



Co-funded by the  
Erasmus+ Programme  
of the European Union

Project:

**"Innovative Metodologies and PRactices on VET"**

Acronym:

**IMPROVE**

Programme:

**Erasmus Plus KA2 Strategic Partnerships for VET -  
Development of Innovation**

Action n.

**2018-1-UK01-KA202-047912**

# **EDUCATIONAL HANDBOOK**

## **"Teaching through gamification, simulations and digital storytelling"**

Made by

**Youth Europe Service**



## INDEX

1. GAMIFICATION AND STORYTELLING: AN EUROPEAN OVERVIEW .....	3
IN UK .....	3
<i>A case study in UK</i> .....	7
IN GREECE .....	9
<i>A good practice in Greece</i> .....	12
IN ITALY .....	14
<i>A good practice in Italy</i> .....	17
IN FINLAND .....	19
<i>A case study in Finland</i> .....	23
IN POLAND.....	25
<i>A good practice in Poland</i> .....	27
2. INTRODUCTION: WHY PLAY-BASED LEARNING?.....	31
<i>Possible learning results</i> .....	35
<i>Gamification in VET</i> .....	36
3. GAMIFICATION OF LEARNING .....	38
<i>Two forms of gamification</i> .....	38
<i>Five games dynamics</i> .....	40
4. DIGITAL STORYTELLING FOR LEARNING .....	46
<i>Storytelling in teaching</i> .....	47
<i>Types of Digital Storytelling</i> .....	49
5. SIMULATIONS .....	55
<i>Advantages of simulations:</i> .....	59
<i>Lego Serious Play</i> .....	60
<i>MinecraftEdu</i> .....	61
6. CONCLUSIONS.....	63

## 1. GAMIFICATION AND STORYTELLING: AN EUROPEAN OVERVIEW

### IN UK

The continuous development of video games production and use has opened up a wide range of applications for videogames, that diverse beyond entertainment and extend to other areas such as medicine and therapy, cognitive abilities such as executive functioning, memory and learning.

A big part of videogames are simulations and storytelling, since interest and engagement of videogames are highly influenced by a suitable context, which is obtained by having a compelling storyline.

For instance, sport videogames are more engaging when players understand the build-up storyline between the 2 sides, making the simulation within the game much more realistic for players.

These features reinforce the reward system and gratification of videogames, thus supporting the many applications of videogames.

The implications of these wide range of applications led to the concept of gamification, which refers to the introduction of game

design features and characteristics into non-games contexts in order to enhance the experience. Werbach and Hunter (2015) identified five game features commonly used in gamification:

- Constraints: Involve balancing limitations and freedom for a player as well as integrating forced trade-offs in the design of a gamified solution.
- Emotions: Aim to produce enduring player engagement and appear during an activity.
- Narrative (storytelling): consists in presenting and exposing players through either an explicit or implicit storyline having its own consistent inner logic and following a certain context.
- Progression: Usually point/rank based systems that report the player's growth and development when navigating through a game and the possibilities to do so.
- Relationships: consider the social interactions of players in a game, which can create feelings of camaraderie, status and altruism.

One of the applications of gaming can be to support traditional and non-traditional education such as Vocational Educational Training (VET). By using the powerful engaging power of games, gamification can make VET more interesting, appealing and better tailored to the learners' reality. In line with the increase in videogames popularity, gaming in the UK has shown a similar popularity, with reports showing the UK gaming industry to be the 6th biggest in the world.



Many of its application are toward education, with organizations such as TIGA (The Independent Game Developers' Association) accrediting and overseeing gaming-related courses that support UK learners in achieving relevant transferable skills. Moreover, research among teachers and student have demonstrated that gaming

supports learner's development of creative problem-solving while using approaches that present an excellent opportunity to engage students in activities which can enhance learning and produce a wide range of educational benefits;

For instance, the Learning Teaching Scotland Association reported the following findings:

- Game-based learning approaches build on many children's existing interests, skills and knowledge and can narrow the gap between children's home and school cultures;
- Game-based learning approaches can increase communication between parents and teachers and school leaders and enhance parental engagement in children's learning;
- Game-based learning approaches have the capacity to increase teacher motivation;
- Game-based activities provide a great opportunity to support the delivery of curriculum.

Aligned with the development of gaming in the classroom, another concept based on videogames implemented in the UK are "Serious Games". Serious games are a branch of gaming focused on training players and users on more specific disciplines by incorporating simulations, virtual reality and mixed media.

Nathan Roberts, senior lecturer in computing at Wrexham Glyndŵr University stated, *"For me, serious games offer unique and innovative ways to provide specialist training,"* he added. *"It isn't about providing something under the guise of an entertainment game but using gaming technology to deliver unique benefits and innovative ways of engaging users."*

#### A case study in UK

BT is one of the leading providers of communication services in the UK, with services ranging from networked IT, Internet provider, TV and mobile services to local and national customers. Due to its activity, BT is target by several cyber-attacks, making cybersecurity a major priority for the company. With this purpose in mind, BT

partner with Immersive Labs to provide training to its cybersecurity analysts. The trainees would have access to the gaming-based learning courses at Immersive Labs digital platform, which included access to pre-configured learning environments, relevant security



tools, guided learning, and 'Immersive Originals' Capture the Flag (CTF) labs, which replicate complex real-world challenges. Additionally, users could access the SaaS platform at any time, on any modern connected device – the only requirements being an Internet connection and web browser. This allowed security professionals to immediately get to grips with practical challenges in

a virtual environment, without the need for setup, configuration or senior staff oversight.

### IN GREECE

The dynamic nature of our era promises a collapse of the remaining learning and educational boundaries, given the fact that both are more likely to occur outside than inside the traditional institutions, a forecast that brings up a new educational avenue, where none of us can know everything, each of us knows something; but combining our resources and skills we can put the pieces of a puzzle together (Evangelos Sitas, Gamification as tool to raise sociocultural awareness, November 2017) . Given that gaming is present in more and more aspects of life, the value of online gaming, virtual augmented reality, simulation as well as digital tools and apps is given a wide space for development and exploitation in many fields of human activity. During the last 10 years the role and presence of gaming as a process of using game thinking and game dynamics to engage audiences and solve problems, is not only place on marketing or communication field but also in the educational sector.



