Climate Heritage Game
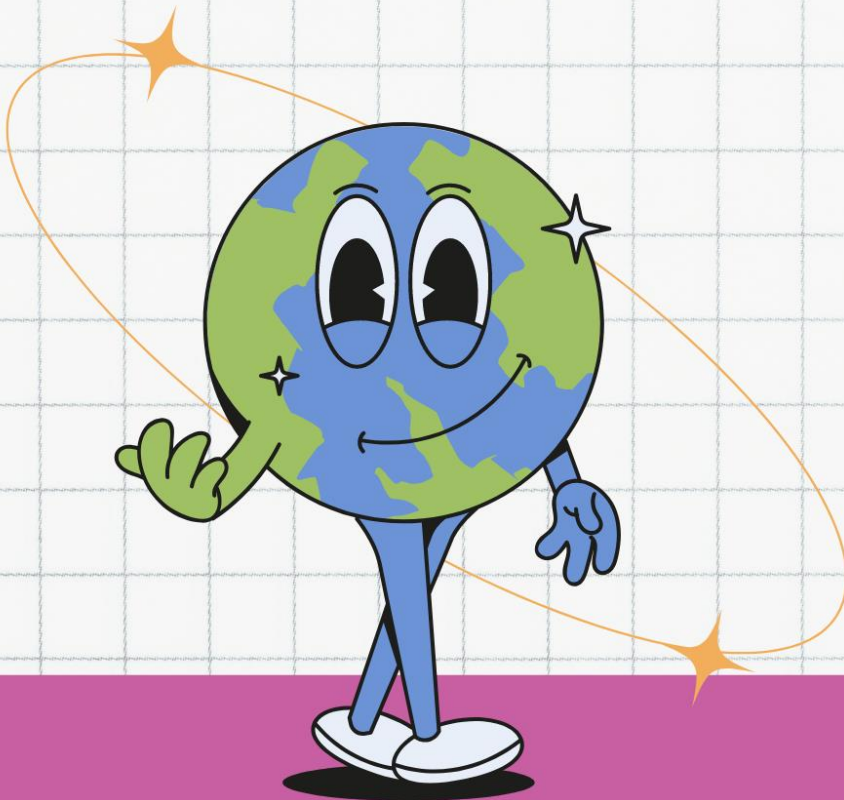
TRAINING COURSE ON HOW TO DEVELOP A DIGITAL GAME FOR EDUCATIONAL PURPOSES

Climate Heritage
Game

Project Number	2020-1-FR01-KA226-SCH-094827
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Action	Partnership for Digital Education Readiness
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Partnership:

P1. Etudes et Chantiers Corsica (France)

études ET chantiers Corsica
STUDII E OPERE

P2. IDEC (Greece)

idec

P3. Agrupamento de Escolas de Alcanena (Portugal)

agrupamento de esco
alcanen

P4. POLITEKNIKA IKASTEGIA TXORIERRI S.COOP (Spain)

POLITEKNIKA
TXORIERRI

P5. PREDICT CSD Consulting (Romania)

PREDICT
CSD CONSULTING

P6. Prof. Ivan Apostolov Private English Language School (Bulgaria)

Prof. Ivan Apostolov
ENGLISH LANGUAGE SCHOOL

Table of Contents

Climate Heritage
Game

INTRODUCTION

Module 1: Introduction

1.1. General Description

This module aims to introduce the Training Course on how to develop a digital game for Educational Purposes (IO1). This Training Course for teachers includes the basic academic and practical guidelines as well as resources to create a digital game for educational purposes based on a previously selected open-source platform.

In this module, we will first introduce the training course on how to develop a digital game for educational purposes.

Then, in the second part, we will discuss how the IO1 modules are structured.

In the third part of this introductory module, an overview of the training course, and in particular the modules that are part of this training course, will be provided.

And finally, we will present the final assessment developed to test your knowledge of IO1.

1.2. Final evaluation

☑ Once the learner has completed the 5 modules of the training course, they have to take the quiz to test their knowledge on how to develop a digital game

1.2. Learning Units

Unit 1: Introducing the Training Course on How to develop a digital game for Educational Purposes (IO1)

❖ Aim

The main goal of Intellectual Output 1 is to create a Training Course that will include the basic academic and practical guidelines as well as resources to create a digital game for educational purposes based on a previously selected open source platform.

❖ Target audience

The training course will address teachers at secondary school level and will equip them with the necessary skills to develop educational game-based applications in a game development platform.

❖ Content

Unit 2: Module structure

❖ Description

Short description of the module summarizing its learning material

❖ Competences

Competences applied in the module regarding DigComp 2.0: The Digital Competence Framework for Citizens.

❖ Skills & Knowledge to achieve the competences

Prerequisites both in terms of skills and knowledge to apply the competences sought by the module

❖ Training format
❖ Assessment method

How can the module be assessed?

❖ Learning Units

Development of the learning content, including the theoretical part of the course.

Unit 3: Training Course overview

Module	Description	Competences	Skills & knowledge to achieve the competences	Training format	Assessment method
Module 1: Gamification in Education	This module addresses the concept of Gamification. Benefits of gamification	Creativity Strategic thought Concentration Agility Teamwork Problem-solving	Technological prerequisites: Teachers and students must have sufficient knowledge in terms of the use of technologies so that they can feel more comfortable using these tools. Educational prerequisites: Knowledge- Teachers must be able to choose the most important elements of gamification for their	The "Ajedrez Básico" project: https://clic.xtec.cat/projects/ajedrez2/jclic.js/index.html	Kahoot test: https://create.kahoot.it/share/climate-heritage-module-1-quizz/0bc6caba-28b9-4125-807c-28e9f16a4472 Practical exercise

			students and subject, and contextualize the application of the game to obtain the expected results.		
Module 2: Presentation of the Learning Library Platform	Introducing the Learning Library Platform	get used to some basic elements used on the learninglibrary.eu platform understand essential gamification elements used in Moodle	basic editing skills in Moodle and/or HTML copyright rules	Presentation and case study to follow an example already produced on the platform.	We consider that the best approach in assessment is to have the participants create an item of each type mentioned in this module.
Module 3: Structure of the learning game	Game development phases Game structure	***Competence area 1. Information and data literacy:*** 1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content	***Competence area 1. Information and data literacy:*** 1.1 Browsing, searching and filtering data, information and digital content To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them 1.2 Evaluating data, information and digital content To analyse, compare and critically evaluate the credibility and	The project "INCREMENTA - Innovation and Creativity Mentality Advancement in SMEs" A game and two guidebooks: Creativity Guidebook and Collaboration management Guidebook The game is available after registration here	

| | | *Competence area 2. Communication and collaboration* 2.1 Interacting through digital technologies 2.2 Sharing through digital technologies 2.4 Collaborating through digital technologies *Competence area 3. Digital content creation* 3.1 Developing digital content 3.2 Integrating and re-elaborating digital content *Competence area 4. Safety* 4.3 Protecting health and well-being | reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content. 1.3 Managing data, information and digital content To organise, store and retrieve data, information and content in digital environments. To organise and process them in a structured environment. *Competence area 2. Communication and collaboration* 2.1 Interacting through digital technologies To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context. 2.2 Sharing through digital technologies To share data, information and digital content with others through appropriate digital technologies. To act as an intermediary, to | | |

| | | *Competence area 5. Problem solving*
5.2 Identifying needs and technological responses
5.3 Creatively using digital technologies. | know about referencing and attribution practices.
2.4 Collaborating through digital technologies
To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge.
Competence area 3. Digital content creation
3.1 Developing digital content
To create and edit digital content in different formats, to express oneself through digital means.
3.2 Integrating and re-elaborating digital content
To modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original and relevant content and knowledge.
Competence area 4. Safety
4.3 Protecting health and well-being | | |

			To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies. To be able to protect oneself and others from possible dangers in digital environments (e.g. cyber bullying). To be aware of digital technologies for social well-being and social inclusion. **Competence area 5. Problem solving** 5.2 Identifying needs and technological responses To assess needs and to identify, evaluate, select and use digital tools and possible technological responses to solve them. To adjust and customise digital environments to personal needs (e.g. accessibility). 5.3 Creatively using digital technologies To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in		

			cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.		
Module 4: Elements of Gamification	Why use gamification tools? Tools offered in the Learning Library Platform	Problem solving Digital competencies Decision making Creativity	***Educational prerequisite***: a) From the teachers' perspective: Before applying gamification tools to the learning process the first step is to have a clear vision of the objectives while also define the learning outcomes. Also it is important to acknowledge the student's needs, identify their behavior and the way the accept and perceive the gain information. This way the teacher will know how to use the proper elements of gamification. To ensure that the learning process is fruitful, the teacher needs to set some rules or/and instructions on how to approach this learning method. b) From the learners' perspective: Is important for students to	•Quizzes: different type of quizzes •Ranking •Badges •Rewards (e.g. completing the module unblocks hidden content) •Progress bars and experience points •Embedding other tools (Kahoot, Quizzizz, etc.) The platform of "Learning Library" is accessible through: www.learninglibrary.eu	Kahoot game: https://create.kahoot.it/details/84d3cd42-342e-4899-b15e-dd7dfced08a7

			understand that this learning approach even though it has elements of the game is mainly for educational purposes from which they can benefit. It is important to highlight that students need to approach the gamification activities in a creative and playful way while also striving for collaboration and "fair play". ***Technical prerequisite:*** The most important prerequisite in this sector is for both teachers and students to know how to use and interact with the "Learning Library" and the tools that it provides. It is also needed, for both parts to be familiar with the internet and how to access and use it.		
Module 5: Game Case Study	To provide teachers with an example of a game made on the e-Learning platform	Digital competences: 1.1. Gettin g used to digital platforms such as	1. Digital competences: 1.1. Getting used to digital platforms such as learninglibrary.eu For teachers: Basic editing skills in Moodle (or HTML),	***For teachers:*** The teaching team designing the game will be trained by experts to learn how to build the game. Once they have gained the necessary skills, they will be able	Each exercise, each site and each mission of the game is rated once it is played. This helps students to self-evaluate and progress autonomously.

| learninglibrary.eu. | learninglibrary.eu 1.2. Browsing, searching and filtering data (evaluating data) 2. Strategic thought. 3. Team work 4. Concentration 5.Agility. | developing digital content in general. 1.2. Browsing, searching and filtering data (evaluating data)

For students: To analyse, compare and evaluate the credibility of sources of data. For teachers: Copyright rules.

2. Strategic thought, ability to think ahead and anticipate. For teachers: Coordinate an action plan focused on a relevant achievement so players work on a specific topic to reach the target. | to implement the game.

For students: Students will be able to play the game again and again until they acquire the necessary competences. In the same way, they will also be able to do independent quests on each of the locations, in order to better approach the missions. | |

- **Unit 4: Final evaluation**
  - o Methodology

GAMIFICATION IN EDUCATION

Module 2: Gamification in Education

2.1. General Description

In the world we live in today, the digital realm is all-encompassing, and children are born into a society where the transition from analog to digital media has already occurred. As a result, they are exposed to technological devices from an early age, becoming acquainted with their functionality and gradually developing skills in a self-directed manner. This familiarity and interest in digital tools can prove valuable for their future growth and development. As educators, it's essential to recognize this reality and leverage it to engage students in meaningful ways that promote their technological literacy and success.

If we add to this aspect, the potential in terms of education and cognitive development that such tools, when properly used, can present, then the obvious advantage of the use of new technologies in education is justified.

