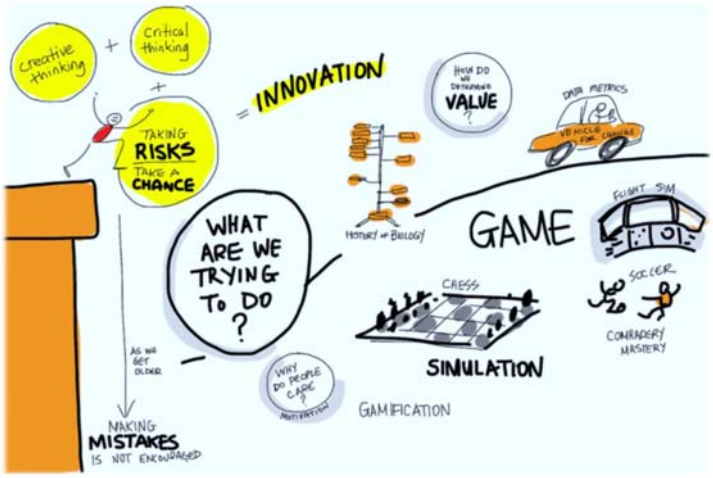
Ciprian VLAD

Gamification – An Innovative Teaching Method



Galati University Press

2021

Ciprian VLAD

Gamification – An Innovative Teaching Method

Ciprian VLAD

Gamification – An Innovative Teaching Method

Galati University Press

2021

Colecţia Ştiinţe Inginereşti

Galati University Press –

Editura Universităţii „Dunărea de Jos”

Str. Domnească, nr. 47, 800008 – Galaţi, ROMÂNIA

Tel. 0336 13 01 39; Fax: 00 40 236 46 13 53

gup@ugal.ro

Referenţi ştiinţifici:

Prof. dr. ing. Elena MEREUȚĂ

Conf. dr. Alexandru NECHIFOR

Lector:

Georgiana DOBREA

Descrierea CIP a Bibliotecii Naţionale a României
VLAD, CIPRIAN
Gamification : an innovative teaching method */ Ciprian Vlad. - Galaţi : Galaţi University Press, 2021*
ISBN 978-606-696-227-8

37

ISBN 978-606-696-227-8
Tipărit la Editura Universităţii „Dunărea de Jos”

Funded by the Erasmus+ Programme of the European Union

Foreword

Education has a fundamental role in EU 2020 strategy. As a meter of fact, quality education can increase employment rate, helping unqualified people to act in accordance with with labour market demands. Moreover, EU, in Entrepreneurship Action Plan, stated the needs to foster competitiveness through the inclusion of people in business sector.

Considering the aforementioned priorities, the Erasmus+ project, GAMEST perfectly fits into these EU policies frameworks. In fact, the project identifies in gamification an innovative instrument to teach entrepreneurial contents, increasing learners' engagement in the subject matter. Gamification involves employing game mechanics to non-game environments. Consequently, it could be considered as a tool to enhance skills of both educators and learners and can be a practical vehicle to encourage entrepreneurial mind-set and related skills.

EU have as one of its main objectives to bring high quality education. In order to achieve that goal, gamification can be considered one of the most valuable assets that can be applied to already existing or new courses, making them more fun to undergo and easy to follow, thus giving to students a perception of their progresses that may be easier to understand. The General Objective of this project, is to support the promotion of high-quality and innovative teaching based on the application of gamification strategies.

GAMEST' major purpose is to strengthen and support skills educators. In fact, it targets VET teachers, educators and trainers and it has a strong dimension associated to the development of teaching, mainly in entrepreneurial education field.

This book is the result of the Erasmus+ project, named GAMification tEchniqueS for entrepreneurial vet Teachers. It has 3 chapters and a list of references, the first chapter having the title *Theoretical and practical backgrounds of gamification*, the second one is named *Application and benefits of the gamification to entrepreneurial teaching* and the third one, *E-learning Platform Technical Manual*.

Finally, the aim of this material is to supply a specific and relevant didactic approach of gamification for all those educators, teachers and mentors

Funded by the
Erasmus+ Programme
of the European Union

involved in the VET entrepreneurial teaching, providing the didactic methodology framework.

This book is the result of the GAMEST project. (www.gamest.eu)

Funded by the
Erasmus+ Programme
of the European Union

Cuprins

Funded by the Erasmus+ Programme of the European Union

Funded by the
Erasmus+ Programme
of the European Union

Introduction

Author: Ciprian Vlad („Dunărea de Jos" University of Galati, Romania)

The Erasmus+ project entitled "GAMification tEchniqueS for entrepreneurial vet Teachers" (GAMEST) refers to VET priority and was designed to introduce systematic approaches to, and opportunities for, the initial and the continuous development of VET teachers, trainers, and mentors in both school and work-based settings, including through the development of effective digital, open, and innovative education and pedagogies, as well as practical tools.

To ensure the success of the project, 5 European partners were involved in the team work, the consortium bringing together participants from four countries:

- "Dunărea de Jos" University of Galați, Romania;

- FVB S.R.L. – The Hive, Italy;

- Šolski Center Novo Mesto, Slovenia;

- Prism Consulting Srl, Italy;

- Universidad de Santiago de Compostela, Spain.

Also worth mentioning are the following:

- further information on the T4 Erasmus+ project, available at: https://www.gamest.eu/
- to view the audio-visual products created for the GAMEST project and to self enrol into Gamest online platform in order to access the materials: https://erudire.it/.

Objectives

The general objective is to support the promotion of high-quality and innovative teaching based on the application of gamification strategies.

SPECIFIC OBJECTIVE 1: Define the state of the art of gamification applied in entrepreneurial education and detect to what extent the target group is already engaged with gamification practices. This will increase awareness among VET providers about the possibility to apply gamification pathways to their VET entrepreneurial courses

Funded by the Erasmus+ Programme of the European Union

SPECIFIC OBJECTIVE 2: Strengthen gamification skills and their application knowledge for VET educators. This will strengthen gamification skills of the target group and their ability to gamify their entrepreneurial courses.

Target group

The project target group includes:

- VET providers, specifically teachers
- coaches and mentors involved in entrepreneurial education

Description of the E-learning platform

Platform access:

Participants can view the audio-visual products created for the GAMEST project by following the link https://erudire.it/ or direclty from the project platform https://www.gamest.eu/tools/ (Click on ”Go to” next to e-Learning platform).

For registration, participants must take the following steps:

- Press ***create an account*** on the homepage of the platform;
- Fill in the required data;
- After logging in, you need to click on the ***enter*** tab of the ***International Projects*** course category in the homepage of the platform and choose ***GAMEST***
- Then click on ***Enter this course***

Funded by the
Erasmus+ Programme
of the European Union

Chapter 1: Theoretical and practical backgrounds of gamification

1.1. A short introduction to gamification

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia)

In the last few decades, considerable progress and positive changes have occurred in education. The teacher-centered pedagogies and practices are slowly but for sure moving toward a student-centered learning, which means, that in the forefront are the students' needs, learning styles, background (language, culture, values, family …), and interests.

Learning and teaching approaches are meeting the expectations of the "Cyber Generation", also known as "Generation Z" or "Gen Z". This generation, always "switched on", born into the age of high-tech communication, raised up with information technology, connected 24/7 to information, and having multiple mobile devices, prefers environments that support group work (simulating social media connectivity), multi-tasking, and engagement with the social aspects of learning.

Therefore, it is not very surprisingly, that different technological solutions have led to a range of innovative learning approaches such as flipped classroom, blended learning, video-based instruction, gamification, as it has shown that traditional instructing methods relying on e.g., repetition, memorization, and basic comprehension are not sufficient (Kapitzke, 2006).

Obviously, the growing number of students with their personalized learning desires (to select the subject they prefer, environment in which they feel comfortable, the time for teaching and learning), and the fact that the Internet is supporting this student-mobile-driven education, are confronting teachers/mentors/professors with the awareness that current Didactics should be radically improved.

The need for new didactics can be seen in the vast amount of proposed didactics frameworks. When summarized, all of them consist of three important parts:

Funded by the Erasmus+ Programme of the European Union

- A set of human beings with their relations (for example students and teachers in a classroom),
- An organization of human practice and knowledge, and
- A set of artefacts used to mediate and relate the previous two (Winslow, 2009).

It has to be outlined, that various educational models, proposed lately, on which new didactics could be built on, are focused heavily on how to make full use of Internet and ICT in order to achieve the desired results in the learning activities.

However, the modern society is demanding (besides the technological/informational skills), additional skills and competencies from students - future members of the large job market, due to employers who are seeking for workers, capable to tackle all the needs of the growing and modern economy.

After a consensus among educators, stakeholders, business leaders, crucial 21st century skills and competencies should cover different areas and aspects of life, putting in the forefront learning, complex thinking, and communication skills (Saavedra & Opfer, 2012). The main idea, ruled by nine suggested "rules" is that teachers should provide learning activities, which enables the development of thinking skills, encourage learning transfer, and permits the use and applicability across different disciplines.

Among the numerous new learning trends already outlined, gamification has shown to be an appropriate solution in managing the educational process effectively and in ensuring an engaged and improved performance by students. The success behind this approach lies on using everyday experiences, which are converted into *game-based activities*, comprising different (enjoyable) elements like cooperation, exploration, storytelling, and competition.

The emphasis is thus on *game*, as the assumption is, that students like to play games, which are engaging and fun. From this point of view, among several definitions of gamification is the simplest one, which defines gamification as the application of game elements to non-game activities (Nah et al., 2014). A more

Funded by the
Erasmus+ Programme
of the European Union

extended definition of gamification outlines, according to Kapp (2012), four core elements:

- Game thinking
- Game-based mechanics
- Aesthetics
- Engagement and motivation

When linking these four elements together, then gamification can be understood, as converting different *everyday aspects/actions/situations* into *game-based activities*, which can be reached by using *game-mechanics* (e.g., point systems, badges …) in a *graphical designed environment* (aesthetics), with the purpose to *engage and to motivate* a person in a particular activity.

It has to be outlined, that simply adding game mechanics/elements (for instance points, badges etc.) to an experience/activity is still *not* a gamification, as the engagement is embedded *in the experience itself* and not in the elements. Furthermore, "making something into a game" with the purpose to create fun and money for game owners is also not gamification. Real gamification seeks for the motivational power of a gameful design, and how to apply it into real life issues.

When designing games, it is obviously that it is very important for a game designer to find out, *what exactly motivates a person*, even if it is not logical. Gamification is also about the understanding how a player feels, and according to this, to design features, which will empower those feelings.

1.2. Identifying the benefits of gamification in VET education

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia)

A common problem, which are facing teachers/trainers around the world, is the disengagement of their students. How to engage disengaged students, how to provide a better motivation and at the same time a learning experience? How do we know when the students are motivated? The problem of disengaged students is huge, and can affect a training program, so the question is, which learning strategies to use in order to excite the students and to provide the desired learning experiences, at the same time to trigger the student's behavioral change?

Before approaching this problem, the ultimate question is *what* makes a student motivated?

Funded by the Erasmus+ Programme of the European Union

According to studies, variables having an impact on the student's motivation, can be *intrinsic*, e.g., the desire to be involved, curiosity, challenge, and *extrinsic*, e.g., compliance (to meet another's expectation), recognition (to be publicly acknowledged), competition... (Williams and Williams, 2011). Human beings, and particular students, are complex creatures, with complex needs and desires; however, "recognition" and/or "reward" seems to be the most important "motivational drivers". When having also in mind the rise of social media, widespread use of smart devices, Internet, and the desire to incorporate fun in a learning environment, which uses real-life based activities, then it is not very surprisingly, why gamification has gained momentum in the last two decades.

Piaget's advocacy to use games in the process of children's interaction and learning from their environments was marginalized until the moment when various research studies have proven the benefits of implementing gamification in education. The ability (i) to make the learning interesting and (ii) to engage the students (Adams & Dormans, 2012) has popularized and wide-opened the door to this learning approach.

According to a vast number of studies about gamification (Dicheva et al., 2015; de Marcos et al., 2016), five key benefits can be outlined:

- Gamification can be applied to address different kinds of training (soft skills training, professional skills training, product training, …)
- Gamification is not only covering the needs of the Cyber Generation but also diverse learner profiles who benefits from this approach
- Engaged learning experience and new/augmented reality contributes to a higher recall and retention

- A well-designed gamified course can affect and drive a change in the learner's behavior over time
- A well-designed gamified course puts the learners in relatable situations, which could be encountered in real-life.

Gamification has proven to influence the cognitive, affective and psychomotor domain. It arouses the student's interests in the subject matter and learning motivation and helps in the construction of a new knowledge making use of the student's prior daily life experience and knowledge (cognitive domain). Gamification improves the student's way how to deal with things emotionally,

Funded by the
Erasmus+ Programme
of the European Union

e.g., with feelings, enthusiasms, attitudes, values, appreciations (affective domain).

Furthermore, gamification affects the psychomotor domain, which includes the use of motor-skill areas, physical movement and coordination, which is measured in terms of precision, techniques in execution, distance or procedures (Simpson, 1972).

Despite of the considerable results of gamification in education, critics argue that gamification fails to cover all the pedagogical needs from particular learners and adds unnecessary competition stress, frustration, anxiety, or even negative social comparison (de Marcos et al, 2016; Martí-Parreño et al., 2016). Outlined is also the fact, that gamification produces better results in STEM subjects than the humanities (Kim et al., 2018) as also the danger of developing student's behavior which relies on learning only when extrinsic motivation is provided.

1.3. Differences and similarities between game-based learning and gamification

Author: Marko Nikolić (FVB S.R.L. – The Hive, Italy)

1.3.1. Definition of "gamification" and "games-based learning"

Gamification is defined as the introduction or application of game elements in non-game contexts ([Gamification is the addition of game elements to non-game activities], 2021). It's a relatively new concept, but it has been around for years, in fact game derived elements have always been incorporated into other areas of daily life.