More and more institutes, private or public educational organizations and services introducing in their curricula game-based activities. During the HR Community Conference & Awards 2019: “The game under the service of productivity”, organized by Skywalker.gr for the 5th in a row time , experts coming from both educational and entrepreneurial field emphasized the role-playing ability of the game and referred to the Horizon 2020 program, which attempts to create a capability test through the game. Speakers highlighted the difficulty of recording human characteristics, wondered if power games could be overthrown, and praised the value of the game, which, it is said, applies to all people,

cultivates a cooperative spirit, supports socialization and at the same time undermines social images, while helping not only emotional intelligence but also multiple intelligences, a crucial parameter for both productivity and a better life. In particular, Mrs Nancy Pansi, Honorable Professor of Human Resources Management at the Athens University of Economics and Business, spoke out the value of the experiential role of education, on the integration of gamification in all areas of life and on the importance of integrating the game into business life. She emphasized that gamification has come into our lives. The game is fun and through it we can directly measure our performance, the success of our goals, develop our partnership. In addition, gamification has entered entrepreneurship. Many start-ups invest in the game to improve employee productivity and prevent routine work life. (retrieved from ecozen.gr, <https://ecozen.gr/2019/05/hr-community-conference-amp-awards-2019-to-paichnidi-stin-ypiresia-tis-paragogikotitas/>)

### *A good practice in Greece*

Members of the team at the Center for Greek Studies at Simon Fraser University (SFU) in Vancouver created an application for Greek diasporas to learn Greek ... by playing. It is an innovative language learning program that has become a reality (please refer to "Rebooting Greek: Learning Greek to the Greeks of diaspora" - [https://www.youtube.com/watch?time\\_continue=4&v=\\_1CA0iuN-Os](https://www.youtube.com/watch?time_continue=4&v=_1CA0iuN-Os)).

This initiative aims to provide Greeks of the diaspora with a modern digital platform for learning the Greek language through the use of innovative pedagogical approaches and technologies. They are so far collaborating with the department of 15 universities in China, while the students attending Greek studies have exceeded 4,000! The New Media Lab is the technology group of the Greek Studies Department "Stavros Niarchos" and is carrying out many interesting projects. Costas Dedegikas, head of the New Media Lab, along with Dionysius Arkadianos, is a first-generation Canadian, as his father emigrated to the country in the 1950s to follow about 20 years later and also his Greek mother. He talks to HuffPost Greece about the

Greek language abroad that fights with survival. He is also pointing out that if nothing changes, it will be lost. The Stavros Niarchos Institute of Greek Studies' New Technologies Lab has many years of experience in the field of educational technology, mainly through the development of the Odysseus online learning platform. This platform has been used for over 15 years to teach Greek language to students at Simon Fraser University in Vancouver, Canada. As the preservation and dissemination of the Greek language, especially in the ranks of the Greek community, is a central pillar of the mission of the Center for Greek Studies and the Stavros Niarchos Foundation, there has always been a desire to capitalize on the know-how gained over the years in order to revive the interest in the Greek language, especially at younger ages. Given the age group's attraction to technology, the idea of an application that would use the 'playmaking' methodology to attract the interest of young students and create additional incentives to engage with it was particularly appealing and showed to have prospects for success. Finally, through the decisive contribution of the Stavros Niarchos

Foundation, this idea finally becomes a reality. The most important element of this program is the creation of internal motivation especially for young students to engage in learning the Greek language. In order to achieve this, we have resorted to the gamification methodology, whereby we borrow some elements found in video games, such as pay, points, scores, runs, etc., in order to present the learning process in a comprehensible and simultaneous way to young students - users. The inherent attraction of children of this generation to technology is still an ally in this

endeavor (*Retrieved* from

HuffPost Greece -

[https://www.huffingtonpost.](https://www.huffingtonpost.gr/entry/rebooting-greek-e-)

[gr/entry/rebooting-greek-e-](https://www.huffingtonpost.gr/entry/rebooting-greek-e-)

[prospatheia-katheyton-na-diadosoen-ten-ellenike-ylossa-stoes-ellen](https://www.huffingtonpost.gr/entry/rebooting-greek-e-prospatheia-katheyton-na-diadosoen-ten-ellenike-ylossa-stoes-ellen)

[es-tes-diasporas\\_gr\\_5ce506bae4b09b23e65ab681](https://www.huffingtonpost.gr/entry/rebooting-greek-e-prospatheia-katheyton-na-diadosoen-ten-ellenike-ylossa-stoes-ellen-tes-diasporas_gr_5ce506bae4b09b23e65ab681)).



## IN ITALY

The game is becoming one of the main way in which learning takes place because it permits to develop an informal and natural way for

pedagogical and didactic research.

Both in board games than in e-games, players show skills and abilities that are considered essential in school and training activities, such as:

- continuity in action,
- commitment, ability to take calculated risks,
- attention to detail,
- constancy,
- high learning rates
- problem-solving skills.

Following the result of Wingage's and AESVI researches, both managed in 2018 in Italy:

- there are 17 million players;
- around 1.7 billion euros were spent in video games;
- gamers using mobile devices (tablets or smartphones) are about 10 million;

- players are equally distributed between the ages of 6 and 64 years old.

The game phenomenon is so very significant that different companies are already creating serious games as tools to improve engagement, with particular attention to the customer and to the training sector. In addition, the new generations are moving a lot from the classic frontal classroom training to a new frontier of



e-learning. Following "L'arte del coinvolgimento: Emozioni e stimoli per cambiare il mondo" edited by Hopeli in 2017, one of the most important Italian game expert, Mr. Fabio Viola, said that

*"engagement design aims to transform users into experiencers with a methodology that we could call Engagement Centered Design".*

He found that *"the gamification is an operational key used to rethink every moment of our everyday life"*. For him "video games are the only experience whose users speak in the first person (for example when they say <<I saved the princess or I killed the monster>>) and this demonstrates that they feel co-protagonists and this permits to improve the learning processes and also the storage of information in the long-term memory of the experience.

### *A good practice in Italy*

In Italy, gamification and storytelling are also used to promote cultural heritage: an important example of this



is the game Father and Son ([www.fatherandsongame.com/](http://www.fatherandsongame.com/)), used by more than 2 million of people, produced (in 2 dimensions using Unity) by the National Archaeological Museum of Naples to

promote some exclusive collections such as the Farnese and the wonderful Egyptian collection or those of Pompeii and Herculaneum. The director of the Museum, Dr. Paolo Giulierini, declared that with this e-game it is possible to *"achieve one of the museum's new Strategic Plan objectives activating a new connection with the public, both the people visiting the museum, and virtual visitors"*: this because it is possible to interact from all over the world with the



Museum and the city of Naples. In the game, narration and story are the main protagonists

and the players can do a journey through the ages begins, from ancient Rome to Egypt, passing through the Bourbon age and coming up to the Naples of today, assuming the role of Michael (the protagonist). Father and Son is the first video game in the world published by an archaeological museum and intended to entertain and be thought provoking for both young and adult audience.