It should be noted that the wealth of appropriate environments for educational practice, available to teachers in digital media, is very diverse. Among these digital environments, the Games (or digital games) stand out for their involvement, timeliness, and playful aspect. Thus, the term "Gamification" has been increasingly associated with the teaching-learning process and beyond. This term is associated with the use of "game" elements in non-"game" contexts.

It is a concept that reflects motivation, involvement, reward systems, and collaborative teaching. Its application will make the class more innovative and interactive, allowing students to become active agents in their learning process. We can conclude that pleasure and involvement can be associated with learning, a language, and communication compatible with the current reality. Playing influences several other positive aspects in addition to learning, such as: cognitive, cultural, social, and affective.

Some more evident benefits of using this teaching strategy in the integral training of students, compared to traditional teaching, are:

- **Improves the assimilation of knowledge:**

The fact that the student is playing promotes a set of visual stimuli that will allow him to more easily remember the contents covered in the class, stimulating the student's memory capacity.

- **Makes the learning process more enjoyable:**

It changes the perception of children and young people regarding pedagogical tasks, no longer seeing them as an obligation, changing the way they see them.

- **Develops autonomy:**

Using games for pedagogical purposes, students become protagonists in their learning process, with the teacher acting only as an advisor/mediator in this process.

- **Increases concentration:**

Contrary to distracting students, as expected, gamification allows students to improve concentration, as a healthy competition between the group is stimulated, and it is necessary to increase attention to solve challenges and advance in the various stages of the game.

- **Improves student results:**

Through the application of gamification, the student is encouraged to deepen their knowledge and this stimulus expands to other areas/subjects, making their school results progressively improve. There is also greater retention and cognitive integration of the contents learned.
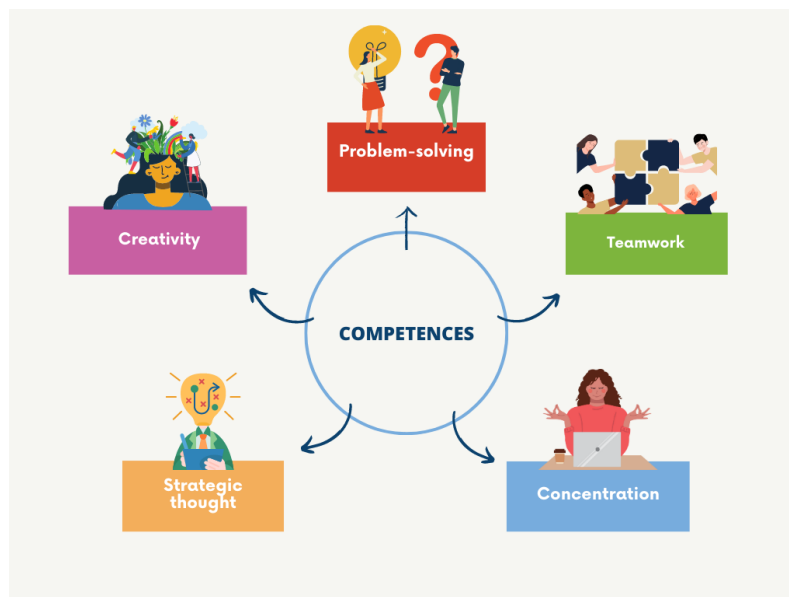
- **Encourages persistence:**

Allows you to fail and learn from mistakes.

- **Immediate feedback:**

Allows students to make self-corrections to improve their results.

2.2. Competences

By learning about gamification, teachers will be able to test, cultivate and improve the following skills:

Creativity: Gamification can enhance a teacher's ability to encourage creative thinking in their students by providing fun and engaging activities that foster imagination and innovation.

Strategic Thought: Through gamification, teachers can develop strategic thinking skills in their students by creating challenges that require planning, analysis, and decision-making.

Concentration: Gamification can improve a teacher's ability to help students stay focused and on task by providing activities that are immersive and require sustained attention.

Agility: Gamification can promote agility and adaptability in students by presenting challenges that require quick thinking and flexible problem-solving skills.

Teamwork: Gamification can help teachers foster collaboration and teamwork among their students by creating activities that require group effort and communication.

Problem-Solving: Gamification can improve a teacher's ability to help students develop problem-solving skills by creating challenges that require critical thinking and analysis.

2.3. Skills & Knowledges needed to achieve the competences

- **Technological prerequisites**:

Teachers and students should be able to:

- ❖ have sufficient knowledge in terms of the use of technologies so that they can feel more comfortable using these tools.
- ❖ be familiar with the mechanics of different types of games, including how to set goals, provide feedback, and create challenges that are appropriately challenging yet achievable.
- ❖ apply basic principles of game design, such as creating a clear narrative, incorporating elements of choice and consequence, and balancing difficulty levels.
- ❖ comfortable use different game-based learning platforms, such as Kahoot, Quizlet, or Classcraft, and be able to navigate the features of these platforms to create and deliver engaging learning experiences.
- ❖ critically analyze the effectiveness of game-based learning strategies, and evaluate the impact of gamification on student engagement, motivation, and learning outcomes.

- **Educational prerequisites:**

Teachers should be able to:

- ❖ choose the most important elements of gamification for their students and subject, and contextualize the application of the game to obtain the expected results.

❖ identify and articulate clear learning objectives for each game or gamified activity they use in the classroom. They should also be able to evaluate the effectiveness of the game in meeting those objectives.

❖ design or modify games to fit their subject area and learning objectives, and to adapt them to meet the needs of different learners, including those with learning differences or disabilities.

❖ be aware of ethical and legal considerations related to gamification, including issues related to data privacy, student safety, and intellectual property rights.
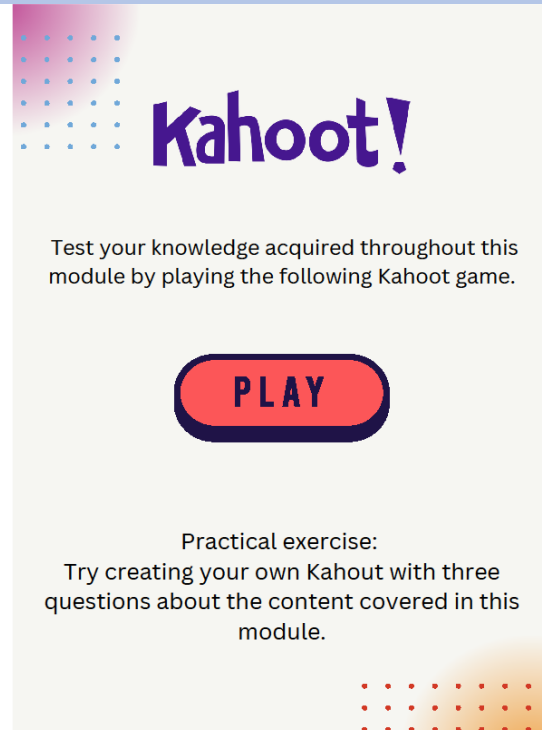
2.4. Training format

A good example of how games can be a very important tool in learning for children and teenagers is the "Ajedrez Básico" project from Escuela Sant Bernat Calvó (Vila – Seca) created by Jordi Montamat.

In a Job Shadowing project carried out at the beginning of the school year of 2022, Agrupamento de Escolas de Alcanena had contact with the author of this project who, when visiting their school cluster, explained to colleagues in Mathematics, the potential of using this digital tool to teach various mathematical concepts through the use of chess.

In this game, it is possible to develop skills at the level of mathematical reasoning, but also knowledge at the linguistic level and organizational orientation, with puzzles etc.

The students reacted very positively, improving the application of knowledge in terms of mathematics in the 6th year, namely in the part relating to Geometry and Measurement, and mathematical fractions.

2.5. Assessment method

Kahoot!

Test your knowledge acquired throughout this
module by playing the following Kahoot game.

PLAY

Practical exercise:
Try creating your own Kahout with three
questions about the content covered in this
module.

* Instructions: To play the quiz press "Ctrl" and left click on the image and you will be taken directly to the Kahoot game created by the Climate Heritage team.

2.6. Learning Units

<u>An introduction to gamification</u>

❖ Definition of gamification

Gamification is a powerful tool that can revolutionize the way we teach and learn. It consists of applying game elements such as challenge, different levels, reward, and teamwork, to non-game activities. This process allows students to learn in more interesting ways, making the learning process more enjoyable and effective.

In other words, gamification, in the world of education, means bringing game mechanics to the classroom to make learning more attractive. It's not just about using digital tools, but about creating game-related processes that inspire and motivate students to learn. With the right strategies, teachers can use gamification to enhance student engagement and learning outcomes, creating a more dynamic and interactive learning environment.

<u>Learning aspects in games</u>

- A very important factor in a game is competitiveness. Friendly competitiveness is fundamental for the development of cognitive abilities, as well as for socialization among colleagues.
- Games have well-defined goals, which facilitates concentration.

- Feedback in games is relatively simple: playing poorly results in a scoring penalty, and playing well results in a higher score. This feedback is instantaneous and allows the player (or the learner) to improve more quickly.
- Many games are based on collaboration, which is a key aspect of learning.
- The feeling of satisfaction in achieving the objectives of the game. The reward awarded to the player is motivating and addictive, leading the player (or the learner) to want to invest more time in the game.
- Exploring the teaching potential of games

Examples of traditional games and why they "teach how to learn" (e.g. board games, sports games…)

Traditional games have been increasingly implemented in teaching to develop students' cognitive abilities.

These games, like chess or checkers, and other board games, aim to promote and develop reasoning. In turn, the so-called sports games develop not only the student's motor skills but also encourage participation and interaction among all, since many of them are team sports, and therefore promote the effective integration of students in the class group.

The Tangram game can be used as a resource for teaching Geometry, also associated with the GeoGebra software to enable the development of students' geometric thinking.

❖ Target groups: which students most benefit from gamification?

Although all students benefit from this method of teaching and personal development, it should be noted that those who benefit the most are usually students with more cognitive difficulties and difficulties in interaction and socialization.

It is with these playful and dynamic games that students are forced and stimulated to reason and learn in a fun way and, in the case of more introverted students, they are also encouraged to cooperate and interact with other children, characteristics that a theoretical class would never provide.

❖ Gamification and Psychology: basic elements (e.g. serious games)

Serious games aim to promote more specific cognitive abilities, such as memory, psychomotor skills, or even selective visual attention.

They have a more specific character and therefore their approach is more delicate. Serious Games simulate real-world situations or processes that are designed to solve a problem. Often these sacrifice fun and entertainment to achieve the desired type of progress for the player.

An example is the Typlife project, a project aimed at young diabetics that has the mission to create a smartphone application for diabetes control, and while they develop the

application, they study their disease daily and will reap fruits from their project in the future.

