Gamification of Learning, Simulations & Digital Storytelling for VET

Guided Professional Skills @ VET

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PREFACE

Module 1 *Gamification of Learning, Simulations & Digital Storytelling for VET* is part of WP2 of the GPS@VET project, reference nr. 2023-1-DE02-KA220-VET-0015273, co-funded by the Erasmus+ Programme of the European Commission.

The Module aims to contribute towards an innovative teaching and training concept for VET, which includes the use of innovative pedagogical methods and concepts as well as the use of digital tools. It is tailored to equip VET teachers with the essential tools and insights required to integrate game-based learning, simulations and digital storytelling seamlessly into their instructional practices. By empowering educators with new approaches and methodologies, it will be possible to make learning in VET more effective, efficient and sustainable, engaging learners, motivating them and getting them excited about learning, with the anticipation of a transformative impact on VET education.

The main target groups for this module are VET teachers and VET trainers, professionals working on VET, general education teachers and trainers, educational professionals in general.

Module 1 *Gamification of Learning, Simulations & Digital Storytelling for VET* is composed by an Introduction and five main chapters:

Introduction

Chapter 1 National Research into de State of the Art of Game-Based Learning, Simulations and Digital Storytelling for Learning Purposes

Chapter 2 Gamification of Learning

Chapter 3 Simulations for Learning

Chapter 4 Digital Storytelling for Learning

Chapter 5 Good Practices Sample

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INTRODUCTION

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Digital games for educational purposes are now beginning to be used in formal learning contexts. But to what extent do digital games fulfil the requirements of learning? In this module we present the benefits of game-based learning methodologies, simulations and digital storytelling as methodologies that can be used to benefit and facilitate learning, as well as addressing specific requirements for their positive use and demands for their successful integration.

The challenge of how to successfully integrate learning with playful elements and games into formal educational contexts is not an easy one for teachers and educators.

In this module we describe significant aspects of game-based learning and simulation, and interactive digital storytelling with game-based learning, as fundamental aspects for creating serious educational digital games that effectively contribute to the development of meaningful learning.

Firstly, a review is made of the state of the art in the GPS@VET project's partner countries on game-based learning methodologies, simulations and digital storytelling in education. A chapter is dedicated to each of the methodologies, dealing in greater depth with the specificities and requirements for proper use of the methodology in teaching-learning contexts and some examples are given of its application. Finally, a chapter is dedicated to a collection of good practices on these methodologies in the partner countries, which can serve as good inspirational examples for other initiatives and for its application by trainers and educators in their daily VET work contexts.

1. GAMIFICATION OF LEARNING, SIMULATIONS AND DIGITAL STORYTELLING: WHY TO USE IT IN VET?

The GPS@VET project partners' motivation for designing this module is based on the development and implementation of an innovative teaching and training concept for VET, which includes the use of innovative pedagogical methods and concepts, as well as the use of digital tools. Our specific objectives for the 'Gamification of learning, simulations & digital storytelling' module are:

- making learning in VET more effective, efficient and sustainable we need a strong foundation for its embedding in the actual educational situations and further consolidation with gaming elements by focussing Game-Based Learning (GBL) and Play-Based Learning (PBL);

- creating a blueprint, state of the art on the beneficials of game-based learning methodologies, simulations and digital storytelling, making learning in VET more effective, getting learners involved, engaged and excited about learning;

- creating a learning, playing and working dynamic for double loop learning, with the aim of winning, playing and achieving new levels of understanding, self-awareness and self-efficacy in VET;

- involving VET learners, engaging them and getting them excited about learning, introducing a system of rewards without harsh penalties for learners who aren't afraid to step out of their comfort zone and fail, unconsciously encouraging them to learn.

2. Gamification of Learning, Simulations and Digital Storytelling: All Over Europe

Serious games, simulations and serious digital storytelling are progressively becoming an integral part of educational practices across Europe, but there is still much to be done to promote the use of these methodologies as a systematic and integral approach to teaching practices. These innovative approaches have gained significant visibility, as research data points to significant results in terms of engaging students in dynamic, interactive and immersive experiences. However, the research also shows the need to invest more systematically in teacher training to equip them with the necessary skills and competences to apply these approaches and methodologies.

Gamification refers to integrating game elements (points, rewards, leaderboards, challenges, etc.) into educational settings to enhance student' s engagement, motivation and to improve learning outcomes. By integrating game elements into educational contexts, teachers and trainers can effectively engage learners, promoting an active participation, and fostering a deeper understanding of the subjects.

Simulations replicate real-world processes and situations, providing experiential learning opportunities in a controlled environment. Simulations are particularly popular in higher education, work-based learning and STEM subjects (Science, Technology, Engineering, and Mathematics) subjects.

Digital storytelling combines traditional narrative techniques with multimedia tools to create compelling educational content. Digital storytelling methodology can involve the use of videos, animations, interactive timelines, and augmented or virtual reality (AR/VR) experiences. Digital storytelling highly promotes creativity, critical thinking, and communication skills.

The increasing integration of these approaches reflects the broader trend towards digitalisation and innovation in education. There are, however, many questions surrounding the digitisation of learning. Still, it is to be hoped that educational developments will promote the potential of these approaches to make learning more engaging, accessible, inclusive and effective within European contexts.

The following chapter is a brief overview of the state of research and educational practices on game-based learning, simulations and digital storytelling in the countries of this project's consortium.

Chapter 1: National Research of Game-Based Learning, Simulations and Digital Storytelling for Learning Purposes

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1.1 COUNTRY: PORTUGAL

1.1.1 State of the Art of Game-Based Learning in Portugal

Game Based Learning (GBL) gained significant visibility in recent years in Portugal in the context of new teaching and learning methodologies that have emerged in the educational context (Cardoso, 2018).

GBL has become increasingly widespread, mainly due the main contributions of serious games for intrinsic motivation, cognitive stimulation, critical and creative thinking, developing competences, experiencing emotions, learning, problem solving, simulation of real situations, socialization, team building (Barradas & Lencastre, 2017; Carvalho, 2015; Chapman, 1988; Johnson et al, 2013; Kishimoto, 2002; Piaget, 1990).

In a comprehensive review on studies and projects centred on GBL and Gamification, Coutinho & Lencastre (2019) pointed the positive perception of teachers concerning these methodologies, recognizing its added value to the learning processes, recommending its widely dissemination through educational organizations. Authors also pointed out that investing in teachers' training is fundamental for the successful implementation of GBL and gamification.

From the students point of view, many studies pointed to improvements in their school performance. Authors are suggesting that "school and teachers should take into account students' extra motivation, achieved through the use of mobile devices and the use of games, and the benefits to the learning process and improvement of school performance that the students' motivation, interest and commitment bring." (Coutinho & Lencastre, 2019, p. 89).

Also, Coutinho & Lencastre (2019) emphasized the role of parents as facilitators, as such, they should be informed on the use of GBL and gamification methodologies by teachers.

In Portugal, there are some good examples of the use of GBL applied at various levels of education, from primary education to secondary education, vocational education and university education, including teacher training.

In Initial Vocational Education, we highlight the results of a study carried out by Barradas & Lencastre (2017) with the aim of identifying the main implications of using gamification and GBL to promote positive competitiveness in VET students on an IT course. In a game scenario, there was designed a narrative consisting of six different interconnected challenges, which aimed to improve the learners' learning experience, both individually and as a group. A group of VET learners were monitored using direct observation and a focus group interview survey, as well as automatic data from software logging to the online sharing platform. The results of the study point to the pedagogical validity of integrating games and gamification into teaching and learning processes. The authors concluded that the use of the serious game contributed to promote a positive competitiveness in VET learners. VET learners played, individually and in groups, up to the time limit of the challenges, in pursuit of the maximum score, with no apparent signs of disinterest. More information is available at the link:

https://repositorium.sdum.uminho.pt/bitstream/1822/55491/1/2017_Revista_Investigar_em_Educacao_Barradas%26Lencastre.pdf

In school education sector, the game TimeMesh, developed under SELEAG Project (503900-LLP-1-2009-1-PTCOMENIUS-CMP), co-funded by the European Commission, is a serious game aimed at the last stage of elementary school. The game's main objective is to enable students to acquire knowledge about European history and geography through three scenarios, based on the curriculum and involving cultural and historical realities from the Maritime Discoveries, the Industrial Revolution and the Second World War. The game is a time-travel adventure with challenges based on puzzles and strategic and logical interaction between characters. Alpha, Beta and Gamma testing were applied through its application to 68 students from 5 schools in Madeira, Portugal. The results showed three main important

aspects: motivation and engagement of the students; benefits from the game in what concerns to learning; great satisfaction with the game experience. Moreover, the extended use of the game to more than 5.000 users demonstrated that TimeMesh serious game is a significant learning tool about European citizenship (Baptista & Carvalho, 2013). More information is available at the link: https://recipp.ipp.pt/bitstream/10400.22/3419/5/ART_RicardoBaptista_2013_GILT.pdf

Coelho, Motta and Paiva (2018) investigated the usability of the Kahoot software (https://kahoot.com/) in the educational context, concluding that this app is a plausible teaching tool that enables students to learn in an interactive and more motivating manner, providing teachers with an alternative way of assessing learning outcomes, bringing teachers closer to students during the assessment process.

Regarding gamification for learning purposes, Pinto & Cardoso (2019) concluded: "the gamification of learning is a trend, as an inevitable and irreversible path, especially if we consider the potential of the application of artificial intelligence to digital games." (Pinto & Cardoso, 2019. p. 713)

1.1.2 State of the Art of Simulations in Portugal

The use of pedagogical simulation techniques in Vocational Education and Training in Portugal has gained relevance as an effective methodology for developing technical, behavioural and cognitive skills. Simulations allow students to experience real scenarios in a controlled environment, where creative solutions can be tested at lower costs and where mistakes can be constructive learning opportunities.

One of the training areas where the use of simulation has been widely applied is health, specifically in the teaching of nursing and medicine.

Simulation learning environments provides increased opportunities for students to familiarize themselves with clinical skills before consolidating them in real clinical practice. It improves the ability to visualize physiological responses to medications and nursing interventions, facilitates learning decision-making, self-reflection and critical thinking. (Martins et al., 2014)

A recent study by Santana et al. (2023) pointed out that realistic simulations in nursing education enable the development of cognitive and theoretical, social, behavioural, technical and practical skills in the training of students.

In the training of pilots and aeronautical professionals, the use of simulators is widespread. The advantages include the fact that training does not depend on weather conditions or airspace congestion; that emergency situations can be trained without putting people and property at risk; and that the exercise can be interrupted or altered as desired by the instructor. (Costa, 2008)

A study on the application of virtual reality simulation (VRS) in firefighter training also showed its relevance in promoting the development of decision-making skills in operations management. (Reis, 2018)

A case study applied at the University of Algarve on Simulation games as tools for integrative dynamic learning, highlighted that the *Cesim Global Challenge* simulator can be an effective educational tool for the areas of management and entrepreneurship, but it must be accompanied by the prior use of traditional resources (tutorials, lessons, examples, discussions) to achieve effectively structured learning. (KIKOT et al., 2013)

An exploratory study with primary and secondary school teachers showed that the use of apps with tangible interaction based on Augmented Reality (AR) technology in the teaching of mathematics led to the conclusion that AR in general can be successfully used as a resource for teaching mathematics. (Cerqueira et al.,2020)

In Initial Vocational Education and Training, Aboim (2020) used the simulation game *Two Point Hospital* with students on a Family Assistant and Community Support course. This game allows the player to take control of real-life situations applied to hospital management. The results showed that the game impacted to improve behavioural and interpersonal skills, as well as students' engagement, but less effective than expected in acquiring knowledge.

1.1.3 State of the Art of Digital Storytelling in Portugal

Digital storytelling and games are used in education in Portugal as an inspiring and entertaining learning tool (Bidarra &Andrade, 2016). According to a study conducted in Portugal by Bidarra & Andrade (2016) – https://repositorio.ucp.pt/handle/10400.14/22782 – storytelling promotes learning in different areas and at different ages. There are similarities in the skills needed and acquired both as storytelling and in the development of a story in a game, such as feedback, communication, interactivity, engaging, motivation and critical thinking, all of which develop in some way with the use of digital storytelling. Students and teachers appear as knowledge creators in the construction of their storytelling, at a wide range of ages, from pre-school to adulthood. One interesting tool for creating an interactive story in the game is the Alice software (https://www.alice.org/).

Recently, in a dissertation on the use of interactive storytelling in early childhood education, Borges (2023) stated that storytelling combined with interaction and immersion, offering the simulation of situations, could be the future of learning and the closest practical way to apply knowledge. Storytelling allows the story to be experienced in a more believable way, enhancing learning and making it easier to consolidate knowledge. Children are not just listening or imagining a journey, they are acting within the stories, so they can be part of them. Children experience the story as part of their reality, as the virtual and the real blend together in these immersive experiences, especially at an age when learning takes place through experience and example.

Borges (2023) highlighted the use of storytelling games as a powerful tool, already understood and adapted by new generations, for transmitting knowledge that is necessary and important for education and child development.

A case study of a project implemented by Andrade (2012) focused on the use of Digital Storytelling as an educational strategy to combat indiscipline and improve students' behaviour at school. The project was implemented in an Educational Territory of Priority Intervention – students developed their own film, based on their life stories, using multimedia resources. The results were positive overall and very encouraging in the sense that they promoted the quality of educational practices, valuing attitudes, the capacity for discovery and innovation and reflective thinking (Andrade, 2012).

Some studies also emphasize the pedagogical advantages of Digital Storytelling applied to the Vocational Education and Training context. In a case study developed in a VET course in classroom context, Silva (2012) applied the Digital Storytelling as a learning strategy, based on the assumption that it stimulates creativity and enhances skills such as communication and digital literacy. The main conclusion of the study suggests the positive influence of Digital Storytelling in the satisfaction of the trainees, in the learning process and in the transfer of behaviours to the workplace context. The results indicated that the Digital Storytelling methodology influenced the group's involvement, encouraging reflection and the formation of opinions, since the information transmitted is processed at a deeper level. In addition, the trainees showed a high rate of information retention and were able to transfer and/or apply the skills acquired in a work context.

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1.2 COUNTRY: POLAND

In Poland, the use of games, simulations and digital storytelling for educational purposes is becoming increasingly popular and is gaining recognition.

1.2.1 Gamification in Education

This project conducts research on the use of game elements and the phenomenon of gamification in the teaching process.
In Poland, an important and interesting initiative to show the possibility of including gamification and games in the didactic process was the Laboratory of Digital Didactics for Schools of the Malopolska Region.[1] The project developed educational games and methodological materials on the use of gamification in education (...)[2]. Digital games in school practice are still rarely used, which is probably related, on the one hand, to the lack of a wide range of games dedicated to education, and on the other, to the reluctance to play games among some teachers and parents. The game gives students the opportunity to test themselves in an acceptable and less stressful way. A student can enter the game several times, as long as he or she has not reached a level of competence that satisfies him or her. Thus, the student is not immediately judged, and failure becomes an important part of the teaching process, sometimes even a necessary part of solving a problem or achieving a goal.[3] It is also important that when students become familiar with the rules of games, they are encouraged to modify and invent their own rules. Teaching through games, therefore, not only promotes active participation and involvement of the student in the educational process but can be an effective method in the formation of pro-innovation attitudes.[4] For teachers, games provide support in communication, building relationships and learning about students' interests, which in turn translates into greater involvement in lessons. Their use in the teaching process not only makes lessons more interesting, but also provides students with tools for effective knowledge acquisition.[5]

In 2023, a competition was announced in Poland under the auspices of the Ministry of Culture and National Heritage, MEiN and GovTech, based on the first game in the history of Polish education to be included among school supplementary reading - "This War of Mine".[6] The contest was intended for students and teachers at secondary schools. The task for students was to write a story, report or diary based on the game and submit the entry. The task for teachers was to create a scenario for a lesson based on the game and conduct it with students. The game covered topics that could be discussed in ethics or social studies lessons. The game is based on an analysis of several armed conflicts over the past several decades and shows the perspective of civilians who fought for survival every day and had to make many difficult choices.[7]

In 2019 and 2020, an educational and research project was implemented in Poland: "Playing on Screen. Youth in the world of digital games." The aim of the activities was to gain up-to-date knowledge about the

[1] About games and gamification in education - Andrew Pe, Milosz Pe Katarzyna KowalczykCertified teacher. Master's degree in Polish studies, oligophrenopedagogue, librarian. (The article is an abridgement of the text published in Gamification in Education and Business, eds. M. Makowiec, A. Witoszek - Kubicka, Krakow 2019).). https://nauczyciele.edu.pl/wp-content/uploads/2021/05/TW%C3%93RCZA-EDUKACJA-TW%C3%93RCZY-NAUCZYCIEL-CZERWIEC-2020-2.pdf
[2] See: http://www.ldc.edu.pl/[04.11.2019]
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[5] https://www.gov.pl/web/laboratoria/moc-gier-w-edukacji
[6] https://www.gov.pl/web/grywedukacji
[7] https://samorzad.pap.pl/kategoria/edukacja/wystartowal-konkurs-dla-uczniow-i-nauczycieli-pod-patronatem-mein-na-podstawie

use of digital games by children and young people and to educate the public about responsible gaming.[8] The largest study to date of digital game playing by young people in Poland was carried out. A research report was published in 2021, which included recommendations[9]. Among other things, the inclusion of digital games in the process of education of children and young people in Poland, supplementing and systematically expanding the offer of training for teachers preparing them to use digital games in teaching.