There are three basic features that are common to all games:

- A set of well-defined rules;
- A quick feedback system;
- The participation in the games is voluntary and primarily for fun.

The main goal of gamification in the educational and training context is to raise the level of motivation and active involvement of participants in an experience.
Gamification usually refers to a series of requirements that must be complied with in order to be applied to education.

Funded by the
Erasmus+ Programme
of the European Union

First, there must be no hierarchies, because there are neither professors nor exams. The results of the work are based on peer-to-peer learning and learning-by-doing.
Secondly, it relies on the engagement of the participants who do not need to be educated on the rules but must be involved based on what excites them mostly, providing for the possibility of changing the rules themselves during the progress of the game.

In addition to the principles mentioned above, we can also mention the visual status, social commitment and freedom of choice, which enhance the effectiveness of applying the game to the educational context.

Many times, games are designed to allow players to understand the subject in the real world. These games have a different impact from other media as they allow the student to be able to immerse themselves in scenes and settings that are difficult to express in reality and to be able to act as the protagonist of the first-person perspective. When the application takes place in non-virtual environments, they are called "serious games".

1.3.1.1. Serious Games

Thanks to the introduction of serious games in teaching mechanics, a significant change in teaching methods has been possible, like:

- Introduction of a new language;
- Learning based on the level of play;
- Learning based on group activities
- Learning based on scores and rewards to achieve goals.

For example, video games were introduced with the aim of solving the problem of bullying, immigrants or war victims, telling stories from the victim's point of view, conveying the concepts of "integration" and "inclusiveness" and understanding of diversity. Others that help learn languages, history and math.

These immersive technologies allow children and adolescents not only to develop empathy, but also to learn the practical point of view, to stimulate and encourage creativity, focus, collaboration, learning through trial-and-error paths, memory and exploration.

It is important to say that games are not just about computers or video games. They can also include card games, board games, word games, or even games that don't require any supporting materials. However, the common denominator is that all game-based learning has a goal and a set of rules to follow.

Funded by the
Erasmus+ Programme
of the European Union

1.3.2. Differences and similarities between gamification and game-based learning

Those who decide to adopt gamification choose to use fun elements as a problem-solving strategy, through games that allow users to participate more in certain activities. On the other hand, those who choose "serious games" focus more on a fun experience for educational and training purposes. In fact, learning related to play allows people to acquire new knowledge and new information faster: in this way, even completely unknown concepts will be very easy to absorb. Active participation allows the achievement of objectives and is closely related to learning. Both gamification and game-based take part in the concept of Gaming.

As already mentioned, the first case concerns the design of games in an educational perspective, made with a specific level of realism, useful for the correct simulation of real situations. Gamification, on the other hand, makes it possible to use classic techniques and elements of games (points, badges, rankings, among all). The latter thus make the game more efficient from the point of view of involving people.

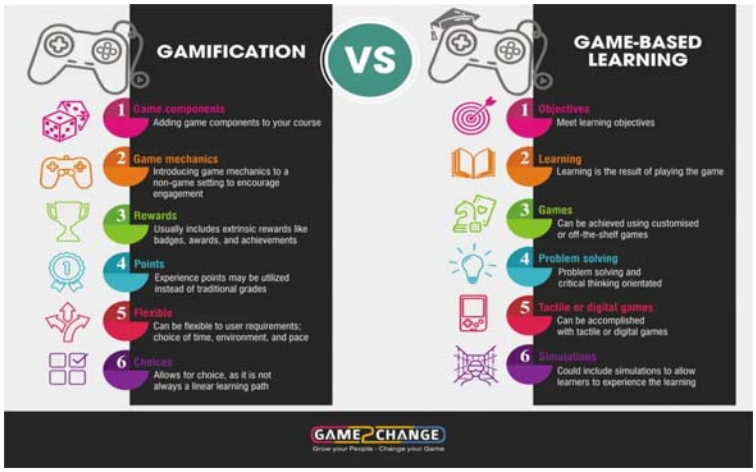


Image 1: The image lists the main characteristics of the practices under study; therefore, it can be useful to summarize what has been said so far.

1.3.3. Practical and application examples of gamification

Allstate Insurance CO

An American insurance company uses gamification as a training system in addition to traditional models. The company has decided to employ

Funded by the
Erasmus+ Programme
of the European Union

gamification to convey knowledge about privacy, corporate policy and teach employees how to use it best. Specifically, the participants play the role of a superhero and, they fight against an opponent intent on stealing customer data. Through this game they were able to learn the theory in a fun way by putting into practice what they had learned in a theoretical way.

Duolingo

According to Apple, it was the application of the year in 2013 and continues to be a great success and represents an example of gamification. Duolingo allows you to learn a foreign language through fun quizzes that advance the player to successful levels thanks to reward systems. This example of gamification is applied to an educational context, managing to advance the level of learning even without paying any cost; even if it is possible to accelerate the progression process by purchasing Duolingo Plus. Through Duolingo, users have emphasized the success achieved with this type of gamification because they are more involved than a normal language course motivated to finish all levels.

BeeUp

Is an online platform where students can register to "solve" business case studies. Business cases are based on problems faced in the real world by BeeUp partners; for example, how to develop a new business model for an innovative product or how to develop a marketing strategy for a company. The platform is open to the public and, after solving ten business cases, students obtain a "business model innovation" certificate. BeeUp, thanks to its way of working for groups and the possibility of applying theoretical concepts to solve real problems, is increasingly used by high school teachers.

The points system used in the platform is as follows: the points are divided into two categories, those earned through the resolution of cases, and those for cooperation and collaboration carried out by answering questions or queries from other students on the platform's online bulletin board.

Both types of points add up to form the "experience score" which reflects the overall value obtained by the student. This score is displayed in a graph that shows the student's progress over time. Students can also reach different user "levels", depending on the accumulated score; this allows them to approach more advanced case studies on the platform.

Funded by the
Erasmus+ Programme
of the European Union

Sony Wonderbook

The Japanese company Sony has launched a device called Wonderbook that hooks onto the PS console. The software allows the player, through a book-shaped object, to display the stories contained in it on the screen of the PS3. The first title of the book compatible with Wonderbook was "Book of Spells", that is the book of spells, based on the Harry Potter universe invented by the British writer J. K. Rowling.

Corporate Training Education - Deloitte Leadership Academy

Launched in 2008, the Deloitte Leadership Academy (DLA) is an online training program for Deloitte employees and customers. In 2012, Deloitte introduced gamification elements into its program, with the help of a consultant, such as badges, awards for participation and obtaining results and rankings to stimulate competition. In this case, the innovation concerned the reset of the ranking every seven days, so as not to discourage the last but rather to encourage them to commit even more.

Also, in this case there are goals to be achieved in the group, to stimulate cohesion and teamwork, for example: if the whole team watches a video-tutorial on a topic, the whole team earns points in the standings. Since the implementation of gamification in the DLA program, there has been a 37% increase in weekly interaction in the program and a 46% increase in the number of users who logged in daily; moreover, the same time taken by users has increased since the introduction of these new methods.

ClassDojo

Is an application that helps teachers manage their class by facilitating the immediacy and strength of feedback, stimulating continuous improvement in pupils and ultimately creating a more interactive and profitable learning environment. It also allows teachers to help their pupils reflect on their progress and encourage certain behaviors with virtual recognition and timely feedback.

Assassin's Creed

The video game developer Ubisoft has created a series of virtual tours to discover the Greek and Egyptian locations that can be visited in **Assassin's Creed.** Without a time-machine, the world of ancient Egypt, known to most people, is a half-finished puzzle, completed by historians, for the time being. The streets of Alexandria, ancient long forgotten temples, have been unearthed by a video game. The developer of Assassin's Creed, Ubisoft Montreal, has allowed

Funded by the
Erasmus+ Programme
of the European Union

players / students to discover more closely, through the most interesting environmental recreations in history.

From this year, however, the game will also be introduced for educational purposes, in a completely new world: education. The Assassin's Creed Origins version allows players to discover history through a beautifully crafted version of ancient Egypt. This February, Ubisoft released a new combat-free virtual museum tour called Discovery Mode which gives teachers and students the chance to explore the ancient Egypt, even more closely, in the first person. It is an important step for commercial video games, which thus move from the living room to the classroom.

Minecraft

The game is a very interesting example of Game-Based learning. In its Edu version, Minecraft, it has begun to spread in this last period also in Italian secondary schools. Game-Based is used both to strengthen the learning of subjects and to encourage the development of skills such as computational, critical and creative thinking. A tool worth getting to know better.

The Walking Dead

Basically, this is a game based on the difficult choices that some human beings are forced to make, also due to circumstances, in a world where the security of modern society is next to nothing and altruism is a virtue that few can afford. The dilemmas of the game mix well with the teaching of moral philosophy: whether an action is good or whether the value of an action depends on its outcome. The game denies players to opt for an "easy way out" or "do what's right"; every decision requires some sacrifices to preserve our humanity and maintain our moral virtues.

While only the seriously deranged would kill and steal for the right to take a selfie, the primary need for food, water and security can quickly devour the civilized side of humanity. In the struggle for survival at the lower levels of Maslow's hierarchy of needs, the moral codes of justice and good become collateral damage.

Funded by the
Erasmus+ Programme
of the European Union

There are no win-win scenarios in the world of The Walking Dead; in the game, one man's gain corresponds to another's loss of earnings. The game constantly places the player in dilemmas that inevitably have positive and negative outcomes: someone will starve, choosing to save one person will result in the death of another.

1.4. From the identification of an idea toward the gamification

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia)

A review of literature, focused on methods used for the gamification has shown that similar processes are employed.

The methodological steps, when summarized, can be outlined as follows:

1. ***Preparation for the project which will be gamified – activities to be managed before the gamification starts***

- It is important to define problems (objectives) which are a part of a new project and how to approach them with gamification
- It is important to define how to measure the success of the gamification, e.g. it is not sufficient to have only ideas, but also to clearly define the objective and how to measure them (Herger, 2014)
- It is important to determine, whether the gamification is an appropriate solution for solving the identified problems
- Literature overview is an important part, as it helps in clarifying the objectives. Some authors outline that definition, ranking and justification of the project objects is recommended (Werbach & Hunter, 2012)
- It is important to define not only objectives and how to measure the outcomes if using gamification in the project, but also to know the costs (budget), who will be the part of the project team, duration of the project, etc.

2. ***Analysis – analyzing the knowledge of students /or any user, analysis of the activities which will be used in the gamification and the analysis of the gamification itself***

- The main purpose is to enhance motivation in students through gameful experiences (Huotari & Hamari, 2016). Students or any user involved in such a project should be analyzed with e.g., observations, surveys, focus

Funded by the Erasmus+ Programme of the European Union

groups … This is important, as the student group or any group involved in the project can be very heterogenic, which can result with a very ineffective user analysis (Finneran & Zhang, 2003; Dignan, 2011).

- Very useful is to outline the students' motivational factors, goals, needs …
- Another analysis is to focus on the context, i.e., to identify and to understand the context where the gamification should be applied.

3. ***Game-design – activities in order to gain different ideas for gamification***

- There is no agreement upon which game-designs should be used, and which gamification techniques. Usually, the selected one should be in accordance with the results obtained from the analysis of students/users, in accordance with the motivational objectives, needs and goals.
- The selection and design of gamification approaches should be a creative process, and a background/practice could be very helpful in this phase. Some studies outline that it is better to focus on the needs of students/users then on technology or game elements (Francisco-Aparicio et al., 2013; Hamari & Koivisto, 2015)
- Iterative brainstorming is very helpful as it provides several solutions, which have not shown up previously. After obtaining them, a list of possible consolidated ideas for game-design should be created.
- Best practice examples could be helpful as a starting point for "coming up with ideas", or visualization (process models) to understand the relationships between users, their behavior and environment, …

4. ***Planning the gamification approaches and prototypes – making prototypes***

- This is a phase where the ideas should be concreted by developing gamification designs. It is helpful to put it on paper, or to create a "prototype" and to test the success iteratively
- In the planning of a prototype, experts with interdisciplinary skills should be involved who understand the game design, the human motivation, the applicability in a business process.

5. ***Implementation of the gamification approaches***

- This can be a "pilot" phase – it is the continuation of the prototyping (Brito et al, 2015; Deterding, 2015)

Funded by the
Erasmus+ Programme
of the European Union

- Gamification solutions can be built within an own team, or gamification platforms can be used
- It is useful to involve a gamification expert, because most of the time, there is a lack of a strong knowledge/background in the development of gamification platforms

6. ***Evaluation and testing***

- The aim is to investigate whether the gamification solutions developed in the previous phases meets the needs of students/users. An example of evaluation could be "playtesting" … the observation of students/users when solving tasks in a game. Actually, the observing of the behavior of students/users is according to studies more efficient, as the students/users have problems in expressing their experiences verbally (Herzig et al., 2015).

7. ***Monitoring (after the release of a gamificated process/project)***

- The gamificated project should be a "never-ending-story". It should be investigated/monitored in regular intervals. Data collected from these monitoring should be used in the evaluation of the implemented game mechanics and to check whether the desired user behavior is achieved.

1.5. Gamification and e-Learning

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia)

Gamification is a thought process *and* a methodology, oriented toward engaging and motivating learners with various learning profiles. What is often misunderstood is that gamification is necessarily bounded with technology. However, gamification has been going on even before the Internet existed, using the same concepts and techniques after the rise of the digital and technologized world. What is new is the possibility to enhance and to energize activities with technology, but at the end, it is still the "design" of a gamification which is in the forefront and then the technology to be applied.

To design a gamified e-Learning system, it is compulsory to understand the core concept of a game: the reward mechanisms, progress tracking and goal focused activities. Learners must undertake some tasks in order to fulfill the desired goal. From this point of view, tracking the learners' progress and reward mechanisms are essential in their motivating and engagement (Glover, 2013).

