinguish	Decide	Delete
Relate	Relate	Model	Divide	Deduct	Design
Select	Rephrase	Organize	Examine	Defend	Develop
Show	Show	Plan	Function	Determine	Discuss
Spell	Summarize	Select	Inference	Disprove	Elaborate
Tell	Translate	Solve	Inspect	Estimate	Estimate
What		Utilize	List	Evaluate	Formulate
When			Motive	Explain	Happen
Where			Relationships	Importance	Imagine
Which			Simplify	Influence	Improve
Who			Survey	Interpret	Invent
Why			Take part in	Judge	Make up
			Test for	Justify	Maximize
			Theme	Mark	Minimize
				Measure	Modify
				Opinion	Original
				Perceive	Originate
				Prioritize	Plan
				Prove	Predict
				Rate	Propose
				Recommend	Solution
				Rule on	Solve
				Select	Support
				Support	Test
				Value	Theory

3. Design Gamification with Moodle

GAME ACTIVITY	MOODLE ACTIVITY
Accomplishment of personal adventure	Studying learning resources Accomplishment of personal assignment Solving tests (quizzes)
Accomplishment of team adventure	Accomplishment of group assignments
Repetition of adventure	Repetition of learning resource/activity (with permission for repetition) in order to achieve better results (points)
Passage of level	Passage to the next learning section when a given criteria is met
Level repetition	Repetition of learning resources/activities (with permission) in order to achieve missed badges
Obtaining of badge	Obtaining of badges, certifying successfully completion of learning activities and achieving some learning objectives
Obtaining of reward	Obtaining access to additional optional learning material
Obtaining of points	Obtaining points from assessed learning activities
Discover hidden treasures	Opening of hidden or grayed-out learning resources/activities when some other learning resources/activities are successfully completed
Feedback when progression is noticed	Obtaining of badge or points Teacher feedback
Time restriction for accomplishment of adventure	Setting up a time restriction of a learning resource or activity
Personal communication	Chat/forum/shared files with another student or teacher
Common communication	Chat/forum/shared files with other students and teachers

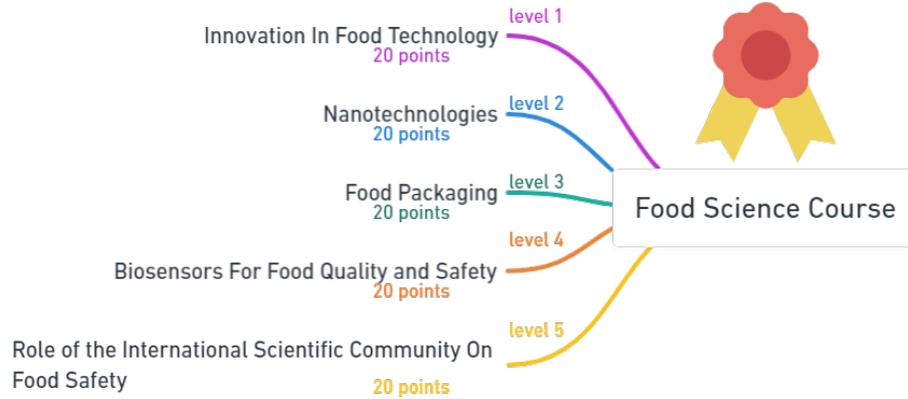
DEMO Example from a Research Methods course using gamification

1. Course division in 10 parts (topics: 9 lectures and 1 final presentation).
2. For each topic the learners receive a star.
3. We add level badges for each star level obtained by the learner.
4. Award of final Researcher badge for a general mean of course graduation.

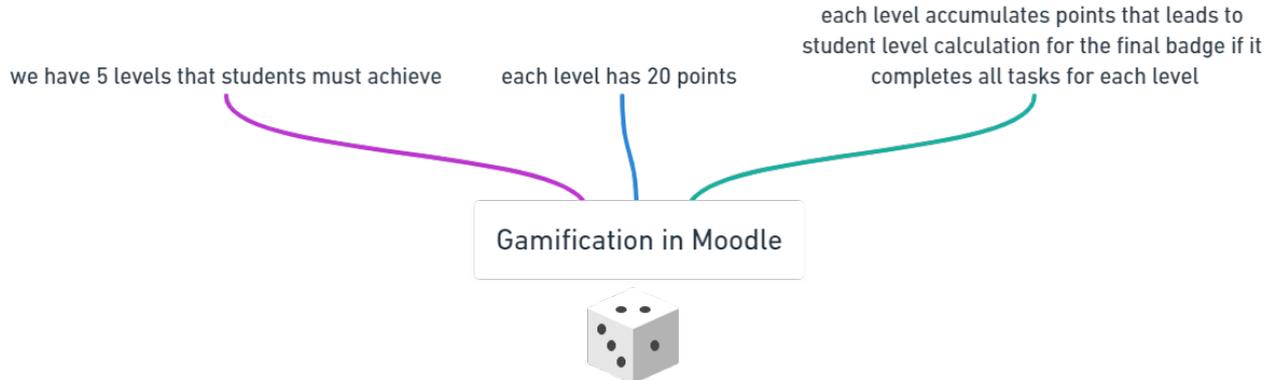


Model of how to gamify a course in Moodle

01	Course modules + quiz	<ul style="list-style-type: none">• Decide the number of modules in your course• Based on the content you create a quiz for each module
02	Quiz for each module	<ul style="list-style-type: none">• Quizzes in Moodle are used to evaluate student understanding of material. Moodle quizzes are comprised of a Quiz activity that contains one or more questions from your course Question bank.
03	LevelUP!	<ul style="list-style-type: none">• A block which added to a course to give experience points to students as they progress through a course.• It displays their current level and progress towards the next level.
04	Badges	<ul style="list-style-type: none">• Badges are a good way of celebrating achievement and showing progress. Badges may be awarded based on a variety of chosen criteria and may be displayed on a user's profile.
05	Final certification	<ul style="list-style-type: none">• Customized certificate for the course graduation