2.7.   References

Some academic references about the concept of gamification webography:
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https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-017-0042-5

"Gamification in Education: What is it & How Can You Use It?"; published on 1st May 2020 on the site "True Education Partnerships"

https://www.trueeducationpartnerships.com/schools/gamification-in-education/

"Why Gamification Fails in Education - And How to Make it Successful"; published in 2017 in the book: Serious Games and Edutainment Applications (Vol. II); editors: Minhua Ma and Andreas Oikonomou; Springer International Publishing AG 2017

https://www.researchgate.net/profile/Rob-Van-Roy/publication/309396821_Why_Gamification_Fails_in_Education_and_How_to_Make_It_Successful_Introducing_Nine_Gamification_Heuristics_Based_on_Self-Determination_Theory/links/59f1ea570f7e9beabfcc522a/Why-Gamification-Fails-in-Education-and-How-to-Make-It-Successful-Introducing-Nine-Gamification-Heuristics-Based-on-Self-Determination-Theory.pdf

"A conceptual framework to implement gamification on online courses of computer programming learning: implementation" ¸Martinha Piteira [1, 3], Carlos J. Costa [2, 3] Manuela Aparicio [3, 4]

[1]IPS - Instituto Politécnico de Setúbal [2]ISEG, Lisbon School of Economics & Management, Universidade de Lisboa (PORTUGAL) [3]Instituto Universitario de Lisboa (ISCTE-IUL) ISTAR-IUL, Portugal [4]NOVA IMS, Universidade Nova de Lisboa, Portugal

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https://www.scitepress.org/Papers/2020/93434/93434.pdf

"Gamification in Education: 4 Ways to Increase Student Engagement"
https://www.edutopia.org/article/gamification-education-4-ways-increase-student-engagement

"Gamification and Game-Based Learning in the Classroom"
https://www.teachthought.com/education/gamification-and-game-based-learning-in-the-classroom/

"The Benefits of Gamification in Education"
https://www.creativebloq.com/inspiration/benefits-of-gamification-in-education

 "Gamification in Education: Why It Works and How to Do It"
https://www.teachthought.com/education/gamification-in-education-why-it-works-and-how-to-do-it/

Quiz in Portuguese: https://clic.xtec.cat/projects/ajedrez2/jclic.js/index.html

Some videos on the subject can give us a more complete view of the subject

Webinar Gamification in Education – Genially
https://www.youtube.com/watch?v=6wLP3ga-byk

Classroom Gamification tips https://www.youtube.com/watch?v=hDn5FM7aX1s

The Power of Gamification in Education – TEDxUAlberta
https://www.youtube.com/watch?v=mOssYTimQwM

Top 5 Gamification Examples in Education Today
https://www.youtube.com/watch?v=1CZtIIy7tRU

Gamification versus Game-based learning: What's the difference?
https://www.youtube.com/watch?v=reWxOKrsA00

Climate Heritage
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LEARNING LIBRARY PLATFORM

Module 3: Learning Library Platform

3.1. General Description

The main purpose of this module is to introduce the learninglibrary.eu and to indicate how The Climate Heritage game was structured. The e-learning platform learninglibrary.eu is the hosted zone proposed for some key deliverables in this project, as well as the Climate Heritage Game itself which consists of a variety of questions and other types of resources (ex. videos etc.).

There are various platforms you can use to learn 2D, 3D game development; some examples are listed below:

- ❖ Godot Engine;
- ❖ GameMaker Studio 2;
- ❖ Unity;
- ❖ Corona;
- ❖ RPG Maker;
- ❖ libGDX;
- ❖ Ren'py;
- ❖ AppGameKit;
- ❖ CryEngine;
- ❖ Unreal Engine;
- ❖ Amazon Lumberyard;
- ❖ Cocos2d-x;
- ❖ Titanium;
- ❖ Articulate Storyline etc.

Proposing this game model approach, learninglibrary.eu, on a Moodle environment, we started from:

- ❖ the quiz system of the game as presented in the Climate Heritage project application;
- ❖ various discussions in the context of the project partnership;
- ❖ the steps that needed to be followed in game development which are connected with schools staff who learnt and prepared the content themselves (questions for the quizzes, educational videos etc.);
- ❖ the exploration, within the partnership, of other game options/engines: Unreal, Articulate Storyline etc. These kinds of game platforms were considered too complex and there was a concern that teachers who are going to use them might not invest lots of hours in the learning curve.

3.2. Competences

This module is developed in order for teachers to:
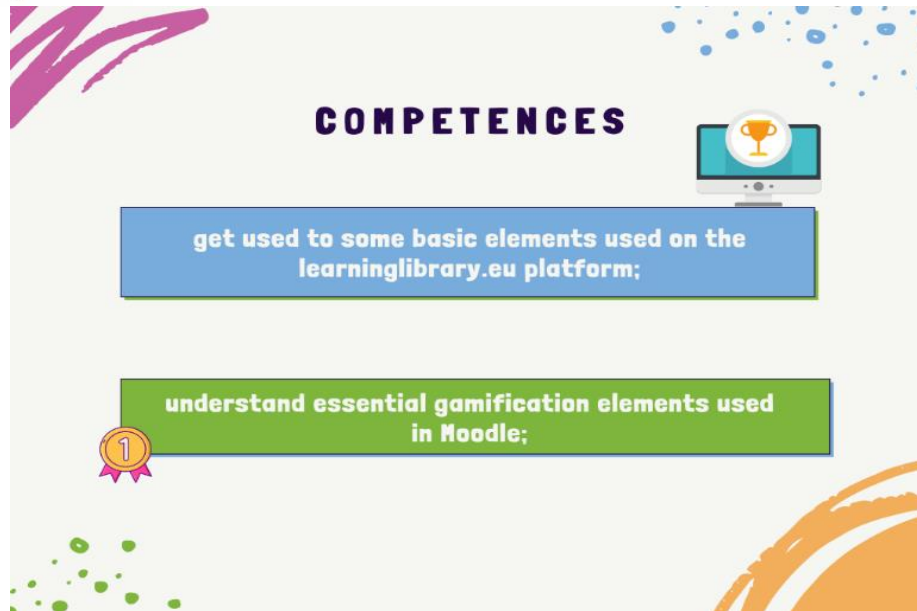
Specifically, teachers will be able to:

1. Understand and get used to basic elements used on the learninglibrary.eu platform which is an essential competence for teachers who want to effectively use this online learning platform. By becoming familiar with the platform's tools and features, teachers can easily create, manage, and share their learning materials with students, track their progress, and engage them in various activities. Additionally, the ability to navigate and use online platforms is a vital skill in today's digital age, and it can help teachers stay up-to-date with the latest teaching methods and technologies.

2. Understand gamification elements used in Moodle in order to enhance student motivation, engagement, and learning outcomes. Gamification is a powerful tool that can transform a dull learning experience into an exciting and rewarding one, by incorporating game-like elements such as points, badges, levels, leaderboards, and challenges. By using these elements strategically, teachers can foster a sense of achievement, competition, and community among their students, and encourage them to actively participate in their learning journey.

3.3. Skills & Knowledge needed to develop the competences

- Technological prerequisites:

Teachers need to know and respect copyright rules, while also having a basic level of knowledge and editing skills in Moodle and/or HTML so that they do not encounter problems when trying to interact and use the platform.

In addition, teachers should have a basic understanding of game mechanics and design principles in order to create a game that is not only educational but also enjoyable for students. This may involve researching different types of games and how they can be adapted for educational purposes.

Finally, it is important for teachers to continuously assess and evaluate the effectiveness of their online educational game in achieving the intended learning outcomes. This involves collecting and analyzing data on student engagement, performance, and feedback, and using this information to refine and improve the game over time.

3.4. Training format

Presentation and case study to follow an example already produced on the platform.

3.5. Assessment methods

The Climate Heritage team considers that the best approach in assessing the gained knowledge is to create an item of each type mentioned in this module.

3.6. Learning Units

Basic story
Here, the participant (the player) will have to fulfil some proposed missions, and with each one, will face some challenge in order to "save" a cultural site. The villains can be the climate change factors which deteriorate the world, the cultural site included.
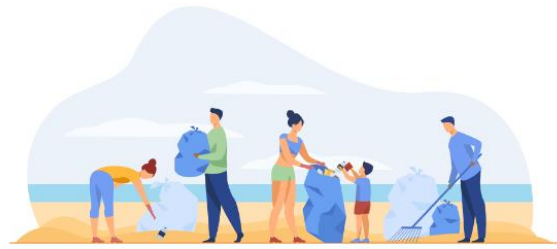
A detailed story
A detailed script can be proposed later by the partners, schools etc.

Missions
We start from the materials proposed in the application for each school to have:
- short video;
- article;
- photos;
- short text;
- 25 questions grouped in 5 sets of 5 questions/each cultural site.

Mission 4

Information

📄 Video - A Plastic Wave

📄 Reading material - Mission 4

Challenges

🔲 Crossword - Mission 4

🔲 Hangman - Mission 4

🔲 Snakes and Ladders - Mission 4

Test your knowledge!

✅ Quiz - Mission 4

📘 Glossary - Challenges - Mission 4

Each mission can have a "battle", some kind of a little challenge. The challenges can be:
-        Crossword;
-        Cryptex;
-        Hangman;
-        Snakes and Ladders;
-        Find multiple hotspots;
-        Find the words;
-        Another story made with Branching Scenario etc;

Examples of gamification elements

Badge system in place
After each level, a badge will be awarded to players who successfully pass it.

Completion Progress bar

A progress completion bar will show the exploration already made and areas to be discovered.

Ranking

The players will see a leader board with top results on a general, monthly and weekly basis.

Ranking

| | Weekly | Monthly | General |

Pos	Fullname	Points
1	Jade	6.0
1	Sheila	6.0

SEE FULL RANKING

RANKING GRAPHS

Level Up!

Players are encouraged to explore the missions and level up.

Level up!

1

0^{xp}

120^{xp} to go

Participate in the course to gain experience points and level up!

Game rules

- to be defined;

Optional

- collecting coins system;
- treasure hunt;
- trade system;

3.7. References:

"Tutorials for authors", H5p: https://h5p.org/documentation/for-authors/tutorials

"Branching Scenario Tutorial", H5p: https://h5p.org/tutorial-branching-scenario

"Game module", Moodle: https://docs.moodle.org/311/en/Game_module;

Climate Heritage
Game

LEARNING GAME STRUCTURE

Module 4: Learning Game Structure

4.1. General Description

The main purpose of this module is to provide guidelines for teachers on how to structure a learning game that they want to create. It elaborates the steps, main elements, features, and hints for successful development of a game.

In the beginning as a logical continuation of the first two modules we introduce the topic of a Learning game. At this point the difference between gamification and game-based learning should have been made. Thus, in this module the learner narrows the scope in terms of some practical steps and content to create a learning game for school students applying the suggested platform and other examples, tools, and approaches.

The preparation is very important and it is directly related to the overall teaching approach that you as a teacher apply in your work. It is also highly affected by the school policy, practices, culture and how games are integrated in the learning process.
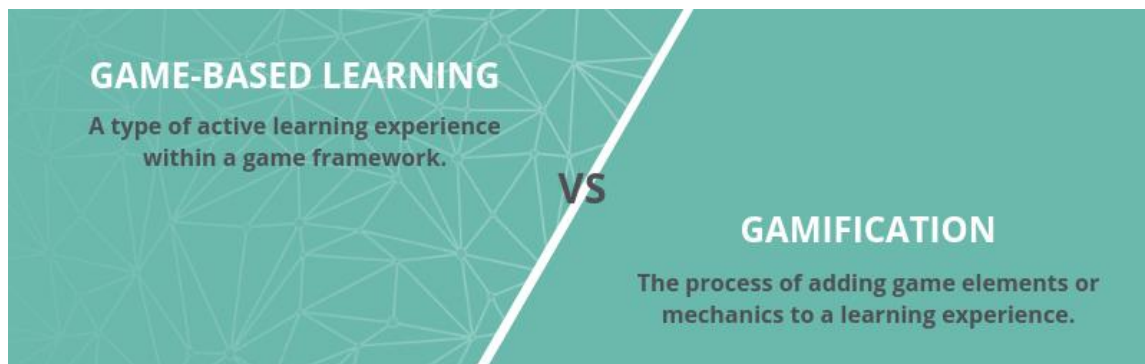
The games allow experiential learning for the students and help them better understand the subject matters in real world context. According to Mind Research Institute:

In game-based learning, the game is the learning experience, whereas in gamification, the game components are added to the traditional instruction method.