Research results for students: young people who use digital games may be more motivated to learn, especially when these games are used for educational purposes, playing digital games together may also foster relationships, bonds between students

Results for the schools: increased knowledge of how students use digital games, what their needs are which provides an opportunity to use the collected results to build school e-addiction prevention programs. Increasingly, teachers are choosing to teach lessons based on storylines taken from digital games. Such use of games can increase the attractiveness of the lessons conducted by teachers. In September 2020 the Ministry of Education has launched a pilot program involving the introduction of computer and video games into schools. The MEN points out that the use of computer games in schools is already provided for in the core curriculum, which obliges teachers to develop students' digital competencies. [10]

Results for parents: Parents' understanding of the process of playing their children's digital games (as well as their role in the process) seems very important, even more so in situations where the parent himself is an active participant in playing digital games

In the spring of 2021 in Poland, a project called "Grydaktyka, or education through games" was implemented to popularize the use of computer games in education. It studied the use of serious games in the school education of educational institutions. The research was an attempt to answer the questions of what games students play daily, whether there are educational games among them and what kind, and whether students see the sense of using games in education and possibly what kind of games they could be. The survey was also conducted among school teachers, with the aim of obtaining information on the impact of computer games on the educational process and social-emotional development of children and adolescents. The research confirms that people who play games can assimilate much more information, as well as remember it for longer and become more intelligent.[11]

1.2.2 Research on Educational Simulations in Education

Research on the use of educational simulations to educate students is being conducted in many Polish universities. These studies include analysing the impact of simulations on the development of students' practical skills and evaluating the effectiveness of simulations compared to traditional teaching methods. Simulation games are an excellent way to stimulate motivation for learning, reveal competence gaps in a stress-free way. [12]

In 2020, a survey was conducted to indicate the opinions of students in the study group on the use of simulation games in university classes.[13] The results showed that respondents mostly positively evaluate the opportunities provided by the simulation game. Also, more universities are introducing games into their

[8] https://dbamomojzasieg.pl/badaniegranienaekranie/
[9] https://dbamomojzasieg.com/granienaekranie/ .
Book https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf
[10] Report Playing on Screen. Youth in the World of Digital Games p. 14 https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf
[11] Research report on the use of computer games in school teaching https://grydaktyka.pl/raport-badan-dotyczacy-wykorzystania-gier-komputerowych-dydaktyce-szkolnej/
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[13] USING SIMULATION GAMES AS A FORM OF TEACHING FOR HIGH SCHOOL STUDENTS IN THE AREA OF MANAGEMENT Kinga JANECKA , Mateusz JUŹWIK University of Szczecin, KN Project Management "Project" Szczecin (https://zij.edu.pl/wp-content/uploads/2020/09/K.-Janecka-M.-Jue%CC%A8wik.pdf)

curricula. The games develop skills or competencies[14]. In 2020/2021, there was also a survey among students for the Erasmus + project on the advantages of teaching in the use of games and simulations at universities.[15]

1.2.3 Research on Digital Storytelling for Learning Purposes

In 2019, a guide for teachers was developed based on the project Europe of Our Life: Digital Storytelling.[16] This guide is designed for teaching and learning through digital storytelling. The digital storytelling technique can be a powerful educational tool that engages students and enables a deeper understanding of the material. Several articles and printouts related to storytelling were developed between 2006 and 2020[17]

1.3 COUNTRY: UKRAINE

1.3.1 State of the Art of Game-Based Learning, Simulations and Digital Storytelling for Learning Purposes – Ukraine

About 13000 secondary schools, 1300 VET institutions and 300 HEIs operate in Ukraine today.

In 2017, the new Laws "On Education" and in 2020 "On General Secondary Education" were adopted. The New Ukrainian School (2018) is a key reform (with values like focus on students, pedagogy of partnership, fair funding, etc) of the Ministry of Education and Science (MES).

In VET reforms are necessary to meet the needs of the Ukrainian labour market, for the post-war recovery and reconstruction of the country. However, today in Ukraine: 2/3 of school graduates choose higher education, while a third of unemployed people are under 35 years; 60% of VET institutions have worn-out equipment due to unsystematic and insufficient investments; their content and training methods do not meet requirements of employers; cooperation between professional education institutions, local authorities and employers is poorly developed; a low prestige and negative stereotypes of VET exist; teachers aren't motivated enough for professional development.

Reforming VET in Ukraine involves modernization of infrastructure, changes in education standards and teacher training. In 2019-2022, the EU Program "EU4Skills: Better skills for modern Ukraine" was implemented to promote VET reform. In 2020, the MES Board approved the Strategy for Development of Vocational and Technical Education. It detailed the tasks of the Reform Concept "Modern Vocational and Technical Education" (*Decree, 2019*). In 2021, the President of Ukraine signed the Decree "On priority measures for the development of vocational and technical education", and the Council for the Development of Professional and Technical Education was created as a consultative and advisory body. In 2021, the Government approved the State Targeted Social Development Program for 2022-2027, enabling implementation of the decentralization reform, modernization of the content and quality of education, development of partnerships, and popularization of professional education.

The Law of Ukraine "On Professional (Vocational and Technical) Education" (1998) has been improved for years. And on April 2, 2024, MES submitted a draft of the new Law "On Vocational Education" for public discussion. It was developed with the expert support of the Committee of the Verkhovna Rada of

[14] Katarzyna Szymańska1 Państwowa Uczelnia Zawodowa im. Ignacego Mościckiego w Ciechanowie SIMULATIONS AND GAMES IN THE EFFECTIVE SHAPING OF KNOWLEDGE, SKILLS AND COMPETENCES IN THE LABOUR MARKET p.249 (file:///C:/Users/Izba/Downloads/Symulacje_i_gry_w_efektywnym_ksz%C5%82.pdf)
[15] Katarzyna Szymańska1 Państwowa Uczelnia Zawodowa im. Ignacego Mościckiego w Ciechanowie SIMULATIONS AND GAMES IN THE EFFECTIVE SHAPING OF KNOWLEDGE, SKILLS AND COMPETENCES IN THE LABOUR MARKET p.239 (file:///C:/Users/Izba/Downloads/Symulacje_i_gry_w_efektywnym_ksz%C5%82.pdf)
[16] Alexander Kobylarek Pro Scientia Publica Foundation. Link to guide: https://epale.ec.europa.eu/sites/default/files/polish_teaching_guide.pdf
[17] https://pbw.org.pl/przemysl-2,55/storytelling-w-praktyce-edukacyjnej,12026

Ukraine on Education, Science and Innovation, the Federation of Employers of Ukraine, the EU program "EU4Skills" and the Swiss-Ukrainian DECIDE project. It describes active involvement of business in the educational process, expansion of the autonomy of institutions, improvement of educational programs, deregulation of the field etc.

As a result of coronavirus and the war, today's Ukrainian education is quickly adapting new learning technologies (*Galynska, 2022; Ihnatova, 2021; Lazarenko, 2022; Matvienko, 2021; Semerikov, 2022; Tverdokhliebova, 2023*), even though the education sector was affected the most by the war (approx. direct losses are estimated at $10 billion, 3500 educational institutions were damaged and 400 – completely destroyed).

Speaking about **game-based learning**, it is worth mentioning that it is a basis of the New Ukrainian School Concept. Hovewer, research (*Gura, 2022*) indicated that the vast majority of interviewed Ukrainian school teachers showed an insufficient level of professional readiness for the introduction of gamebased learning due to: their insufficient awareness of the developmental, didactic and other functions of games; negative attitude to games in education; dominance of an authoritarian style of communication with students, etc. At the same time, the data from Ukrainian HEIs (*Humeniuk, 2023; Matvienko, 2021*) showed that gamification methods in English language learning encourage positive attitudes to and greater engagement in language study, competition, collaboration, creativity etc.

Similarly, **simulation educational technologies** proved to be extremely effective in the Ukrainian medical education (*Sims; Kovalyova, 2019; Tovstokoryi, 2021; Voloschuk, 2020*).

As to **digital storytelling in education**, its role in the education of children with special needs was presented in (*Glodkowska, 2020*). Although the research in Ukrainin HEIs in 2017–2018 (*Panchenko, 2021*), showed that only a quarter of respondents (26%) have practiced this method; while 72.5% have not used it so far, but are ready to.

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1.4 COUNTRY: TÜRKIYE

This study was conducted as an examination of the current situation of game-based education and digital storytelling in Turkey within the scope of the GPS@VET project.

This study was examined under two separate headings: game-based learning and digital storytelling.

1.4.1 Game-Based Learning

As the great philosopher Plato said, children grow up through play. Throughout history, games have been used for learning purposes. Games have been a means of entertainment and learning for both childhood and adolescence. Especially simulation method games have a very important place in helping students simulate real life and develop analytical solutions. One of the most important steps of learning through gamification is peer learning. Although adults are authorities on life or learning, children attach more importance to the information coming from their peers and store it in their more permanent memories.

1.4.1.1 Overview of GBL in Türkiye

- Educational Games Development

Games have continued to exist throughout history and have been integrated into educational life. Although educational games first started as children's games, goal-oriented games were later developed. With the onset of the digital age, games to fill the free time of students have entered the educational literature. The foundation of digital games in education dates to 2004. With Türkiye's transition to the e-school system, educational games started to be produced by the ministry. Nowadays, educational games are developed by both the Ministry of National Education and private initiatives.

- Gamified Learning Platforms

EBA is an on-line learning platform established by the Ministry of National Education. (www.eba.gov.tr) It includes many games. These games are games with formation prepared by education experts. To give examples of these, Dialect, Dialogue Card, Meds etc.

Game portals created by private initiatives generally provide some of the games used all over the world directly and some of them translated into the native language. (www.mentalup.net)

Web 2.0 Gamified Learning: Web 2.0 applications create important auxiliary resources for games. With these tools, you can play games directly or create your own games. Some examples are puzzle.org, lucky cage, Siyosis etc.

Educational Simulations: Simulation in education has entered education life with the development of the digital world. In Turkey, simulation training was first used most in driver training. Real vehicle equipment, inspired by the once-famous Need for Speed game, was simulated to driver candidates via a screen. In recent years, education through simulation has spread to every field. The best example we can give is the 360 Education Simulation developed by the Ministry of National Education. (https://orgm.meb.gov.tr/360egitim)

1.4.1.2 Digital Storytelling in Türkiye

Stories are an important component of the teaching process. Storytelling creates more holders for the information transferred to permanent memory. We can examine the subject of Digital Storytelling in two stages, specifically for Türkiye. Digitizing existing stories, Creating digital stories.

The digitalization process, which started with the aim of contributing to the education of visually impaired individuals and planning new learning environments, continued with the dubbing of existing books. At this stage, with audiobooks taking their place in the digitalizing world, a trend has started in Turkey. The national library, which is a state institution, has made the works it holds audio. (https://dijital-kutuphane.mkutup.gov.tr) In the next stage, changing technological capabilities created the need to support audio content with visuals. Accordingly, tools and portals to produce digital stories have begun to

become widespread. At this stage, applications and sites are divided into two. The first is hybrid products created by adding animations to existing publications or stories. The second is digital stories containing animations created directly with these tools. Many portals and web 2.0 tools on Digital Storytelling are used in our country. Some of these are cartoon tools such as obliks, avatoon, mirror, while others are animation preparation tools such as opera maker, mblock, movie adventure. Using these tools, we can animate a story or create our own original stories. In order to make the learning process more effective, we can also integrate the learners' own avatars or cartoon characters into the stories.

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1.5 COUNTRY: GERMANY

1.5.1 State of the Art of Game-Based Learning (GBL) in Germany

Research and Development: Germany has been actively involved in research and development related to game-based learning. Institutions such as the German Institute for International Educational Research (DIPF) and various universities across the country have been conducting research to understand the effectiveness of GBL in different educational contexts. Germany has active research initiatives exploring the effectiveness of GBL in enhancing learning outcomes and engagement across different subjects and age groups.

Industry and Innovation: The serious games industry in Germany continues to innovate, developing educational games that align with curriculum standards and address diverse learning needs. Germany has a thriving serious games industry that develops educational games for different subjects and age groups. Serious games are designed with specific learning objectives in mind and are used in educational settings to teach various concepts and skills.

Integration into Education: German educational institutions are increasingly incorporating game-based learning approaches into their teaching practices, recognizing the potential of games to engage students and facilitate active learning. Both educators and policymakers recognize the potential of games to engage students and enhance learning outcomes. Various initiatives have been launched to support the integration of GBL into the curriculum.

Teacher Professional Development: Efforts are underway to provide professional development opportunities for educators to effectively integrate GBL into their teaching practices and curriculum design. Workshops, seminars, and training programs are available to help educators understand how to leverage games for educational purposes.

Collaborative Projects: Collaborative projects between academia, industry, and government are driving advancements in GBL research, development, and implementation. Collaborative projects between schools, universities, and game developers have been initiated to create high-quality educational games that align with curriculum standards and learning objectives. These projects leverage the expertise of different stakeholders to produce effective learning resources.

Digital Infrastructure: Investments in digital infrastructure in schools support the integration of GBL, providing access to technology and resources for educators and students.

Game Design Programs: Germany offers game design programs at several universities, providing students with the opportunity to learn about the principles of game design and develop educational games. These programs contribute to the growth of the serious games industry and the development of innovative educational games.

1.5.2 Examples of Game-Based Learning Initiatives in Germany

Anton App: Anton is a popular educational app in Germany that offers game-based learning activities for students in primary and secondary school. The app covers various subjects, including mathematics, German, English, and other subjects. Students can engage in interactive exercises, quizzes, and mini games to reinforce their learning and practice key concepts.

Serious Games for Health Education: German healthcare institutions and organizations develop serious games for health education and promotion. These games address topics such as nutrition, physical activity, disease prevention, and mental health. For example, games may simulate healthy cooking recipes, encourage exercise routines, or raise awareness about public health issues such as smoking cessation or HIV/AIDS prevention.

Fiete Math Climber: Fiete Math Climber is a game developed by Ahoiii Entertainment, a German game studio, aimed at teaching math skills to young children. Players help the character Fiete climb mountains by solving math problems, such as addition, subtraction, multiplication, and division. The game combines fun gameplay with educational content to engage children in learning math concepts.

MINTfit: MINTfit is an initiative in Germany that promotes game-based learning in STEM (Science, Technology, Engineering, and Mathematics) education. The project develops educational games and digital learning resources to enhance STEM learning experiences for students. These games cover topics such as physics, chemistry, biology, and engineering, providing interactive and engaging ways to learn scientific concepts.

Serious Games for Sustainability Education: German environmental organizations and educational institutions create serious games to raise awareness about sustainability issues and promote eco-friendly behaviors. These games simulate environmental challenges, such as climate change, pollution, and resource management, allowing players to explore solutions and make decisions to mitigate environmental impacts.