## IN FINLAND

The Finnish National Board of Education and the Finnish Ministry of Education and Culture have supported the development of virtual learning environments through governmental grants since 2007. These grants are mainly targeted to professionals to support the development of educational environment using the know-how of the Finnish game industry. New opportunities for learning have



been created by various social media environments as well as 3D virtual worlds, mobile devices, learning games and simulations. An

example of the granted programme is Skene programme (2012–2015) which was to professionalize the promising Finnish game industry and enable greater economic impact for the sector. Tekes, Finnish Funding Agency for Technology and Innovation, funded 105 game company projects, and 9 academic research projects funded during this period. The development of learning environments in

vocational education and training emphasizes working life cooperation, student orientation, multi-channel learning support and guidance, and the reform of educational institutions' operational culture. The widespread use of ICT as a tool for promoting learning and working life is a key element in the development of VET learning environments. Gamification emphasizes the potential of games for learning different tasks and sets of tasks, but also as a developer of collaborative skills. The Finnish VET sector emphasis the use of ICT-based and blended learning, relying largely upon the local institutions' own resources and expertise. A good example of regional investment in digitalisation of education is Omnia, Joint Authority in Education in the Espoo Region. Omnia was established to serve the educational needs in VET of people of all ages in the three neighbouring cities: Espoo, Kirkkonummi and Kauniainen. Espoo is the secondlargest city in Finland and part of the Capital region with a population of over 265,000 inhabitants. Several major companies are based in Espoo, including Nokia Solutions and Networks, Microsoft Mobile, KONE,

Neste Oil, Fortum, the Orion Corporation, the Outokumpu Group and the video game developers Rovio and Remedy Entertainment. The mayor of Espoo mentioned in an interview in 2016 that the City of Espoo invests heavily in educational development to become an innovative builder of the future. Learning and education have always been held in high esteem by the people and the City of Espoo. Omnia has become a pioneer in and a catalyst for bringing in online VET teaching, learning and digital and other technological solutions to changing classrooms. The Omnia vision is that learning can happen anywhere, can be personalised and is linked with social learning, co-operative learning, problem solving and development. It is a regional education development centre with five campuses and 860 staff serving around 40,000 learners. The Finnish National Board of Education has made Omnia one of the national professional development providers for VET and provides programmes for teachers and students on: Digital learning environments, The use of game thinking and game mechanics in solving problems, Mobile learning, Entrepreneurial teaching and

learning, and Leading the 21st-century school. More information about Omnia: <https://www.omnia.fi/internationalomnia>

Following a similar trend , a joint professorship was appointed to Dr. Juho Hamari (DSc, Econ) as Professor of Gamification at the University Consortium of Pori as of January 2017 and is the first in Finland. Gamification entails game-like elements in different kinds of systems and game dynamics and mechanics are applied, for example, in online services, education as well as in working life. According to Professor Hamari, studying gamification is very important as games and game-like activities have risen to a central role in different sectors of life and, even more extensively, in the whole society. Gamification is not only the application of game mechanics in online services but also a wider phenomenon that permeates society and culture. Playing games creates new thinking models in other areas of life and gamification aims to influence people's experiences, motivations and behavior in many different areas of application. This shows the importance of gamification in

learning and how it is supported at national level by the Finnish National Board of Education.

### *A case study in Finland*

LOL - Lievästi Outoa Liiketoimintaa is a business development game where students and entrepreneurs interact through an online board game. The students and entrepreneurs operate within an online community where the entrepreneurs present their business challenges and the students suggest creative solutions to the



problems assigned to them. The game enables the students to work on authentic business problems in an entertaining and engaging manner, the entrepreneurs gain new insights and ideas and contribute their knowledge and skills to the learning process. The teachers observe how business ideas are put to the test and how learners explore real-world possibilities. The students are assigned to teams, which compete with each other, and are given virtual workspaces to develop and share their ideas. The game features a Facebook page for communication and

collaboration. Game updates, new tasks and feedback on tasks also appear as notifications in Facebook. YouTube is used to present interviews and reports. The teams of students when providing creative solutions to the business challenge must bear in mind the logistical, commercial and other constraints confronting the entrepreneurs. The participating entrepreneurs present their ideas and problems in videos. As the competing teams progress in their work, the game offers them various incentives and rewards to maintain their motivation and create friendly competition. Once the students have presented their ideas to the entrepreneurs, they receive feedback on the originality, usefulness and feasibility of their suggestions by the entrepreneurs and on their learning and communication skills by the teachers. Finally, a jury of participating entrepreneurs chooses the winners based on the best match between the solutions and the business objectives. Virtual trophies and awards are then given to the winning teams.

Criteria	CPS	Yes, how	No, how
Contributes to a VET teacher's continuing professional development	x	Need to develop skills in using ICT tools, communicate with the students remotely,	

plan		evaluate their communication skills	
Is supporting development of divergent thinking skills	x	New tasks and updates on the cases are provided to the students, they can interact between each other and with the entrepreneurs and teachers through Facebook	
Is supporting development of lateral thinking skills	x	Students can put their learning into context and need to adapt their problem solving skills based on new elements	
Is supporting development of creative skills	x	Students need to be creative to provide innovative solutions to compete with the other teams and be selected as the best	
Is supporting employability of students	x	Students work with and for companies, potential recruiters	
Is supporting development of DT toolkits for teachers	x	Teachers can share information and support the students teams in real time	
Is developing industrial currency of teachers and working-life relevancy of education	x	Collaboration between the teachers, students and enterprises is improved, the communication between the parties is smoother	
Has an element of innovation relevant to teachers	x	The entrepreneurs can add new elements to the cases directly to the students, teachers are more observing and evaluating the learning process	
Has proof of teacher & employer co-design	x	The teachers and companies agree on the cases at first and evaluate the teams jointly	

## IN POLAND

In Poland, open access to modern information technologies is generating a new type of society that increases the productivity and competitiveness of the whole market and requires significant changes in the education system. In the last years especially also in Poland the most innovative approaches in education are using gamification of learning to increase students 'enjoyment, interest and engagement in the study. Therefore, the gamification industry is

intensively growing and developing as also finding new fields for implementation of its products also in VET sector. Through games not directly associated with knowledge and skills, it is possible to influence students' behavior and increase their skills, capabilities, commitment and motivation. The most well-known company that produces computer games in Poland is CD Projekt Red that realized in 2007 the game Wiedźmin (Eng. The Witcher) which turned out to



be a worldwide success. The market of this type of games is worth about 100 million euro and grows by approximately 15 – 20% a year. Actually there are platforms which can be easily integrated into the education process by the creation on their basis of interactive

games, quests and quizzes such as FlipQuiz, Socrative, ClassDojo, Kahoot, Goalbook, Duolingo, Ribbon Hero, etc. Tasks created on this platform allow including photos and videos. In this kind of modern and interactive gaming platforms students can answer questions created by the teacher using tablets, smartphones or laptops or any devices connected to internet. In other cases, the aim of the game is to combine different areas of professional training into a single educational process with the introduction of e-learning tools

#### *A good practice in Poland*

Revas ([www.revas.pl](http://www.revas.pl)) is a group of people fascinated with entrepreneurship who want to make the classes more engaging and practical. The Revas team has set a goal to change the theory-only teaching method by introducing tools for practical learning how to set up and run a business. In Revas Business Simulation Game the students are making decisions on running a small business. Revas Simulations helps (young) people experience and understand business. The game can be used in business education classes to run courses in a practical, engaging and fun way in more than 10

industries(automotive, transport, tourism, IT, hairdressing, cosmetics, construction and catering industries, etc.). Simulation participants, divided into teams, run virtual companies and make realistic business decisions similar to decisions made daily by real managers. Teams analyze market information to make strategic and operational business decisions. The teams can compare their results and improve their skills on each round. The simulation is a flexible



tool that can be used in various education levels. In higher education, for example, it can be used in courses on

business, economics, operational management, financial accounting or business for 'non-business students' courses. It is also fit for secondary schools - courses on management, accounting, entrepreneurship, economics, marketing, and key business competence workshops. In corporate training it can be included to business – managerial skills training or 'experience business' workshops. Business simulation teaches thinking, which is not

common in traditional teaching. In a simplified way simulation shows the basic principles of economics. Simulations give students the opportunity to have a holistic view of business, so they better understand the rules of the enterprise and market mechanisms, and can also experiment with business strategies in a secure, virtual environment. Students, playing the basics of entrepreneurship in simulations, play the role of company managers



and go through a decision-making process in which:

- receive market information (demand for individual services, the number of man-hours necessary to perform each service,

the amount of materials used, the minimum wage, costs of marketing activities),

- analyze market data to make decisions in accordance with the strategy chosen,
- make business decisions that are compared with decisions made by the owners of competing companies (classmates),
- they send decisions to a server, where market mechanisms are simulated using mathematical algorithms,
- receive the results of decisions taken, which become the initial situation in the next decision round.