Gamification helps modify the teaching process and make it more engaging and interactive by adding the new elements.
Here below you can find some practical examples of gamification in the classroom:
- Forming student teams to work and/or compete to achieve a certain goal.
- Awarding students for their achievements enabling them to earn points and giving rewards.
- Timed flash cards or worksheets.
- Assigning badges or other ways to reward the completion of tasks, activities and work.

- Listening for certain keywords or situations to complete a bingo-type sheet.
- Using dice to generate random numbers for an activity.

Gamification works well and can be applied as a first step and approach to modernizing the way of teaching. A number of studies have shown that offering excessive external rewards for an internally satisfying behavior can lead to a reduction in intrinsic motivation (Deci et al., 1999). Intrinsic motivation is a type of internal desire that is based on the satisfactions of behaving "for its own sake."

If designed well, game-based learning has the capacity to harness students' intrinsic motivation and love for play and lead them toward complex problem solving.
The goal of game design is to produce a game that offers the player the opportunity for meaningful play.
"*Meaningful play occurs when the relationships between actions and outcomes in a game are both discernable and integrated into the larger concept of the game*" (Salen & Zimmerman, 2003)

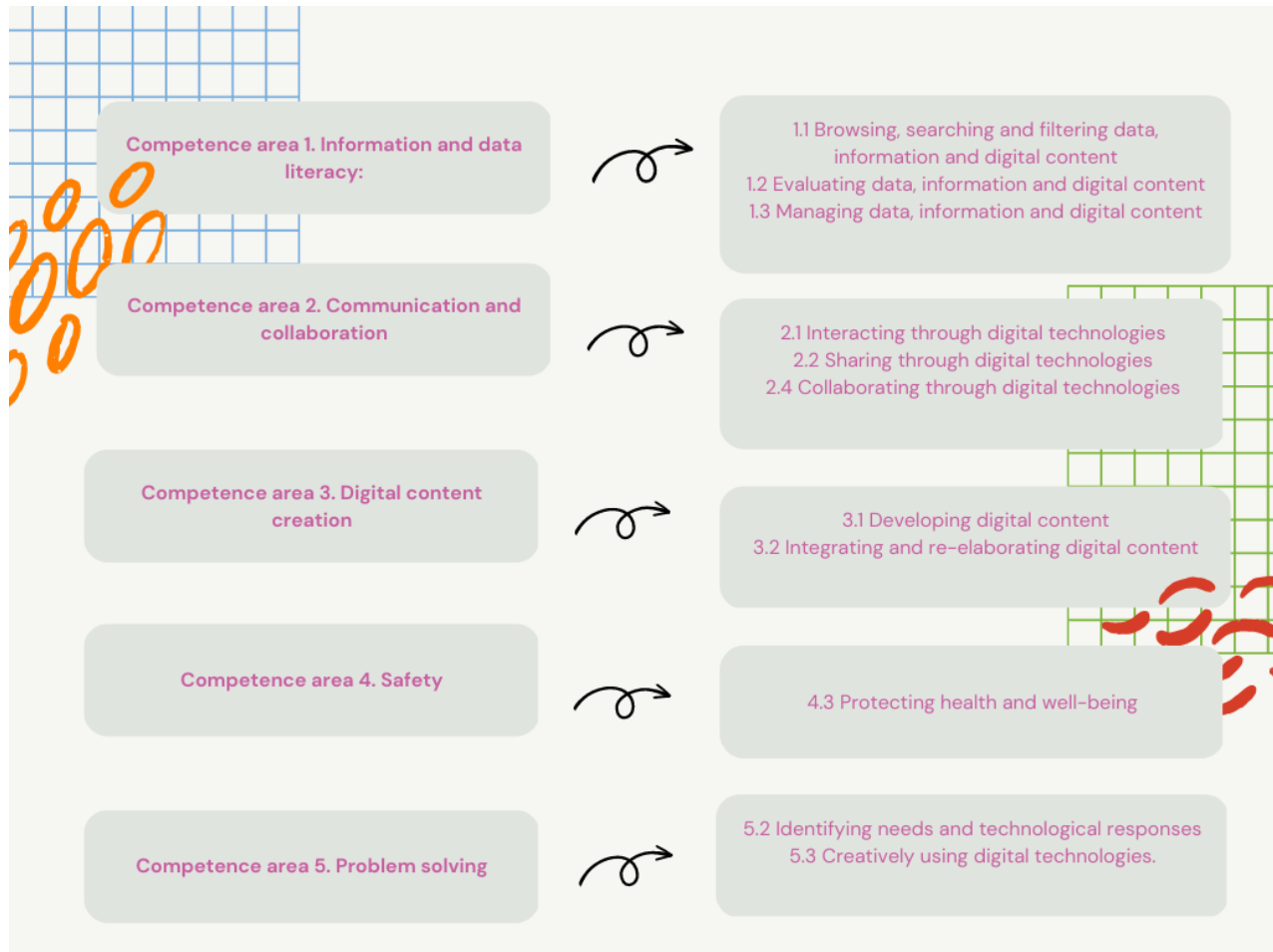Some key points and factors to be considered before creating a game and applying game-based learning:

- When students work on game-based learning, they might be thinking that they're having fun with a game, and the purposes of the game should be explained in the beginning.
- The games that are applied to the education process in your school and classes as a tool should be aligned with the curriculum and means of nurturing creativity, motivation and engagement.
- In this respect you start the creation of the game with deliberate analysis and alignment with the standards, rules, curriculum and the requirements of the national education law and system while keeping the freedom of the content and design.
- The members of the team who will work on the game creation is critical. In general, collaboration is one of the key success factors in the process of innovating the education process and system. Members of the team are experts in education, curriculum, and game creation, including IT experts.
- Clear definition and decision on the exact subject and the lesson/s and learning outcomes that will be taught to students by the particular game.

In conclusion, game-based learning requires very careful preparation, collaboration, goal setting in terms of knowledge, skills, and competence development of students. It also requires review, analysis, consideration and alignment with the standards and rules of the school and the national education system and law. Then the design, structure and overall development are synchronized with those requirements and various techniques, types of games, elements, content can be easily applied.

4.2. Competences
The following competences are related to this particular module based on DigiComp 2.0[1]:

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[1] https://joint-research-centre.ec.europa.eu/digcomp/digital-competence-framework-20_en

Competence area 1. Information and data literacy:	1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content
Competence area 2. Communication and collaboration	2.1 Interacting through digital technologies 2.2 Sharing through digital technologies 2.4 Collaborating through digital technologies
Competence area 3. Digital content creation	3.1 Developing digital content 3.2 Integrating and re-elaborating digital content
Competence area 4. Safety	4.3 Protecting health and well-being
Competence area 5. Problem solving	5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies.

Specifically, this module will help teachers to be able to:

- Effectively curate, evaluate, and manage digital content.
- Communicate, share, and collaborate with students through digital technologies.
- Develop and adapt digital content to create engaging and effective learning experiences.
- Ensure the safety and well-being of students in online learning environments.
- Identify individual student needs and use technology to promote problem-solving skills.

4.3. Skills & Knowledge needed to achieve the competences

Based on DigiComp 2.0[2], teachers need to have sufficient knowledge in the following areas:

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[2] https://joint-research-centre.ec.europa.eu/digcomp/digital-competence-framework-20_en

❖ Competence area 1. Information and data literacy:

1.1 Browsing, searching and filtering data, information and digital content

To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them

1.2 Evaluating data, information and digital content

To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content.

1.3 Managing data, information and digital content

To organise, store and retrieve data, information and content in digital environments. To organise and process them in a structured environment.

❖ Competence area 2. Communication and collaboration

2.1 Interacting through digital technologies

To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context.

2.2 Sharing through digital technologies

To share data, information and digital content with others through appropriate digital technologies. To act as an intermediary, to know about referencing and attribution practices.

2.3 Collaborating through digital technologies

To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge.

❖ Competence area 3. Digital content creation

3.1 Developing digital content

To create and edit digital content in different formats, to express oneself through digital means.

3.2 Integrating and re-elaborating digital content

To modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original and relevant content and knowledge.

❖ Competence area 4. Safety

4.3 Protecting health and well-being

To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies. To be able to protect oneself and others from possible dangers in digital environments (e.g. cyber bullying). To be aware of digital technologies for social well-being and social inclusion.

❖ Competence area 5. Problem solving

5.2 Identifying needs and technological responses

To assess needs and to identify, evaluate, select and use digital tools and possible technological responses to solve them. To adjust and customise digital environments to personal needs (e.g. accessibility).

5.3 Creatively using digital technologies

To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.

4.4. Training format

Presentation with the main points of this module is available at the project website:

Case study

A game was created for teaching Creativity and collaboration management under the project "INCREMENTA - Innovation and Creativity Mentality Advancement in SMEs" where a video game was developed based on a story plot and series of questions, puzzles, decision trees, etc. with the main goal to modernize an old factory into a new energy efficient building with innovative management and development as a business. The game is a complementary part to two guidebooks: Creativity Guidebook and Collaboration management Guidebook.

These two guidebooks could be easily adjusted for use by students in their management and business studies. The plot revolves around the roles and decisions that the player needs to make as a manager in the factory.

The game is available after registration here.

It serves as a good example for plot development and overall game design and structure with various elements around a complex topic of Innovation and collaboration.

- **Unit 1. Game development phases**
  - **Sub-unit 1. Preparation**

According to Suzi Wilczynski, founder and CEO of Dig It Games, learning games are "*built the same way a teacher builds a lesson plan. We start with a learning goal and then we work backwards.*"

Before the process starts there is a stage of team formation with experts of education, curriculum, and game and IT experts. You as a teacher decide on the subject and the respective lesson/s, topics to be taught by the game that is going to be developed. The approach could follow the lesson plans and or part of them. It could also cover interdisciplinary subjects and approaches.

The skills, knowledge, attitudes of students are critical to be pre-defined with the school and/or external staff and experts in curriculum and lesson plans design.

The approach to creating a game as design and structures is directly related also to the way you want to increase students' motivation and engagement. Students' engagement and motivation are enhanced as games allow adjusting the material to their expectations, addressing their learning style and giving them freedom and ownership at the same time. The game that you will create can easily combine several topics and subjects creating a versatile learning tool.

The learning game provides students a safe environment for failure, too. It can be hard for students, especially adolescents, to fail in a public setting like a classroom. Thus, games give them a chance to experiment and try out new things.

The assessment is also made easier and decreases the level of stress and students learn through experimentation and trial and error. Even if the game design includes questions, cases and exercises for testing it is part of a game for the students and they perceive it as a play and not testing.

Once the learning goal and outcomes are defined the team is formed and the following elements are planned, analysed and broken down into tasks:

- Scenario/s
- Game design
- Game architecture and platform to be used
- User interface

The team can be formed to work together and/or only advise on the specific steps and stages. It could be expanded to bring in experts as needed for certain tasks like fact verification, curriculum building, testing and validation, UX design, interface, functionalities, etc.

Such stakeholders like parents and teachers, school management and other staff are also considered.

Thus, as Suzi Wilczynski states "*No stone is left unturned in the game development to create something that is rigorous, engaging, and aligned to standards*".