Learn Life Science: Learn Life Science is a game-based learning platform developed by the Institute for Life Sciences Engineering at the Technical University of Berlin. The platform offers interactive games and simulations to teach students about life sciences, biotechnology, and bioengineering. Players engage in virtual experiments, explore biological processes, and solve scientific challenges to deepen their understanding of life science concepts.

LudInc: LudInc is a German educational game developer that creates games for learning purposes. Their games cover various subjects, including language learning, mathematics, history, and social skills. For example, "Lernerfolg Grundschule" (School Success Elementary School) series offers educational games tailored to the German elementary school curriculum, helping students practice skills and prepare for exams in a playful way.

1.5.3 State of Digital Storytelling in Germany

Research and Theoretical Frameworks: Scholars in Germany have been exploring digital storytelling within the context of education, drawing upon theories of narrative, media literacy, and constructivism. They examine how digital storytelling can enhance learning outcomes, foster creativity, and promote critical thinking skills among students. Researchers also investigate best practices for incorporating digital storytelling into curriculum design and instructional strategies

Practical Application in Education: Educators across Germany integrate digital storytelling into various educational settings, including schools, universities, museums, and cultural institutions. They use digital storytelling to engage students, document cultural heritage, facilitate language learning, and promote intercultural understanding.

Technological Innovation: Technological advancements have enabled the development of innovative digital storytelling tools and platforms in Germany. These tools often feature user-friendly interfaces, multimedia integration, and collaborative functionalities, empowering users to create and share digital stories across different media formats.

Multimedia Platforms and Tools: Germany has a wide range of multimedia platforms and tools available for creating and sharing digital stories. These platforms often provide user-friendly interfaces, templates, and multimedia resources to support the creation of interactive and engaging stories. Educators and students can leverage these tools to develop their storytelling skills and produce multimedia-rich learning content.

Collaborative Projects and Initiatives: Collaborative projects and initiatives bring together educators, researchers, artists, and technologists to explore the potential of digital storytelling for learning and cultural expression. These initiatives involve interdisciplinary collaborations, co-design processes, and community engagement to develop inclusive and impactful digital storytelling experiences. Collaborative storytelling projects are common in German classrooms and educational programs. Students work together to create digital stories, collaborating on scriptwriting, media production, and editing. These collaborative projects promote teamwork, communication skills, and digital literacy while allowing students to share diverse perspectives and experiences.

Professional Development and Training: Professional development programs and training workshops offer educators opportunities to enhance their digital storytelling skills and integrate storytelling techniques into their teaching practices. These programs provide hands-on experience, resources, and support for educators to create and implement digital storytelling projects in their classrooms.

Cross-disciplinary Applications: Digital storytelling is used across different disciplines and subject areas in German education. Whether it's language learning, history, science, literature, or social studies, educators incorporate digital storytelling to explore complex concepts, foster creativity, and encourage students to express their understanding in innovative ways.

Innovative Storytelling Formats: Germany is known for its innovation in storytelling formats, including interactive narratives, immersive experiences, and transmedia storytelling. Educators experiment with these formats to create dynamic and engaging learning experiences that captivate students' interest and imagination.

Digital Storytelling in Teacher Training: Teacher training programs in Germany incorporate digital storytelling as a pedagogical tool for pre-service and in-service teachers. Educators learn how to integrate digital storytelling into their teaching practices, design storytelling-based lesson plans, and assess students' storytelling projects effectively.

Cultural and Linguistic Diversity: Digital storytelling is used to celebrate cultural and linguistic diversity in Germany. Immigrant communities, minority languages, and indigenous cultures utilize digital storytelling to preserve and share their stories, traditions, and heritage. Digital storytelling projects serve as a means of cultural expression, intercultural dialogue, and community empowerment.

1.5.4 Examples of Digital Storytelling Initiatives for Learning Purposes in Germany

"Deutsche Geschichte in Dokumenten und Filmen" (German History in Documents and Films): This project, developed by the German Historical Institute in Rome, offers a collection of digital stories that explore various aspects of German history through documents and films. It provides educators and students with multimedia resources to engage with historical events, figures, and themes. Source: germanhistorydocs.org

"Geschichten aus der Heimat" (Stories from Home): "Geschichten aus der Heimat" is a digital storytelling project aimed at promoting cultural heritage and intergenerational dialogue. It involves students interviewing elderly residents in their communities about their life stories, traditions, and memories. These interviews are recorded, edited, and shared digitally, preserving local history and fostering connections between generations.

"Erzählwerkstatt Digital" (Digital Storytelling Workshop): The "Erzählwerkstatt Digital" is a digital storytelling workshop offered by educational institutions and cultural organizations across Germany. In this workshop, participants learn how to create their digital stories using multimedia tools and techniques. They explore storytelling principles, narrative structures, and digital media production skills to craft compelling narratives on topics of personal significance or social relevance.

"Transmediale Bildungsräume" (Transmedia Education Spaces): This initiative explores transmedia storytelling as an innovative approach to education and learning. It involves the creation of interactive storytelling experiences that span multiple media platforms, such as websites, mobile apps, social media, and immersive installations. Students engage with transmedia narratives to explore complex topics, solve problems, and collaborate with peers in interactive learning environments. Source: TransmediaStory

"Digital Storytelling in der Fremdsprachenbildung" (Digital Storytelling in Foreign Language Education): German language teachers incorporate digital storytelling into their curriculum to enhance language learning and cultural understanding. Students create digital stories in German, using language skills and cultural knowledge to communicate personal experiences, explore cultural themes, and connect with German-speaking communities worldwide. Sources: bircu-journal.com and DigitalStorytelling

"KulturGeschichten" (Culture Stories): "KulturGeschichten" is a digital storytelling project that highlights cultural diversity in Germany. It features stories told by individuals from diverse cultural backgrounds, sharing their experiences, traditions, and perspectives. These stories are presented through multimedia formats, including videos, audio recordings, and interactive multimedia presentations, allowing audiences to engage with and learn from diverse cultural narratives.

"Science Slam": While not traditional digital storytelling, the Science Slam format involves scientists presenting their research in engaging and accessible ways, often incorporating storytelling elements. In Germany, Science Slams are popular events held at universities, research institutions, and science festivals, where researchers compete to communicate their work effectively through storytelling, humour, and multimedia presentations.

1.5.5 State of the Art of Simulations for Learning Purposes in Germany

Research and Development: Academic institutions and research organizations in Germany actively contribute to the development and evaluation of simulations for learning. Researchers explore various aspects of simulation-based learning, including its effectiveness in enhancing student engagement, improving learning outcomes, and facilitating skill acquisition across different domains.

Technological Innovation: German companies and institutions are at the forefront of technological innovation in simulation software and hardware. Advanced simulations offer immersive, interactive, and realistic learning experiences, leveraging technologies such as virtual reality (VR), augmented reality (AR), and gamification to create engaging and effective learning environments.

Integration into Education: Simulations are increasingly integrated into formal and informal educational settings in Germany, spanning primary, secondary, and higher education, as well as vocational training and professional development. Educators use simulations to complement traditional instruction, provide hands-on learning experiences, and simulate real-world scenarios relevant to students' academic and professional interests.

Collaborative Projects and Partnerships: Collaborative projects and partnerships between academia, industry, and government drive innovation and best practices in simulation-based learning. These collaborations facilitate the co-design, development, and implementation of simulations that address specific educational needs, align with curriculum standards, and promote interdisciplinary learning.

Teacher Training and Professional Development: Training programs and professional development initiatives equip educators with the knowledge, skills, and resources to effectively integrate simulations into their teaching practices. Teachers learn how to select, adapt, and implement simulations to support diverse learners, scaffold learning experiences, and assess student progress.

Virtual Laboratories and Training Facilities: Germany is known for its advanced virtual laboratories and training facilities, particularly in fields such as engineering, medicine, and manufacturing. These facilities provide students and professionals with hands-on experiences in simulated environments, allowing them to practice skills, conduct experiments, and troubleshoot problems in a safe and controlled setting.

Simulated Work Environments: Simulations are also used to recreate real-world work environments, allowing learners to develop job-specific skills and competencies. For example, in vocational training programs, simulations simulate workplace scenarios to prepare students for their future careers. Additionally, businesses use simulations for employee training and professional development.

Serious Games and Gamified Simulations: Germany has a growing serious games industry that develops gamified simulations for learning purposes. These simulations combine elements of games with educational content to engage learners and enhance retention. They are used in both formal and informal learning settings to teach complex concepts, foster critical thinking, and promote collaboration.

Simulation-Based Assessments: Simulation-based assessments are increasingly being used in educational and professional settings to evaluate learners' competencies and skills. These assessments often involve interactive scenarios or simulations that require learners to apply their knowledge and problem-solving abilities in realistic contexts. Germany has been exploring the use of simulation-based assessments in areas such as medical education and workforce training.

1.5.5 Examples of Simulations for Learning Purposes in Germany

Virtual Laboratories in STEM Education: Many universities in Germany offer virtual laboratories for students in science, technology, engineering, and mathematics (STEM) fields. These virtual labs allow students to conduct experiments and simulations online, replicating real-world laboratory environments. For example, students can perform chemistry experiments, simulate electronic circuits, or explore physics phenomena through virtual simulations. Source: Virtual Laboratory and practicing-stem-in-simulation-virtual-lab-environment

Medical Simulators for Healthcare Training: German medical schools and healthcare institutions utilize advanced medical simulators for training healthcare professionals. These simulators replicate clinical scenarios, patient interactions, and medical procedures, allowing students to practice diagnostic skills, surgical techniques, and patient care in a realistic and safe environment. Examples include surgical simulators, patient manikins, and virtual reality simulations for medical training. Source: best.charite.de and landstuhl.tricare

Simulation-Based Training in Aviation: Germany is home to several aviation training centers that use flight simulators for pilot training and aircraft maintenance. Flight simulators provide realistic flight experiences, allowing pilots to practice flying different aircraft models, navigating through various weather

conditions, and handling emergency situations. Aviation maintenance technicians also use simulators to learn troubleshooting and repair procedures for aircraft systems. Source: lufthansa-aviation-training.com and airbus.com

Business Simulations for Management Education: German universities and business schools incorporate business simulations into management education programs. These simulations simulate business environments, allowing students to make strategic decisions, manage resources, and analyze market dynamics in competitive settings. Students gain hands-on experience in business planning, marketing, finance, and operations management through interactive simulation exercises. . Sources Kiel uni-kiel.de

Industry 4.0 Simulations for Engineering Training: With Germany's emphasis on Industry 4.0 and advanced manufacturing technologies, engineering schools and training centers use simulations to educate students about digital manufacturing processes and technologies. These simulations cover topics such as computer-aided design (CAD), computer-aided manufacturing (CAM), robotics, automation, and additive manufacturing (3D printing). Students learn how to design, simulate, and optimize manufacturing systems using digital tools and simulations. . Sources: tu-berlin.de and Heidelberg srh-university.de topsim.com

Emergency Response Simulations for Disaster Preparedness: German emergency response agencies and disaster management organizations conduct simulations to train first responders and emergency personnel for disaster preparedness and response. These simulations simulate various disaster scenarios, such as earthquakes, floods, and terrorist attacks, allowing responders to practice coordination, communication, and decision-making skills in simulated crisis situations. Example Bremen: emergency.copernicus.eu

Simulated Trading Platforms for Financial Education: Financial education programs in Germany often incorporate simulated trading platforms to teach students about financial markets, investment strategies, and portfolio management. These platforms simulate stock markets, allowing students to buy and sell stocks, bonds, and other financial instruments using virtual funds. Students learn about investment principles, risk management, and financial decision-making through hands-on trading simulations. Souces: goethe-business-school and livex.uni-frankfurt

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1.6 COUNTRY: ROMANIA

Combining game-based learning, simulations, and digital storytelling for educational purposes offers a multifaceted approach to engaging and effective learning experiences.

1.6.1 Game-Based Learning (GBL)

Game-based learning is increasingly recognized in Romania as an effective method for engaging students and enhancing learning outcomes. Educational institutions and educational technology - EdTech companies are developing games tailored to the Romanian curriculum and educational standards. These games span various subjects and age groups, offering interactive and immersive learning experiences. It's a promising field in Romania, with growing research and implementation across various educational levels.

1.6.1.1 Overview of GBL in Romania

Educational Games Development: There's a growing interest in developing educational games tailored to the Romanian curriculum and educational standards. These games span various subjects, from mathematics and science to languages and history. For instance, a game might simulate historical events, requiring players to make decisions and witness the consequences, thus enhancing their understanding of history.

Gamified Learning Platforms: Online platforms and learning management systems (LMS) are incorporating gamification elements to make learning more interactive and enjoyable. For example, points, badges, leaderboards, and progress tracking are integrated into online courses to motivate students to progress through the material.

Virtual Reality (VR) and Augmented Reality (AR) Applications: While still emerging, VR and AR technologies are increasingly being utilized in educational settings in Romania. These immersive technologies provide unique opportunities for experiential learning. For instance, students can explore virtual environments to understand complex concepts or historical settings.

Serious Games for Skills Development: Serious games, designed specifically for skill development rather than pure entertainment, are being utilized in vocational training and professional development programs. These games simulate real-world scenarios and allow learners to practice and refine their skills in a risk-free environment.

Research and Academic Initiatives: Universities and research institutions in Romania are conducting studies on the effectiveness of game-based learning approaches. These initiatives aim to assess the impact

of games on student engagement, knowledge retention, and academic performance across different subjects and age groups.

1.6.1.2 Future of GBL in Romania

With ongoing research, increased accessibility of technology, and dedicated efforts to address existing challenges, GBL has the potential to become a more prominent and effective educational tool in Romania. It can play a significant role in making learning more engaging, personalized, and ultimately more successful for students.

1.6.1.3 Examples of GBL

Educational Apps: Several Romanian developers have created educational apps for various subjects, catering to different age groups. These apps can be used as supplementary learning tools or for independent practice.

National Competition "Olimpiada de Logică, Jocuri Matematice și Gândire Critică" (Logic Olympiad, Math Games, and Critical Thinking): This national competition incorporates game-based elements to make learning logic and mathematics more engaging for students.

University Gamification Initiatives: Some universities in Romania are exploring gamification, a sub-category of GBL, by incorporating game-like elements such as points, badges, and leaderboards into their learning platforms to increase student motivation and engagement.

1.6.4 Simulations

Simulations are widely used in Romania for educational and training purposes across various fields, including STEM education, healthcare, vocational training, and emergency response. These simulations provide hands-on learning experiences in a safe and controlled environment.

1.6.4.1 Overview of Simulations in Romania

Educational Simulations: Educational institutions in Romania are increasingly adopting simulation-based learning approaches to enhance traditional teaching methods. Simulations are used across various subjects, including science, mathematics, engineering, and healthcare education. For instance, physics simulations allow students to conduct virtual experiments and observe real-world phenomena in a controlled environment.

Virtual Laboratories: Virtual laboratories provide students with hands-on experience in conducting experiments without the need for physical lab equipment. These simulations are particularly useful in subjects like chemistry, biology, and engineering, where access to lab facilities may be limited. Students can interact with virtual equipment, manipulate variables, and observe outcomes, thereby deepening their understanding of scientific concepts.

Medical Simulations: Healthcare professionals in Romania benefit from simulation-based training for medical procedures, patient care, and diagnostic skills. Simulated scenarios allow medical students, nurses, and doctors to practice clinical skills in a safe and controlled environment before working with real patients. High-fidelity medical manikins, virtual reality simulators, and computer-based simulations are commonly used for medical training.

Industrial Simulations: Industries in Romania, including manufacturing, automotive, and aerospace, utilize simulations for product design, process optimization, and training purposes. Simulation software allows engineers and technicians to model complex systems, analyse performance, and identify potential improvements. For example, automotive companies use simulations to test vehicle designs for safety, efficiency, and durability before production.

Emergency Response Training: Simulations are employed for training emergency response teams, including firefighters, paramedics, and law enforcement personnel. These simulations replicate various

crisis scenarios, such as natural disasters, terrorist attacks, and medical emergencies, to prepare responders for real-life situations. Virtual reality simulations and tabletop exercises are used to assess and enhance decision-making skills in high-pressure environments.