Funded by the
Erasmus+ Programme
of the European Union

Furthermore, implementing gamification into an e-Learning system is very alike the creating of a software design with all its phases as analysis, design, development, implementation, and evaluation.

Among all these phases, the development phase, which takes place after the system is designed, relies heavily on technology. Review of e-Learning systems shows that they have a lot in common with online web applications using technologies as Java, JavaScript, PHP … and rely very often on Web 2.0 technology for a better visual presentation (Urh et al., 2015).

Before gamification has been applied to e-Learning systems, it was applied in entertainment and business. However, not all gamified design elements from these areas have shown to be suitable also for the education, due to (i) different types of personality and (ii) various learning habits of the learners (Strmečki et al., 2015). Common gamified design elements found in various e-Learning systems are listed below:

- Points – points are used for centuries in education, and a required element in gamification as they can be
- converted commitment/activity grades at the end of the school year
- Rewards – rewards relate to badges and/or trophies (achievements), and compulsory also in a e-Learning system, where they can be a very powerful motivator, as learners (and people in general) adores the collecting of all kinds of badges and trophies (Zichermann & Cunningham, 2011)
- Customization – customization allows a learner to customize the avatar, font-type, background and is a highly motivating feature
- Leaderboard – leaderboards are used in e-Learning systems to motivate competitive learners, showing e.g., only the first best learners, or multiple leaderboards for each activity and a cumulative leaderboard for all activities (Enders, 2013). According to Glover (2013), leaderboard is not only used for competitive activities, but also to encourage teamwork.
- Levels – levels are associated with progress, and progress is a "must have feature" in gamification. In e-Learning, levels are topics and lessons, which should be carefully and logically planned, and balanced as well. Levels enable the tracking of progress, and are a sort of feedback, how well the learner is learning and what exactly should be improved in the future.

Funded by the
Erasmus+ Programme
of the European Union

- Challenges and quests – challenges, varying in length, difficulty, and completion time, are an added value, not very often used in e-Learning, (Schonfeld, 2015), however could be used when combined with rewards meaningful to the learners.
- Feedback – according to Zichermann and Cunningham (2011), feedback is the most important game mechanics, which should be provided throughout the whole learning process, as it gives the learners an information if they are going in the right direction.
- Freedom to fail – an important part of the gamified e-Learning is the possibility to experiment within the activities, at any level, and to access activities unlimited amount of time, everything for the sake of *learning*.

Funded by the
Erasmus+ Programme
of the European Union

Funded by the
Erasmus+ Programme
of the European Union

Chapter 2: Application and benefits of the gamification to entrepreneurial teaching

2.1 Gamification mechanics

Authors: Juan C. Vidal and Manuel Lama (Universidad de Santiago de Compostela, Spain)

The term gamification mechanics is often used alongside gamification, but most people do not understand its actual meaning or how to apply these mechanics in a specific context such as in a learning experience. The fact that there is no concrete accepted definition for gamification mechanics, also called game mechanics or verbs of gamification, does not help either. In general, the term mechanics refers to how some elements, typically found in games, operate in order to contextualize but also to restrict the experience of the students (Hunicke et al. 2004).

It should be emphasized again that gamification is not about creating games but about transforming experiences, and mechanics play a key role in this process. In fact, their purpose is to take a core experience and surround it with game-based elements that will drive students' engagement.

Gamification mechanics looks, therefore, to improve engagement by stimulating students using typical game-based motivators (Burke 2014) such as:

- Autonomy, so a student can take his own decisions and have the control of the experience.
- Mastery, so a student can improve or overcome challenges. However, if he loses the ability to get better, he could quickly become disinterested and bored.
- Purpose, so a student can feel that he makes a difference in the current context or narrative.
- Progress, so a student can have a clear sense of his advances. Here, the core experience should reflect some kind of state, like a chessboard in a chess game.
- Social interaction, so a student can compete, collaborate or connect to other students in ways he usually does not in real life.
- Status, so a student can see his achievements and be able to establish comparisons with other students such as in leaderboard.
- Rewards, so a student can receive points or badges for his achievements.

Funded by the Erasmus+ Programme of the European Union

The former list only mentions some of the most important motivators in the context of gamification. However, there are more motivators that may improve students' engagements such as peer pressure (e.g., peer reviews or feedbacks), avoidance (e.g., to lose points or status), scarcity (e.g., exclusive or unique rewards), and, of course, fun. And as we will see below, certain mechanics are specially aimed at some of the motivations we have just mentioned.

In this chapter, we present a set of game mechanics that can be used and combined to achieve the engagement loop of students in entrepreneurial education. Although there are more than 50 types of gamification mechanics currently recognized, according to the website Gamified UK, we will focus on the 5 main mechanics available nowadays in e-learning systems (Zichermann et al. 2011).

2.1.1 Points

Points are the most basic game scoring mechanism, as almost every game genre has some scoring system. Points are one of the gamification mechanics to which people are most exposed today.

They affect many facets of our lives such as tests, performance evaluations, loyalty programs, etc. They are crucial in almost any gamified system, as it is essential to evaluate students' actions. Points allow us to get the student to carry specific tasks, without the need for motivation other than the points themselves.

In an educational context, students may earn points by progressing throughout the course or by achieving some specific activity, and usually appear on a leaderboard. Points may also be tied to some other reward, e.g., getting a badge or leveling up when a student gets enough points.

Intrinsic motivators: Progress, rewards, status, social interaction.

Funded by the
Erasmus+ Programme
of the European Union

2.1.2. Badges

Badges are a graphical representation of points. Awarding badges generally reinforces motivation because of the goal to complete a collection, and because of the surprise of unlocking a badge unexpectedly, discovering its shape and creating expectation. Badges also allow the student to boast about their achievement and/or to feel recognized.

Badges can be awarded according to:

- Achievement of goals
- Completion of activities
- Completion of levels.

They can also be employed as a way to establish leaderboards so that students feel motivated and aspire to achieve a greater degree of recognition. Other interesting ways to use badges include:

- Badges for reinforcing effort or diminishing fear of failure
- Social recognition badges
- Penalty badges that promote continuing until the end of a task.

An example of the application of badges in education can be found in universities such as MIT, the University of California, and Seton Hall University, among others. These organizations are awarding digital badges as a symbol of recognition, representing:

- Learning (what a person knows)
- Skills (what a person does)
- Role in a community (what a person represents).

Goals must be set in order to keep motivation, and independently of the learning model or technique that is employed (Project learning, Flipped Classroom, traditional methods, etc.), these goals must seek to:

- Promote interest
- Guide and maintain effort
- Achieve the desired learning goal.

Intrinsic motivators: Mastery, purpose, rewards, status, social interaction.

2.1.3. Leaderboards

Leaderboards are one of the most important gamification mechanics. They are basically tables with the names of the highest scorers and may come in

Funded by the
Erasmus+ Programme
of the European Union

different flavors: individual or group. The idea is that leaderboards are motivating because people like to win and winning is motivating because it gives us status in our communities. Leaderboard mechanics essentially create competitive dynamics in students, where the motivation arises from the satisfaction of being compared to their peers.

Leaderboards allow teachers to detect the most active or best students in certain aspects. They should have one fundamental characteristic: to not be discouraging.

They must ensure that the student does not lose their interest for not being in the highest positions. Different leaderboards can be implemented to prevent students from losing their interest or getting stuck in the game: by geographical areas, by time periods, by training and by levels.

Among other benefits:

- Leaderboards drive our desire to compete with others and to become the best. The position on the leaderboard triggers –in most people– the desire to improve to beat others.
- Leaderboards are effective when it comes to increasing player retention and engagement. Showing the player that the goal is achievable motivates the player to keep playing until the goal has been achieved.
- Leaderboards also make performance performances visible to others. It gives players the opportunity to show off how well they are doing.

Finally, leaderboards bring in the social aspect of points and badges

Intrinsic motivators: Mastery, status, social interaction.

2.1.4. Challenges

With the right support, students who are expected to achieve more, very often can. Increasing the challenges your students face (whether they be incremental classroom changes or semester-long projects) are an important part of helping them realize their potential at school.

Challenges are exercises to measure the students' skills and knowledge. They require an effort by a student or a group in order to overcome them. Challenges take players out of their comfort zone and bring them into the mechanics of the game. They enrich the learning experience and direct or modify the behavior of the students. Challenges that are presented to the student may be framed in situations or plot conflicts. Overcoming the mission or final objective,

Funded by the
Erasmus+ Programme
of the European Union

successfully or not, will depend on the student's progress through the different challenges.

There are many types of challenges, for example:

- Information challenges provide information visually without requiring any interaction. They rarely provide a score and are instead followed by other challenges where students must answer according to that information.
- Image challenges use images as a resource to ask a question. This includes selecting images, marking specific areas within an image, relating them to terms, ordering them and more.

- Mobile challenges exploit the capabilities of mobile devices to set exercises such as taking a photo using the camera, checking a location using the GPS, or scanning a QR code.
- Audio challenges use sound to set a question and for the student to record their answer.
- Questionnaire challenges show questions in a multi-response questionnaire where the student must select the correct one. Choosing if a statement is true or false is included this type of challenge.
- Social challenges are based on sharing content with other students, using their own social network or a separate tool, in order to create a community and share information. They are very useful to promote causes or to create fellowship.

Intrinsic motivators: Purpose, progress, status, social interaction.

2.1.5. Narrative

Storytelling has been used as a method of learning since the beginning of humanity. Look at cave paintings or how oral traditions have been passed down from generation to generation. Narrative is, therefore, one of the main mechanics in gamification. The elements of the game allow us to teach and empower the

Funded by the
Erasmus+ Programme
of the European Union

motivation of the students; but by adding a story, we can also create an unforgettable experience to last in the mind and heart of the students.

A narrative is a story but, while a narrative is happening now, a story has already just happened. It is used to give structure and meaning to the process of gamification, so that it does not become a succession of abstract concepts. The narration also gives coherence to the gamification and helps to understand the content. For this reason, it is convenient that the mechanics also follow the plot or story.

A story has to have a beginning, a middle and an end. There are many structures out there for building stories, the most famous of which is the Monomythic or Hero's Journey created by Joseph Campbell. The basic premise is that a normal person embarks on a journey that sees them taught, tested, failing, recovering, overcoming adversity and finally winning the day.

Importantly, the journey takes them way out of their comfort zone and when they return, they are not the same person they were when they left. In some ways it is very similar to how learning works: we are set a challenge, we leave our comfort zone, are taught, learn new skills, fail, try again, eventually succeed and are different by virtue of having learned something new.

A narrative or story needs a theme. It is necessary to know what students like to ensure that the story will resonate or at least interest and entertain them. Do some research, ask students if they actually like the theme you are considering. If they don't, find another way. Also, you don't need to be a literary genius to write a decent story for a gamified solution, but it does need to make sense and be consistent. Even if the experience is going to be non-linear, make sure you write it in one stream, then figure out where the breaks are for the narrative atoms. Anyway, you need to understand how it will be played out but also answer questions such as:

- How much choice are you going to really give players?

Funded by the Erasmus+ Programme of the European Union

- Are there multiple endings, are their multiple starting points?
- What are the key narrative atoms, or micro-stories that must be seen in order for the player to have a complete story at the end of the game?

Intrinsic motivators: Autonomous, mastery, purpose, progress, social interaction.

2.1.6. Other mechanics

As we previously mentioned, there are many other gamification mechanics as important as the one we have just described. In the context of education, the following are also very used:

- Relationships. People interact with one another. It is always more fun to participate in something with more colleagues. Through mechanics such as user versus user challenges, group actions, or team competitions, relationships between colleagues and team members are reinforced.
- Intrinsic motivators: Social interaction.
- Constraints. Deadlines, time limit, limited amount of tries, count downs, etc. are just some examples of constraints that can be imposed to an activity or to the whole process of gamification.
- Intrinsic motivators: Status, rewards.
- Journey. A mechanic with small milestones that are part of bigger ones, that is, individual steps until reaching the goal with different levels of progression, in terms of difficulty.
- Intrinsic motivators: Autonomous, purpose, progress, social interaction.
- Incentives. In addition to points and badges there may be other types of incentives/prizes.
- Intrinsic motivators: Social interaction.
- Levels. Unlocking levels based on progress, improved skills, and accumulation of points etc.

Intrinsic motivators: Mastery, purpose, progress.

2.2 Gamification dynamics

Authors: Juan C. Vidal and Manuel Lama (Universidad de Santiago de Compostela, Spain)

Gamification dynamics are the elements that encourage students to move from one point to another, the motivations or reasons for which a person plays

Funded by the Erasmus+ Programme of the European Union

(Werbach and Hunter, 2015). They represent the needs and desires of the students, which can be fulfilled by taking advantage of game mechanics.

Unlike mechanics, who are configured by the designer, dynamics are produced by players. Game dynamics are difficult to predict and even can lead to behaviors that are not desired by the developer. They create interest and motivate the student to participate in the activity being carried out, being global aspects linked to human desires, needs and concerns that build motivation for the students.

Motivation is demonstrated through personal choice of commitment to an activity and determines the intensity of effort and persistence in it. It is a dynamic, increasing and decreasing process. There exists *extrinsic motivation*, triggered from outside the organism and stimulated through acknowledgements such as points and badges; and *intrinsic motivation*, which is born from the students and readies them towards what they feel interested or attracted to.

Motivation can be achieved through elements such as points, badges, leaderboards, progress bars and avatars, which enhance skills, autonomy and social relations. It is intrinsic in human beings to expect a reward when they perform a task, whether it is a physical reward or in the form of thanks. If they are not rewarded, they can become frustrated and unmotivated.

It is therefore essential that the dynamic is to the liking of the students and creates a certain pleasure, which will make the students like the dynamic and feel motivated to perform the task.

The proposed gamified system must ensure that each student is always motivated, aside from outside acknowledgements, whether or not they are rewarded. Any gamified project is a methodology intrinsically linked to motivation and ensures a high level of student performance. In this section some of the most popular dynamics are presented: collaboration, competition, creativity, social, and exploration.