The key to success is to reach a balance between fun and learning in a gameplay design model (Prensky, 2001)[3]. Unfortunately, this is not easy because game design is not a precise science, which is mostly due to the subtle nature of fun (Koster, 2004). However, there have been many success stories of game designs that managed to teach almost pervasively while engaging external players to the point of playing the game even if they were not interested in the educational content.

Another important aspect to be considered is the integration with the existing learning management system (LMS). It is a standards-compliant way and allows a two-way

Communication as follow: system–game, game–system. It allows new ways for the educational use of the created game and the use of the existing resources, approaches, tools in the system.

Either using existing LMS or another platform as the Learning Library platform presented in Module 2 the following structure elements should be developed at the first stage/phase:

Defining a plot and gaming objectives

Defining the main objectives of the game and the story that will evolve is crucial for the successful creation of a game.

Defining learning objectives: start with a learning goal and then work backwards

Students work toward a goal, choosing actions and experiencing the consequences of those actions. They actively learn and practice the right way to do things. The result is active learning instead of passive learning.

Finding the right balance between gaming and learning:

Game goals

Learning goals

Alignment of goals

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[3] Prensky, M. "Digital game based learning", New York: McGraw-Hill, 2001.

Design of feedback

Goals in learning and games

Implementing learning

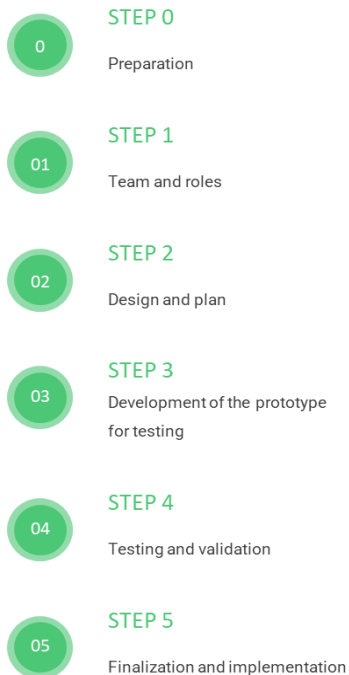- **Sub-unit 2. Game development and implementation**

Game based learning platforms are designed to increase learner engagement and productivity by incorporating gaming elements into the training strategy. Here below we propose one possible approach to developing the game and the respective implementation. It is based on the research done by our team and existing tools, games and analysis:

Phase 1. Preparation

Phase 2. General design

Phase 3. Implementation

We suggest breaking down these three phases into the following steps:

0
STEP 0
Preparation

01
STEP 1
Team and roles

02
STEP 2
Design and plan

03
STEP 3
Development of the prototype
for testing

04
STEP 4
Testing and validation

05
STEP 5
Finalization and implementation

The below activities define the above five steps:

PREPARATION

Adaptation to the education and curriculum requirements

Development of the topics and content of the lesson plan/s

Setting learning and gaming objectives

Development of a storyline

TEAM AND ROLES

Forming the team for the game

Assigning roles in the process

DESIGN AND PLAN

Definition of type and range of game design

Graphic design

DEVELOPMENT OF THE PROTOTYPE FOR TESTING

Content creation

Development of the elements

TESTING AND VALIDATION

Testing with students

Adaptation

FINALIZATION AND IMPLEMENTATION

Final version

Adjusting the game for future use

One of the critical steps is the alignment of the design and the storyboard. Both of them should be compelling and interesting enough to motivate and engage students in the process.

It is recommended to use a platform which provides the functionalities, guidelines and main element for the game creation. As already presented in Modules 2 the platform allows easy integration of the content and stories/scenarios to be used.

Another component of the game development is the assessment methods and tools to be developed.

- **Unit 2. Game structure**
  - o **Sub-unit 1. Types of games**

The main game types could be divided into three main groups:

Physical games:

- Board games
- Word games
- Card games
  - o Matching games
  - o Trick-taking games
- Puzzles

Virtual games:

- Adventure games
- Puzzle games
- Role-playing games
- Strategy games
- Sports games
- First-person shooter games

Game-like simulations and role playing

Simulation and role play games could be applied in both physical and digital environments. They provide opportunities for different scenarios and storytelling.

When developing the game, it is important to decide and define the type of play – solo players or team play. The design and development processes following the game needs analysis to establish when and how students' interaction will happen.

- Principles of video games

The following principles of development for video games are suggested below[4]:

- **interaction**—video games require a player to take part in order to play the game, unlike many learning experiences which allow the learner to take an inactive role
- **risk taking**—video games provide a low-risk environment in which to try different approaches to problem solving; if one approach does not work the player can simply try another

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[4] Gee, J. P., Good video games and good learning, Blog post, 2005, http://www.jamespaulgee.com/sites/default/files/pub/GoodVideoGamesLearning.pdf

- **agency**—players have an ownership in the outcomes and course of the game
- **well**-ordered problems—video games present problems in a way such that the difficulty level of what the player must solve starts at an easy level and becomes progressively more challenging
- **situated meanings**—all knowledge and experience in a video game is connected to the context in which the player finds him or herself
- **systems thinking**—players of a video game receive information and undergo challenges that are always mindful of the context of the whole game; all the learning is connected to the entirety of the system; there are no parts that exist in isolation
- **performance before competence**—players of a video game are taught skills that they use at a low level and practice over and over again until they achieve mastery at these skills.

As mentioned above, there are existing platforms and we provide a sample list below[5]:

EdApp is a game based learning platform that integrates different engagement elements to help you increase course completion rates while ensuring an effective learning experience for your learners.

Kahoot is a well-known online quiz maker and game based learning platform, Kahoot! uses visually appealing gamification elements to maximize engagement and ensure higher completion rates among learners.

Gametize is an enterprise-grade game based learning platform and LMS solution that enables organizations to enhance their employees' training experiences, whether they are going through onboarding or upskilling programs. With this tool, you can easily design your own gamified content by choosing from a vast library of game templates, which are divided into project categories like employee engagement, learning and development, talent acquisition, and many more.

Centrical is a powerful gamification training software that allows you to design gamified microlearning content. With its intuitive user interface, you'll be able to create polished game-based learning materials without needing advanced technical design skills. On the platform, you can customize learning challenges, set prize-winning competitions, or design quest-based game narratives to help your employees adopt the right behaviors, practice skills in a risk-free virtual environment, and improve the overall knowledge and skills they need to succeed.

Archy Learning is an all-in-one gamification training software and eLearning platform that you can use to host global classrooms, perfect for those who are training remote teams across the globe. With its intuitive user interface, you can easily copy and paste Youtube links or upload classroom notes, PDFs, and other digital resources that your learners will need to complete their training. You can even design learning paths by incorporating

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5   https://www.edapp.com/blog/game-based-learning-platforms/

custom course quizzes, mixed media exams, homework, interactive video modules, and personalized games.

Hoopla is a sales gamification software and engagement solution specifically designed to motivate sales teams to increase performance through contests, leaderboards, and real-time recognition. With this eLearning mobile app, you can identify sales goals and create tournament-style or race-style contests to promote friendly competition between employees and accelerate overall team productivity.

Raptivity is an interactive eLearning solution that you can use to design engaging and visually stimulating online learning materials. The tool features a growing library of pre-made responsive interactions that include parallax displays, panning slides, and 360 interactions. Even with no design expertise, anyone can customize interactive quizzes, games, simulations, flashcards, and brainteasers through the tool's user-friendly interface.

ProProfs is another online on-demand training tool that's packed with features designed to create training courses with ease. It boasts a wide selection of bite-sized courses featuring sought-after skills, such as business writing, data analysis, and web development.

GoSkills is another online on-demand training tool that's packed with features designed to create training courses with ease. Courses on GoSkills are mobile-friendly and cloud-based so they can be taken anywhere. It also features gamification examples like daily streak and time-tracking goals.

Hurix Digital is an end-to-end digital content solution provider integrating different content creation and delivery platforms. With this tool, you can customize your LMS according to your organization-specific training workflow. Its game-based learning strategy incorporates puzzles, problem-solving games, strategic games, challenge-based games, and many more.

There are many other options to be used but the overall principles and approaches are similar.

- **Sub-unit 2. Content creation**

Multimodality: blending different formats is the common approach when creating online games.

In the list below we provide possible resources and tools[6]:

- Videos:
    - **Free Movies**
    - **Learner.org**
    - **National Archives**

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[6] https://www.uen.org/general_learner/multimedia_resources.shtml

- o **Next Vista for Learning**
- o **The Open Video Project**
- o **Reel Classics: Classic Movie Video Clip Gallery**
- Pictures:
  - o **21 Free Stock Photo Sites for your Social Media Images**
  - o **American Memory Project**
  - o **Art Images for College Teaching**
  - o **BlogPiks**
  - o **Deviantart.com**
  - o **Every Stock Photo**
  - o **Free Stock Photos**
  - o **FreeFoto**
  - o **FreeImages**
  - o **FreePhotoBank**
  - o **FreeStock**
  - o **Freestocks**
  - o **Free Digital Photos**
  - o **Free for Commercial Use**
  - o **Free Nature Stock**
  - o **Gratisography**
  - o **High Resolution Textures**
  - o **Icons8 Photos**
  - o **ISO Republic**
  - o **Kaboompics**
- Clip Art and Animated images:
  - o **Classroom Clip Art**
  - o **OpenClipArt**
  - o **The Teacher Files**
- Texts.
- Other tools and sources for content:
  - o PowerPoint
  - o YouTube
  - o Doodly
  - o Google Slides
  - o Canva
  - o Ludus
  - o Beautiful.ai
  - o Prezi
  - o Powtoon
  - o Genially

In conclusion, as presented above:

A possible approach to develop the game and its mechanics and rules can be found in "Rules of Play: Game Design Fundamentals" by Katie Salen and Eric Zimmerman. The next

step is to consider the pedagogical and curriculum requirements[7] including integration, adaptation, and assessment. Additionally, consider the requirements and resources needed to design, select, and/or obtain the game, and make it successful.

The next Module 4 provides more information, tools, examples and other resources for the development of gamified elements and games structure using The Learning Library platform - www.learninglibrary.eu

4.6. Resources:

Video*: Using Game-based Learning in the Classroom* by MIND Research Institute

Links to game-based learning research:
- **An Investigation of the Interrelationships between Motivation, Engagement, and Complex Problem Solving in Game-based Learning**
- **Video Gaming Can Increase Brain Size and Connectivity**
- **Making People Fail: Failing to Learn Through Games and Making**
- **Level Up and Learning: A national survey on teaching with digital games**
- **Gaming Mindsets: Implicit Theories in Serious Game Learning**

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[7] Moreno-Ger, P., Burgos, D., Martínez-Ortiz, I., Sierra, J. L., & Fernández-Manjón, B., Educational game design for online education. Computers in Human Behavior, 2008, 24(6), 2530-2540. http://www.sciencedirect.com/science/article/pii/S0747563208000617

ELEMENTS OF GAMIFICATION

Climate Heritage
Game

Module 5: Elements of Gamification

5.1. General Description

Gamification, just like any concept, consists of separate elements. Each of them, employs a different way of transmitting educational material and has its own pros and cons depending on both the end user and the context in which it is used.

In the field of education, elements of the game are being included in the learning process due to their multidimensional purposes. These elements are being used, to attract student's interest in the material being taught and to ensure their active and fruitful engagement in the learning. Gamification consists of a sequence of not only processes and activities which are used to solve problems in the context of learning by adding aspects that are used in the game.