1.6.4.2 Future of Simulations in Romania

With continued investment in technology infrastructure and simulation development, simulations have the potential to become a more prominent learning tool across Romania. More research on the effectiveness of simulations in Romanian educational contexts is needed to inform best practices. By embracing simulations and overcoming the challenges, Romania can leverage this technology to provide effective and engaging training experiences across various sectors.

1.6.4.3 Examples of Simulations in Romania

Virtual Labs: Several universities and educational institutions in Romania offer virtual labs in various science disciplines.

Medical Simulation Centres: Some Romanian hospitals and universities have established medical simulation centres with advanced simulation technology.

VR Training Programs: Companies in various sectors are adopting VR-based training programs to upskill and train their workforce through simulations.

1.6.5 Digital Storytelling (DS)

Digital storytelling is leveraged in Romania to enhance learning experiences, promote cultural heritage, and foster creativity among students. Educators and cultural institutions use digital storytelling platforms to share narratives, document history, and engage audiences.

1.6.5.1 Overview of Digital Storytelling in Romania

Cultural Preservation and Heritage: Digital storytelling is utilized to preserve and promote Romania's rich cultural heritage and traditions. Museums, cultural institutions, and heritage sites use digital platforms to share stories about historical events, folk traditions, and cultural artifacts. For example, interactive digital exhibits allow visitors to explore archaeological sites or historical landmarks virtually.

Education and Learning: Digital storytelling is integrated into educational settings to enhance learning experiences and foster creativity among students. Teachers and educators create multimedia storytelling projects that enable students to research, write, and produce their own digital stories. These projects encourage critical thinking, collaboration, and digital literacy skills. Students may create digital stories on topics ranging from literature and history to science and social issues.

Community Engagement and Social Change: Digital storytelling serves as a powerful tool for community engagement and social advocacy in Romania. Community organizations, NGOs, and grassroots movements use digital media to share personal stories, raise awareness about social issues, and advocate for change. Digital storytelling campaigns address topics such as environmental conservation, human rights, gender equality, and social justice.

Tourism Promotion: The tourism industry in Romania utilizes digital storytelling to attract visitors and showcase the country's natural landscapes, cultural attractions, and tourist destinations. Tourism agencies create multimedia content, including videos, blogs, and interactive maps, to highlight unique experiences and encourage travellers to explore different regions of Romania. Digital storytelling platforms provide virtual tours, travel guides, and personalized recommendations to enhance the visitor experience.

Film and Media Production: Digital storytelling has transformed the film and media landscape in Romania, enabling filmmakers, animators, and content creators to produce innovative and immersive narratives. Digital technologies allow for the creation of interactive documentaries, animated shorts, web

series, and virtual reality experiences. Romanian filmmakers leverage digital platforms to distribute their work to domestic and international audiences.

1.6.5.2 Future of Digital Storytelling in Romania

With increased access to technology and growing awareness of its benefits, DS is poised to become a more widely used tool in Romania. It has the potential to revolutionize the way stories are told and experienced, fostering creativity, engagement, and learning across different sectors.

1.6.5.3 Examples of Digital Storytelling in Romania

Project: "Legendele digitale ale Clujului" (The Digital Legends of Cluj): The Cluj-Napoca Central Library launched this project to preserve and share local legends. They collaborated with local artists to create short animated stories based on these legends, making them accessible to a wider audience and engaging a younger generation.

Project: "poveștile sustenabilității" (Sustainability Stories): A green NGO created a series of DS projects highlighting sustainable practices in Romanian villages. They use video interviews with local farmers and artisans who are implementing sustainable solutions, aiming to inspire others and promote environmental awareness.

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Centre for Learning & Performance Technologies (Romania): https://www.navy.ro/despre/organizare/ci/ci.php

Chapter 2: GAMIFICATION OF LEARNING

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This chapter approaches gamification in the educational context, giving clues as to how gamification of learning can be put into practice. Game-based learning methodologies and approaches are discussed, as well as the principles and mechanisms of game-based learning.

From a more practical point of view, hints are given as to how teachers can practically design their own games for specific learning purposes and several examples of existing online game sources that can be used, specifically in the field of VET.

2.1 Putting the Gamification of Learning into Practice

In recent years, gamification has emerged as a powerful tool for enhancing learning experiences across various domains. By integrating game elements into educational contexts, educators can effectively engage learners, promote active participation, and foster a deeper understanding of the subject matter.

2.1.1 Understanding Gamification

Gamification involves the integration of game design principles and mechanics into non-game environments to motivate participation, drive engagement and facilitate learning. It harnesses the innate human inclination towards play and competition to make learning more enjoyable and effective.

Key elements of gamification include points, badges, leaderboards, challenges, rewards, and progression systems, all of which serve to incentivize desired behaviours and actions.

2.1.2 Benefits of Gamification in Learning Gamification

The adoption of gamification in education offers numerous benefits for both educators and learners. Firstly, it increases learner motivation by providing clear goals, instant feedback, and a sense of achievement. Secondly, it promotes active learning and problem-solving skills as learners interact with content in a dynamic and immersive environment. Thirdly, it enhances knowledge retention through repeated practice and reinforcement. Finally, gamification fosters collaboration and social interaction among learners, leading to a more engaging and inclusive learning experience.

2.1.3 Practical Applications of Gamification

There are various ways to incorporate gamification into learning activities across different educational settings.

For example, in a classroom setting, educators can use gamified quizzes, interactive simulations, and role-playing exercises to reinforce concepts and assess learning outcomes.

In online courses, gamification can be implemented through progress tracking, virtual rewards, and collaborative challenges to keep learners engaged and motivated.

2.1.4 Implementation Strategies

Successful implementation of gamification requires careful planning and consideration of learners' needs and preferences. Here are some key strategies for integrating gamification into learning.

Clearly Define Learning Objectives: Before incorporating gamification into learning activities, educators must clearly define their objectives. What specific knowledge or skills do they want learners to acquire? By aligning game mechanics with learning goals, educators can ensure that gamification enhances, rather than detracts from, the educational experience.

Select Appropriate Game Elements: Not all game elements are suitable for every learning scenario. Educators should carefully choose elements that align with the subject matter, the preferences of the target audience, and the desired learning outcomes. For example, a language learning app might use badges to reward users for mastering new vocabulary, while a math game might incorporate levels to challenge students at different skill levels.

Promote Collaboration and Competition: Gamification can foster collaboration among learners by incorporating social features such as multiplayer games, team challenges, or collaborative problem-solving activities. Additionally, friendly competition through leaderboards or point-based systems can motivate learners to strive for improvement and achieve their goals.

Provide Meaningful Feedback: Timely and constructive feedback is essential for guiding learners' progress and reinforcing desired behaviours. Game mechanics such as instant feedback, progress tracking, and performance analytics can help learners understand their strengths and areas for improvement, encouraging them to persist in their learning efforts.

Balance Challenge and Achievement: Effective gamification strikes a balance between challenge and achievement to keep learners engaged and motivated. Tasks should be challenging enough to promote learning and skill development but not so difficult as to frustrate or discourage learners. Incremental progression, adjustable difficulty levels, and personalized learning paths can help maintain this balance.

Incorporate Narrative and Storytelling: Narrative-driven gamification can immerse learners in engaging scenarios, making learning more compelling and memorable. By integrating storytelling elements into educational games, educators can contextualize learning content, stimulate curiosity, and evoke emotional responses, enhancing overall engagement and retention.

2.1.5 Conclusion on implementation strategies

In conclusion, gamification holds immense potential for transforming the learning experience by making it more interactive, engaging, and effective. By leveraging game design principles and mechanics, educators can create dynamic and immersive learning environments that cater to the diverse needs of learners. However, successful implementation requires careful planning, strategic design, and ongoing evaluation to ensure meaningful outcomes. By putting the principles of gamification into practice, educators can unlock new possibilities for enhancing learning and fostering a lifelong love of learning.

2.2 Game-based Methodologies and Approaches

Game-based learning encompasses various methodologies and approaches aimed at using games to facilitate learning and achieve educational objectives.

Here are some prominent methodologies, along with references supporting their effectiveness:

Gamification: It involves incorporating game elements, such as points, badges, leaderboards, and rewards, into non-game contexts to increase engagement and motivation. It often employs game-like mechanics to encourage desired behaviours and drive learning outcomes.

Serious Games: There are games designed with a primary purpose other than entertainment, such as education, training, or behaviour change. They simulate real-world contexts and challenges, allowing learners to practice skills, solve problems, and make decisions in a safe and engaging environment.

Example: "Dragon Box School" series, which uses engaging puzzles to teach mathematical concepts.

Simulation-Based Learning: It involves creating realistic representations of processes, systems, or environments for learners to interact with and explore. Simulations can range from virtual environments to physical models and provide experiential learning opportunities that mimic real-world situations.

Students take on specific roles within a simulated scenario, allowing them to experience real-world situations in a safe and controlled environment. This can be particularly useful for practicing decision-making, problem-solving, and critical thinking skills.

Example: A medical simulation game where students diagnose and treat virtual patients.

Immersive Learning: It involves creating deeply engaging and interactive experiences that fully engage the learner's senses and attention. Virtual reality (VR), augmented reality (AR), and mixed reality (MR) technologies are often used to immerse learners in simulated environments or scenarios.

Collaborative Learning Games: It involves multiplayer experiences where learners work together to achieve common goals, solve problems, or complete tasks. These games promote teamwork, communication, and cooperation among participants.

Educational Games (Edutainment): These commercially available games can be repurposed for educational purposes by educators. They can be a good way to supplement traditional instruction and make learning more fun.

Example: Minecraft Education Edition, which allows students to build and explore virtual worlds while learning about history, science, and technology.

Branching Narratives: Learners progress through a story that adapts based on their choices and actions. This format encourages critical thinking and allows students to explore the consequences of their decisions.

Example: Language learning apps that use branching narratives to create interactive stories for vocabulary and grammar practice.

Role-Playing Games (RPGs): Learners take on characters within a fictional world and collaborate to achieve goals. This approach can be beneficial for developing teamwork, communication, and problem-solving skills.

Example: Tabletop RPGs like Dungeons & Dragons can be adapted to teach historical events, literature, or science concepts.

We also highlight the following approaches:

Intrinsic vs. Extrinsic Motivation:

- Intrinsic: Learning is driven by the enjoyment of the game itself and the desire to master its challenges. (https://www.game-learn.com/en/)
- Extrinsic: Motivation comes from external rewards like points, badges, or leaderboards. (https://www.prodigygame.com/main-en/blog/game-based-learning/

Narrative-Driven Learning: Embedding learning objectives within a compelling story fosters deeper engagement with the material. (https://www.game-learn.com/en/)

2.3 Principles and Mechanisms of Game-based Learning

2.3.1 Principles of Game-Based Learning

Game-based learning (GBL) leverages the motivational aspects of games to create engaging and effective learning experiences. Here are some key principles behind successful GBL according to:

Interactivity: Learners actively participate, make choices, and receive immediate feedback within the game environment.

Immersiveness: Well-designed games create a captivating world that draws learners in and fosters focused attention.

Adaptative Problem Solving: Games can adjust difficulty levels and challenges based on the learner's performance, promoting a sense of mastery and progress.

Feedback: Effective GBL provides clear and timely feedback that helps learners understand their mistakes and improve their performance.

Freedom of Exploration: Learners are encouraged to experiment and explore within the game's boundaries, fostering curiosity and deeper understanding.

2.3.2 Mechanisms of Game-Based Learning

These principles are achieved through various mechanisms that drive learner motivation and engagement. Some examples include:

Points & Scoring: Earning points, badges, or climbing leader boards provides a sense of accomplishment and motivates learners to progress.

Challenges & Levels: Games often present progressively more difficult challenges, encouraging learners to develop their skills and knowledge.

Rewards & Power-Ups: Rewards like virtual items or power-ups can incentivize desired behaviours and keep learners engaged.

Choices & Consequences: Games allow learners to make decisions that impact the narrative and their progress, fostering critical thinking.

Collaboration & Competition: Working together or competing with others can enhance motivation, social learning, and problem-solving skills.

Leaderboards & Competition: Healthy competition with peers can motivate learners to improve and strive for higher goals.

Narrative & Storytelling: A compelling story or narrative arc keeps learners invested in the game and the learning process.

Challenge & Mastery: Games provide learners with a sense of challenge that is both stimulating and achievable, promoting a desire for mastery.

By incorporating these mechanisms thoughtfully, GBL can transform dry learning content into an interactive and rewarding experience.

These principles and mechanisms are interrelated. For instance, effective feedback can enhance the feeling of immersion, while a well-designed narrative can provide context for challenges and promote mastery.

2.4 Game-Based Learning: Driving Towards Practice Through Engagement

Game-based learning (GBL) has become a powerful tool for educators, transforming dry theory into engaging experiences that drive students towards practice. This is achieved by incorporating elements and components of gaming that foster motivation, competition, and a sense of accomplishment.

Here's a breakdown of key aspects that fuel engagement in GBL:

2.4.1 Elements of Gaming

Points, Badges and Leaderboards: Awarding points for completing tasks, badges for achieving milestones, and showcasing progress on leaderboards creates a sense of achievement and friendly competition, motivating students to strive for improvement.

Challenges and Quests: Presenting learners with well-defined challenges and quests within the game narrative injects a sense of purpose and accomplishment. Overcoming challenges keeps students engaged and reinforces mastery of learned concepts.

Storytelling and Immersion: Weaving a compelling narrative into the game creates a sense of immersion, transporting students to a world where they can actively apply their knowledge and skills. This fosters deeper engagement with the learning content.

Feedback and Rewards: Providing immediate and constructive feedback throughout gameplay allows students to learn from mistakes and adjust their strategies. Pairing feedback with relevant rewards, like unlocking new levels or abilities, reinforces positive learning behaviours.

Choice and Control: Empowering students to make choices within the game environment fosters a sense of agency and ownership over their learning journey. This can involve selecting learning paths, customizing avatars, or influencing the game narrative.

2.4.2 Components of Gaming

Goal Setting and Progression: Clearly defined learning goals within the game provide a roadmap for students, while a progressive structure with achievable milestones keeps them motivated.

Differentiation and Personalization: Effective GBL caters to diverse learning styles and paces by offering differentiated content or personalized learning paths within the game.

Collaboration and Competition: Integrating opportunities for collaboration or healthy competition within the game environment can foster teamwork, communication, and problem-solving skills.

Adaptive Learning: Advanced GBL platforms can adapt the difficulty level or learning content based on individual student performance, ensuring a personalized and engaging learning experience.

2.4.3 Building Engagement Through Effective Design

By thoughtfully incorporating these elements and components into GBL design, educators can create truly engaging experiences that not only motivate students to learn but also prepare them for real-world application through practice.

2.5 Designing Games for Vocational Education and Training (VET)

Vocational Education and Training (VET) plays a crucial role in preparing individuals for the workforce by equipping them with practical skills and knowledge. In recent years, there has been a growing recognition of the potential of game-based learning in enhancing the effectiveness of VET programs. Games can engage learners, promote active participation, and provide a dynamic learning environment that simulates real-world situations.

Following, we explore the principles and best practices in designing games for VET contexts, along with relevant references to support a better understanding of game-based learning for VET.

2.5.1 Understanding the Needs of VET Learners

Before designing games for VET, it's essential to understand the specific needs and characteristics of the target learners. VET learners often prefer hands-on, experiential learning activities that are directly relevant to their future careers.

2.5.2 Incorporating Authentic Contexts

Games designed for VET should incorporate authentic contexts and scenarios that mirror real-world challenges and situations encountered in the workplace. This helps learners to transfer their learning more effectively into practical applications.

2.5.3 Balancing Engagement and Learning Objectives

While games are inherently engaging, it's essential to strike a balance between engagement and achieving learning objectives. Games should align closely with the desired learning outcomes of the VET program.

2.5.4 Providing Feedback and Assessment

Games can offer immediate feedback and assessment opportunities, allowing learners to monitor their progress and identify areas for improvement. Effective feedback mechanisms are integral to the learning process.

2.5.5 Leveraging Technology

Technology plays a significant role in the design and delivery of game-based learning experiences for VET. From simulation tools to virtual reality environments, leveraging technology can enhance the authenticity and effectiveness of games.