## 2. INTRODUCTION: WHY PLAY-BASED LEARNING?

In this guide, the core target is, obviously, entrepreneurial-oriented and so it is focused on creating business learning that is also multi-faceted as businesses itself. Entrepreneurial mindset can be seen as a more generic driver for VET as well as middle and higher education in general. There are many tools useful to innovate the VET system that have not been still fully exploited or completely used and that are essential for the future of VET. They are:

1. Gamification,
2. Storytelling,
3. Simulations,
4. Playing,
5. Collaborative Learning,
6. Virtual Reality,
7. Mobile Learning,
8. Internet of things,
9. Artificial intelligence

and so on.

To permit learning in VET to become more efficient, effective, operative and sustainable it is essential to insert it into the actual educational system.

And it is important to design and implement effective strategies for enhancing basic skills for professionals and increasing incentives for adult training by providing an engaging learning environment.

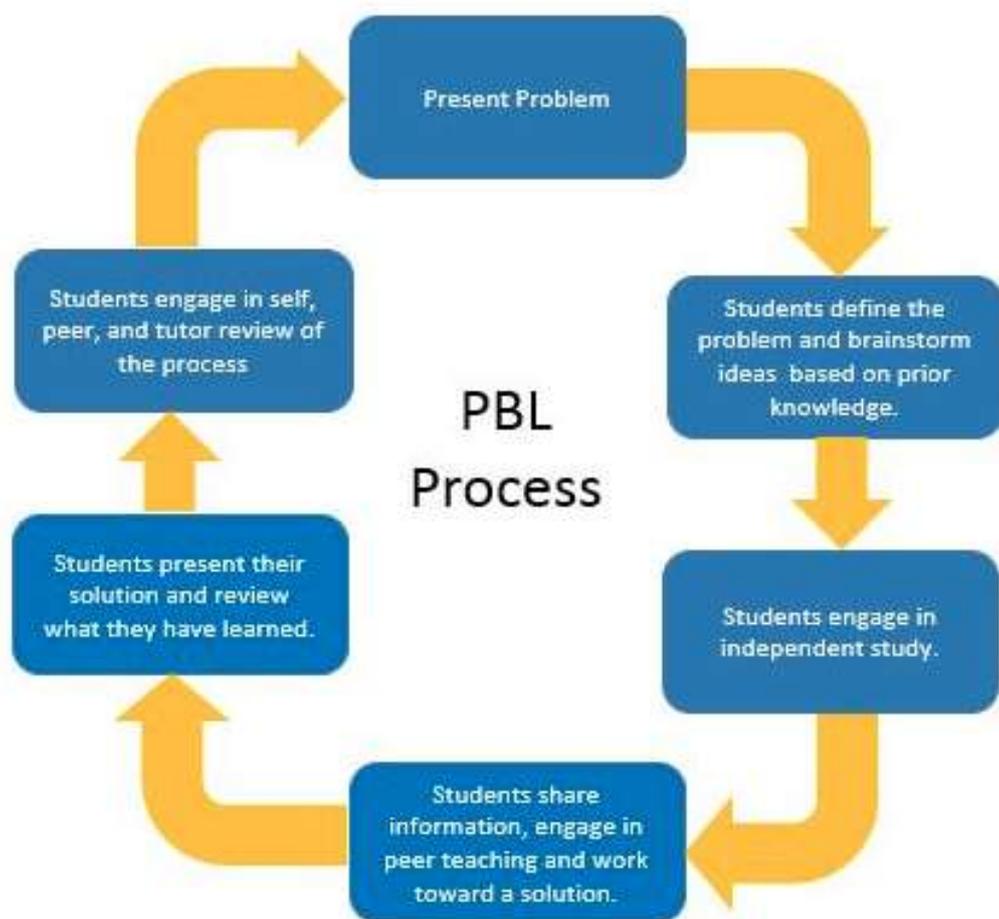
This because the game-based learning is practically the use of a game, or game elements, in the teaching process, to achieve predetermined educational outcomes.

Gamification is a challenge in pedagogical practice and is certainly a great way to motivate students and it is necessary to combine it with the Problem-Based Learning (a method to place the apprentice at the very core of learning process).

In this way, the apprentice obtains a full ownership of the start of a life-long learning process.

Introducing the basic terms of learning in VET through a game at the very beginning of the educational process is of course very

useful because it permits that apprentices (who typically have a less favorable earlier school experience and need to be encouraged by being welcomed and empowered through a student-centered pedagogy) to be more involved in the learning in active way.



(Source: <http://www.slideshare.net/kategukeisen/problem-based-learning-basics>)

Problem Based Learning Process.

It is important to not confuse Problem-Based Learning with Project-Based Learning because its approach is to learn about a

subject through the experience of solving open-ended problems found in trigger material; prototypical questions that orient the learner towards understanding what PBL questions ideally are.



The PBL process does not focus on problem solving with a defined solution, but it allows for the development of other desirable skills and attributes. This includes knowledge acquisition, enhanced group collaboration and communication.

What it is needed to create an innovation in VET system, is to use effective and interactive experiences that can motivate and actively

engage students in the learning process: this is where game-based learning comes in.

### Possible learning results

While until now, the game designers have been producing and refining highly motivating learning environments for their players to enjoy, now the game is used to teach something and to engage better the students in the lesson obtaining better learning results and participation.

Using games, it is possible to obtain very good learning results on the students because:

- the game has a controlled and safe environment;
- they can apply quickly what they learned playing;
- it is possible to make mistakes and errors without creating personal crisis
- games provide a context for engaging and exciting practices;
- using different kind of games, students can learn a variety of important skills and obtain specific capacities, also developing a variety of connections with the content;

- game helps the memory and so learning is easier,
- game can also grab students' attention and actively engage, motivate and challenge them;
- also shy students can participate positively
- it permits to motivate VET trainers to see the elegance and sustainability of teaching

### Gamification in VET

The integration of gamification in VET permits to motivate a lot young apprentices to:



- o make a difference,
- o find a job,
- o start a company,
- o participate to the community.