It is important to understand that the main aim of gamification is not to ask students to play games in the classroom; board games which test their trivia knowledge, but to focus on how to apply the elements of the game to learning activities.

To the question, "Why using gamification tools?" the answer is to enhance and to enrich the learning process by adding the elements of game which can directly affect students' behavior, commitment and increase their motivation. This way, it will build the base for improving their knowledge and skills as well. Moreover, this form of active learning focuses on how to help students to develop the skills of collaboration, teamwork and acknowledge the responsibility that their own actions and decisions hold.

When applying elements of the game in the teaching process it is also important to highlight the "how"; the strategy the educator needs to implement in order to achieve the desired outcomes. Firstly, the beginning step is to acknowledge the characteristics of the students in order to determine if the chosen tools are suitable and effective. The determining factor in this step is to "see" how students respond to the learning content and how they engage with the learning process.

The second step to follow is to define the learning objectives in a clear way. The learning objectives are part of the educational agenda and is necessary to achieve them so the other activities, including gamification have an existing purpose. The next step is based on the fact that the content of the gamification activities needs to be developed in an interactive, engaging way including multimedia elements.

Last but not least, an important step of gamification is to assist the learners with tasks to perform which will lead to accumulation of points, winning awards etc. These actions are essential in order to achieve the objectives which were defined in the learning process. When students are performing independent work they can get individual awards such

as badges. There are also some other activities which require the interaction of students which later creates a big learning community.

In conclusion, this module introduces the learners to the different elements of gamification specifically available on the Learning Library platform. It explains how to use tools such as quizzes, badges, rewards or ranking within their learning games. Recognizing which element is the most suitable to the needs of the class as a whole.

5.2. Competences

Teachers, after understanding the concept of gamification and its elements, will be able to develop the following skills and use them in their classrooms.

The competencies described below, may be different but interconnected.

01 Problem solving

Problem solving is the steps someone needs to follow in order to solve problems. Some of the steps are; determining the cause of the problem, identifying and implementing possible or alternative solution/ solutions. An educator can use gamification as a problem solving tool. In the learning process the use of elements of the game can enable learners to solve possible problems/issues or even challenges based on the knowledge they have gained.

02 Digital competencies

Digital skills are based on the reliant and critical usage of the spectrum of all digital technologies that are related to information, communication and problem-solving in different scenarios and aspects. By using gamification tools in the context of learning, learners will have the chance to challenge their ICT knowledge and skills.

03 Decision making

Decision making is defined as the process in which someone has to take an initiative on making a choice by identifying a decision, assembling information, and evaluating alternatives. Quizzes, as an element of the game, can stimulate learners' decisiveness and motivate them to make decisions while also testing their knowledge.

04 Creativity

Creativity is a way of generating and recognizing ideas, alternatives and potentials in scenarios such as; solving problems, communication with others, entertainment. In the learning process, elements of the game are a way of facilitating creative thinking. This is due to the fact that gamification can lower the barriers of established behavioral norms and routines by offering new rules and sometimes even new realities.

5.3. Skills & Knowledges needed to achieve the competencies

❖ Educational pre-requisite:

a.   From the teachers' perspective: Before applying gamification tools to the learning process the first step is to have a clear vision of the objectives while also define the learning outcomes. Also it is important to acknowledge the student's needs, identify

their behavior and the way the accept and perceive the gain information. This way the teacher will know how to use the proper elements of gamification.

To ensure that the learning process is fruitful, the teacher needs to set some rules or/and instructions on how to approach this learning method.

b. From the learners' perspective: Is important for students to understand that this learning approach even though it has elements of the game is mainly for educational purposes from which they can benefit. It is important to highlight that students need to approach the gamification activities in a creative and playful way while also striving for collaboration and "fair play".

❖ Technical pre-requisite:

a. The most important pre-requisite in this sector is for both teachers and students to know how to use and interact with the "Learning Library" and the tools that it provides. It is also needed, for both parts to be familiar with the internet and how to access and use it.

5.4. Training format

The Learning Library is an online platform which was made especially for the Climate Heritage Game project. This platform provides educators the ability to enrich the learning process by making their own gamified courses and exams. The platform offers a plethora of different and useful tools such as;

- Quizzes: different type of quizzes
- Ranking
- Badges
- Rewards (e.g. completing the module unblocks hidden content)
- Progress bars and experience points
- Embedding other tools (Kahoot, Quizzizz, etc.)

The platform of "Learning Library" is accessible through: www.learninglibrary.eu

1. Quizzes
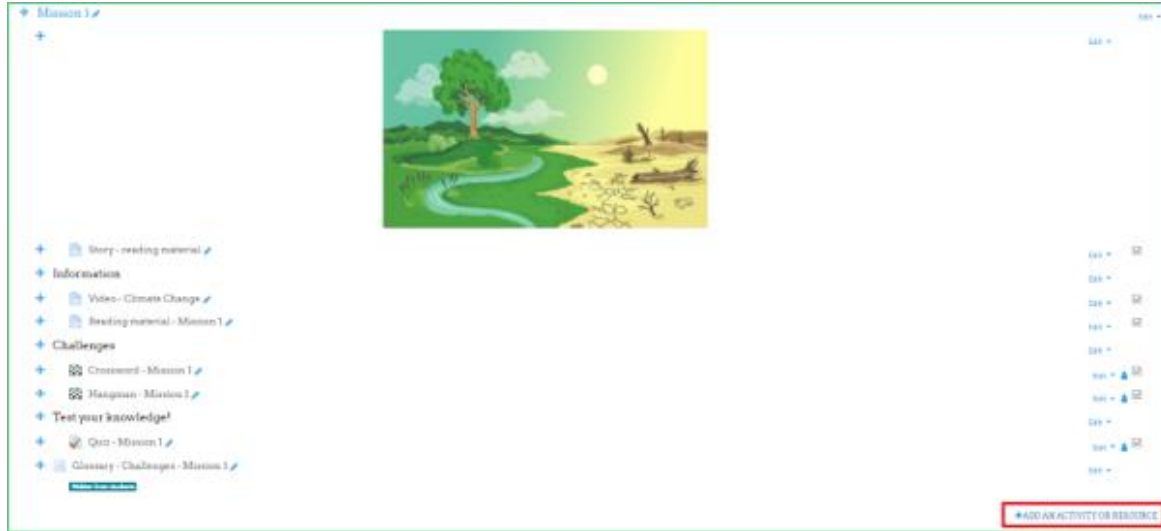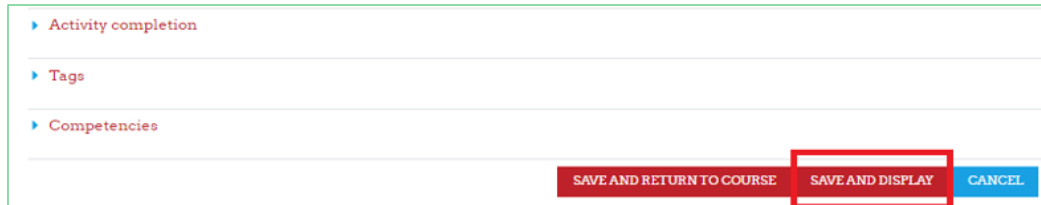
On the bottom-right of a Topic of your course, select "ADD AN ACTIVITY OR RESOURCE"
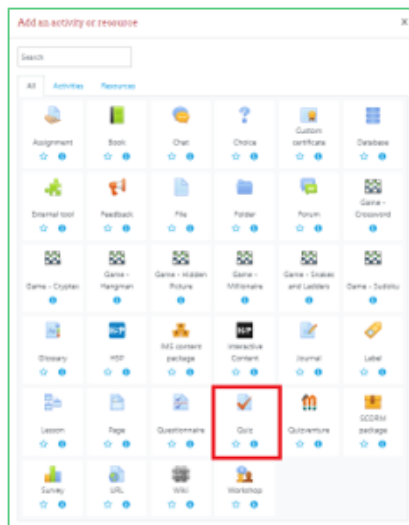
In the list that shows up, select "Quiz"
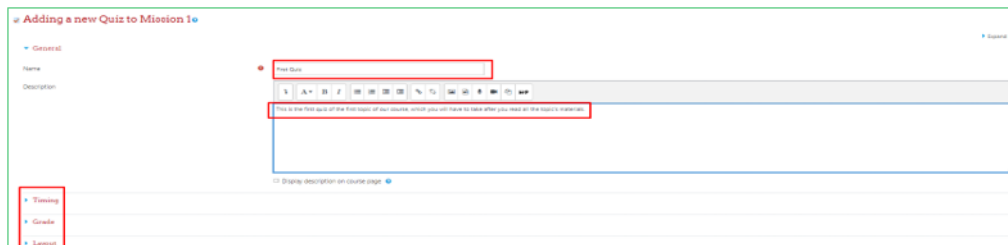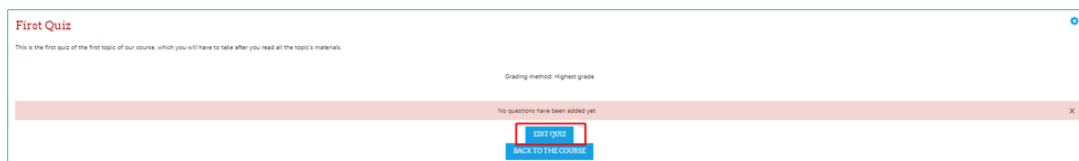
Set a name and (optionally) a description for your Quiz, and then you can customize some of its essential elements (like grading, number off attempts, appearance etc) from the list below:
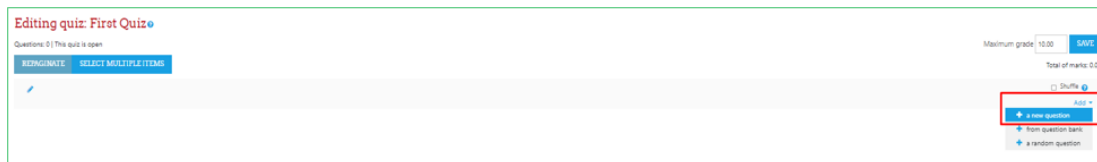
After you're done, select "SAVE AND DISPLAY" at the bottom

Select "EDIT QUIZ"…

…select "Add" and then "a new question"
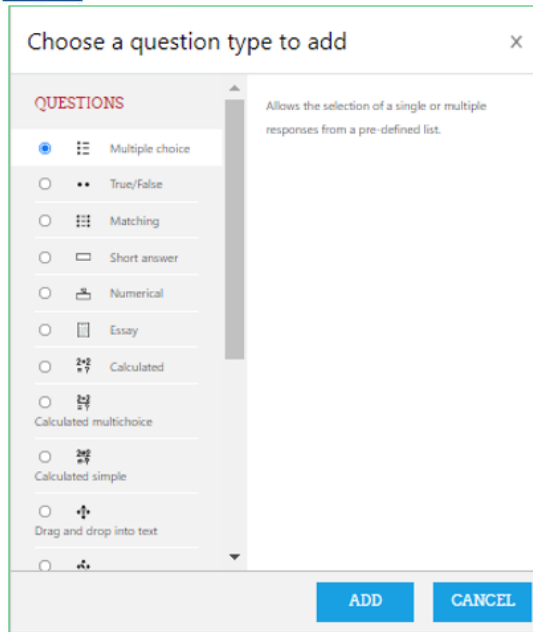
You will then come up with a list of the question types that are available, each with its own customization options. A quiz can contain various types of questions, so feel free to select those that best suit the needs of your course.