2.5.6 Summarising the principles and best practices in designing games for VET contexts

Designing effective games for VET contexts requires careful consideration of learner needs, authentic contexts, learning objectives, feedback mechanisms, and technology integration. By following best practices and drawing on relevant references, educators and instructional designers can create engaging and impactful game-based learning experiences that enhance the vocational skills and knowledge of learners.

2.5.7 Examples of effective games designed for Vocational Education and Training contexts

Simulated Work Environments

Example: A game that simulates a virtual workplace environment relevant to the vocational field, such as a simulated construction site, hospital ward, or retail store. Learners interact with virtual colleagues, customers, and equipment to complete tasks and solve problems commonly encountered in their profession.

Objective: To provide learners with hands-on experience in a safe and controlled environment, allowing them to practice skills and procedures before entering the workforce.

Scenario-Based Decision-Making Games

Example: A game with realistic scenarios and dilemmas they might face in their vocational roles. Learners must make decisions and navigate through the consequences of their choices, developing critical thinking and problem-solving skills.

Objective: To promote decision-making abilities and ethical reasoning in vocational contexts, preparing learners to handle real-world challenges.

Skill-Building Mini-Games

Example: A collection of minigames focusing on specific vocational skills, such as welding techniques, medical procedures, or customer service interactions. Each minigame provides hands-on practice and immediate feedback on performance.

Objective: To reinforce skill acquisition and mastery through repetitive practice in a gamified format, increasing retention and proficiency.

Team-Based Simulation Games

Example: A collaborative game where learners work together in teams to solve complex problems or complete projects relevant to their vocational field. Each team member takes on a different role, fostering teamwork and communication skills.

Objective: To simulate real-world teamwork dynamics and promote collaboration among learners, preparing them for collaborative work environments.

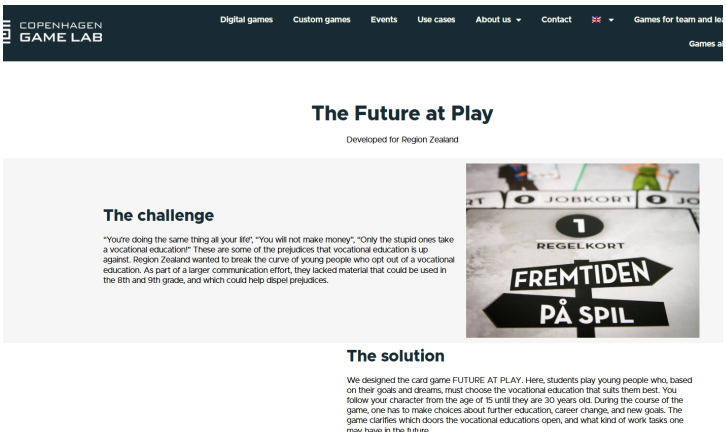
Virtual Reality (VR) Training Modules

Example: Immersive VR experiences that replicate vocational settings, allowing learners to interact with equipment, tools, and environments in a highly realistic manner. Learners can practice tasks and procedures with a sense of presence and immersion.

Objective: To provide experiential learning opportunities that closely resemble real-world contexts, enhancing skill acquisition and spatial awareness.

2.5.8 Examples of Vocational Education and Training games to be find online

Future at Play is a card game designed to help students explore different vocational education options. Players take on the role of a young person and make choices about their education and career path. The game helps students understand the different types of vocational education available and the skills they can learn. You can find information about the game here: [Learning game about vocational education]



Future at Play card game

Website:

https://cphgamelab.dk/en/skraeddersyede-laeringsspil/future-at-play/

Wordwall is a website that offers a variety of educational games, including some that are specifically designed for vocational training. These games can help students learn about different careers, practice job skills, and prepare for job interviews. You can find Vocational Training games on Wordwall by searching for "vocational training" or "technical education." [Wordwall vocational training games]

Worldwall

Website:

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kursuskomputer.1001tutorial.com

Wordwall offers a variety of vocational training games, including quizzes, matching games, and word scrambles. These games can be used to help students learn new vocabulary, test their knowledge of a particular topic, or practice their spelling and grammar skills. https://wordwall.net/en-us/community/vocational-technical-education/games

There are also many educational games available online that can be used for vocational training. These games can cover a wide range of topics, from customer service to computer programming. You can find these games by searching for "[vocational training games]" online: https://wordwall.net/resource/54092764/kiwis-copy-of-ethenet-coaxial-cable-and-fiber-standards

2.6 E-Tools for Game-Based Learning (GBL)

E-tools for game-based learning (GBL) are digital applications that facilitate the development, delivery, and management of educational games.

These tools offer a range of features to support educators and learners throughout the GBL process.

Here are some popular e-tools for game-based learning:

Game Development Tools: These tools allow educators and instructional designers to create their own educational games without requiring extensive coding knowledge. Some popular options include:

Twine (https://www.twine.net/): An open-source tool for creating interactive fiction games with a focus on storytelling.

Construct 3 (https://www.construct.net/en): A drag-and-drop game development platform with a visual interface that simplifies game creation.

Game Maker Studio 2 (https://gamemaker.io/account): A more advanced game engine offering greater flexibility and power for creating complex games.

Website:

Opens in a new window
kummara.com

Learning Management Systems (LMS) with Gamification Features: Many LMS platforms now incorporate gamification features that can be leveraged to create game-like experiences within traditional learning environments. These features may include points, badges, leaderboards, and other mechanics to motivate learners and promote engagement. Some popular LMS platforms with gamification features include:

Ilias (ilias.de) Learning Content Management: ILIAS offers a centralized repository for storing and managing diverse content, including learning materials, forums, chat rooms, tests, surveys, virtual classrooms, and external tools. This flexible structure enables content sharing without requiring course creation, allowing ILIAS to function as a knowledge base or website. Video: Course Introduction ILIAS LMS

Moodle (https://moodle.org/): An open-source LMS platform that offers a variety of gamification plugins and extensions.

Blackboard Learn (https://www.blackboard.com/): A commercial LMS platform that offers built-in gamification features such as points, badges, and leaderboards.

Cornerstone (https://www.cornerstoneondemand.com/): A commercial LMS platform that allows for the creation of custom game-like learning experiences.

Educational Game Platforms: There are a growing number of online platforms that host a variety of pre-made educational games on a wide range of subjects. These platforms can be a valuable resource for educators to find games that align with their curriculum and learning objectives. Some popular educational game platforms include:

Kahoot! (https://kahoot.com/): A platform for creating and playing quiz-based games that can be used for review, assessment, or friendly competition.

Wordwall (https://wordwall.net/): A platform for creating a variety of interactive word games, such as crosswords, word searches, and match-up games.

Quizlet ([invalid URL removed]): A platform for creating and playing flashcards and other study games.

By leveraging these e-tools, educators can create engaging and effective game-based learning experiences that can transform the way students learn.

These are just a few of the many e-tools that are available for game-based learning. The best tool for you will depend on your specific needs and goals.

Consider the following factors when choosing an e-tool for GBL:

Ease of use: How easy is it to learn and use the tool?

Features: Does the tool offer the features you need to create the type of game you want?

Cost: Is the tool free, or does it have a subscription fee?

Platform: Is the tool compatible with the devices your students will be using?

By carefully considering these factors, you can choose an e-tool that will help you create effective and engaging game-based learning experiences for your students.

2.7 Management of Game-Based Learning (GBL)

2.7.1 Selection and Integration

Carefully Curate Games: Not all games are created equal. Consider learning objectives, target audience, and alignment with curriculum standards when selecting GBL resources.

Pre-Game Preparation: Prepare students by introducing game mechanics, learning objectives, and assessment strategies before diving into gameplay.

2.7.2 Implementation and Facilitation

Clear Instructions and Expectations: Set clear expectations for in-game behaviour and participation. Provide scaffolding and support during initial gameplay sessions.

Monitoring Progress and Engagement: Track student progress within the game environment and observe their engagement levels. This allows for adjustments and targeted interventions if necessary.

2.7.3 Assessment and Evaluation

Alignment with Learning Goals: Ensure assessment strategies directly measure the learning objectives targeted by the GBL experience.

Formative and Summative Assessments: Utilize a combination of formative assessments (e.g., in-game performance data) and summative assessments (e.g., post-game quizzes) to gauge learning.

2.7.4 Additional Considerations

Technical Support: Ensure access to reliable technology and provide technical support for students encountering difficulties.

Balance with Traditional Learning: GBL should complement, not replace, traditional instructional methods. Utilize a blended learning approach that leverages the strengths of both.

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Chapter 3: SIMULATIONS FOR LEARNING

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Simulations are becoming increasingly popular in education to create engaging and effective learning experiences. They provide a safe and controlled environment for learners to practice skills, make decisions, and experience real-world scenarios. This can lead to improved knowledge retention, skill development, and increased confidence.

The best example to demonstrate how simulations are necessary is flight training. Pilots don't learn how to fly an airplane by studying instruction manuals. They must operate the planes and learn what every button, lever and crank does. Most people have the luxury of learning new things through trial and error. Pilots can't afford any mistakes. A mistake or pressing the wrong button in a real aircraft could lead to serious consequences. Therefore, to avoid this, the initial training will take place in a flight simulator (https://www.geo-fs.com/).

Aviation is not the only industry that could benefit from simulation in their training programs. Other high-risk industries such as natural resource extraction, firefighting or healthcare are obvious candidates. Students who want to become professionals in these industries need a safe and controlled learning environment. In this environment they can evaluate different scenarios and gain practical knowledge without being dangerous.

In addition, students of all ages and across a variety of subjects can benefit from learning through simulation. A simulation allows users to interact with the learning environment. They can make changes and see the instant results of their actions. The best part is that I can make mistakes. They can make as many mistakes as they need before they fully understand the concept they are learning.

A learning simulation is an educational tool that recreates real-world scenarios in a controlled environment. Learners actively participate, make decisions, and experience the consequences of their actions without facing real-world risks. This fosters a dynamic and engaging learning experience that promotes skill development, knowledge retention, and critical thinking.

3.1 Putting the Simulations for Learning into Practice

Learning simulations are a valuable tool for educators, offering a dynamic and engaging way to prepare learners for the challenges they might face in real-world scenarios. By incorporating simulations into their teaching practices, educators can create a more effective and impactful learning experience for their students.
Simulations make students more interested in what they are learning, while getting them more involved. If students are given the chance to practice what they have learned in theory, they will deepen the subject overall. Therefore, they will gain a deeper understanding of how things work.

There are many software tools that allow teachers and educators to create a simulation that can be used in the classroom. As the simulation creator, the trainer needs to identify the top tasks that the students will need to do and then design a simulation to follow the identified goal and tasks. Students will have to perform the designed steps; additional information may be added along the way. Once an educational simulation is created, it can be used repeatedly. The growing trend is that simulations will become the norm for teaching applied sciences. Simulations have huge potential to take learning to the next level.

3.2 Simulations as Methodologies and Approaches

To successfully implement simulations for educational purposes, it is essential to use a variety of methods and strategies tailored to specific learning objectives and student needs. Here is an overview of the main simulation methods currently in use.

3.2.1 Case Studies

Case studies in simulation leverage real-world scenarios or fictionalized but realistic situations to create a foundation for learning through simulations. Case studies in simulation provide a rich context for learners to engage with the simulation experience. They offer a background story, relevant details about the scenario, and potentially introduce specific challenges or problems that need to be addressed. This context helps learners understand the situation and make informed decisions within the simulation.

Presentation: Students are given realistic scenarios related to their field of study, which can be inspired by texts, articles, videos or even their own experiences.

Analysis: Students analyze the scenario in detail, identifying key issues, factors involved and possible solutions.

Discussions and Debates: Students share their views and perspectives on the scenario, debating alternatives and arguing for proposed solutions.

Development of Solutions: Students work individually or in groups to develop concrete solutions to identified problems, considering available constraints and resources.

Presentation of Solutions: Students present the proposed solutions to their colleagues and the teacher, arguing their effectiveness and feasibility.

3.2.2 Role-playing Games (Role-Playing Simulation)

Role-play simulations offer a dynamic and interactive approach to learning by placing participants in simulated scenarios where they take on specific roles. Role-play simulations offer a dynamic and interactive approach to learning by placing participants in simulated scenarios where they take on specific roles. Role-playing simulations offer opportunities to practice communication, collaboration, and conflict resolution skills within a safe and controlled environment. Learners can experiment with different communication styles and approaches while interacting with others playing assigned roles. While role-play simulations can

be used to practice specific technical skills, the primary focus is often on developing essential "soft skills" like critical thinking, communication, teamwork, and problem-solving.

Role assignment: Students are assigned specific roles within the simulated scenario, such as managers, employees, customers, patients, etc.

Improvisation: Students take on the given roles and improvise actions and dialogues according to the script, adapting to the evolution of events.

Observation and Feedback: The teacher or an external observer monitors the role-play and provides constructive feedback to the students, highlighting strengths and areas for improvement.

Reflection: After completing the role play, students reflect on the experience, analysing how they handled the role they were given, the difficulties encountered, and the lessons learned.

3.2.3 Virtual Reality (VR) Simulations

VR simulations, or Virtual Reality simulations, create entirely immersive computer-generated environments. The defining characteristic of VR simulations is the complete immersion they offer. Learners wear VR headsets that block out the real world and replace it with a simulated environment. This creates a sense of "being there" within the virtual world, fostering a highly engaging learning experience. VR simulations engage multiple senses. Headsets often provide visual and auditory stimuli, and some advanced systems may incorporate additional sensory elements like vibration or temperature changes. This multi-sensory experience further enhances immersion and strengthens the feeling of being present within the simulated scenario.

Use of Digital Platforms: Dedicated online simulation platforms or VR (virtual reality) applications are used that realistically recreate the real scenario

Individual or Group Interaction: Students can interact individually with the simulated scenario or collaborate in groups to solve common tasks

Feedback and Assessment: Digital platforms can provide automatic feedback to students throughout the simulation, allowing progress to be assessed and areas for improvement to be identified. Example: https://www.youtube.com/watch?v=4nwQ36m9aDE

3.2.4 Augmented Reality (AR) Simulations

Overlay digital elements onto the real world, will allow learners to practice procedures or interact with virtual objects in a real-world setting. AR simulations overlay digital information and objects onto the physical world through a device like a smartphone or headset. Learners can see and interact with these virtual elements within the context of their real surroundings. AR simulations allow learners to visualize 3D objects and concepts within their physical space. For instance, they could see a virtual dinosaur skeleton superimposed on a desk or explore the internal workings of an engine overlaid on a real engine block. This visualization goes beyond static images or videos, offering a more interactive and immersive learning experience.

Set the Stage: Introduce the topic and learning objectives. Briefly explain how the AR simulation will be used.

Guided Exploration: Provide clear instructions on using the AR app or platform and interacting with the virtual elements.

Active Learning: Design activities that encourage students to explore the AR simulation, analyze information, and answer questions. Discussion and Reflection: After the AR experience, facilitate discussions to solidify understanding and encourage students to reflect on their learning journey.

Example: https://www.youtube.com/watch?v=47GVkOv9RuA

3.2.5 Simulations with Physical Models

Simulations with physical models offer a unique and engaging way to learn by doing. The core characteristic is the tangible nature of the models. Learners can physically manipulate, build, and interact with these scaled-down or simplified representations of real-world systems. This tactile engagement promotes a deeper understanding compared to purely theoretical concepts.

Use of Models, Prototypes or Simulators: Physical models, models or simulators are used that faithfully reproduce the specific elements of the field of study (for example, flight simulators, medical simulators).

Practical Exercises: Offer a hands-on approach to learning, allowing you to interact with scaled-down or simplified versions of real-world systems.

Example: https://www.youtube.com/watch?v=yQ2-yVXFMeE (circuit design)

3.3 Implementing Simulations for Learning – Choosing the Right Method

Define Learning Objectives: What specific skills, knowledge, or behaviours should learners gain from the simulation experience? Who are the target learners, and what is their existing knowledge base?

Choose the Right Simulation: Select a simulation methodology (e.g., case study, VR) that aligns with your learning objectives and target audience. Consider factors like technology needs, accessibility, and cost.