This because it permits to develop the most important conceptual skills for a professional career that are:

1. Analysis,

2. Communication,
3. Creative Thinking,
4. Leadership,
5. Problem-Solving.

The use of game, in fact, permits to develop the ability to:

- think creatively about,
- analyze the situation with a critical vision
- understand complicated and abstract ideas.

### 3. GAMIFICATION OF LEARNING

The gamification of learning is the educational approach that permits to motivate learners and to facilitate the learning by using video game design and game elements in all the learning environments, maximizing enjoyment and engagement through capturing their interest and inspiring them to continue learning, having also an active role. Gamification is the introduction of game elements in a non-game situation because it is exactly the process of defining the elements which make those games fun and motivate players to continue playing, and using those same elements in a non-game context to influence behavior and favor learning.

#### Two forms of gamification

There are two forms of gamification:

- 1) Serious games
- 2) Gamification of learning

In the first type, the learning experience is developed using serious stories, that can potentially have an impact on students on attending

class, focusing on meaningful learning tasks, and taking initiative. We have in this case the game-based learning that can draw students into virtual environments that look and feel familiar and relevant, having a motivational impact because they can quickly see and understand the connection between the learning experience and their real-life work

On the other side, gamification of learning does not involve learners in designing and creating their own games, or in playing commercially produced video games.

The gamification of learning allows learners to touch in such a way the real-world applications and benefits of the subject matter, making them able to get a first-hand look at how their choices within the game result in bad consequences or awards.

Games have some distinctive features which play a key role in gamification:

- the users are all participants (employees, clients or students);
- there are always challenges or tasks that the users have to perform and progress towards defined objectives;

- if the tasks are realized points can be accumulated as a result;
- there is the possibility to obtain various badges as awards for completing specific actions;
- there are different game levels which users pass depending on the accumulated points;
- normally there is also a ranking of users according to their achievements.

So using Gamification is possible to improve user engagement, flow, learning, organizational productivity, employee recruitment and evaluation, voter apathy, physical exercise, traffic violations, and many other things.

### *Five games dynamics*

There are five game dynamics used in gamification:

- Constraints are about balancing limitations and freedom for a player as well as integrating forced trade-offs in the design of a gamified solution.
- Emotions aim to produce enduring player engagement and appear during an activity.

- Narrative is represented for a player through either an explicit or implicit storyline having its own consistent inner logic and following a certain context.
- Progression reports the player's growth and development when navigating through a game and the possibilities to do so.
- Relationships consider the social interactions of players in a game which can create feelings of camaraderie, status and altruism.

This provides teachers and researchers with a framework to design



engaging learning environments. Just using an element does not necessarily create an engaging gamification environment. For

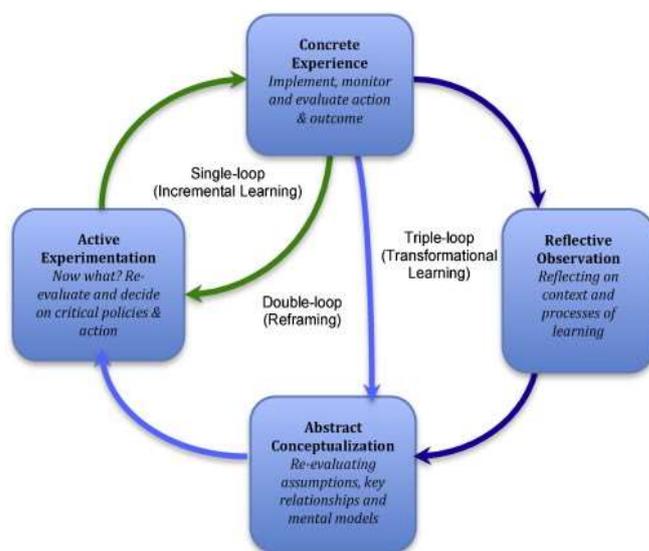
instance, providing points as in grading tests would not be considered an engaging gamification environment for most students as they are used to this. Creating teams to compete in an engaging set of problems to be solved and keeping a leaderboard scoring system might be challenging and create intensive team cooperation.

Many studies on the matter show that gamification can have very positive effects on learners and in general on persons in terms of cognitive flexibility, changing role perspectives, etc.:

- improving individual's ability to comprehend digital content
- facilitating a certain area of study (for example the music);
- penetrating all sectors of life where awareness, latent ambitions and mental growth are at stake.
- increasing the effectiveness of traditional learning goals like memorization and skill routinization;
- refreshing learning concepts;
- developing willingness to change themselves.

However, when teachers use or develop new approaches in learning process it is essential to define learners' characteristics and profiles in order to determine whether if the new tools and techniques are suitable for them, even if, of course, the decisive factors are the predisposition of the learners to interact with the learning content and to participate in learning events with competitive nature.

It is important to follow the triple-loop learning model, that involves "learning how to learn" by reflecting on how we learn in the first place. In this situation, participants would reflect on how they think about the "rules," not only on whether the rules should be changed.



This form of learning helps us to understand a great deal more about ourselves and others regarding beliefs and perceptions. Triple-loop

learning games place the learner at the core of a realistic situation and ask to discover 'hidden' relationships in a certain domain.

Where gaming aims at winning, playing aims at conquering new levels of understanding, self-awareness and self-efficacy. In terms of VET, it is the learner who attempts to become his/her own coach. Of course this means that the learning objectives have to be specific and clearly defined. The purpose of education is to achieve the learning objectives, because otherwise all activities (including gamification activities) will seem pointless. The objectives determine what educational content and activities to be included in learning process and selection of appropriate game mechanics and techniques to achieve them.

It is now a matter of finding complementary arrangements for VET mentors to convey such process and find adequate scenarios for progressively integrating its learning outcomes in meaningful segments of the job performance: this because gamification of learning is a much broader process than finding appropriate game templates and integrate them in curricular and instructional contexts. In particular for VET, gamification in learning has the extra effect of "Breaking the Yoke of Seriousness"; As "Work" is

inextricably bound to serious business, the novice might easily get too much infatuated with “avoiding mistakes” so that “risk avoidance” easily emerges and hampers mindset for learning and understanding.

#### 4. DIGITAL STORYTELLING FOR LEARNING

The Digital Storytelling, or the Storytelling made with digital tools (web apps, webware), consists in organizing selected contents from the web in a coherent system, supported by a narrative structure, in order to obtain a story consisting of multiple elements of various formats (video , audio, images, texts, maps, etc.).



*Characteristics of this type of communication*

They are:

- the charm: deriving from the fabulative character that stories possess, given that they are basically stories;
- the richness and variety of stimuli and meanings: deriving from the high information density and the amalgam of codes, formats,

events, characters, information, which interact with each other through multiple paths and different analog relationships.

It is therefore a form of narration particularly suitable for communication forms such as those of journalism, politics, marketing, autobiography and also teaching.

So storytelling describes the social and cultural activity of sharing stories, sometimes with improvisation, theatrics, or embellishment.