2.   Ranking
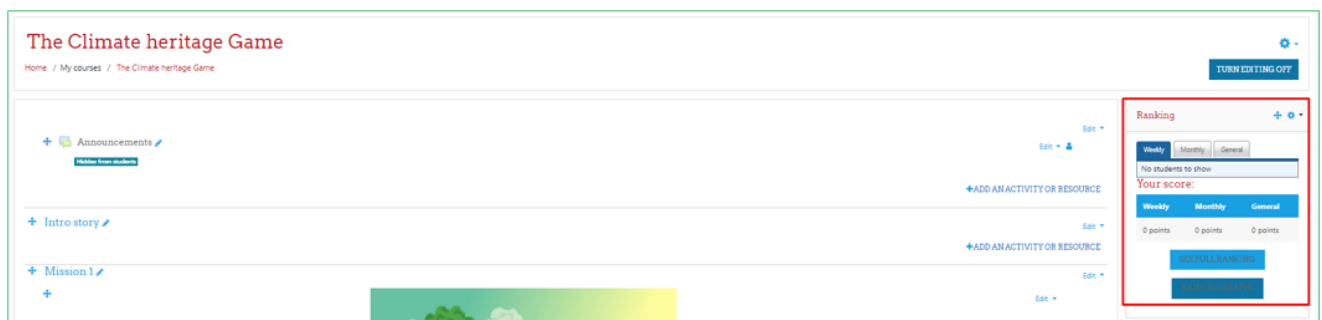
On the "Ranking" section, at the right of your course, you can check your students that hold the highest rankings in your course, on a weekly, monthly or general basis.
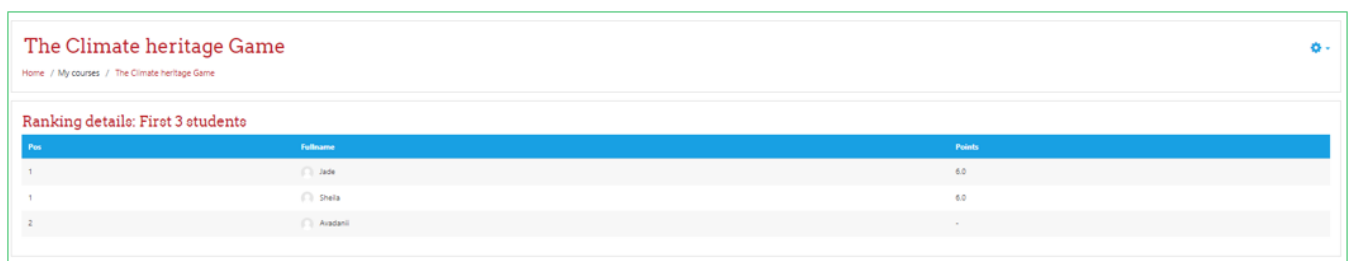
By clicking "SEE FULL RANKING" you can view the full ranking list of your students.

3.   Badges
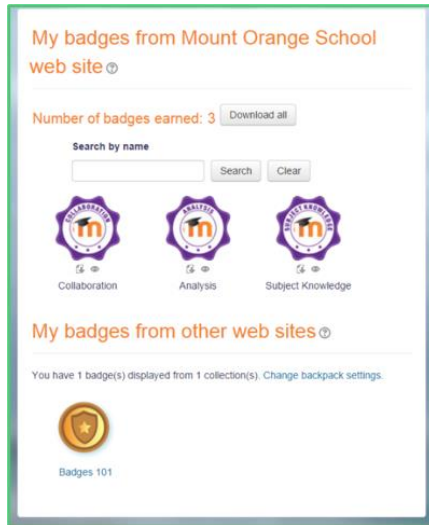
You can also assign badges to students who achieve certain goals. For each badge, you can set its obtain requirements, icon and other attributes. The badges that are obtained, are entered into the "Latest badges" section at the right of the course.

4.   Rewards
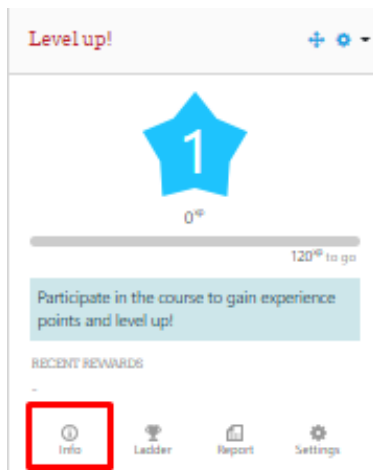
By clicking the "Info" button in the "Level up!" section at the right of your course, you come up with the Control Panel of the various Levels of achievement that you can set for the course, with the possibility of each of them coming with a certain reward.

Levels

Info Ladder Team ladder Report Log Levels Rules Visuals Settings Plus

Do you like the plugin? Please take a moment to **add it to your favourites** on Moodle.org and **star it on GitHub.**

View as   Level count Set points   Algorithm base Algorithm coefficient
Grid   10   Using algorithm   120   1.3

SAVE CHANGES

1

Name
No name
Points required
Description
No description

2

Name
No name
Points required
Description
No description

3

Name
No name
Points required
Description
No description

4

Name
No name
Points required
Description
No description

5

Name
No name
Points required
Description
No description

6

Name
No name
Points required
Description
No description

7

Name
No name
Points required
Description
No description

8

Name
No name
Points required
Description
No description

9

Name
No name
Points required
Description
No description

10

Name
No name
Points required
Description
No description

Course rules

Info Ladder Team ladder Report Log Levels Rules Visuals Settings Plus

Do you like the plugin? Please take a moment to **add it to your favourites** on Moodle.org and **star it on GitHub.**

Grades rules

Students earn points for grades when:

ANY of the conditions are t

+ Add a condition

Events rules

+ Add a rule

0 points are earned when:

ANY of the conditions are t

+ The event is Book: Course module viewe
+ The event is Forum: Discussion subscrip
+ The event is Forum: Subscription create
Event name contains assessable_submitted
Event name contains assessable_uploaded

+ Add a condition

+ Add a rule

45 points are earned when:

Event CRUD is equal to c

+ Add a rule

9 points are earned when:

Event CRUD is equal to r

+ Add a rule

3 points are earned when:

Event CRUD is equal to u

+ Add a rule

0 points are earned when:

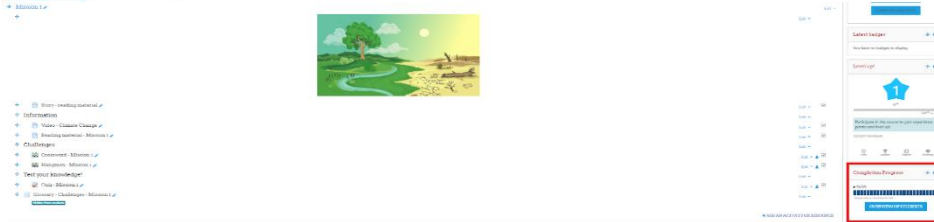Event CRUD is equal to d

+ Add a rule

SAVE CHANGES   CANCEL

Danger zone

RESET COURSE RULES TO DEFAULTS

These levels are mostly managed from the "Rules" tab.

5.   Progress bars

On the "Completion Progress" section, at the right of your course, click OVERVIEW OF STUDENTS...
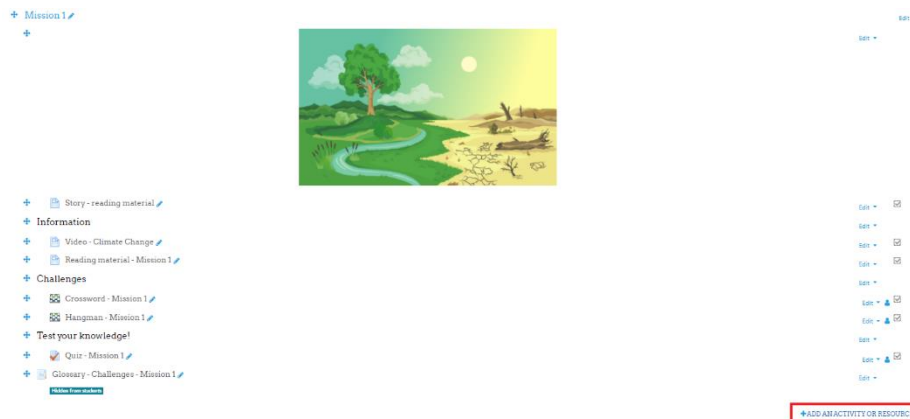
Overview of students

Role Student

		Completion Progress
☐ Avadanii Sergiu	Never	
☐ Jade Penancier	Monday, 4 October 2021, 3:05 PM	
☐ Sheila Larrabaster	Thursday, 30 September 2021, 1:41 PM	

...and you will come up with a detailed progress bar for each student attending the course.

6.   Embedded quizzes

+ Mission 1
+

Story - reading material
Information
Video - Climate Change
Reading material - Mission 1
Challenges
Crossword - Mission 1
Hangman - Mission 1
Test your knowledge!
Quiz - Mission 1
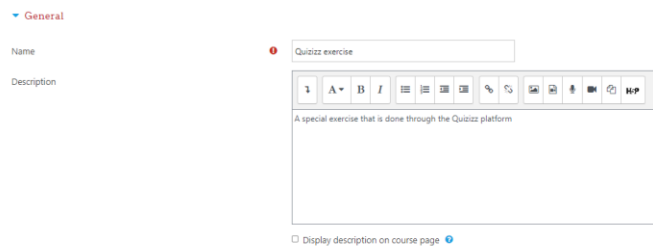Glossary - Challenges - Mission 1
Hidden from students

+ADD AN ACTIVITY OR RESOURCE

On the bottom-right of a Topic of your course, select "ADD AN ACTIVITY OR RESOURCE"
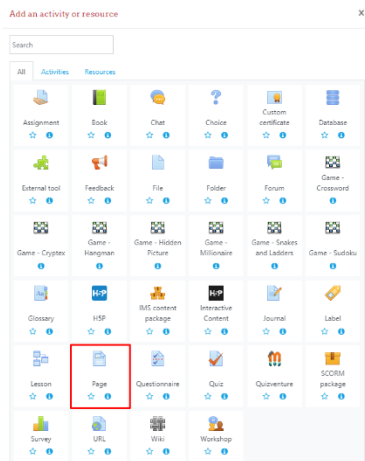
In the list that shows up, select "Page"
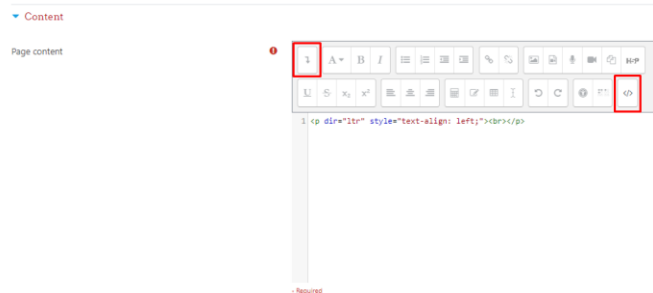
After you assign a name and a description, go to the Content section, press the arrow at the top left and then, from the row of options that show up, the far-right one.
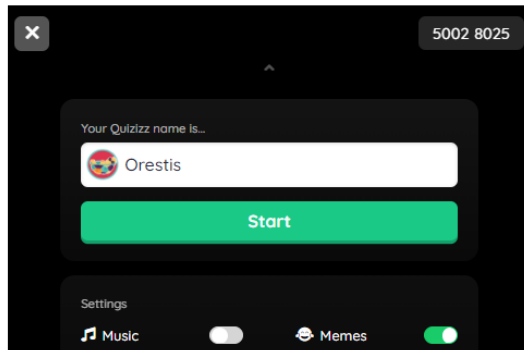
At this point, you need to have acquired an iframe code for the quiz that you have created in an external platform (the process differs for each platform, so please search for platform-specific instructions)

After you acquire it, paste it on the Content section and then press SAVE AND DISPLAY at the bottom of the page.