Design and Develop the Simulation: Create a realistic scenario that reflects real-world challenges. Develop clear instructions and guidelines for learner participation. Plan for pre-simulation activities to provide foundational knowledge.

Facilitate the Simulation: Ensure a safe and engaging learning environment during the simulation. Play the role of observer or facilitator as needed.

Debrief and Reflect: Discuss the simulation experience with learners, analysing their decisions and outcomes. Facilitate reflection on learning achieved and areas for improvement. Connect the simulation back to theoretical knowledge and real-world applications.

By implementing simulations effectively, educators can create dynamic learning experiences that equip learners with the skills and knowledge needed for success.

3.4 Simulations for Learning – Driving Towards Practice

Simulations provide a valuable platform for learners to experiment, make mistakes, and learn from them in a safe space. This "learning by doing" approach allows them to develop skills and gain confidence through practical application.

For designing and implementing effective learning simulations we outlined a framework that will allow educators and trainers to create impactful learning simulations that actively engage learners and promote successful skill development.

3.4.1 Definition of the Context

Learning Objectives: Clearly define the specific skills, knowledge, or behaviours learners will gain from the simulation experience.

Target Audience: Identify the learners who will participate in the simulation, considering their existing knowledge and skills.

Subject Matter: Determine the specific topic or area of focus for the simulation experience.

3.4.2 Teamwork

Team Formation: Consider pre-forming learning teams based on skillsets or randomly assigning roles within the simulation.

Collaboration: Encourage collaboration and communication within teams during the simulation experience.

3.4.3 Skills

Targeted Skills: Align the simulation with the specific skills learners need to develop or enhance.

Practice and Feedback: Simulations provide a platform for learners to practice skills repeatedly and receive feedback on their performance.

3.4.4 Pathways

Pre-Simulation: Prepare learners with essential background knowledge and instructions before engaging in the simulation.

Simulation Delivery: Facilitate the simulation experience, ensuring a safe and engaging environment.

Post-Simulation: Debrief with learners to discuss their experience, analyse their decisions, and identify areas for improvement.

3.4.5 E-Tools

Technology Selection: Choose appropriate e-tools depending on the chosen simulation methodology (e.g., VR software, online case study platforms).

Accessibility: Ensure the chosen e-tools are accessible for all learners with any necessary accommodations.

3.4.6 Management

Project Management: Plan, organize, and track the implementation of the simulation experience.

Resource Management: Allocate necessary resources like technology, personnel, and time effectively.

Evaluation: Develop methods to assess the learning outcomes achieved through the simulation experience.

3.5 Benefits of Simulations

Engaging and Interactive: Simulations can be more engaging than traditional learning methods, keeping learners actively involved in the learning process.

Safe to Practice: Learners can experiment and make mistakes in a simulated environment without real-world consequences.

Skills Development: Simulations allow learners to practice specific skills repeatedly, receiving feedback to improve their performance.

Decision-Making: Learners can experience the consequences of different decisions in a safe environment, enhancing their decision-making abilities.

Teamwork and Communication: Team-based simulations can help learners develop teamwork and communication skills through collaboration.

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Chapter 4: DIGITAL STORYTELLING FOR LEARNING

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Digital storytelling is a short form of digital media production that allows everyday people to create and share their stories online. The method is frequently used in schools, museums, libraries, social work and health settings, and communities. They are thought to have educational, democratizing and even therapeutic effects.

With the rapid developments in information technologies, technology has become an integral part of the education world and is used at all levels of education (Elmas and Geban, 2012). New computers and software attract the attention of teachers, especially students (Fasi, 2019). As a result, the school, classroom, course tools and equipment used, and teaching techniques have been reshaped and new approaches have emerged (Yılmaz, Üstündağ, & Güneş, 2017). Among these approaches, "Digital story" has begun to gain importance as a teaching and learning tool for teachers and students (Robin, 2006; Robin 2008).

According to Robin, digital storytelling can be defined as the presentation of multimedia tools such as text, image, sound, video, animation and music to present information by creating real or fictional information about a certain subject (Robin, 2006). Digital story is the combination of traditional storytelling and multimedia technologies (Yılmaz, Üstündağ and Güneş, 2017). Digital storytelling is the tool that enables emotional interaction with the content through multimedia tools and sharing the content with other people and keeps them together (Yılmaz, Üstündağ and Güneş, 2017; Kieler, 2010).

Like traditional storytelling, digital storytelling focuses on a specific topic and includes a specific point of view. However, digital stories often contain a mix of computer-based images, text, recorded audio narration, video, or music. Digital stories can vary in length, but most stories used in education generally last between two and ten minutes.

The topics used in digital storytelling range from personal tales to the narration of historical events (Wilson, 2018). There are free or paid web tools and various computer software on the internet used to create digital stories.

Teachers' use of digital storytelling to create content depends on their being aware of this software and being able to use technology adequately (Yılmaz, Üstündağ and Güneş, 2017). More effective use of the infrastructure and equipment distributed to schools is directly proportional to the ability of teachers to prepare content at the desired level and quality. However, research shows that teachers still have difficulty in using technology in content development (Elmas and Geban, 2012; Yılmaz, Üstündağ and Güneş, 2017; Demirer, 2013). Teaching materials prepared with the digital story method are among the options that will help eliminate the inadequacy in content development. Digital story software has been in constant change over the last decade, from software used on desktop or laptop computers to web-based applications, smartphones and tablet computers.

While digital storytelling is used in educational environments around the world, new tools have been developed that use easy-to-use interfaces connected to cloud-based storage and online sharing (Robin and McNeil, 2013). In the face of these tools developed for different purposes, teachers and students have problems on how to benefit from these tools. For this reason, the increase in the number of these tools increases the importance of the need for evaluation of these tools (Yiğit, Altun, Alev, Dertlioğlu, & Bülbül, 2007).

It is seen that the number of paid digital story tools that can be used in digital story works on the internet is increasing day by day. The increase in Web 2.0 tools and resources provides users with access to sites, many of which are free, that anyone with an internet connection can use. By uploading visual and audio elements to these sites, these elements can be turned into animations, videos or presentations and shared using an editor (Robin and McNeil, 2013).

For teachers and students to create digital stories in accordance with their desired goals and objectives, it depends on them knowing the features, functionality and suitability of these software for the educational environment.

As a result of the existence and development of technology and the increasing opportunities it offers, the integration of technology is now prominent among today's important work areas. As technology has become an important part of our daily lives, it has become inevitable to integrate it into education, as in other areas. However, technology integration is an important component in the education reforms of many countries, and the integration of technology into the learning-teaching process has accelerated.

We can examine the technologies used in education under two headings: Standard blackboard, chalk, overhead projector, microscope, etc. and so-called digital hardware, internet, software, support, etc. are the titles. With the changes in education in line with the needs of society, the integration of digital technologies (hardware, software, internet, support, etc.) into education has gained importance.

According to ISTE (2000), technology integration can be expressed as "increasing learning by including technology in a content area within the curriculum or in an interdisciplinary framework, making it a part of the teaching process and making it accessible like other educational tools." Therefore, technology integration in education is closely related to the content and applications used in teaching as well as the use of technology.

Storytelling is a unique human experience that makes it possible to convey perspectives and the real or imagined worlds we live in through the language of words. While digital storytelling can be defined as creating the art of storytelling by supporting different tools, on the other hand, it can be expressed as associating multimedia tools such as text, graphics, audio, video and music with each other to provide information on a certain subject.

Digital storytelling emerges as a popular pedagogical tool used by teachers working in different disciplines for students of all ages, educational backgrounds and ethnic backgrounds.

4.1 Digital Storytelling Methodologies and Approaches

In recent years, the world has entered a life cycle we call 'digitalization'. The lives of many of us have become digital in almost every area. In some cases, this digitalization was criticized, and in some cases, it was found to be very useful.

Storytelling is a natural and effective method for human communication. Storytelling is also a way that educators prefer to better explain confusing ideas or information to students. First, the concept of digital story. We can define it as the process of creating a short film of 2 to 6 minutes in which the story writer tells his story, usually using his own voice, with the help of visual and audio tools such as pictures, videos and music.

Digital stories can be informative, instructive, motivating, real or fictional, depending on the subject.

Digital Storytelling method is more effective and supportive than the traditional method. Appealing to more than one sense is directly proportional to increasing permanence in the learning process. In the stories created using only written materials, there was an interaction as much as the student's imagination. This created limitations in the instructor's ability to convey the message he wanted. However, in the digitalized world, the main message intended to be given has triggered more than one stimulus, resulting in more

targeted content. In this respect, the digital storytelling approach has become a very powerful instrument in the process of achieving the desired behavioural change in the individual.

Today's adults are immigrants of the digital age we live in. What does it mean to be an immigrant? Being an immigrant means not being born into that environment. Most today's educators are technological immigrants. However, the materials they study, that is, today's students, are natives of the digital age we live in. For this reason, those providing training must speak the same language as the audience receiving training so that the training process can be carried out successfully. Of course, it is not possible to turn an immigrant into a native. However, creating hybrid structures in this approach will ensure the success of the learning environment by maximizing the instructor's dialogue with the locals.

4.2 Digital Storytelling – Driving Towards Practice

4.2.1 Introducing Characters and Avatars

While the digital world sometimes produces brand new concepts, sometimes it takes its momentum from the past.

Digital storytelling is a somewhat new and somewhat old concept. While storytelling, which is seen as the future of the advertising and marketing world, has just found a response and become popular in the advertising world, it has always been in our lives since the beginning of time. We have always needed stories to understand life, people, our relationships, and social phenomena.

It is a fact that stories offer us characters from which we find something of ourselves, plots that we associate with our lives, or fictions that we can make sense of about our future. That's why we love and need stories.

The use of characters or avatars creates environments within the story that students can identify with. It is possible to create memorable items, both in name and image.

4.2.1.1 Role of Characters

Main Characters: These are the characters at the center of the story. Their experiences, emotions, and goals shape the story.

Supporting Characters: Other characters around the main character. They also contribute to the development of the story.

Antagonists: Represent the obstacles faced by the main character. Conflicts with them make the story interesting.

4.2.1.2 Avatars

Avatars are digital graphics that represent characters. This could be animated characters, comic book figures, or human-like icons.

Avatars are used to enhance the visual aspect of the story and allow the audience to connect with the characters.

4.2.1.3 Visual Design

The design of characters and avatars is important. Colours, facial expressions, clothing and other details should reflect the characters' personalities.

Careful visual design allows the viewer to become more involved in the story.

4.2.1.4 Sound and Dialogue

The characters' voices and dialogue bring the story to life. Sound effects and accurate dialogues emphasize the emotional state of the characters and their relationships.

Voice narration helps us better understand the inner world of the characters.

4.2.1.5 Interactivity

Audience interaction is important in digital stories. Avatars and characters can interact with viewers and make the story more personal.

Ultimately, characters and avatars are the basic building blocks of digital storytelling. Using them correctly increases the impact of the story and allows viewers to have a deeper experience.

4.2.2 Story Creation and Telling Tools

Today's technological developments show us that we encounter a new product every day. In Digital Storytelling, these tools are frequently updated. Today, it is possible to access many of these tools both on the computer and in the application environment (mobile phone or tablet). All that remains is to dream and turn your dream story into an educational tool. In some tools, people can even turn their own pictures into avatars or cartoon characters and become the main hero of the story. This increases the involvement of learners in the subject and their sense of ownership to a higher level. It also minimizes the possibility of giving up and abandoning before reaching your goal.

Here are some popular options:

Canva: Canva is an online design platform with a user-friendly interface. You can use it to create storyboards, infographics, presentations, and other visual content.

WebquestEdu: It is an internet-based teaching and evaluation method that allows students to work individually outside the classroom environment. This approach is a research-based activity in which students interact with resources they have researched on the internet.

Prezi: Prezi offers a circular presentation style and allows you to present content in a fascinating way. You can bring your story to life with zoom and rotate effects.

StoryMapJS: StoryMapJS is a useful tool for creating geographic stories. You can create interactive stories by combining points, texts and images on the map. Source: knightlab

Twine: If you want to do text-based storytelling, Twine can help you create interactive fictional stories.

Voicetooner: It is a tool with which you can voice your animated characters. With this tool, you can make your animated characters tell the story you want.

Toontastic: An application where you can make cartoon animations in a very simple way. Both Google play and iPhone applications are available. With this application, which you can do with just drag and drop and audio recording, you can prepare scenarios related to the subject in your lessons and save them as videos on your mobile phone.

Movie Adventure: Movie Adventure Film Studio is an Android and IOS application where you can make cartoon animations quickly and easily.

Avaturn: It is an application where you can create your 3D avatar using your own picture.

Travel Boast: It is an application where you can create animated maps. You can create a mapped educational tool with entertaining explanations on your mobile phone or tablet.

Each tool has its own advantages and areas of use. To choose the most appropriate tool to support your storytelling, you need to evaluate it according to your needs and target audience. These contents are just some examples. Based on these, the shortest path to the desired goal can be found with technological support in the storytelling process.

Digital Storytelling is the narratives created by teachers and students in education by coming together and using elements such as sound, images and video for their own purposes. This approach is a powerful tool used to make learning materials more effective and impressive.

4.3 How to Use Digital Storytelling in Vocational Education and Training (VET)

Here are some clues as to how digital stories can support and promote the development of learning outcomes in Vocational Education and Training (VET).

4.3.1 Learners' Projects and Presentations

Give VET learners the opportunity to present their professional skills and knowledge through digital stories. For example, they can prepare a digital story that describes the career journey of a person working in a profession or a business process.

4.3.2 Simulations and Scenarios

In vocational training, it is important to simulate certain business processes or create scenarios. Digital stories can be used to role-play these scenarios. For example, a digital story can be created describing the repair process of a vehicle in an automotive workshop.

4.3.3 Workforce Training

Digital stories can be used in training for workforce needs in professional fields. For example, a digital story describing a construction worker's safety precautions can provide workers with practical information.

4.3.4 Promotion of Professional Fields

Digital stories can be used to promote professional fields. This can be an effective method to expose VET learners to different career options and direct them to areas of interest.

4.3.5 Collaboration and Sharing

VET learners can collaborate by creating digital stories in group work or project-based learning processes. This encourages the sharing of knowledge and experience.

Digital storytelling helps VET learners to develop their creativity and communication skills, while also allowing them to transfer professional knowledge and skills more effectively.

Digital Storytelling also can be used as a strategy to communicate more effectively with VET learners and to establish a deeper learning bond with them. Digital storytelling can help VET learners in creating emotional connections and engagement with the learning outcomes. This approach is since stories are better understood and remembered by people, allowing them to trigger emotional responses in trainees.

For example, Digital Storytelling in Brand Communication Training Program is a training program for professionals who want to learn and apply this strategic approach. The program teaches participants the basic principles of effective storytelling, best practices for storytelling on digital platforms, and storytelling strategies. It also provides skills in visual and textual content production, storytelling tools and obtaining measurable results.

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Chapter 5: GOOD PRACTICES SAMPLE

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This Chapter This chapter consists of a collection of Good Practices in the countries on Game-Based Learning, Simulations and Digital Storytelling.

The selection of Good Practices by country has considered specific criteria, ensuring that the content is relevant, effective and meaningful both to the VET context and to meeting the needs of the target groups.

Good practice selection criteria:

Relevance and Applicability: Practices should be relevant to the context of VET and applicable to specific areas of study within the professional field;

Evidence of Effectiveness: Preferably, there should be evidence of effectiveness of the selected practices in the context of VET or similar learning environments;

Learners Engagement: Practices should be engaging and motivating for learners, encouraging active participation and interest in learning;

Embedded Feedback: Practices should incorporate effective feedback mechanisms, allowing learners to receive immediate feedback on their performance and progress;

Customization and Adaptability: Practices should be adaptable to meet the needs and preferences of learners, allowing for personalized learning according to different learning styles and skill levels;

Collaboration and Teamwork: Practices should foster collaboration and teamwork, reflecting the current demands of the labour market and preparing learners to collaborate effectively in their future professional environment.