The term "storytelling" can refer in a narrow sense specifically to oral storytelling and also in a looser sense to techniques used in other media to unfold or disclose the narrative of a story.

### *Storytelling in teaching*

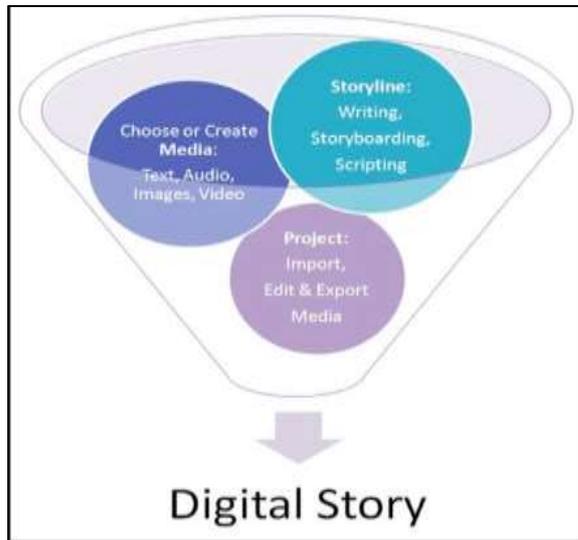
Charm, as indicated above, is the strong point of storytelling in the didactic field, whether we propose to students content in the form of digital stories, or that we propose to students to create such stories through dedicated web applications for this purpose.

This results from several factors:

- the highly gratifying character of a narrative approach;

- the fact that it offers simpler access to abstract and complex concepts;
- the ability of the narrative mechanism, supported by multimedia elements, to generate hermeneutic - interpretative processes and significant conceptual correlations;
- the ease of memorizing the story on a cognitive level;
- the remarkable degree of involvement and the consequent strengthening of the motivational variables and the commitment that the narrative offers;
- the ability to convey significant and impactful messages, structured according to a cause - effect logic;
- a story generates other stories, according to the mechanism of inter-textuality, favoring the collaborative exchange of knowledge, the dialogue dialogue, the critical spirit and the search for new interpretations and points of view on a problem and / or theme;
- the ability of the narrative approach to foster networked knowledge (connective knowledge) and combinatorial creativity.

The image illustrates what are the elements that make up a "Digital



History" and make it a "good story", and it is useful for a general understanding of the characteristics of storytelling that has just been mentioned.

"Digital storytelling" describes

the new practice of everyday people who use digital tools to tell their 'story', often presented in compelling and emotionally engaging or interactive ways. The term 'Digital' storytelling so reflects that the face-to-face format is powerful, however not necessarily the only one.

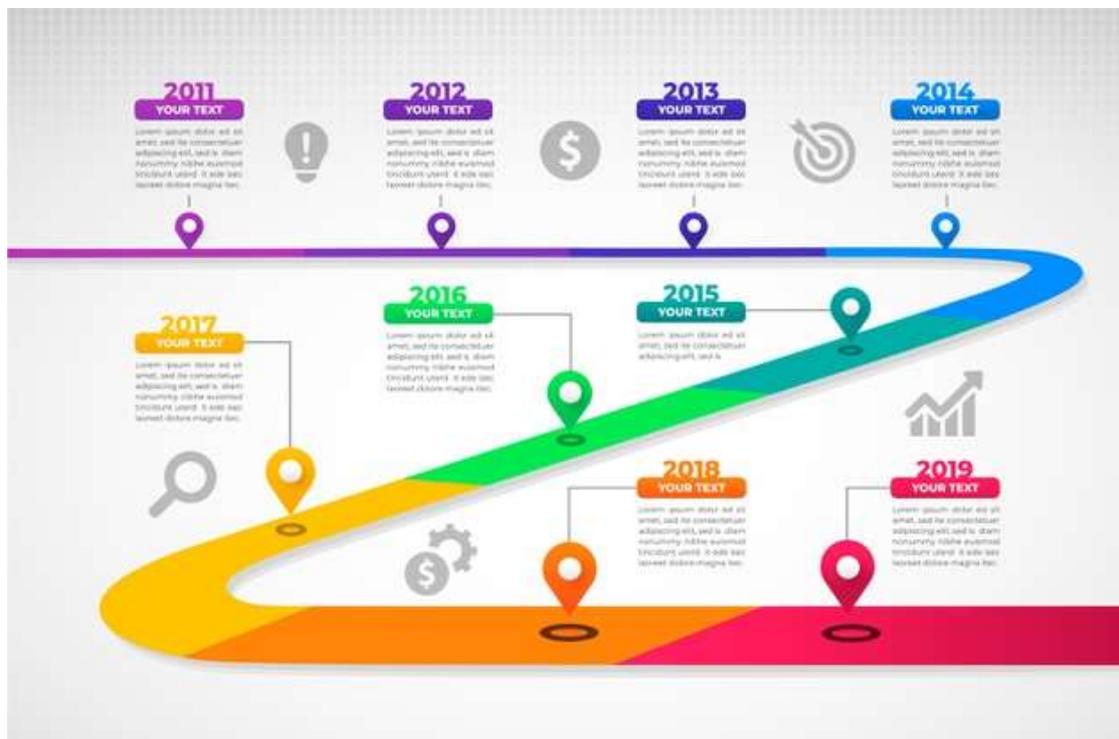
### Types of Digital Storytelling

But now let's see with which kind of tools is possible to practice Digital Storytelling and how web 2.0 with its countless applications allows the creation of Stories. To answer to these necessities it is important to concentrate our attention on some web based applications (of course this is an empirical classification that has no

claim to uniqueness and universality because the services that are offered daily on the web in this area are innumerable):

## 1) Storytelling and Timeline

Timeline creation can be considered a form of narration of events chronologically ordered. The various resources identified on the web around a theme, an event, a problem, a character, are arranged