2.2.1 Collaboration

Creating a collaborative educational environment can build a community of caring individuals who are all working toward one common goal: increasing the students' positive outcomes. Through this dynamic, group or individual collaboration is encouraged, and creativity or sharing ideas are stimulated, always with the aim of reaching that common target. By joining others and devising strategies to play together, personal bonds can be created in the learning

Funded by the
Erasmus+ Programme
of the European Union

environment. Collaborative learning has been shown to not only develop higher-level thinking skills in students but boost their confidence and self-esteem as well. Plan activities give students the opportunity to work and collaborate to learn and grow from each other.

Pedagogical literature uses the term cooperative learning as a synonym of collaborative learning. However, some authors consider that they are slightly different forms of learning:

- ***Cooperative learning*** is a structured form of working groups where students pursue common goals while they are assessed individually. The students' freedom in cooperative learning is much less than in collaborative learning, because it is the teacher who designs and controls the structures of these interactions and the results to be obtained.
- The main benefits of cooperative learning are: *(a)* more positive relationships and greater social support; (*b)* greater intrinsic motivation and self-esteem; and *(c)* better attitudes towards teachers and school.
- ***Collaborative learning*** is the method of instruction in which students work together in small groups to perform tasks collectively in order to achieve a common goal. In collaborative learning, groups are freely created and structured, and each group establishes its own structure for interactions. The main benefits of collaborative learning are: a) development of higher-level thinking and student retention; b) self-management and leadership skills; c) promotion of student-faculty interaction; d) increase in self-esteem and responsibility; and e) preparation for real life social and employment situations.

Furthermore, both cooperative and collaborative learning share some benefits: *(a)* promotes team building; *(b)* decreases violent reactions to conflicts; *(c)* improves friendly, positive, and constructive interactions; *(d)* encourages the development of emotional expression and social skills; and *(e)* allows players to discover their colleagues' capacities, and to value others' effort and success positively.

2.2.2 Competition

Education and competition are two universal ingredients of all human cultures, in fact, of almost all animal life. Humans have always considered education and competition important issues, both in the past and in the present. There have been fluctuations in emphasis and much has changed throughout the centuries.

Funded by the
Erasmus+ Programme
of the European Union

Competition is an event that establishes a healthy environment for individual or team play, in which students can challenge each other to achieve a goal as effectively and efficiently as possible. It allows students to demonstrate who is more knowledgeable, encourages collaboration, and provides winners with prizes such as points or badges. The benefits of the competition dynamics are the following (https://www.competitionsciences.org/tag/impact/):

- ***Improving teamwork and collaboration.*** In case of most team-based educational competitions are required students to take on challenging tasks that needs collaboration, teamwork and good communication. The fact that they are striving to fulfill such a challenging task together, makes them work harder at understanding their specific skills, and how to work well one with another.

The fact that they know other teams are aiming to achieve the same goals, goes a long way in motivating the teams to become more cohesive, and better collaborators.

- ***Enhancing social and emotional learning.*** Social and emotional learning is a complex area of development for students and the educators trying to help them. They can learn how to collaborate with widely differing personalities and to manage subjectivity in their lives. And they can learn to better gauge and evaluate risks. There are variances in how students react to competitions that also impacts how they will realize these benefits. Gender variances exist as do socio-economic variances and age variances. Knowing these facts, it allows us as coaches, competition organizers, and educators to direct our support to help each student individually maximize these benefits from competitions.
- ***Developing academic heroes.*** One critical piece to increasing a student's academic self-identity is in having heroes and idols that they can look up to. To help students increase their respect for academics and interest in learning, it is important that they have heroes in these fields that they can look up to. Competitions are the strongest way to do this. We can learn from athletics on this where we have very specific evaluation criteria on which our youth can easily see who an expert in the field

is and who is not. We know that Lebron James is an expert at basketball because of his ridiculously high numbers of shots, rebounds, blocks, and

Funded by the
Erasmus+ Programme
of the European Union

ultimately wins. Taking a similar structure into academics will help our students place value on educational criteria in ways that they currently cannot.

- ***Increasing intrinsic motivation.*** Competitions have learned this and are relying more and more on highlighting the process and purpose driven challenges behind the competition to drive student motivation. Rarely do we see competitions simply highlight the large awards at the end as the reason to participate. ICS's best-practices in competition design help coaches and competition managers understand how to implement these changes so that their students develop and maintain intrinsic motivation for the challenges they're faced with.
- ***Developing agency.*** People who can analyze situations and determine a course of action without being told what to do is so valuable. Unfortunately, our traditional lecture and test model of schooling leaves no opportunity for students to practice these skills. Competitions on the other hand often require them. In many models of educational competitions, students are required to think on their feet, analyze results of their processes, and make improvements, or determine a new course of action. Through the process of these competitions' students take on the responsibilities.

Following the Bartle's taxonomy of players (Bartle, 2009), in a gamified competition several types of students can be identified: killers, achievers, socializers, and explorers. In the competition dynamics, we focus specially on the killers.

They are very competitive students who like to dispute with other players and who are passionate about action. They want to be the best at the game, and it should come as little surprise that the only way for that to be true is if they beat everyone else. You may expect this personality type to be common, but Bartle's research suggests that only a small number of players are killers, less than 1% to be precise.

2.2.3 Creativity

Creativity is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others. It has been shown that creativity is an acquired skill. Our brain becomes stronger thanks to new experiences, establishing new connections between neurons. Education is one of the best areas for creative exploration and its possibilities are doubled in two directions: in teaching techniques and in the evaluation of learning.

Funded by the
Erasmus+ Programme
of the European Union

Gamification can be an ideal motivating and learning environment to experience new attitudes and emotions in a two-way journey. Games stimulate the student with a challenge, which then they overcome, and the student obtains an emotional reward which turns into a motivator to continue playing. If the challenge is surprising and new for the student, they also obtain a new stimulus based on the novelty that can turn into a motivation to continue playing. Furthermore, creating is fundamental to social progress and well-being. The capacity we have to change things and people through creation is key to find solutions to the challenges we face every day, to improve our lives, our environment and, consequently, our society.

If we want to establish a creative game dynamic, we must consider:

- ***Adding new challenges.*** Each new challenge is a new opportunity for creativity as it represents a new problem to be solved. Challenges act as a catalyst for students to think creatively and come up with simultaneous ideas or solutions. For example, if you turn a knob and find out a door is locked, you begin to automatically brainstorm ideas and solutions: jiggling the knob, pounding on the door, trying your luck with a bobby pin, etc.
- A high level of challenge. Once the student reaches the flow state, the challenges have to be more complicated, testing the player's skills at a higher level. Tired of repeating the same actions and falling again and again in front of the same opponent, the student starts to question the effectiveness of the known methods, so they start to face problems in a creative way. When this happens, the teacher will be forced, if the students maintain their interest, to look for new solutions to the problems.
- ***Freedom of action and emergent gameplay***. This is the most important feature for creativity in any artistic field. The freedom of action can be carried out in a big stage with a lot of elements to interact with, so that highly complex actions can emerge from the interaction of relatively simple game mechanics. This is known as "emergent gameplay": the game makes available multiple options that the player will combine to solve problems.
- ***New ideas based on new methods.*** **The** game is a learning curve. All learning means changing one way of acting for a different one. Every good game requires and provokes that change just like good books or movies. When we design a gamified experience, our aim must be that the student lives an experience which changes them after the game is over

Funded by the
Erasmus+ Programme
of the European Union

2.2.4 Social

Gamification has a clear influence on the cognitive development of students, on their emotions and on the social elements generated throughout the process. It is important to foster the student's need to interact with other peers. Sharing achievements, needs, strategies, asking for help, etc. allows us to analyze the way in which the student will interact with the rest of the participants, and virality is what measures the degree of socialization in the game.

To achieve socialization between peers, game resources are needed. Some examples of social interactive resources are chats, forums, and blogs. These resources make easy a dialogue between the different actors, students, teachers, etc. and allow them to develop an individual thinking. This produces learning thanks to social interaction. Particularly, ICTs increase the possibilities of social development, creating interaction spaces where individuals can find dialogue with people of common interests. They create flexible learning environments and eliminate spatial-temporal borders between teacher and students.

Following the Bartle's taxonomy of players (Bartle, 2009), the aim of socializers is to play in order to interact with other players. For them, playing is about sharing ideas, experiences and creating a network of contacts or friends. This user is motivated by using functionalities such as chats, forums, social networks, etc. They do not seek winning as much as socialization and cooperation with other people, but they seek to reflect, share and discuss with other players.

Examples of socialization exist in several fields:

- ***Business networking***. Business networking is a socioeconomic business activity by which businesspeople and entrepreneurs meet to form business relationships and to recognize, create, or act upon business opportunities, share information and seek potential partners for ventures. It is the process of establishing a mutually beneficial relationship with other businesspeople and potential clients or customers.
- ***Education***. The socialization approach in education focuses on the social dimension of the didactic process, where the key element is harnessing the potential of the group to promote learning (case method, peer tutoring, collaborative learning, etc.).
- ***Marketing***. Gamification is very related to marketing. It replaces, improves and adapts to the online environment more traditional loyalty programs which intend to keep users loyal to brands and products. Furthermore, gamification can take advantage of the power of "social

Funded by the
Erasmus+ Programme
of the European Union

media" in order to increase user engagement with brands, getting users to be proud and share with their social circle that they are "fans" of certain brands.

2.2.5 Exploration

Development of personality and skills requires the free exploration of disciplines, hobbies, trends, and life itself. Due to the fact that curiosity is inherent in the nature of human beings, the exercise of discovering ourselves is something crucial in any educational process. Learning by exploration is a methodological approach that makes the student the protagonist, who will have to find the answers to build their own learning.

To empower exploration in the game, we need to establish a balance between structure and freedom. On the one hand, in order to motivate the student, they must have a certain degree of freedom to decide their actions. In the game, students should be able to choose their team of peers and also the object of study.

On the other hand, the structure of the game refers to navigation and architecture. A linear structure is not usual in an interactive project. Branched, hierarchical structures, with parallel or related worlds, are some of those that allow the students to move freely through worlds chosen by them, reaching different ends according to their choices and providing a sense of freedom in the navigation.

Gamification itself encourages research and exploration, branching off the individual interests of the game to the external aspects surrounding it. These aspects include technical and artistic skills, as well as the desire to know more about other related topics. In the teaching field, experimental learning seeks educational processes that use the previous knowledge of students, providing skills and attitudes to promote the building of their own knowledge, and empowering the experimental activities.

A good example of the exploration dynamic is role-playing. In terms of entrepreneurship, Role-playing is the changing of one's behavior to assume a role, either unconsciously to fill a social role, or consciously to act out an adopted role. It allows students or entrepreneurs to see how their team delivers a pitch while they measure their ability to problem solve and think quickly. Role-playing helps find new development areas, shortcomings or to explore and master the hundreds upon hundreds of negotiation strategies and scripts out there.

Funded by the
Erasmus+ Programme
of the European Union

Entrepreneurs can discover which ones their company or industry uses, which ones have been effective, which ones they want to try out, and practice them until they are comfortable using them. In conclusion, role-playing allows them to practice their material and get the bugs out, and also allows them to see the customer's point of view basing on exploration dynamic.

2.3 Gamification aesthetics

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia)

Even the best games, having great goals and rules, are not played by players, if they do not look appealing. Conversely, a game can be somehow "boring", but nevertheless, attractive when having great aesthetics. The latter is important when designing learning games, where the content can be from the perspective of learners "dull", however interesting because of the aesthetics, which creates enjoyable experiences, happiness, and fun.

If the content of a game is in depth analyzed and planned, having in mind the sensation and emotions of players/learners, then aesthetics should trigger in a player/learner curiosity with its game characters, images, color, story, challenges, environment, strategy, rules etc.

Gamification should include and combine social, technological and aesthetic elements, of which the latter is often marginalized and the least developed one (Niedenthal, 2009).

Encompassing all definitions and debates "what is", and "what is not", with aesthetics, in the context of games, we mean the audial or graphical aspect of the game. There are three core meanings of game aesthetics:

- Game aesthetics as *sensory phenomena*, encountered when playing a game (visual, aural, haptic, embodied)
- Game aesthetics as an *art form*, as it shares certain content, themes, design practices with other media and art forms
- Game aesthetics as an *expression of experience* (pleasure, emotion, sociability, form-giving, …)

Game aesthetics, when well understood, keeps the player "in the game" by affecting the learners emotional and psychological needs (e.g., the desire to improve the previous score, the curiosity what will be the next task …). The best

Funded by the
Erasmus+ Programme
of the European Union

gamification projects create a sense of satisfaction, happiness and fun, and enable the learners/players to express themselves.

According to Hunicke et al. (2004), there are eight aesthetics/ways, how to create engagement:

- Sensation – engagement through experiencing beauty
- Fantasy – engagement through imaging to be someone else ("make-believe")
- Narrative – engagement through storytelling
- Challenge – engagement through overcome different obstacles
- Fellowship – engagement through non-competitive social interaction
- Discovery – engagement through finding new things
- Expression – engagement through self-discovery and self-expression
- Submission – engagement through habit-forming.

In the study from Lundgren et al. (2009), a list of properties is presented, which seem to be relevant for gameplay aesthetics. Some of them are mentioned below:

- Rule consistency – rules in a game has to be consistent (non-contradictory)
- Simplicity – well-defined rules are more understandable
- Use of chance – little or no chance are certainly the least desired scenarios in a game, as also too much chance
- Emergence – each game has a bundle of specific and general rules, the latter tending to lead to synergy effects
- Rule cohesion – rules in a game can be more or less tightened affecting the level of experimentation and balance
- Tempting challenge – challenge should be interesting, tempting, and provide the player/learner the possibility to overcome it
- Meaningful choice – making choices, closely related to game's level of difficulty, should be meaningful to the player/learner
- Integrated theme – rules and theme should be connected, as without a theme, rules impossible to remember
- Varying strategies – strategy, seen as a set of choices, should be designed in such way, that it is not easy to discover

Funded by the
Erasmus+ Programme
of the European Union

- Skill – in all games, analytic, strategic or tactical skills are required. However, skills as creativity, drawing, reactions, bluffing, and empathy as well…

It is important to understand, that aesthetics is a crucial part of a game. Even when a game is experienced different in learners (from the perspective of feelings, intensity…), the learners play the game *because of the aesthetics*, and *experience it through dynamics*. Aesthetics can be easily overlooked when creating a game while working on the game mechanics. Furthermore, same game mechanics does not result with the same game aesthetics.