5.1 Collection of Selected Good Practices

Title of the Good Practice: "Ilha Periscópio"

Country:

PORTUGAL

Methodology of intervention:

Game-Based Learning

Links:

https://redge.dge.mec.pt/ilha/

Description of the Good Practice

Ilha Pericópio is an interactive digital educational resource, including a set of interactive pedagogical games, developed by the *Directorate-General for Education* (DGE) in partnership with the *Universidade Nova de Lisboa - iNOVA Media Lab*, the *Faculdade de Letras da Universidade de Lisboa*, the *Instituto Politécnico de Setúbal* and the *Universidade de Aveiro* and co-financed by the ESF through POCH.

The resources were developed under the RED Project – a pioneering project in Portugal aimed at producing digital educational resources, scientifically and pedagogically validated. The project is in line with the objectives set by the European Commission (H2020) to improve the quality and efficiency of education and training systems.

Promoter Organisation of the Good Practice

The *Directorate-General for Education* (DGE) of the Ministry of Education (ME), abbreviated to DGE, is a central service of the direct administration of the Portuguese State with administrative autonomy.

It is the body responsible for implementing policies relating to the pedagogical and didactic components of pre-school education, basic and secondary education and out-of-school education and providing technical support for their formulation, focusing mainly on the areas of curriculum development, teaching and assessment tools and educational support and supplements.

Results of the Good Practice

Ilha Pericópio is a valuable digital educational resource for defining pedagogical strategies to support learning, covering various themes/domains in the curricular areas of Science, Mathematics and Portuguese. It consists of a series of educational games. Each game follows a narrative path which, in constant interactivity, challenges the player to overcome difficulties, restoring a sense of progression in learning.

In the area of Science, there is a part dedicated to students and another for teachers (https://redge.dge.mec.pt/ilha/periscopio/science/perfil);

73 activities are available, including proposals for didactic approaches, records for children, learning assessment tools, conceptual and curricular frameworks, as well as various original resources to support lesson planning (e.g. video tips and video lessons) and their exploration with children (e.g. digital games, infographics, podcasts, video-makers).

In the area dedicated to Portuguese, it is possible to find interactive resources that lead the child to mobilize knowledge about the Portuguese language (https://redge.dge.mec.pt/ilha/periscopio/topic-list/VHeK8k6wnjQ5AFxaEhYh). The challenge *O Comboio dos Sons às Letras* (The Train from Sounds to Letters) is designed to guide the little traveller in discovering the relationship between oral and written language. *DIGIBIBLIO* aims to encourage the learning of reading comprehension strategies. *Fábrica de Textos* (Text Factory) aims to help children understand the stages and processes involved in producing a text, following a coherent and cohesive structure and respecting correct spelling. *A Casa na Quinta* (The Farmhouse) promotes lexical awareness and grammatical knowledge, including activities on the internal structure of words and sentences.

In the area of Mathematics, there are various games in which the player must respond correctly to challenges posed by a character representing a certain profession: the fisherman - mental calculation; the farmer - finding numbers on the line; the truck driver - organizing data; the mountaineer - addition and subtraction; the constructor - multiplication and division; the archaeologist - classifying figures; the architect - planning solids; the drone driver - spatial orientation; the grocer – measure; the analyst - graphical representations in OTD. (https://redge.dge.mec.pt/ilha/periscopio/topic-list/4dqbEL90nyHFjP3FhGCz)

Country:

PORTUGAL

Methodology of intervention:

Game-Based Learning

Links:

https://redge.dge.mec.pt/ilha/

***Title of the Good Practice**: "STORYLINE – STORYtelling for (Language) Learning in an Interactive and Non-formal Environment"*

Description of the Good Practice

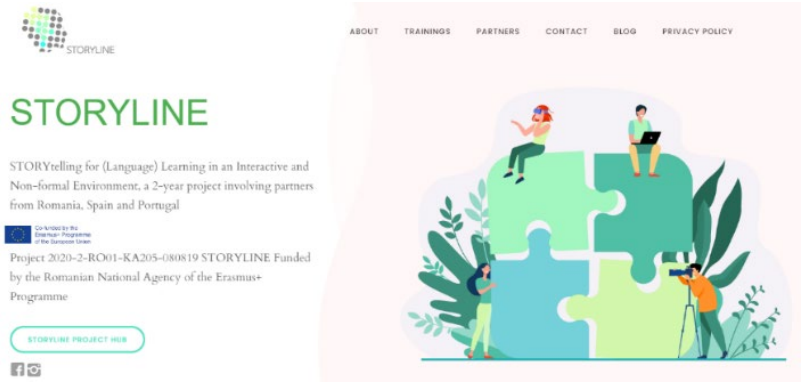
STORYLINE uses storytelling to facilitate dialogue between locals and expats, between young and old communities, with a view to drawing attention to the importance of community cooperation in achieving social prosperity.

The main aim of the project is to encourage intercultural and intergenerational bonds and to promote cultural heritage and exchanges through storytelling and language learning.

During the project implementation each country partner will organize 1 transnational training course for young workers: "Digital Storytelling for Social Inclusion" (Span); "Digital Storytelling in Youth Work" (Portugal); "Digital Non-Formal Language" (Romania).

After the youth workers return to their countries, they will organize a local workshop for young people on storytelling. The 20 young people, together with the experts, will interview elderly people and people with fewer opportunities who have experienced difficulties in their community about their stories.

The stories will be selected, edited and adapted into different levels of reading material for young students. Young people will also be involved in the editing and translation process of adapting the stories. The adapted stories will be collected in the StorytellingHUB.



Country:

PORTUGAL, ROMANIA, SPAIN

Methodology of intervention:

Digital Storytellying

Links:

https://storylineproject.eu/

Promoter Organisation of the Good Practice

STORYLINE project, reference nr. 2020-2-RO01-KA205-080819, is co-financed by the European Commission's Erasmus+ Programme. The project aims to empower young people for innovative work in the field of storytelling and language learning and to promote inclusion and social cohesion through an intercultural, inclusive and intergenerational approach.

The project brings together 5 organizations from 3 European Union countries: Lusófona University (Portugal); HEI- House of Education and Innovation (Romania); University of Granada (Spain); Phoart

Production S.R.L. (Romania); Didark. Didáctica de Arte y Arqueología S.L. (Spain).

Results of the Good Practice

"EscapeStory Sphere" – an interactive language learning game that promotes cultural heritage and storytelling as a way of learning about a language and culture. The game will be available for free, online, and can be used with or without virtual reality glasses, via a computer, cell phone or tablet.

StorytellingHUB - a platform for language learning through digital stories. It will contain 63 stories produced by young workers (edited, translated and adapted for different levels of reading material for young students). Of the 63 stories available in the HUB, 12 of them will be transformed into virtual reality "escape rooms".

eBook - made up of the stories produced and also containing good practices in language learning developed during the training of young workers.

Country:

PORTUGAL, ROMANIA, SPAIN

Methodology of intervention:

Digital Storytellying

Links:

https://storylineproject.eu/

***Title of the Good Practice**: "Practice@Business: transferring, applying and disseminating Practice Enterprise methodology in Portugal"*

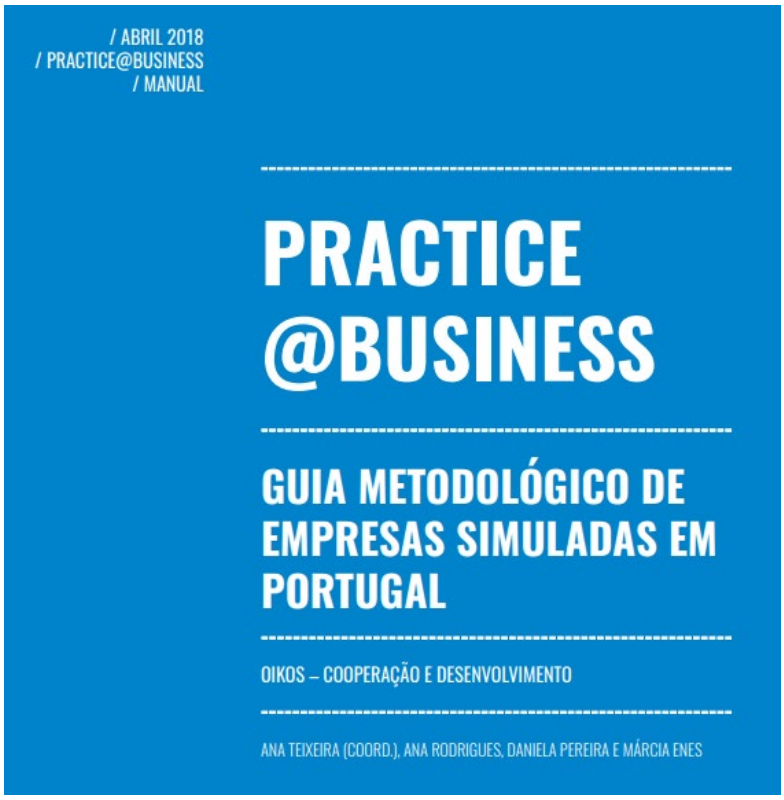
Description of the Good Practice

Practice@Business is an EU-wide partnership project, reference nr. 2015-3-PT02-KA205-002787, co-funded by the Erasmus+ Programme of the European Commission.

The *Practice@Business* project enabled the Portuguese organization *OIKOS* to transfer, apply and disseminate in Portugal an innovative training method - the "Simulated Enterprises" methodology. This is a methodology that was previously unknown and not owned or applied by any Portuguese organization, despite its enormous training potential and recognized success in various parts of the world, particularly with young people. This methodology was transferred through a partnership established with two European organizations: *EUROPEN* (coordinator of the international and European networks of Simulated Enterprises) and *Fundacio Inform* (representative of one of the central offices of this network).

In a nutshell, the "Simulated Enterprises" methodology consists of recreating a real business environment that replicates the departmental division, interaction dynamics and usual procedures/tasks of a real company, used for training/educational purposes.

The *Practice@Business* project won the 2019 good practice award from the Portuguese Erasmus+ Agency: https://www.youtube.com/watch?v=nw6PQxSX8uI.



Country:

PORTUGAL

(transfer of best practices from countries Germany and Spain)

Methodology of intervention:

Simulations

Links:

https://erasmus-plus.ec.europa.eu/projects/search/details/2015-3-PT02-KA205-002787

Promoter Organisation of the Good Practice

OIKOS - Cooperation and Development is a non-profit association, internationally recognized as a Non-Governmental Organization for Development (NGDO), founded in Portugal in 1988.

OIKOS' main areas of intervention are the environment and climate change, food security and the local economy, access to basic social services, citizenship and human rights.

Results of the Good Practice

Methodological Guide to Simulated Enterprises in Portugal – The Guide systematizes information on the "Simulated Enterprises" methodology and is specially designed to be used by professionals working in the areas of Youth, Education, Training, Employability. It describes the methodology to train young people for the school/work transition with proven results in terms of professional integration and retraining. It's a versatile and flexible methodology, also applied to other audiences. Available at: https://ec.europa.eu/programmes/erasmus-plus/project-result-content/b46ccc8b-e836-47a3-8bb4-4e8a4086838c/1._Guia_metodol_gico_-_Empresas_simuladas.pdf.

Pedagogical Plan for the application of the "Simulated Enterprises" Methodology in Portugal – A set of skills (technical and transversal) were defined as the focus of the training plan, and the strategies to be used to train these skills using business simulation were identified. It provides information for the implementation of the methodology, with a view to training for employability and entrepreneurship, through the training of technical and transversal skills. Available at: https://ec.europa.eu/programmes/erasmus-plus/project-result-content/5dae41af-08bf-40e8-a509-7aeecfc4db2d/2._Referencial_de_desenvolvimento-Empresas_simuladas.pd

Pedagogical Plan for applying the "Simulated Enterprises" Methodology in Portugal - "Transversal Skills for Professional Qualification" programme – It gives detailed information on a sequence of sessions to set up and run a simulated enterprise (duration of each session, technical and transversal content, procedures to be carried out on computer platforms and documents to be used). Available at: https://ec.europa.eu/programmes/erasmus-plus/project-result-content/f523f5b2-cb24-422a-86f2-0ee2d6d21bc6/3._Programa_-_Empresas_Simuladas.pdf

Country:

PORTUGAL

(transfer of best practices from countries Germany and Spain)

Methodology of intervention:

Simulations

Links:

https://erasmus-plus.ec.europa.eu/projects/search/details/2015-3-PT02-KA205-002787

Title of the Good Practice: Lean Thinking – A simulation game in the training of entrepreneurial attitudes and 21st century competencies

Description of the Good Practice

The goal of the game is to foster cooperation, creativity, process thinking, and continuous improvement in students. Participants design a product that meets customer expectations while maximizing value with minimal effort. They then create an efficient production process using team resources. The game is played in four iterations, with students analyzing results, solving problems, and implementing changes after each iteration. Students create a set of values to guide their teamwork and responsibility. The program also supports teachers with electronic materials, lesson plans, and simulation games available on an e-learning platform, along with a Young Lean Leader's Guidebook containing instructional content and video support.

Promoter Organisation of the Good Practice

Lean Education Foundation

The foundation was established by the Founder - LeanQ Team sp. z o.o. on 27.06.2018. The vision of the foundation is the combined communities of business practitioners, schools and universities co-creating curricula that are used in elementary school, vocational schools, technical schools, high schools and universities.

The author and initiator of the LEAN EDUCATION Foundation's activities is Joanna Czerska - currently president of the Foundation.

Results of the Good Practice

Over the course of 8 nationally implemented editions, more than 4,000 students and their teachers have already participated in the program.

The best evaluation is the opinions of the students' teachers available on our YT: click here

Interviews with teachers can be found in two places:

1. on the YouTube channel - playlist teachers about the programme;

2. in the form of transcripts of short interviews.

Country:

POLAND

Methodology of intervention:

Game-Based Learning & Simulations

Links:

https://www.gry.lean.info.pl/, https://lean.info.pl/gry-symulacyjne-w-edukacji/, https://zie.pg.edu.pl/aktualnosci/2022-01/edu-inspiracje-wzie-gry-symulacyjne-w-edukacji

https://photos.app.goo.gl/4HU36ymZs193PMiG8

https://photos.app.goo.gl/2SnkVweSA3xFu57e9

https://photos.app.goo.gl/uW7w945ki5qUG1qVA

https://photos.app.goo.gl/54KRYYMQv7aS3pqJA

https://photos.app.goo.gl/GVKp5xJXAb8tg6Ce9

Title of the Good Practice: Simulation games in the didactics of Production Management, Logistics Management and Lean Management

Description of the Good Practice

The goal of the game we use is to develop in students the spirit of cooperation, work sharing, creativity, process thinking, process performance management and continuous improvement.

The purpose of the games we use is to introduce students to issues that are abstract to them, i.e. production processes or logistics processes.

The purpose of using simulation games in education is to change the process based on conducting team experiments, supported by testing and evaluation of common ideas. During the game, students can learn about the process and its specifics and take on the roles of participants. The result of these activities is the development of joint solutions.

The task of the games is to prepare students to accept new knowledge and embed it in the context shown by the game. At the same time, by playing, students can control processes and verify what works and what doesn't. This allows them to understand the challenges faced by those managing these processes and creates an excellent context for showing the reason why the knowledge being transferred is useful in practice.

We use games in first- and second-degree programs. Wherever there is a need to understand the broader context or complex processes. They can also be successfully used in the education of secondary school students.

LeanQ Team simulation games perfectly combine theory and practice. They engage players to think and act in accordance with Kaizen principles in an attractive way. The use of simulation games in the education of young people is a fantastic tool to help develop the attitudes and skills of students that are desired by employers. Students engaging in the game learn about the concept of implementing lean management, while developing soft skills.

Promoter Organisation of the Good Practice

Gdansk University of Technology, Faculty of Management and Economics

The university educates engineers, economists, managers and business leaders in fields sought after by employers. It offers a chance for professional success in the industries of management, finance and the fast-growing IT industry. The good quality of education is confirmed by the international accreditations granted to us, including: AMBA, CEEMAN, PKA, EMOS and IPMA-Student.