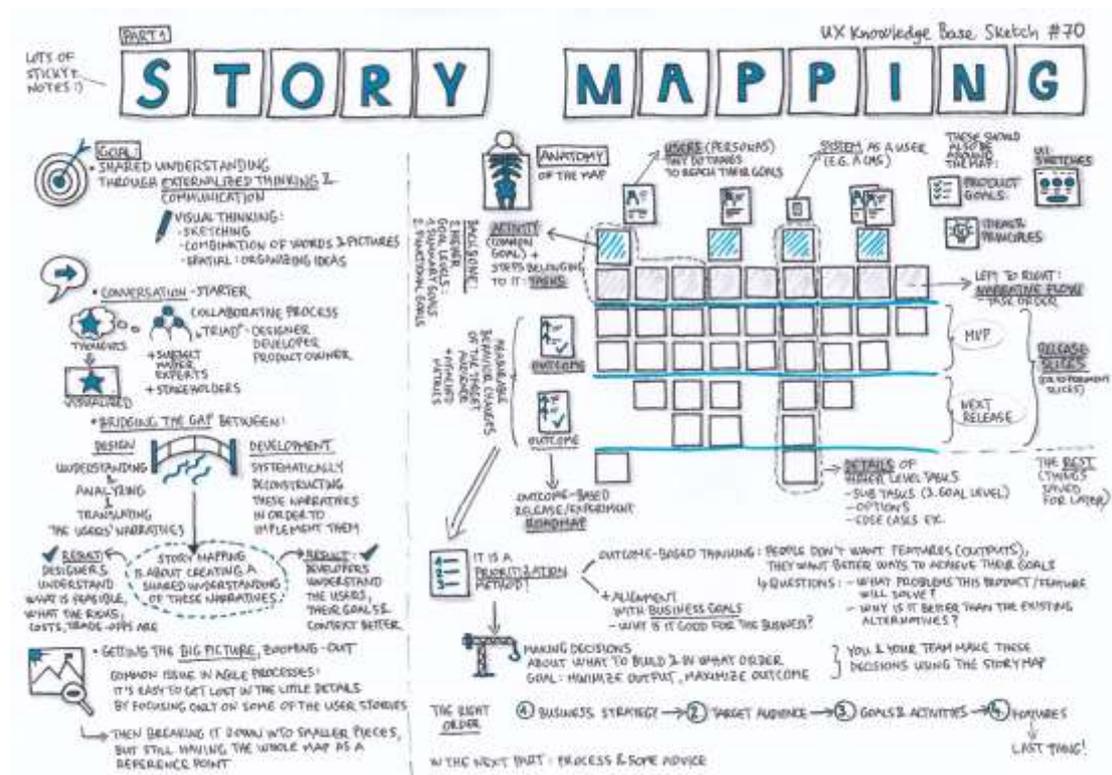


in the form of cards or slides, within a chronological sequence represented by a bar and arranged according to the appropriate chronology, using for example web tools like Whenintime, TikiToki, Xtimeline, Dipity, Timeglider and Timerime, which are tools that lend

themselves to didactic use in the disciplines of the luministic area such as history, literature, political science, etc.

## 2) Storymapping

It can be considered a form of storytelling that uses geographic maps or images to insert in them a series of links to web resources relating to a specific theme in order to obtain a navigable route.



Mass media and newspapers make extensive use of this form of storytelling for their inquiries and dossiers.

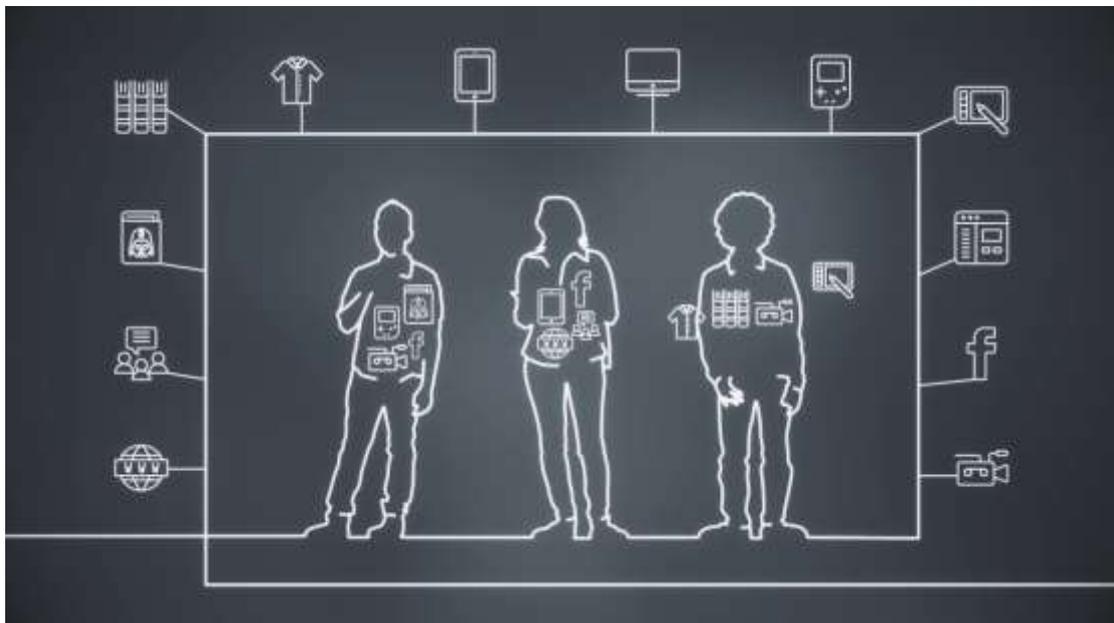
Here are some web services that allow you to create storymaps:

- StoryMap JS

- Build a Map
- Google Tourbuilder

### 3) Transmedia storytelling

It is a matter of creating a story by organizing in an environment, modeled on the news magazine or on the presentation, resources available on the web in various formats (images, videos, animations,



texts, sounds, music, news, etc.) relating to a given world or theme or problem or character, in order to obtain a multimedia and hypertextual story. This method can also be useful to illustrate a project to be carried out (also didactic) or the results of a project.

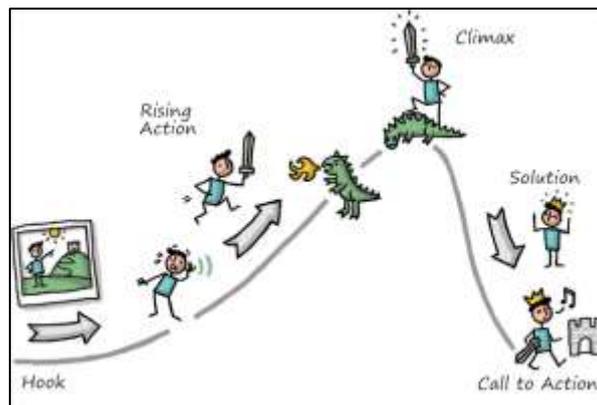
This form of storytelling is also particularly used in the journalistic field. Useful tools to do generate trans-media stories:

- Storify
- Capzles

#### 4) Visual Storytelling

In this case the story is told through the use of images. The possibilities of using an image are varied:

- the images can be arranged in series as in a presentation or slideshow and accompanied by links, texts, by the recorded voice of a narrator.
- may be accompanied by links to multimedia resources and/or by the recorded voice of a narrator;
- the image can be made interactive so that clicking on it opens resources on the web;
- an experience can be told through the collection of images, creating albums or message boards accompanied by short captions



Some visual storytelling services that exemplify the various possibilities are Thinglink, Narrable, Meograph and Pinterest.

## 5) Video storytelling

In this case we are faced with web services or browser based where the story is created through the possibility of manipulating videos by



inserting text, links, annotations, images, questions, etc. The result are interactive videos that can contain multimedia elements within them. For creating them is possible to use

- Put
- ShortHand
- Zentrick
- Popcorn Maker
- Storygami+

## 5. SIMULATIONS

Simulations are similar to serious games, but they simulate real-world things and their purpose is user training in an environment resembling real life. Gamification and simulation-based

learning are what gives eLearning an edge over traditional training methods: in fact for sure there are a lot



of the benefits of integrating audio with visual and interactive elements into a unique package (creating for example an eLearning course). But it is important to clarify that simulation is a technique for practice and learning that can be applied to many different disciplines and trainees and it is not a technology. Simulation permit to replace and amplify real experiences with guided ones, often “immersive” in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.