There is no clear "recipe" how to create great aesthetic in a gamification model. Some of the already known "rules" and the outcomes from other areas, such as the visual presentation of architectural styles, humans, and narrative structures, can be applied and reused if they are related to games. When combined with the needs of a particular group of players/learners, great aesthetic can be achieved.

2.4 Toward developing teacher's skills in gamification

Author: Cristina-Corina Bențea ("Dunărea de Jos" University of Galati, Romania)

In a changing world, where information explosion and scientific and technological developments are huge, the education systems must continuously keep in step with innovations in science and technology. Therefore, the developments in computer and multimedia technologies have contributed on increasing quality in education and new tools, models and practices have developed (Su et al., 2005). In this context, teachers have to understand that traditional pedagogical approaches and methods are not sufficient for actual generation of digital learners. Educators have to be prepared to adopt and integrate, in a larger extent, these technology challenges in all phases of the teaching-learning process.

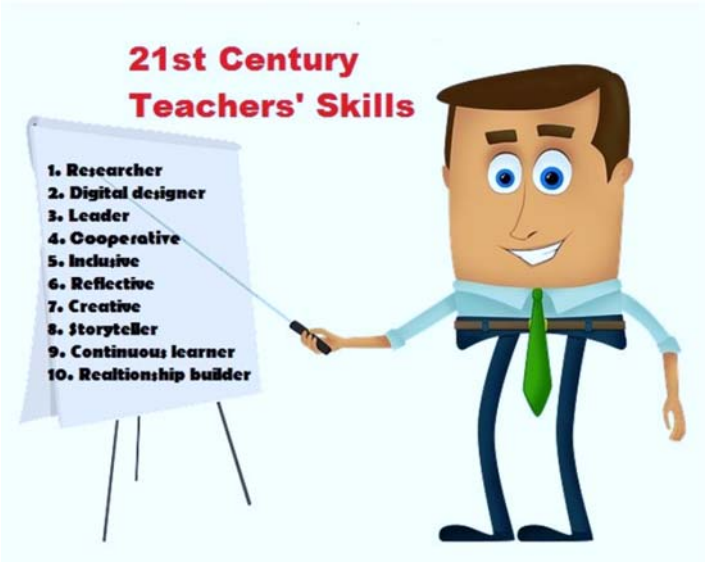
Gamification is such an effective approach which supposes the application of game principles and elements in a learning environment (EduTrends, 2016). Interactive media included games, digital video games and gamified applications, online open courses and platforms and gamified courses are such powerful and

Funded by the Erasmus+ Programme of the European Union

innovative tools with important advantages for instructive-education process. When are properly used, all these tools can maximize teaching and engagement of the students and encouraging them to continue learning.

Using gamification techniques stimulates students to consciously and actively participate in learning situations, enhances their motivation, helps them to search and research the new knowledge on their own and to find solutions to problems, get them a sense of goal achievement and mastery. Gamification is becoming a significant component for teaching-learning core contents to students in classroom.

It is important for teachers to know how to use the educational gamification in their courses. Applying gamification in educational process emphasizes action learning, brings students into direct contact with concrete real-life situations, makes positive changes in students' behaviors and attitudes toward learning, improves their motivation and engagement and effectively requires their critical thinking and imagination.



Nowadays, there is a need to prepare students for an active and creative life which supposes a greater participation in solving of the many complex problems of an information society. From this point of view, the traditional didactical approaches are not sufficient, and the education process requires the implement of the active–participatory didactical approaches in a larger extent.

Funded by the
Erasmus+ Programme
of the European Union

Teachers must be able to choose the most relevant elements of gamification for their students, and to apply these elements consistently in their courses, in a larger extent, aiming to immerse students in the learning process, enhance engagement, develop positive learning attitudes, and promote the acquisition of knowledge and skills in their students.

In education, attempts to efficiently implement gamification in teaching-learning activities may have low results due to the teachers' lack of expertise or experience. Therefore, it is necessary for teachers to acquire and develop a series of professional competences and abilities in order to enable them to experience the gamification tools in their teaching-learning activities. Such set of practical skills includes:

- ability to understand the concept, mechanics of the games and strategies for implementation of gamification in order to make the learners experience of education more engaging;
- ability to clearly define achievable and measurable learning objectives that underlie the educational activity and to explicitly present them prior to engaging gamification elements (Kolb, 2015);
- ability to design and carry out the gamified teaching-learning activities adapted to the specific interests of their students. The gamified education should be organized based on the active learning principles through creating flexible educational experiences aiming to improve students' skills;
- ability to prepare gamified educational contents which should be interactive, engaging and rich in multimedia elements;
- ability to adapt the learning activities to students' knowledge and skills, to increase the difficulty level and the required efforts in game-tasks and to create conditions for repeated performances (Simões, Redondo, & Vilas, 2013);
- ability to plan and organize the learning activities so that students can build their own strategies and achieve goals. So, teachers need to anticipate what knowledge and skills should be acquired by their students as a result of the task that they have to perform;

Funded by the
Erasmus+ Programme
of the European Union

- ability to objectively assess the students' progress, namely the acquired levels of knowledge and skills, and to lead their efforts in games in the direction of achieving a specific learning goal;
- ability to select various types of games for teamwork, building of trust, exploration, content consolidation, revision and development of creativity;
- ability to implement students' active learning through the combining the collaboration with competition between learners. Thus, teachers must be able to organize both independent activities that offer individual awards (such as badges) and interactive activities between learners that bring them collective and visible results (such as leaderboards) (Hsin-Yuan Huang & Soman, 2013). Unlike gamification stimulates the need of competition, the focus should be rather on developing cooperative learning and teamwork skills instead of competition between students. Cooperative games generate challenges and can be effective tools for encouraging active learning, teamwork and responsibility for the performance of the group;
- ability to create an educational gamification environment favorable for an effective learning process;
- ability to supervise and manage the students' behaviors and performances in challenging game environments;
- ability to combine gamification with traditional teaching methods. Albeit gamification is design to better engage students, not all students can perform on high levels in a gamified educational environment.

2.5. Applicability of gamification in real-life and entrepreneurial based situations

Author: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia); Marko Nikolić (FVB S.R.L. – The Hive, Italy)

2.5.1 Introduction

In 2012, according to the market research firm Gartner, it was forecasted that by 2014 over 70% of companies would have at least one gamified product, and by 2015 over 50% would have gamified innovation. Moreover, with 47% of

Funded by the Erasmus+ Programme of the European Union

implementations currently focused on user engagement, researchers found that enterprise is the largest market segment, consisting of 25% of the gamification market.

When talking about gamification, we should consider the demography of population. In fact, gamification is an effective way to engage and motivate "millennials," also known as "Gen Y", that represent the 65% of the US workforce (data of 2017). And, as noted by Jane McGonigal, this generation has typically spent 10,000 hours in gaming by age 21, about the same amount of time they have spent in school.

So, looking for a new way to engage, teach, reward, and retain employees, companies now turn to gamification when dealing with HR-related issues. In fact, gamified concepts have begun being incorporated in real-world processes such as recruitment, learning and development.

Talking about the different ways in which gamification can be implemented in a company, we should mention that this methodology is useful to the organization in establishing a learning culture, in find and fix knowledge gaps, in keeping employees updated on company policies and products, in making learning fun and effective, in promoting team building and training staff on new technology.

More in depth, gamification can be applied by companies in several ways. First of all, it can be used for training, for example to onboard new employees and retrain current employees. Secondly, in order to pick up team building, it can help in increasing trust and communication skills between insiders and new entrances, in encouraging collaboration and improving motivation. With the use of games, business results certainly improve, because it creates competition for knowledge, it promotes information sharing across teams and improves employee engagement.

2.5.2. How to apply gamification in companies

2.5.2.1 Gamification: searching for the best-case studies in the classroom

The main idea is as follows: a group of participants/students is transformed into *a simulated company.* Various objectives within the company help contribute to the overall purpose of the company namely, to produce an output of high

Funded by the
Erasmus+ Programme
of the European Union

quality in as little time as possible, by rational use or resources and human resources.

The main goal is to produce an intellectual or practical output and to be socially engaged in terms of contributions to the common good.

The type of a company: Ltd.-liability of members is limited to what they have invested or guaranteed to the company. Ltd. may be limited by shares or guarantee.

The advantages of this type of companies over sole traders are collaboration, shared responsibility, shares, costs, etc.

Indicators of a successful company are profit, a growing customer base, team satisfaction: developing a work environment that drives your team to be more progressive and productive and business owner satisfaction.

1. Preparation for the project which will be gamified:

The group is instructed about the goals and outcomes of the project, potential techniques which help us reach the aim, evaluation, recognition, and rewards.

The main aim/output of the simulated company may comprise different areas of school activities, e.g. technology and science, mathematics, practical lessons, etc. from finding solutions to simple problems to making simple objects or gadgets.

In the first phase brainstorming is introduced to establish how much participants already know about gamification and how they determine organizational skills.

In the next phase we set the rules, time frame and deadlines, sources (e.g., e-sources and traditional ones), resources, indicators of progress and rewards.

a. Rules: how many participants can collaborate in a simulated company), what is its organizational chart (from executives to other employees), what kind of work/assignments they carry out, when they can progress from one level to another.

b. Timeframe: duration of assigned tasks is agreed by consensus, depending on how broad and comprehensive the task is including possible obstacles (e.g., meagre sources).

c. Sources and resources: depending on the needs of a project.

Funded by the
Erasmus+ Programme
of the European Union

d. Indicators of a successful outcome of a project are quite challenging to define. As a simulated company we might opt for Results-Based Management which includes Key performance indicators, which are external: satisfaction of customers, internal: upgrading and improving quality, introduction of systemic solutions, innovations, personal and professional growth of participants-employees and their satisfaction and gaining new experience and knowledge. Therefore, it is important to introduce techniques to measure these indicators: e.g., by observation, keeping journals of "business" performance, questionnaires which are collected in an e- classroom, tests.

e. Rewarding and recognition: collecting badges in Moodle once the task is done and uploaded, which might lead to a final grade (if it is a classroom situation)

2. Analyzing the knowledge/skills of the participants-students:

a. Entry level situation is analyzed by means of testing and interviews and consequently potential roles of participants are distributed.

b. Knowledge and skills of participants are tested through discussion and testing.

c. Motivational elements are set in the form of badges or points that consequently lead to a final mark or grade. They might be set in Moodle when students upload their completed assignments. Another motivational element is competition, which is defined as an inborn potential which might evolve in a simulative social environment. Competition might be perceived as a positive trait which contributes to personal growth. Motivation is not only about winning but also about building awareness of one's own personal development.

3. Different ideas for gamification

Gamification techniques are chosen according to participants' prior knowledge of gamification and their own aspirations, which are tested by brainstorming. A good idea is to explore some examples of best practices which can be found on the internet or elsewhere. When deciding which type of gamification technique to choose it is important to bear in mind that the students' experience and motivation is crucial. Another idea is visualization: by drawing charts, tables the students might discuss and jot down the main ideas that will be gamified.

4. Planning the gamification approaches

Funded by the
Erasmus+ Programme
of the European Union

The situation that will be gamified is a *simulation of a company*. Accordingly, different roles should be distributed: every individual participant has its *own quest* and *levels of progress* according to the task that has to be carried out. There are four main areas:

Directors such as the Chairman, Executive Director, and non-Executive Director. They lead strategic business activities and have ultimate responsibility.

Corporate Officers can include the Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Information Officer (CIO) and others. They have specific areas of expertise and responsibility.

Managers are responsible for day-to-day running of specific areas of the business. Some organizations have more levels than others.

Employees are the largest group, carrying out essential functions as directed by managers.

A carefully designed structure can help a company work more effectively, because each of its "staff members" has their responsibility clearly defined.

Each member has to study what his/her appointed position in a company means, therefore they have to explore different sources, e.g., companies' profiles to establish what tasks and duties they carry out: this will be their first assignment; when done it will be uploaded into e-classroom and later assessed.

5. Implementation of gamification approaches

The implementation is based on all previous activities. The roles are distributed according to students' preferences and aspirations. They have already set a goal (an outcome, a product, a completed task or assignment), which is their quest. They also agree on how many levels they have to reach. The roles and the tasks were distributed by consensus.

Focal points in assignments are as follows:

- deadlines, timeframe (set in Moodle)
- project management (who, what and how), distribution of tasks, quality control
- outcomes (if they have reached the desired quality and standards).

6. Evaluation and testing

Funded by the
Erasmus+ Programme
of the European Union

Before you are able to measure the effectiveness of your project, you need to determine if the project has been run as planned and if it has reached the expected outcome.

During the process of evaluation, you should answer the following questions:

- Has the project reached the participants' expectations?
- Are participants satisfied with all aspects of the project?
- Has the gamified project reached the objectives set at the beginning?
- Have all the activities been implemented as planned? If not, why?
- Has this approach improved the way students learn and gain new knowledge and skills?

Evaluation is carried out by observation (by teachers or selected students), peer-evaluation or self-evaluation. They have to establish whether the gamified environment contributed to a successful outcome as stated in **1.d** (indicators of a successful outcome).

7. Monitoring

Monitoring is always systematic and is carried out during the project implementation by observation. It has to establish if the tasks and activities lead towards progress and positive results. Moreover, it has to indicate whether the strategy in project implementation is a success or failure and if the activities have any impact on the interactions.