Model of how to gamify a course in Moodle



Level up! Plugin of Moodle

Moodle has a special plugin, called Level up!, which enables gamification of learning with the following features:

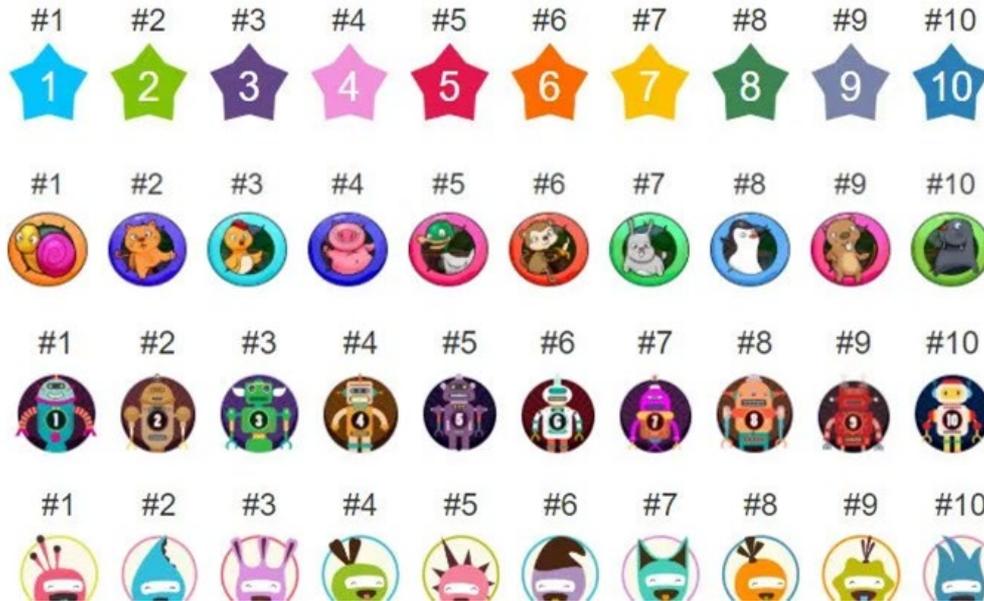
- ★ Ability to set the number of levels and the experience required to get to them
- ★ Automatically captures and attributes experience points to students' actions
- ★ Displays current level and progress towards next level
- ★ Report for teachers to get an overview of their students' levels
- ★ Notifications to congratulate students as they level up
- ★ Simulates a ladder to display the rankings of the students
- ★ Images can be uploaded to customize the appearance of the levels

Level up!. at https://moodle.org/plugins/block_xp

Take a look at the Research Methods course which uses the Level Up!



Level Up! in Moodle



Level Up! can be used as a means of quickly identifying student progress during a course

Teachers can look at the Level Up! Teachers can use this as an efficient means of identifying at risk students, class mean progress and high-flyers in the course.

Level Up! Arrives with four default level badge theme sets. These are pictured in the blog masthead image. These are: Standard (Stars), Animals or Robots



Does gamification add to the overall course time?

Most EU University Programmes are based on the European Credit Transfer and Accumulation System (referred to as "ECTS") as defined in the ECTS Users' Guide. One credit unit corresponds to a student's 25-30 hours of work on behalf of the (average) learner in achieving the learning outcomes of the course.

As part of your gamification approach, if you plan to ask your students to engage with the course before or after your lectures, you need to account this time into the overall ECTS plan.

How gamification can be applied to food science and technology ?



Miro time and group work
(continues to Moodle sandboxes later on)

- Learning objectives
- Gamification activities for evaluation and assessment



20' min break



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Reflection 20'

MOODLE hands-on – Develop the course you designed!

Take 30 min as a teacher/course designer after which all groups present their work!

1. Moodle Link <https://elearning.cut.ac.cy/?lang=en>
2. Access the folder to find your account (sign up your name and take one id your name is not there, <link>
3. Access badges to use in your course design <link>

Step 1:

One person will implement the LEVEL-Up – S/he will be a cohost and share her/his screen.

Step 2:

Another person will implement Lecture 1 – S/he will be a cohost and share her/his screen.

Step 3:

Another person will implement Lecture 1 – S/he will be a cohost and share her/his screen.

....

Tutor supports all steps.



References

Connolly, T. M. (2012) A systematic literature review of empirical evidence on computer games and serious games. *Computers & Education* 59.2, 661-686

Huang, W., S. Dilip. (2013) A Practitioner's Guide To Gamification Of Education. PDF, Toronto: Rotman School of Management, 2013
Huang, W., S. Dilip. A Practitioner's Guide To Gamification Of Education. PDF, Toronto: Rotman School of Management.

Kapp, K. (2012) *The gamification of learning and instruction: game-based methods and strategies for training and education*. Bloomsburg: John Wiley & Sons, 2012.

Level up!. https://moodle.org/plugins/block_xp



We hope you enjoyed the workshop!

Thank you for taking the time to participate in the evaluation at: <link>

Workshop offered by:

<https://www.cyprusinteractionlab.com/>

<http://edmedia.cyens.org.cy/>

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