Simulation-based learning can be the way to develop professionals' knowledge, skills, and attitudes, providing a valuable tool in learning to mitigate ethical tensions and resolve practical dilemmas. Simulation-based training techniques, tools, and strategies can be applied in designing structured learning experiences, as well as be used as a measurement tool linked to targeted teamwork competencies and learning objectives.

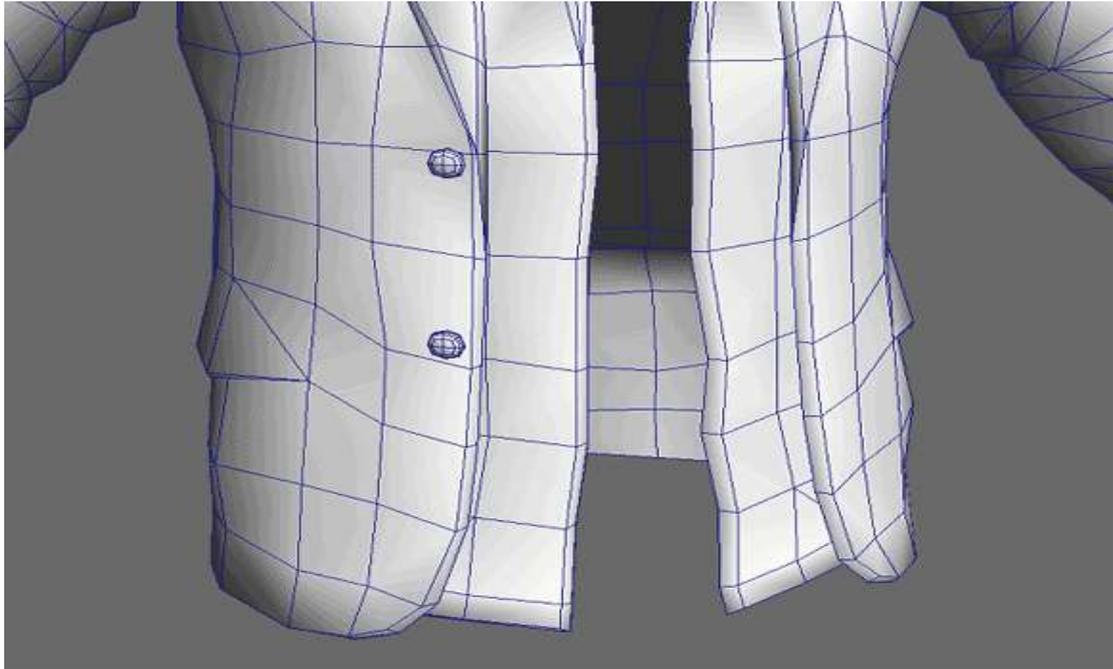


Teamwork training conducted in the simulated environment may offer an additive benefit to the traditional didactic instruction, enhance performance, and possibly help reduce errors.

This means that simulation-based gamified learning is the combination of recreating real-life scenarios through animation or re-enactment, with the ability to play the training course like it is a game, where learners can visualize the intricacies of performing specific tasks and earn badges, points, and levels as they progress through the training.

It consists of simulating real-life situations and environments, with audio and video elements, using a game to spice up the training. Of course, many companies and industries using this kind of training can obtain important benefits on their workers having the possibility to train them better and faster.

Examples of using simulation-based learning in the industrial sector can be found in manufacturing, automotive, medical sector, hospitality, health and fitness and food-service industry and in many other fields. For instance, in fashion and retail, simulation-based learning can help to create visual models that later can be concretely produced to sell them.



Furthermore, fashion brands can use simulation courses to train end-customers in different ways an accessory can be worn or mixed and matched.

Simulation and gamification are definitely futuristic methods of training. As AR and VR make its way into our day to day life, they will soon be the go-to method for an organization to train employees on complex topics. At that point, simulation-based gamified courses will be the primary content fueling training activities. Where safety is an issue, videos and animation courses will always be the staple training format. The benefits of shifting to simulation-based courses

are many, and these benefits will only continue to increase in the future thanks to the evolution of ICT and internet tools.

### Advantages of simulations:

Trying to list possible benefits in using simulation-based courses we have that:

- advantages can be obtained in safety ( flight simulator, nuclear power plant, etc.)
- In most cases these kind of courses are cheaper and more accessible than real-life (because you can follow them directly from home)
- There are many platform for discovery learning
- Student can control the learning environment and constructs their personal knowledge in the way they prefer
- And many others

Let's see now some particular examples that explain very well why it is good to use simulations in training:

## Lego Serious Play

“The LEGO® SERIOUS PLAY® Method” is a technique which improves group problem solving. By utilizing visual, auditory and kinesthetic skills, the Method requires participants to learn and listen, and it provides all participants with a voice. The Method serves as a shared language regardless of culture or position. It is a



facilitated meeting, communication and problem-solving process in which participants are led through a series of questions, probing deeper and deeper into the subject. Each participant builds his or her own 3D model in response to the facilitator’s questions using specially selected LEGO® elements. These models serve as a basis

for group discussion, knowledge sharing, problem solving and decision making. Its goal is improving creative thinking and communication because people with this method can build with Lego bricks 3-dimensional models of their ideas and tell stories about their models: this permit people to share emotions, ideas, opinions, etc. in an easy way and to imagine possible developments in any field.

### MinecraftEdu

An American school teacher, from New York, has produced a



version of Minecraft for schools. This specific version, called MinecraftEdu, is a software program that allows Milwaukee

Montessori School students to put their imaginations, ingenuity and collaboration skills to the test, as students work to develop a functional virtual world all their own- With this tool, educators can drop students into a world of ancient cultures, Chemistry, English, and more.



## 6. CONCLUSIONS

From what we showed in this interesting guide, it is now clear that gamification, storytelling, simulations etc. can be used also in VET system to teach students and learners and adopted and effectively integrated if an overall pedagogical framework has been articulated.



Problem-Based Learning seems the best method to be used because it places the learner at the very core of the life-long learning process. Following what the professor Kommers of the

University of Utrecht in The Netherlands said in 2015 "*The choice of narration*" is a clever choice to let existing VET trainers build upon their prior traditions and reflexes". But it is always necessary to have an appropriate didactic framework that allows all the new-coming ICT tools to be integrated and used by the learners themselves.

What can be used for the moment with great advantages are for sure gamification, storytelling and simulations but soon also Artificial Intelligence and many other tools will be used to have better and creative MOOCs.

Big Data applications, Learning Analytics, or other tools will be adapted to trainings and new objectives and goals will be obtained for sure.

We have just to wait, the future is already behind the corner....



### **Credits**

*This Handbook was realized in the project “Innovative Metodologies and PRactices on VET” in the framework of the European program “Erasmus Plus KA2 Strategic Partnerships for VET” This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.*

*Project's code: 2018-1-UK01-KA202-047912*



Co-funded by the  
Erasmus+ Programme  
of the European Union