Funded by the
Erasmus+ Programme
of the European Union

Chapter 3: Didactic methodology framework outlined

Authors: Lorena Mihelač (Šolski Center Novo Mesto, Slovenia); Juan C. Vidal and Manuel Lama (Universidad de Santiago de Compostela, Spain); Cristina-Corina Bențea, Adriana Petrescu, Ciprian Vlad („Dunărea de Jos" University of Galati, Romania); Marko Nikolić (FVB S.R.L. – The Hive, Italy); Virginia Rosania and Claudia Ponsiglione (Prism Consulting S.r.l., Italy)

MODULE 1	**Theoretical and practical backgrounds of gamification**
Unit 1.1	A short introduction to gamification
Unit 1.2	Identifying the benefits of gamification in VET education
Unit 1.3	Differences and similarities between game-based learning and gamification
Unit 1.4	From the identification of an idea toward the gamification
Unit 1.5	Gamification and eLearning

Funded by the Erasmus+ Programme of the European Union

STRUCTURE OF MODULE 1 – THEORETICAL AND PRACTICAL BACKGROUNDS OF GAMIFICATION					
Unit 1.1	***Content of the Unit***	***Expected Learning Outcomes***	***Length of the Unit***	***Learning Topics***	***Learning Materials***
	A short introduction to gamification	- Understanding about what gamification is and what not - Understanding the difference between game designer and game player - Understanding about how business problems and other challenges can be approached with gamification	- ... hours - … min per video	- Defining gamification (in general) - Defining gamification in education - The science behind gamification - Cognitive enhancement and gamification - Causes and best response - Gamification approaches from the point of age, knowledge, cultural background …	Video, additional material (ppt, articles …)
Unit 1.2	Identifying the benefits of gamification in VET education	- Understanding how gamification enriches learning achievement, knowledge (declarative, procedural), and higher order thinking skills - Understanding the impact of gamification on values, appreciation, enthusiasm, motivation, and attitudes - Understanding the impact of gamification of physical movement, coordination, and the	- ... hours -… min per video	- Cognitive domain - Affective domain - Psychomotor domain	Video, additional material (ppt, articles …)

Funded by the Erasmus+ Programme of the European Union

		use of motor-skill areas - Understanding the pro and contra about gamification			
Unit 1.3	Differences and similarities between game-based learning and gamification	- Understanding the essential differences and similarities between gamification and game-based learning (GBL) - Understanding the human needs (to collect, compete and succeed) - Understanding the necessity for a variable approach depending on type of training, goals, and human (individual/company) needs	- ... hours -… min per video	- Gamification vs game-based learning (GBL): defining differences and similarities - Types of training and gamification vs GBL - Goals, human needs (individual/company), and gamification vs GBL	Video, additional material (ppt, articles …)
Unit 1.4	From the identification of an idea toward the gamification	- Understanding the behavior, needs, and expectations of Gen Z - Understanding how to apply the essential parts of the proposed methodology in VET education	- ... hours -… min per video	- Cyber generation (Gen Z) – specificities - Applying gamification methodology: • Preparation • Analysis • Game-design • Planning of gamification approaches and prototypes • Implementation • Evaluation and testing	Video, additional material (ppt, articles …)
Unit 1.5	Gamification and eLearning	- Understanding that gamification should help in achieving the learning objectives - Understanding that gamification is	-... hours -… min per video	- Learner-centered eLearning - Gamification as design sensibility - Relevance of content and real-life scenarios	Video, additional material (ppt, articles …)

Funded by the Erasmus+ Programme of the European Union

		focused not on technology but on content and design - Understanding that the content is relevant, and that gamification should be applied to real-life situations - Understanding that not all game mechanics and game dynamics elements are applicable in the education area			

Funded by the Erasmus+ Programme of the European Union

MODULE 2	Application and benefits of the gamification to entrepreneurial teaching
Unit 2.1	Gamification mechanics
Unit 2.2	Gamification dynamics
Unit 2.3	Gamification aesthetics
Unit 2.4	Toward developing teacher's skills in gamification
Unit 2.5	Applicability of gamification in real-life and entrepreneurial based situations
Unit 2.5.1	Gamification: searching for the best-case studies in the classroom - ŠCNM: best-case study 1 - ŠCNM: best-case study 2

STRUCTURE OF MODULE 2 – APPLICATION AND BENEFITS OF THE GAMIFICATION TO ENTREPRENEURIAL TEACHING

Unit 2.1	***Content of the Unit***	***Expected Learning Outcomes***	***Length of the Unit***	***Learning Topics***	***Learning Materials***
	Gamification mechanics	- Understanding gamification mechanics as the foundational aspects of gamified experience - Understanding game mechanics in relation to elements of the game system, player experience, game hardware … - Understanding elements of game mechanics applied in different game contents - Understanding how game mechanics are used as building blocks in the well-known games	-... hours -… min per video	- Defining game mechanics (in general) - Defining elements of game mechanics (quantity, spatial, state, action) - Curated list of game mechanics (points, badges, leader boards, relationships, challenge, constraints, journey, narrative, emotion)	- Video, additional material (ppt, articles …)

Funded by the Erasmus+ Programme of the European Union

Unit 2.2	Gamification dynamics	- Understanding the difference between game mechanics and game dynamics (setting up the game mechanics by game designers vs game dynamics by players) - Understanding how to address individual motivations of learners by tailoring game mechanics - Understanding what can be achieved when both game mechanics and dynamics are applied in the right manner	-... hours -… min per video	- Defining game dynamics (in general) - Who designs game mechanics and who game dynamics? - Types of player behavior: anticipating types of dynamics (describing in-game behaviors and strategic action/interactions emerging during the playing of game)	- Video, additional material (ppt, articles …)
Unit 2.3	Gamification aesthetics	- Understanding that digital games exists in the domain of art and aesthetic experience - Understanding that the players perception and sensation of each game is impacted by its visual/auditive components - Understanding that (digital /non digital) games share certain content, themes, design practices, forms, aims with other media and art forms - Understanding that games can be approached as artifacts and generate an aesthetic experience	-... hours -… min per video	- Are games art? - Sensory phenomena - Aspects of (digital/non digital) games shared with other art forms - Game aesthetics as an expression of game experienced by the player	- Video, additional material (ppt, articles …)

Funded by the Erasmus+ Programme of the European Union

Unit 2.4	Toward developing teacher's skills in gamification	- Understanding that teachers have to be self-motivated and prepared to for technology challenges - Understanding that traditional didactical approaches and methods are not sufficient for the generation Gen Z - Understanding that a gamified educational environment demands from a teacher superior interpersonal, collaborative, creativity, and presentation skills combined with personal and professional experiences	-... hours -… min per video	- Conquering technology - Conquering new techniques in engaging and motivating digital learners - Gamified educational environment and teacher's skills	Video, additional material (ppt, articles …)
Unit 2.5	Applicability of gamification in real-life and entrepreneurial based situations	- Understanding that gamified situations/environments can transform individuals' relations with policies, products, services, and everything that can be tracked, monitored, and modeled into game-space - Understanding that a gamified alternative reality can improve the experience of real life - Understanding that gamified situations can improve the quality of life (in general)	-	- Game design and power: transforming individuals' relations with the "outside world" - From a gamified alternative reality toward the "real" reality - From gamified business organization experiences toward educational solutions in engaging students	- Video, additional material (ppt, articles …)
Unit 2.5.1	Gamification: searching for	- Understanding that real-life situations and	-... hours	- Real-life examples	- Video, additional

Funded by the Erasmus+ Programme of the European Union

	the best-case studies in VET education - ŠCNM: best-case study 1 ŠCNM: best-case study 2	company environments are better experienced when being gamified	- … min per video	transitions into personal use and experience - Gamified company environment in classroom	material (ppt, articles …)

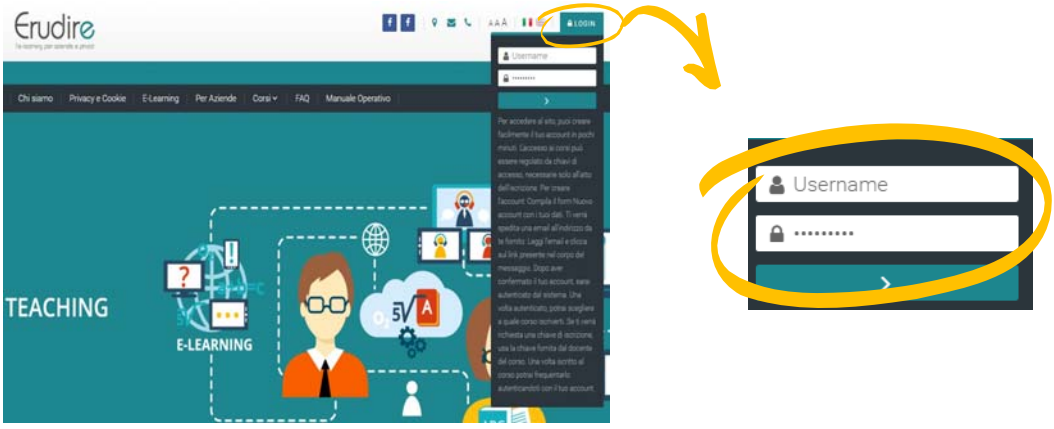
Funded by the Erasmus+ Programme of the European Union

Chapter 4: E-learning Platform Technical Manual

Authors: Virginia Rosania and Claudia Ponsiglione (Prism Consulting S.r.l., Italy); Cristina-Corina Bențea, Adriana Petrescu, Daniela Mioara Rotaru, Ciprian Vlad („Dunărea de Jos" University of Galati, Romania); Lorena Mihelač (Šolski Center Novo Mesto, Slovenia); Juan C. Vidal and Manuel Lama (Universidad de Santiago de Compostela, Spain); Marko Nikolić (FVB S.R.L. – The Hive, Italy)

4.1 Platform user registration

To view the audio-visual products created for the GAMEST project, you need to register on the "E-learning platform at http://www.erudire.it/ by logging in at the box in the top right hand corner as shown as follows:



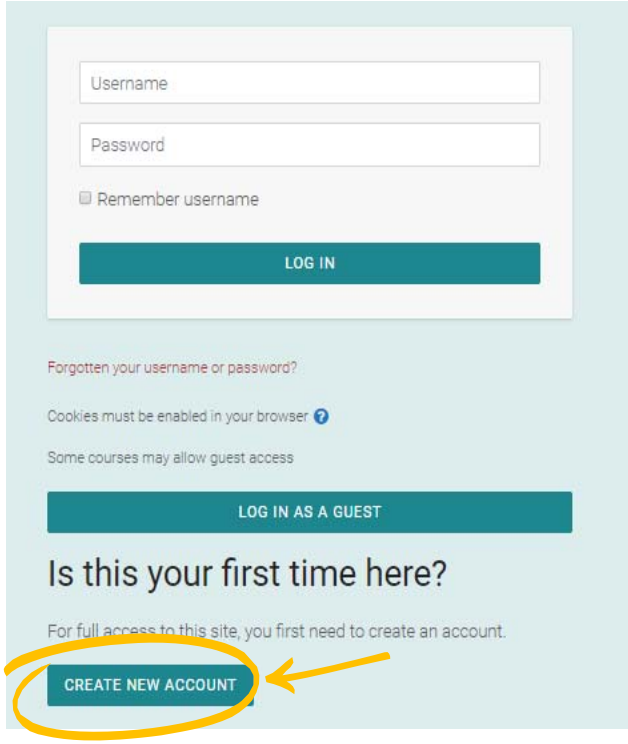
Funded by the Erasmus+ Programme of the European Union

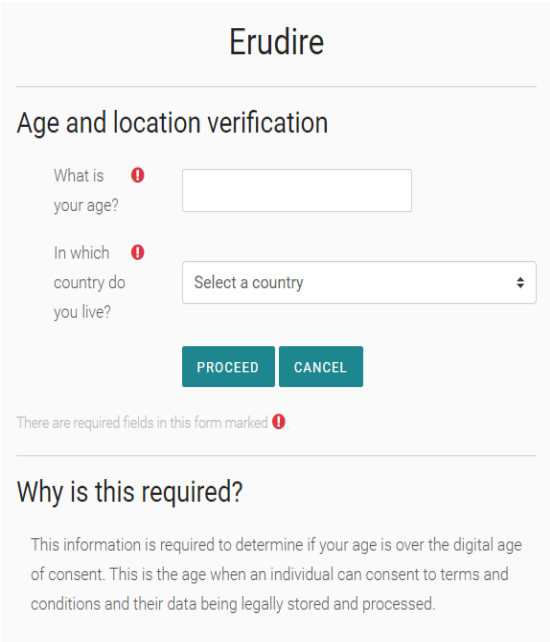
Create an account

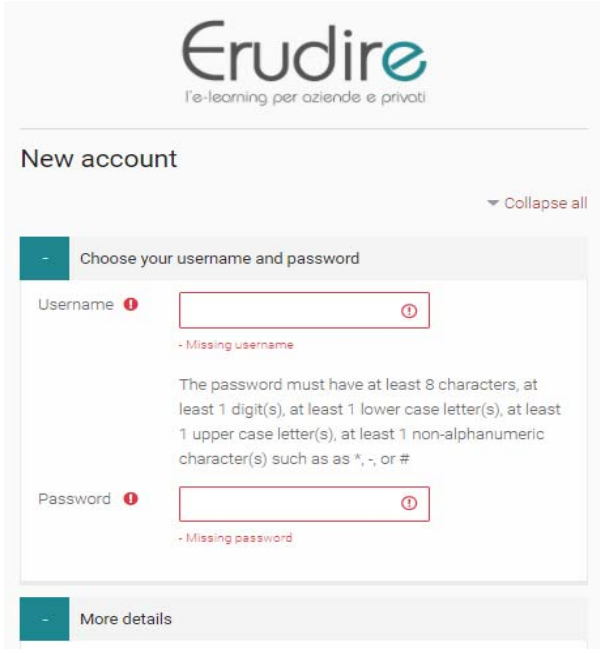
If you do not have access credentials, you need to register, by clicking on «create an account» on the homepage of the platform.