From now on, every time that a student clicks on this Page in the course, he/she can do your external quiz as if he/she were on the external platform it was created.

5.5. Assessment methods

Test your knowledge on gamification by playing this Kahoot game: https://create.kahoot.it/details/84d3cd42-342e-4899-b15e-dd7dfced08a7

5.6. Learning Units

1. Why use gamification tools?

1a. Students' assessment

The "exam time" is always viewed as an unpleasant process from the students' side, since it takes the form of a "cold and judgmental process" that they have to go through.

By gamifying a scheduled exam, you "sugar coat" it thanks to these 2 elements that derive:

- Students are more familiar with the concept of a game and therefore, although they know that it's still an exam, they subconsciously view it as a more pleasant process
- It creates a sense of competition among students (by bringing them in mind the "multiplayer mode" of certain videogames or perhaps a game night house gathering), motivating them in this way to have a better performance.

1b. Maintaining students' interest

Even if we're talking about an ordinary lesson delivery, and not an exam, gamification can once again prove a key element, this time for maintaining the students' interest throughout the process.

Yet another time, the students will provide more of their attention span if they view something they have in their subconscious as a pleasant experience; hence the games.

But remember.. In today's Internet age, the attention span of most people (even adults) is more limited due to the overwhelming flow of information they are exposed to everyday.

Therefore, in order to maintain their attention better, you should employ the element of surprise.

Instead of repeating the same type of game again and again, you should incorporate in your curriculum as many types as possible in order to:

- Keep the students wondering on what's going to follow
- Offer variety
- Have them get their hands on many different games and try their skills and knowledge on them

2.   Tools offered in the Learning Library

2a. Quizzes: different types of quizzes

2b. Ranking

2c. Badges

2d. Rewards (e.g. completing the module unblocks hidden content)

2e. Progress bars & experience points

2f. Embedding other tools (Kahoot, Quizzizz, etc)

5.7. References:

More information on Gamification in a video form accesible by everyone on Youtube: "Top 4 Gamification Techniques" https://www.youtube.com/watch?v=iX3zQo_TCM0

Nadezhda Angelova .Gamification in education.

Gamification in the Classroom: How to Get Started:
https://www.chalk.com/resources/gamification-in-the-classroom-how-to-get-started/

WHAT IS PROBLEM SOLVING?: https://asq.org/quality-resources/problem-solving

Digital competence: the vital 21st-century skill for teachers and students:
https://www.schooleducationgateway.eu/en/pub/resources/tutorials/digital-competence-the-vital-.htm

Decision-making process: https://www.umassd.edu/fycm/decision-making/process/

What is creativity?: http://www.csun.edu/~vcpsy00h/creativity/define.htm

How 'gamification' could revolutionise creative thinking in the workplace:
https://theconversation.com/how-gamification-could-revolutionise-creative-thinking-in-the-workplace-122852

GAME CASE STUDY

Module 6: Game Case Study

6.1. General Description

The main purpose of this module is to provide teachers with an example of a game made on the e-Learning platform learninglibrary.eu. This example is based on the consequences that climate change is having on local cultural heritage, and it's called "The Climate Heritage Game".

The Climate Heritage Game is composed of 5 different missions, each of them is based in a different country from Europe. At the same time, each mission involves 3 different sites or places and 3 different degrees of difficulty. The aim of the game is to progress and solve all these missions in order to save Europe's heritage from climate change.

The first level of each mission and each site is called Acquisition of awareness and knowledge about Cultural Heritage in the chosen local area. These first exercises try, in all five missions, to bring the player closer to the local heritage, to culturally, historically or environmentally significant places.

In the second part or level of each mission the player will answer questions that have to do with climate change in general and also specific situations in the region. This part is called Acquisition of awareness and knowledge about Climate Change.

Finally, the third part of each mission aims to find solutions or new ways of dealing with climate change and towards a more sustainable development, bringing new ideas to the preservation of the heritage of each region. This last part of each mission is called Climate-resilient pathways: Adaptation, Mitigation, and Sustainable Development.

This is the main appearance of each mission:

When entering a mission, students will find a brief introduction to each of the places they will be working on, a short text and pictures or a short video. Players will then find a questionnaire with several questions about the place presented in order to understand its importance.

Mission 4 - Bulgaria

Part I
- Video 1 - in progress
- Quiz 1
- Video 2 - in progress
- Quiz 2
- Exercise - Fill in the missing information!
- Video 3 - in progress
- Quiz 3

Part II
- Video 4 - in progress
- Quiz 4
- Video 5 - in progress
- Exercise - Fill in the gaps!
- Quiz 5

Part III
- Video 6 - in progress
- Quiz 6

Once the player is familiar with the place, the mission will lead you to other activities such as gap filling exercises, videos with quizzes, images or open questions.

The following are some examples of these activities:

1. **Quizzes**:

Information
⚑ Flag question
⚙ Edit question

This was such an extraordinary trip, don't you think so? Well now its about time we come to today's Parthenon in Athens of 2022! Despite its glory there are some great threats to the temple but also to the city's climate as well. Shall we learn more about it?

Question **1**
Not yet answered
Marked out of 1.00
⚑ Flag question
⚙ Edit question

Climate change "threatens" the monuments of ancient Greece as atmospheric pollution and acid rain erode the marbles.

Select one:
○ True
○ False

2. **Questions about videos and texts:**

After watching the video and reading the text, answer the following question:

Assigns each group (A, B, C, D and E) of students, the correct activity:

Film making.   Choose... ▲▼

Garbage collection on the river bank.   Choose... ▲▼

Garbage collection on the river beach.   Choose... ▲▼

Sand sifting from river banks to collect microplastics.   Choose... ▲▼

Collection of microplastics in river waters.   Choose... ▲▼

3.   Gap   filling   exercises:

Level 2 - Exercise

There is a great lack of knowledge about what climate change really is, either due to over-information, inaccurate sources or self-interested misinformation, which gives rise to a series of false myths about climate change.

First of all, it is necessary to clarify two concepts which, although closely related, are often mistakenly taken as synonyms: [_____] and [_____]. There is an important difference: global warming is the cause of climate change, i.e. the increase in global temperature caused by human-induced emissions of greenhouse [_____] into the atmosphere, which are causing variations in the climate that would not occur naturally.

The Earth has already warmed and cooled [_____] on other occasions, but the truth is that these cycles have always been much slower, requiring millions of years, whereas now, as a consequence of human activity, we are reaching levels that in other eras brought about [_____] in barely two hundred years.

| Climate Change |
| naturally |
| gases |
| Global Warming |
| extinctions |

✔ Check

⟳ Reuse   ⟨⟩ Embed   H5P

◀ Quiz 1 - Level 2   Jump to...   Quiz - Level 3 ▶

Exercise - Fill in the missing information!

Watch the video and fill in the missing information:

The idea of creating protected areas in Bulgaria appeared as far back as the beginning of 20th century. An important step in this direction was the creating of the Union for Protection of Native Nature in 1928. The motives for establishing Vitosha National Park was that is nearest to the capital and visited by tourists and it had an unarguable importance for the development of [_____].

During the Second Bulgarian state Vitosha and its surrounding areas were strewn with fortresses and about 40 big and small monasteries. In the times of the Ottoman invasion most monasteries were burned out. One of the reconstructed monuments of historical heritage is DRAGALEVTSI "ASSUMPTION" MONASTERY. Of the old monastery complex only the church is now preserved, decorated with [_____]. Today's appearance of Vitosha had been formed in the remote past about 80 million years ago in the end of the mesozoic era. Where now the mountain raises there had been [_____]. Nowadays' relief of the mountain is a result of the [_____]. As a consequence of the continuous rising processes and the characteristic bulbous cracking of the basic rock - sienite, the unique [_____] of Vitosha were formed which do not have anything in common with the glacial moraines known.

| a sea |
| science |
| noticeable frescos |
| "stone rivers" |
| weathering, erosion and the activity of water |

✔ Check

4.   Open answers

As the player completes the missions, he/she will receive the corresponding points and will move up in rank. The general score (where all players are listed) can be seen at any time on the main page of the game, so that each player can play against all other partners.

6.2. Competences

The competencies described below, may be different but interconnected.

1.   Digital competences:

1.1 Getting used to digital platforms such as learninglibrary.eu and

1.2 Browsing, searching and filtering data (evaluating data)

2. Strategic thought
3. Teamwork
4. Concentration
5. Agility

6.3. Skills & Knowledge needed to achieve the competences

1. Digital competences:

1.1.   Getting used to digital platforms such as learninglibrary.eu

For teachers: Basic editing skills in Moodle (or HTML), developing digital content in general.

1.2.   Browsing, searching and filtering data (evaluating data)

For students: To analyse, compare and evaluate the credibility of sources of data.

For teachers: Copyright rules.

2. Strategic thought, ability to think ahead and anticipate.

For teachers: Coordinate an action plan focused on a relevant achievement so players work on a specific topic to reach the target.

6.4. Training format

❖ **For teachers:**

The teaching team designing the game will be trained by experts to learn how to build the game. Once they have gained the necessary skills, they will be able to implement the game.

❖ **For students:**

Students will be able to play the game again and again until they acquire the necessary competences. In the same way, they will also be able to do independent quests on each of the locations, in order to better approach the missions.

6.5. Assessment methods

Each exercise, each site and each mission of the game is rated once it is played. This helps students to self-evaluate and progress autonomously.

6.6. Learning Units

❖ **For teachers:**

1. Getting started

The first part of the process needs teamwork between experts of education and IT experts. Education experts will work on learning goals and contents (local heritage and climate change) and how to achieve such critical and strategic thinking. IT experts will explain to teachers which is the best exercise for each kind of content.

Once this work is finished teachers and IT experts will know:

1.1.   Which is the aim of the game, and which are the contents that need to be prepared.

1.2.   What kind of exercises fix better in each part of the game. For example:

Quizzes

Gap filling exercises

Matching exercises

Text reading exercises

Video watching exercises

1.3.   The main interface of the game

2.   Writing the script

The script will have to be written according to the type of exercise that will be used in the game.

For example, for quizzes: They will be written with the correct answer marked and the feedback we want to give the player after each answer.

4	Did it fulfill its function for a long time?		
		No, it didn´t. Spanish troops broke the iron belt the 12th June, 1937.	One more point for you!
		It´s still working!	NO, it´s not working anymore.
		It has been really useful for Basque warriors for the last 200 years	Try again
		It was succesful for nearly 5 years	A little bit less…

3. Developing the game

In this part of the process the IT experts generate the game. As mentioned before, a specific knowledge is needed for this part. All the data, videos and photos of the scripts will be entered or uploaded and configured to give the corresponding score to each exercise.

4. Testing the game

Educators will test the game, its functions and everything needed and IT experts will change what is wrong or not as originally planned.

5. PLAYING THE CLIMATE HERITAGE GAME

Once the game is ready, students can register and play The Climate Heritage Game