After you have clicked on ”create an account”, you need to follow the registration procedure available.

Then complete the boxes with the information required.





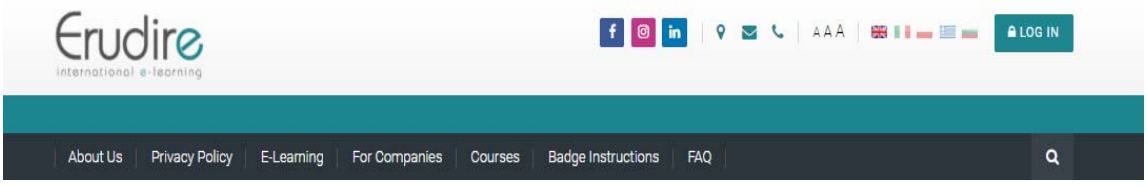


Funded by the Erasmus+ Programme of the European Union

Please bear in mind to:

- Complete the "New account" form with the data requested.
- An email will be sent to the address you provided
- If you do not receive the email, please check your spam folder before contacting us
- Read the email and click on the link contained in the message
- After confirming your account, you will be authenticated by the system
- Once authenticated, you will be able to choose which course to register for
- When you reset the password, please remember that the link received by email is valide only for 30 minutes

To choose the navigation language, all you need to do is select it from the menu bar.



After having logged in with the credentials you have or those you have created, you need to click on the «enter» tab of the «International Projects» course category in the homepage of the platform and choose «GAMEST»

GAMEST

The Project **GAMEST – "GAMification tEchniqueS for entrepreneurial vet Teachers"**, identifies in gamification an innovative vehicle to teach entrepreneurial contents, increasing learners' engagement in the subject matter.

The General **Objective** of this project is to **support the promotion of high-quality and innovative teaching based on the application of gamification strategies.**

ENTER THIS COURSE

Then click on it

Funded by the Erasmus+ Programme of the European Union

4.2 E-learning platform instructional design

Instructional Design:
From learning pills to Movie education

What is Instructional Design?

In short, instructional design is the process by which learning products and experiences are designed, developed, and delivered.

These learning products include online courses, instructional manuals, video tutorials, learning simulations, etc. Instructional designers are the 'architects' of the learning experience and the 'directors' of the Instructional Systems Design ISD process.

Funded by the
Erasmus+ Programme
of the European Union

What is Instructional Design?

Instructional designers create and deliver learning products for business, higher education, and government organizations.

Instructional designers are in high demand worldwide, as organizations are turning towards instructional designers to solve business performance problems through the delivery of effective learning experiences.

Basic Components of Instructional Design

While there are a number of instructional design models and processes, many of their components are similar. They include analysis, design, development, and evaluation.

Analysis

A needs analysis typically includes understanding the needs and learners including why a training or learning solution is required. It may be the case that training is not the solution and some other type of performance improvement or non-training solution will be recommended. In this stage, you'll also begin to develop the goals of the training, including learning objectives, and determine how the training will be delivered.

Funded by the
Erasmus+ Programme
of the European Union

Basic Components of Instructional Design

While there are a number of instructional design models and processes, many of their components are similar. They include analysis, design, development, and evaluation.

Design & Development

Design and development includes the actual design and development of the instructional materials or determining the delivery methods to be used. It often includes drafting curriculum and lesson plans, developing any instructional materials including presentations, e-learning, job aids, participant guides, and anything else to be used in the training.

Basic Components of Instructional Design

While there are a number of instructional design models and processes, many of their components are similar. They include analysis, design, development, and evaluation.

Evaluation

Evaluation looks at how you determine if your training or learning solution was successful. Did it create a measurable impact on the learner's behavior and did that lead to the desired results back on the job?

Funded by the Erasmus+ Programme of the European Union

What does Open Education Resources have to be like to generate learning?

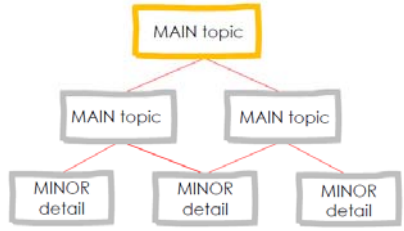
The OERs will be created bearing in mind the following aspects:

- pleasantness of use
- multiplicity of solutions adopted
- attractiveness, to capture learners' attention and favour sharing
- accessibility from any device
- Interactivity
- usefulness, to solve a problem or satisfy a need for knowledge/skills.

Instructional Design Principles

Coherence Principle

The training material is improved when extraneous facts are excluded



- Limit the number of details provided
- Exclude details that are interesting or amusing, but which may distract learners from the key principles that need to be learned

Funded by the Erasmus+ Programme of the European Union

Instructional Design Principles

Segmenting Principle

The training material is improved when it is segmented into short units

- Avoid long forms
- Focus on sequence of short chunks
- Focus on one topic at a time

Instructional Design Principles

Signaling Principle

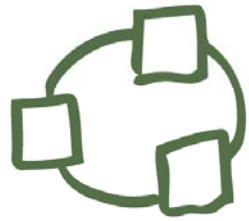
Learning is enhanced when explicit suggestions are given to emphasize or point out important content

Funded by the Erasmus+ Programme of the European Union

Instructional Design Principles

Pretraining Principle

Learning is facilitated when key concepts covered by the path are provided, before starting with the actual content



Ex. explain the names used and the characteristics of the main concept, a story to start, show the objectives of the lesson, a graphic representation that schematizes and introduces topics

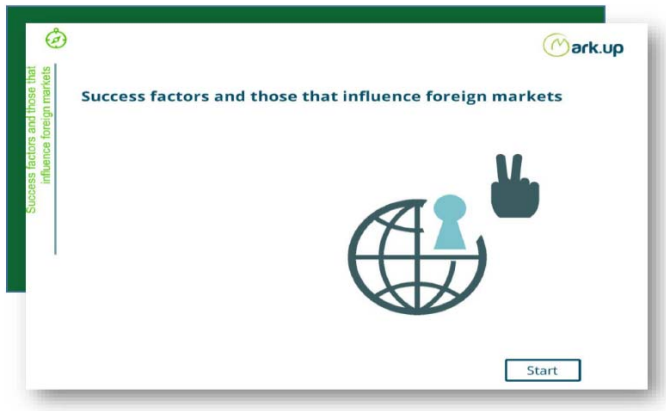
Instructional Design Principles

Personalization Principle

Learning is facilitated when a conversational style is used instead of a formal one

Funded by the Erasmus+ Programme of the European Union

From visual thinking…



… To motion graphic and interactivity

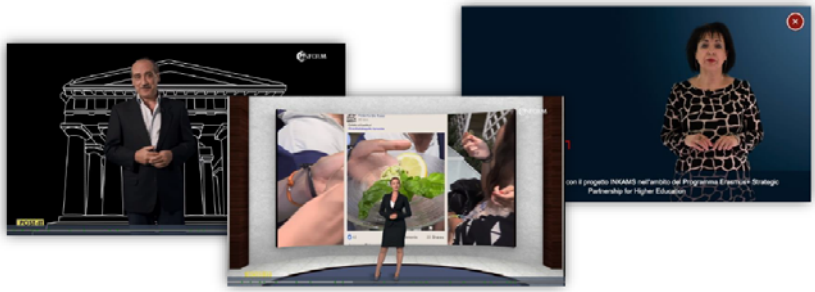
The Interactive Training Video pills

Funded by the
Erasmus+ Programme
of the European Union

STRUCTURE

Educational video: Interactive video training pills

- Introduction: of a maximum duration of 1 minute, created using Motion Graphics, with a series of images that summarise the topic
- Creation in the Studio: Use of the "Chroma Key" with the application of computer graphic and motion graphic solutions.



STRUCTURE

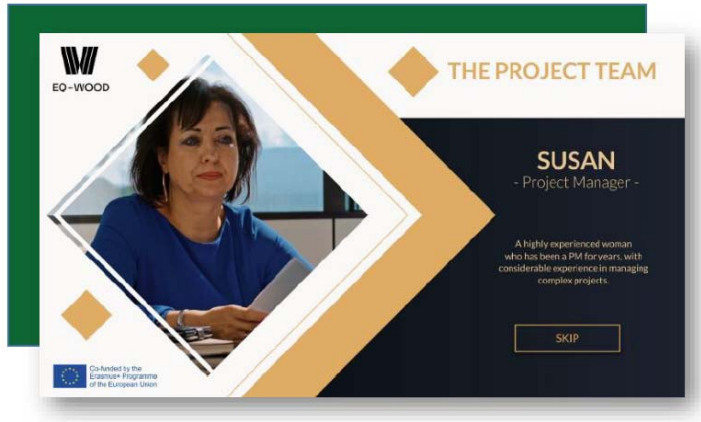
- Use of Interactivity

possibility of accessing the in-depth information recalled by the trainer/presenter in the video to cover the other aspects not included in the OER and which constitute the knowledge baggage that the target Curriculum defined by the partnership, which will allow the viewer to temporarily interrupt the episode and, through the hotspots inserted on the time-line of the video, recalled by specific "Key Words", to access the different training contents provided thanks to which you can:

- ✓ download an in-depth pdf or ppt
- ✓ access a thematic website and/or a portal of the institution and/or reference body
- ✓ watch a further video and/or slideshow of photographs
- ✓ listen to an interview and/or other multimedia content

Funded by the
Erasmus+ Programme
of the European Union

From edutainment…



The Interactive Training Videos with branching narratives

Interactive Training Videos with branching narratives

Users can access one or more branched scenarios, which, thanks to the use of small video clips, shot in first and third person, allow them to make choices that will influence the course of the story, thus being able to verify the consequences of the behaviours acted/chosen in a cause/effect logic.

Funded by the
Erasmus+ Programme
of the European Union

Interactive Training Videos with branching narratives

During the viewing of the interactive videos with narrative branches, questions are proposed regarding the possible decisions to be taken on the circumstance simulated by the actors on stage.

The answers chosen by the user will open, from time to time, a different training scenario, including positive/negative feedback, which will lead him/her to the conclusion of the story, acquiring greater awareness of his/her knowledge on the subject.

...To educational TV Programme

The Educational TV Programme

Funded by the
Erasmus+ Programme
of the European Union

...To educational TV Programme

In line with the most recent logics of entertainment and learning personalization, it adopts and integrates streaming and interactivity models as distinctive elements, which allow users to choose if and when to access the different types of content provided and how to modulate their learning paths according to their needs.

The episodes of the programme alternate sessions in the studio, in which the presenter introduces the different topics with simple and captivating language, with interviews with teachers and experts and short video clips which act as a bridge between the "informative" session and the actual formative one.

Funded by the
Erasmus+ Programme
of the European Union

… and finally

MOVIE EDUCATION

a registered CONFORM methodological model

What is it?

MOVIE EDUCATION (©CONFORM) is a methodological model - registered format, stems from the need to use Entertainment to activate interest and become a driver of engagement in training activities.

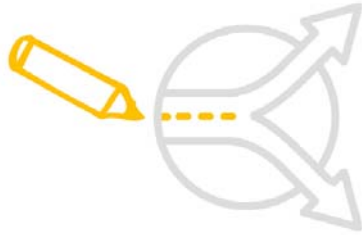
Funded by the Erasmus+ Programme of the European Union

Methods

After years of testing, two key methodologies have been highlighted that are based on Movie Education and have as many training models:

Methods

By applying linear storytelling techniques and / or branching narratives, with the production of movies or cartoons in 2D or 3D, Movie Education allows you to surpass the rigidities and space-time constraints of classic training models, based on classroom teaching and/or on e-learning, which conceive the learner as a party called only to make use of "given" didactic contents (top-down), to allow him/her, instead, to interact with the product, with a greater degree of emotional involvement



Funded by the Erasmus+ Programme of the European Union

Short Movie Laboratory

The Short Movie Lab is a training course that enables students to make their own video and it is able to train them on three levels:

In the first phase, they must learn the notions of what they will enact on stage, regardless of the subject in question (e.g. Economics, Management, Cultural Heritage, etc.) to write the script.
These notions will not be transferred as theoretical training but as practical learning aimed at video production and will facilitate the acquisition of know-how.

Short Movie Laboratory

In the production phase, they will learn the principles and methodology of audiovisual production by acquiring the main video editing and acting techniques that will allow them to realize their own audiovisual production

Funded by the
Erasmus+ Programme
of the European Union

Short Movie Laboratory

In the acting phase, they will have the opportunity to emulate Behavior related to the topics covered, completing training consisting not only of notions but also of behavioral simulations activated by emulating roles.

Audiovisual Production

Audiovisual production companies develop their own productions (short-films, TV series, films or other) whose added value is represented by a cinematographic plot (entertainment) that through the comic genre or empathy involves the viewer and, at the same time, transfers educational content (education) thanks to four USPs (Unique Selling Propositions)

Funded by the
Erasmus+ Programme
of the European Union

Audiovisual Production

Like cartoons and video games, the fact that the product is entertaining and the images are fictional allows the viewers to relax and absorb educational content better

The keywords repeatedly present in the script are imprinted in the viewers mind and he/she better understands their importance

Audiovisual Production

The characters' behaviour educates the viewer on the correct way to act in certain situations, giving added value to the training model

This methodology can be further enhanced by adding interactions where the keywords are not only highlighted by the actors but become clickable buttons and videos that allow users to access further investigation materials (such as documents, videos, audio files, images or external links).

Funded by the
Erasmus+ Programme
of the European Union

5 to Succeed – What is it?

It is an educational web series that combines entertainment and learning, focusing on the movie education methodological model as a reference to immediately convey technical knowledge, together with negotiation, relational, decision-making, creative and entrepreneurial qualities to start-up and manage small businesses.

Web series and Tv series

Similitarities

episodic scanning

re-proposition of established cinema and TV genres

Differences

language based on the communication characteristics of the Net

access in multi-device mode (pc, tablet, smartphone)

Why movie education?

It combines a balanced mix of entertainment and learning, through an interactive, filmic approach, that:

promotes a more effective and conscious assimilation of knowledge and the adoption of emulation behaviour

exploits the potential of new digital technologies, to engage and enthuse viewers and to direct them to technical second-level further investigation, which can be accessed by using interactive tools.

Funded by the Erasmus+ Programme of the European Union

5 to Succeed – Methodology

Movie education guarantees the following three learning dimensions:

1. cognitive ("knowledge"), thanks to the possibility offered to the spectator-learner, whilst watching the episodes, to access and use second-level, in-depth content through hot spots that refer to interactive elements, recalled by the key words contained in the dialogues

2. operational ("know-how"), through the "interpretation" of the different practical phases of the business idea, business modelling, planning and management again, thanks to clicking on hotspots, allows you to access operational tools

3. behavioural ("know how to act"), with the ability to observe skills into practice, allowing the viewer to reflect on entrepreneurial behaviours, identifying errors to avoid and the virtues to be emulated.

5 to Succeed – Methodology

Elements of methodological innovation:

Funded by the Erasmus+ Programme of the European Union

5 to Succeed – Why movie education?

It allows one to overcome the traditional model of training on entrepreneurship and finance, in its classical configurations, typical of classroom teaching and e-learning, that conceives learners as passive subjects, only called upon to access "given" didactic contents (top-down), which does not favor memorization over time

The web-series is able to satisfy viewers' needs to interact directly with fiction with a high degree of emotional involvement, thus, confusing levels between reality and fiction

Entrepreneurial skills become a liquid asset that, through interactivity, overcomes the rigidity and space-time constraints of traditional training

5 to Succeed – Steps for implementation

1 Writing of the original subject

a short draft that tells the story of the film, succinctly providing an idea of times, places and characters

2 Treatment and outline

wider narration of the subject, which can resemble a literary story, containing a description of places, psychological motivations of the characters and some indication of dialogue

3 Script writing

first and fundamental step in the realization of all cinematographic works, television fiction and web series

Funded by the Erasmus+ Programme of the European Union

5 to Succeed – Steps for implementation

4 Choice of the cast

i.e. the actors who interpreted the scenes in Italian of the web series episodes subtitled in English

5 Pre-production

Sorting through the screenplay
Choice of locations
Storyboard

6 Processing

This phase is when the web series goes into production, that is when the scenes of each episode are physically shot

5 to Succeed – Steps for implementation

7 Creation of individual media

This step is foreseen to choose the individual media used and combined to maximize the visual, graphic, narrative and emotional impact of each Web series episode, by virtue of a strong contamination between digital, graphic and expressive factors and narratives

8 Post-production

the last production phase and includes the moments of the realization process after shooting, when the web series episodes are mounted and assembled

Funded by the
Erasmus+ Programme
of the European Union

5 to Succeed – To sum up

The web series can be watched as:

- a film and, thus, experienced as entertainment
- a learning tool that allows viewers to create their own learning path by accessing a plurality of open resources and materials by initiating a movie education process and associating entertainment to edutainment understood in a broad sense and referring to the development of all the constituent elements of entrepreneurial skills:

behaviour - given by the scenes of the film

knowledge - materials sought/products

abilities - tools

Funded by the
Erasmus+ Programme
of the European Union

Funded by the
Erasmus+ Programme
of the European Union

References

Adams, E. & Dormans, J. (2012) Game mechanics: Advanced Game Design, Berkeley: New Riders.

Brito, J., Vieira, V., & A. Duran, A. (2015). Towards a Framework for Gamification Design on Crowdsourcing Systems: The G.A.M.E. Approach. In: *Proceedings of the 12th International Conference on Information Technology - New Generations (pp. 445–450)*. Las Vegas: IEEE.

Burke, B. (2014). Gamify: how gamification motivates people to do extraordinary things. Gartner, Inc.

de Marcos, L., Garćia-López, E., Garćia-Cabot, A., Medina-Merodio, J-A., Domínguez, A., Martínez-Herráiz, J-J., & Diez-Folledo, T. (2016). Social Network Analysis of a Gamified e-Learning Course: Small-world Phenomenon and Network Metrics as Predictors of Academic Performance. *Computers in Human Behavior*, *60,* 312-321.

Deterding, S. (2015). The Lens of Intrinsic Skill Atoms: A Method for Gameful Design. *Human–Computer Interaction, 30*(3-4), 294–335.

Dicheva, D., Dichev, C, Agre, G., & Angelova, G. (2015). Gamification in Education: A Systematic Mapping Study. *Journal of Educational Technology & Society 18*(3), 75-88.

Dignan, A. (2011). *Game frame: Using games as a strategy for success*. New York: Free Press.

EduTrends. (2016). Gamification. Available from: https://www.observatorio. itesm.mx/edutrendsgamificacion.

Enders, B. (2013). Gamification, games and learning: What managers and practitioners need to know. Santa Rosa: The e-learning Guild.

Finneran, C. M., & Zhang, P. (2003). A person–artefact– task (PAT) model of flow antecedents in computer mediated environments. *International Journal of Human-Computer*

Funded by the Erasmus+ Programme of the European Union

Studies, 59(4), 2003, pp. 475–496Glover, I. (2013). Play as you learn: Gamification as a technique for motivating learners. In: *Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications, (MHT' 13), AACE, (pp. 1999-2008).*

Francisco-Aparicio, A., Gutiérrez-Vela, F. L., Isla-Montes, J. L. &. González-Sánchez, J. L. (2013). Gamification: Analysis and Application. In: Penichet et al. (Eds*), New Trends in Interaction, VR and Modeling* (*pp. 113–126).* London: Springer.

Glover, I. (2013). Play as you learn: Gamification as a technique for motivating learners. In: *Proceedings of the World Conference on Educational Multimedia, Hypermedia and Telecommunications, (MHT' 13), AACE (*pp.1999-2008)

Hamari, J., & Koivisto, J. (2015). Why do people use gamification services*? International Journal of Information Management, 35*(4), 419-431.

Herger, M. (2014). *Enterprise Gamification: Engaging people by letting them have fun.* Leipzig: CreateSpace Independent Publishing Platform.

Herzig, P., Ameling, M., Wolf, B., & Schill, A. (2015). Implementing Gamification: Requirements and Gamification Platforms. In Reiners, T. & L.C. Wood, (Eds.), *Gamification in Education and Business* (pp. 431–450). New York: Springer International Publishing.

Hsin-Yuan Huang, W., Soman, D. (2013). Gamification of Education. Toronto: University of Toronto. Retrieved from Inside Rotman: http://inside.rotman.utoronto.ca/behaviouraleconomicsinaction/files/2013/09/ GuideGamificationEducationDec2013.pdf.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004) MDA: A Formal Approach to Game Design and Game Research. In: *Proceedings of the Challenges in Games AI Workshop,*

Funded by the Erasmus+ Programme of the European Union

Nineteenth National Conference of Artificial Intelligence. San Jose: AAAI Press.

Hunicke, R., LeBlanc, M., & Zubek, R. (2004). MDA: A formal approach to game design and game research. In Proceedings of the Challenges in Games AI Workshop, Nineteenth National Conference on Artificial Intelligence. San Jose, CA.

Huotari, K., & & Hamari, J. (2006). A definition for gamification: anchoring gamification in the service marketing literature. *Electronic Markets*, *27*(1), 21-31.

Kapitzke, C. (2006). Internet chatrooms: E-space for youth of the risk society. In Hin, L. T. W. & R. Subramaniam (Eds.), *Handbook of Research on Literacy in Technology at the K-12 Level* (pp. 158-175). London: Idea Group Reference.

Kim, S., Song, K., Lockee, B., & Burton, J. (2018). *Gamification in Learning and Education.* Nottingham: Springer.

Knaving, K., & Björk, S. (2013). Designing for fun and play. In*: Proceedings of the 1st International Conference on Gameful Design, Research, and Applications – Gamification* (*pp. 131–134)*. Stratford: ACM Press.

Kolb, L. (2015). Epic fail or win? Gamifying learning in my classroom. *Edutopia*, 1-5. Retrieved from http://www.edutopia.org/blog/epic-fail-win-gamifying-learning-liz-kolb.

Lundgren, S., Bergström, K. J., & Björk, S. (2009). Exploring aesthetic ideals of gameplay. In: *Breaking New Ground: Innovation in Games, Play, Practice and Theory, Proceedings of DiGRA.* London: DiGRA.

Martí-Parreño, J., Méndez-Ibáñez, E., & Alonso-Arroyo, A. (2016). The Use of Gamification in Education: A Bibliometric and Text Mining Analysis*. Journal of Computer Assisted Learning*, *32*(6), 663-676.

Muntean, C. I. (2011). Raising engagement in e-learning through gamification. In: *The 6th International Conference on Virtual*

Funded by the Erasmus+ Programme of the European Union

Learning ICVL (pp. 323-329). Bucharest: Bucharest University Press.

Nah, F. F.-H., Zeng, Q., Telaprolu, V. R., Ayyappa, A.P., & Eschenbrenner, B (2014). Gamification of education. In: Nah F.FH. (Ed.), *HCI in Business* (pp. 401-409), New York: Springer.

Niedenthal, S. (2009). What we talk about when we talk about game aesthetics. In: *Proceedings of the 2009 DiGRA International Conference: Breaking New Ground: Innovation in Games, Play, Practice and Theory.* Brunel: Brunel University.

Saavedra, A. R., & Opfer, V.D. (2012). *Learning 21st-century skills requires 21st-century teaching.* Bloomington: Phi Delta Kappan.

Schonfeld, E. (2015). SCVNGR's secret game mechanics playdeck. AOL Inc.

Simões, J., Redondo, R.D., & Vilas, A.F. (2013). A social gamification framework for a K-6 learning platform. *Computers in Human Behavior*, 29(2), 345-353.

Simpson, E. (1972). The psychomotor domain. Washington DC: Gryphon House.

Strmečki, D., Bernik, A., & Radosevic, D. (2015). Gamification in E-Learning: Introducing Gamified Design Elements into E-Learning Systems. *Journal of Computer Science* 12(11), 1108-1117.

Su, B., Bonk, C.J., Magjuka, R.J., Liu, X., & Lee, S.H. (2005). The importance of interaction in web-based education: A program-level case study of online MBA courses. *Journal of Interactive Online Learning*, 4(1), 1-19.

Urh, M., Goran, V., Eva, J., & Rok, P. (2015). The model for introduction of gamification into e-learning in higher Education. *Procedia-Social Behav. Sci., 197*, 388-397.

Werbach, K., & Hunter, D. (2012*). For the win: How game thinking can revolutionize your business*. Philadelphia: Wharton Digital Press.

Funded by the Erasmus+ Programme of the European Union

Williams, K., & Williams, c. (2011). Five key ingredients for improving motivation. Research in Higher Education Journal, ll. Retrieved from: 1. http://aabri.com/manuscripts/11834.pdf

Winslow, C. (2009). Comparing theoretical frameworks in Didactics of Mathematics: The G-O-A-model. *Proceedings of CERME 6, January 28th-February 1st, 2009, Lyon France,* 1675-1684.

Wongso, O., Rosmansyah, Y., & Y. Bandung, Y. (2014). Gamification framework model, based on social engagement in e-learning 2.0. In: *Proceedings of the 2nd International Conference on Technology, Informatics, Management, Engineering and Environment, Aug. 19-21, IEEE* (pp. 10-14). Bandung: Xplore Press.

Zichermann, G., &. Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps.* Sebastopol: O'Reilly Media. Inc.

Internet Source:

https://alessandropagano.net/blog/gamification-e-game-based-learning-ostacoli-e-opportunita/ (sitography)

https://blog.mindresearch.org/blog/game-based-learning-vs-gamification#:~:text=based%20Learning%20vs.-,Gamification,to%20the%20traditional%20instruction%20method. (image 1)

https://www.savethechildren.it/blog-notizie/game-based-learning-gamification-e-didattica-cosa-sono

https://trainingindustry.com/articles/learning-technologies/game-based-learning-vs-gamification-do-you-know-the-difference/#:~:text=Game%2Dbased%20learning%20is%20training,objectives%20and%20makes%20it%20fun.&text=Gamification%20is%20the%20application%20of,behavior%20and%20drive%20learning%20outcomes.

https://blog.capterra.com/gamification-vs-games-based-learning/

Funded by the Erasmus+ Programme of the European Union

https://uwaterloo.ca/centre-for-teaching-excellence/teaching-resources/teaching-tips/educational-technologies/all/gamification-and-game-based-learning
https://inservice.ascd.org/the-difference-between-gamification-and-game-based-learning/
https://www.hurix.com/difference-between-game-based-learning-and-gamification/
http://gamithing.altervista.org/serious-games-vs-gamification/
https://www.kallo.it/4-esempi-di-gamification-ben-riusciti/
http://www.net-expert.it/5-esempi-di-gamification-comunicazione-interna-azienda/
https://www.worldgovernmentsummit.org/api/publications/document?id=2b0d6ac4-e97c-6578-b2f8-ff0000a7ddb6
https://amslaurea.unibo.it/8273/1/Gordini_Veronica_tesi.pdf
https://amslaurea.unibo.it/9525/1/baldi_timothy_tesi.pdf
https://www.researchgate.net/publication/330900808_Zombie-based_critical_learning_-_teaching_moral_philosophy_with_The_Walking_Dead
https://elisa-trippetti.medium.com/introduzione-al-game-based-learning-7-risposte-per-chi-insegna-57ee22c31346
https://www.storybench.org/will-educators-warm-learning-possibilities-games-like-assassins-creed/
https://www.gamify.com/what-is-gamification
https://www.competitionsciences.org/tag/impact/

Funded by the Erasmus+ Programme of the European Union

Project Reference Number: 2019-1-RO01-KA202-063211