Country:

POLAND

Methodology of intervention:

Game-Based Learning & Simulations

Links:

https://www.gry.lean.info.pl/, https://lean.info.pl/gry-symulacyjne-w-edukacji/, https://zie.pg.edu.pl/aktualnosci/2022-01/edu-inspiracje-wzie-gry-symulacyjne-w-edukacji

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https://photos.app.goo.gl/54KRYYMQv7aS3pqJA

https://photos.app.goo.gl/GVKp5xJXAb8tg6Ce9

We actively cooperate with the business community, so our students acquire invaluable contacts and participate in training courses, as well as internships that give valuable work experience to boot. We offer additional scholarships for students, grants for scientific circles and financial support for educational and scientific projects from, among others, the IDUB program - Initiative of Excellence - Research University.

Results of the Good Practice

Increased motivation to learn the subject. Improved student performance in subjects where games have been used.

The university uses this method to build an understanding of various subjects, e.g. logistics in its full scope, to delve into details, calculations and conclusions in subsequent classes. As a result, students not only learn but also have fun competing for the best results of their logistics processes.

Country:

POLAND

Methodology of intervention:

Game-Based Learning

Links:

https://dbamomojzasieg.pl/badaniegranienaekranie/

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

Title of the Good Practice: The educational and research project "Playing on Screen. Youth in the world of digital games"

Description of the Good Practice

The aim of the survey was to gain up-to-date knowledge about the use of digital games by children and young people and to educate the public about responsible gaming. The project received a recommendation from the Ministry of National Education.

The survey involved 56 535 students from 768 elementary AND secondary schools across Poland.

The main elements of the "Playing on the Screen" project:

a) Nationwide research conducted - a quantitative survey, implemented in schools across the country, and a qualitative one, including in-depth interviews with game addiction therapists and focus groups focused on the most popular digital games among children and young people.
b) Trainings for Young Volunteers - free trainings during which selected students from schools across Poland were prepared to lead workshops for their peers in their immediate area.
c) Lectures for Parents and Teachers - free meetings for parents and teachers from all over the country, during which it was possible to gain knowledge about the world of digital games and how to effectively support children in playing games responsibly.
d) Research report - was made widely and freely available to the public, especially to schools, municipalities and counties. The report includes recommendations based on the results received.

Promoter of the Good Practice

Halina Konopacka LOTTO Foundation
The mission of the Halina Konopacka LOTTO Foundation is to support society on the road to a happy and responsible life. We activate people to improve the quality of life by popularizing the practice of popular sports, facilitating access to culture, supporting social projects and developing awareness of responsible entertainment.

I Care About My Reach Foundation
Keeping in mind in mind that the basis of a good life is human relations, the DBAM O MY REACH FOUNDATION has been contributing to the responsible use of new communication tools since 2015.

The basis of the activities undertaken is a professional diagnosis of the problem based on scientific research, action in intersectoral cooperation, as well as the idea of participation understood as the inclusion in the process of support of those who themselves need this support. In carrying out our mission, we conduct training, research and educational activities. We organize training courses and

Country:

POLAND

Methodology of intervention:

Game-Based Learning

Links:

https://dbamomojzasieg.pl/badaniegranienaekranie/

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

workshops for schools, institutions and private companies throughout Poland. The recipients of our activities are children, adolescents and adults.

Results of the Good Practice

The collected materials from the research allowed the publication of a book with the results of this study, and a research report was prepared and published, which included recommendations resulting from the results. The completed research made it possible to identify the most important recommendations, including the inclusion of digital games in the process of education of children and young people in Poland, supplementing and systematically expanding the offer of training for teachers to prepare them to use digital games in teaching activities.

Research results for students: young people who use digital games may be more motivated to learn, especially when the games are used for educational purposes, playing digital games together may also foster relationships, bonds between students.

Results for the school: young people who use digital games may be more motivated to learn, especially when the games are used for educational purposes, playing digital games together may also foster relationships, bonds between students. increased knowledge of how students use digital games, what their needs are which provides an opportunity to use the collected results to build school e-addiction prevention programs. Increasingly, teachers are choosing to teach lessons based on storylines taken from digital games. Such use of games can increase the attractiveness of the lessons conducted by teachers. September 2020. The Ministry of Education has launched a pilot program involving the introduction of computer and video games in schools. The MEN point out that the use of computer games in schools is already provided for in the core curriculum, which obliges teachers to develop students' digital competencies. Results for parents: Parents' understanding of the process of playing their children's digital games (as well as their role in the process) seems very important, even more so in situations where the parent himself is an active participant in playing digital games.

Country:

POLAND

Methodology of intervention:

Game-Based Learning

Links:

https://dbamomojzasieg.pl/badaniegranienaekranie/

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

https://dbamomojzasieg.com/granienaekranie/wp-content/uploads/2021/05/Raport-Granie-na-Ekranie.pdf

Title of the Good Practice: TutoDerm Medical Simulator for Education in Clinical and Aesthetic Dermatology

Description of the Good Practice

TutoDerm is a medical simulator dedicated to future dermatologists and aesthetic medicine specialists. It allows mapping - thanks to virtual reality - the activities and procedures of dermatological procedures. The solution is currently being tested in clinical conditions, and is being used, among others, by medical students from the Ludwik Rydygier Medical College in Bydgoszcz and the Medical University of Warsaw.

The Company's product makes it possible to practice dermatological procedures, thus giving doctors, cosmetologists and students a chance to gain experience before they even come into contact with a patient.

Promoter of the Good Practice

InterventionMed SA is a NewConnect-listed innovative Polish technology company operating in the medical segment. The company specializes in the development of medical simulators using virtual reality technology for education in clinical and aesthetic dermatology. Ultimately, the prepared applications are expected to enable a wide variety of dermatological procedures. Depending on the needs, further applications will be developed to simulate the treatment of specific, increasingly complex medical conditions. *InventionMed SA* began operations in January 2018.

Results of the Good Practice

Educational Medical Simulator, using, among other things, VR (virtual reality) technology, as well as dual immersion. The device allows mapping the procedures and actions to be performed before, during and after a dermatological procedure.

The solution created by the InventionMed team is intended to educate future dermatologists and aesthetic medicine specialists. It was loaned by the Warsaw Medical University (WUM), among others, as part of the launch of a series of pilots at the university. Students had the opportunity to test the cutting-edge technological solution. The product is also expected to be offered in Western Europe, the United States and Asian markets including Japan, China, Malaysia and Taiwan.

The work of doctors during this type of treatment is individual in nature. It is expensive and requires time-consuming practical preparation.

The use of the simulator eliminates the problem of a shortage of patients accepting the opportunity to test or learn various types of procedures

Country:

POLAND

Methodology of intervention:

Simulations

Links:

https://strefainwestorow.pl/wiadomosci/20220411/inventionmed-komercjalizuje-projekt-tutordermhttps:/inventionmed.pl/projekty/projekt-tutorderm/

Title of the Good Practice: A Guide for Teachers of the project Europe of Our Lives: Digital Storytelling.

Aleksander Kobylarek Pro Scientia Publica Foundation

Description of the Good Practice

The guide is designed for teachers to teach and learn through digital storytelling. It is designed to be used by both teachers and learners to help and give tips for creating and sharing stories. The guide is designed to familiarize teachers with all the educational possibilities of Digital Storytelling: bringing together methods from many different disciplines and integrating communication and digital competencies into the same process. For other teachers to learn about the effective educational tool of Digital Storytelling and to believe that it will motivate educators and students to introduce the storytelling technique in their lessons. The goal is to go beyond simply teaching ICT (information and communication technology). In this context, the digital storytelling technique and methodology is an excellent tool for personal and social expression and communication.

Another goal is to make this tool accessible to students so that they can control the new technology, create and recreate stories that contain their personal, social or professional needs; stories related to their identity, cultural heritage and environment, cities and countries, relating to the past, future and present of European societies.

One of the main goals of this project is to use information technology as a tool for thinking and reflecting on our European history. Creating the script, designing and reproducing the images, editing and finally making them available to all participants in the educational community is a process of personal and human enrichment of great formative value. Integrated computer-based learning content, such as word processing, presentations, creating tables or designing images with editing software, and creating videos, images and voice, to create their own stories and share them with others in a climate of continuous dialogue and interaction with interlocutors, find their place in this educational process.

Promoter of the Good Practice

Pro Scientia Publica Foundation is a non-profit, non-governmental organization founded in September 2010 in Wroclaw, Poland. It creates, tests and adapts curricula for seniors and provides high-quality guides for adult educators covering three main areas: arts, digital education and critical thinking.

The Digital Storytelling: The Europe of Our Lives project is an endeavour of several European adult education organizations within the framework of the Erasmus+ Adult Education Strategic Partnerships. Storytelling is a comprehensive teaching technique that combines the possibilities offered by modern technology (sound, video, photographs, music) with the tradition of oral storytelling.

Country:

POLAND

Methodology of intervention:

Digital Storytelling

Links:

https://proscientiapublica.pl/wp-content/uploads/2024/03/Teaching_Guide_PL.pdf

https://proscientiapublica.pl/materialy-edukacyjne-educational-materials/podreczniki-i-przewodniki-manuals-and-guidelines/

https://epale.ec.europa.eu/sites/default/files/polish_teaching_guide.pdf

The Digital Storytelling: The Europe of Our Lives project is an endeavour of several European adult education organizations within the framework of the Erasmus+ Adult Education Strategic Partnerships. Storytelling is a comprehensive teaching technique that combines the possibilities offered by modern technology (sound, video, photographs, music) with the tradition of oral storytelling.

EPALE - Electronic Platform for Adult Learning in Europe.

Results of the Good Practice

When working with the Guide, one can see that this is a certain process that teachers will be participants and witnesses. It does not exclude their own creativity. The most important thing is to implement and develop the process proposed by the Guide based on one's own needs. The guide includes a list of topics and themes to choose from, which can be developed. All of them link to activities and exercises in a specific theme. They are designed to make teachers think about their role and place in each theme. They can be completed individually or as a group. Teachers can also come up with their own. At the end of the guide there are prompts to get you started and an evaluation form to find out how well the process worked. There are also tutorials to help teachers learn how to use a range of programs designed specifically for creating digital stories and videos.

Country:

POLAND

Methodology of intervention:

Digital Storytelling

Links:

https://proscientiapublica.pl/wp-content/uploads/2024/03/Teaching_Guide_PL.pdf

https://proscientiapublica.pl/materialy-edukacyjne-educational-materials/podreczniki-i-przewodniki-manuals-and-guidelines/

https://epale.ec.europa.eu/sites/default/files/polish_teaching_guide.pdf

Title of the Good Practice: **The course "How to create historical content using digital storytelling" – A publication for male and female teachers for elementary schools' grades 4 - 8 and secondary schools**

Description of the Good Practice

This course is designed for history teachers who want to explore digital storytelling using innovative tools and multimedia. Participants will develop a timeline and learn visual storytelling techniques based on David Kolb's experiential learning model. Developed by the School with Class Foundation, Asociación Smilemundo, and the King Baudouin Foundation, with funding from the Erasmus+ programme, the course focuses on developing soft skills such as critical thinking and understanding historical processes, rather than memorizing dates. Students will be encouraged to search for information, analyze it critically, and connect the past with the present.

Promoter of the Good Practice

The School with Class Foundation, established in 2015, builds on the success of the School with Class program, which has been running since 2002. The Foundation offers educational programs for schools, teachers, and principals, aiming to innovate teaching methods and school relationships. It organizes free trainings, webinars, and provides lesson plans, materials, and guides. The Foundation supports professional development through methods like design thinking, agile, scrum, educational design, inquiry-based learning, and flipped lessons, drawing on both global and local best practices.

Results of the Good Practice

88% of male and female students find digital storytelling more engaging than traditional teaching.

Digital storytelling makes practical use of digital tools and technology to better teach and understand stories. It includes various forms such as videos, digital timelines and infographics to create interactive narratives.

Many studies have shown that students are more motivated to learn when they use digital tools.

Digital storytelling has a positive impact on student engagement and helps teach history in an attractive way. In doing so, it enhances digital competence and media literacy, and strengthens critical thinking, creativity and active participation in knowledge creation.

Digital storytelling requires the ability to use digital tools to create good materials. Those that are useful for educational purposes have been selected and analysed.

Country:

POLAND

Methodology of intervention:

Digital Storytelling

Links:

Digital Storytelling

Links:

https://www.szkolazklasa.org.pl/materialy/kurs-dighist-cyfrowej-historii/

https://www.szkolazklasa.org.pl/obszary/cyfrowa-historia/materialy-edukacyjne/

Title of the Good Practice: Coursera provides free access to courses for Ukrainian HEIs

Description of the Good Practice

Coursera provides a broad catalogue of content and credentials, including courses, Specializations, Professional Certificates, Guided Projects, and bachelor's and master's degrees. Learning experiences range from targeted hands-on projects to comprehensive, job-ready certificates and degrees.

The most popular Coursera courses on storytelling: 1) Storytelling and Impact: Communicating with Impact: Macquarie University; 2) Leadership Communication for Maximum Impact: Storytelling: Northwestern University; 3) Transmedia Narrative: Narrative Worlds, Emerging Technologies, and Global Audiences: UNSW Sydney (The University of New South Wales); 4) Influence: Storytelling, Change Management and Leadership: Macquarie University; 5) Storytelling in branding and content marketing: IE Business School; 6) Creative writing: Wesleyan University; 7) The Art of Visual Storytelling: University of Colorado Boulder; 8) The Art of Storytelling: IESE Business School; 9) Narrative Economics: Yale University; 10) Powerful tools for teaching and learning: Telling digital stories: University of Houston.

The most popular Coursera courses on gamification: 1) Gamification: University of Pennsylvania; 2) Gamification Learning with Genially: Coursera Project Network; 3) Serious games: Erasmus University Rotterdam; 4) Universal education and instructional technologies: University of Illinois at Urbana-Champaign; 5) Storytelling in branding and content marketing: IE Business School; 6) Content, advertising and social IMC: Northwestern University; 7) Diseño de instrucción por enfoque de Grandes Ideas: Universidad de los Andes; 8) New Trends and Technologies in the K-12 Virtual Classroom: University of California, Irvine; 9) Keys to innovation in university teaching: Universitat de Barcelona.

In response to the ongoing humanitarian crisis in Ukraine, in March 2022, Coursera, collaborating with the Ministry of Education and Science of Ukraine, offered Coursera for Campus Basic free to all Ukrainian higher education institutions and their students. More than 7000 certified courses and 400 specialisations from the best universities and companies in the world were available for free to all students and teachers in Ukraine. More than 35 thousand Ukrainian students and teachers have already joined Coursera and are successfully completing online courses.

Promoter of the Good Practice

Coursera, a global online learning platform that offers anyone, anywhere, access to online courses and degrees from leading universities and companies.

Country:

UKRAIN

Methodology of intervention:

Game-Based Learning, Simulations & Digital Storytelling

Links:

https://medium.com/@ayhanbzkrt/coursera-world-job-skills-2024-report-71ca5a9553c4

https://www.coursera.org/

https://medium.com/javarevisited/top-10-coursera-professional-certificates-to-take-in-2024-25c1df51d1b8

https://mon.gov.ua/eng/news/coursera-rozshiryuye-vilnij-dostup-do-kursiv-dlya-ukrayinskih-zakladiv-vishoyi-osviti

https://www.forbes.com/sites/susanadams/2019/04/25/online-education-provider-coursera-is-now-worth-more-than-1-billion/?sh=c77116430e14

https://www.investopedia.com/articles/investing/042815/how-coursera-works-makes-money.asp

Coursera Inc. (COUR) is an online education provider that offers students access to massive open online courses (MOOCs), specializations, and even degrees. Founded in 2012 in the USA, Coursera does not create educational content. Rather, the company partners with universities and other organizations to provide them with an online platform that students pay to access. Coursera offers products at a wide range of prices, from free-to-audit courses to $30,000-degree programs.

Results of the Good Practice

Coursera is now one of the largest online learning platforms in the world, with 142 million registered learners (as of December 31, 2023). Over 300 leading universities and companies provide instruction, including Stanford, Duke, Google, and IBM. Coursera prioritizes top-quality learning through evidence-based online teaching and learning strategies. The average rating across courses on the Coursera platform is 4.7 out of 5 stars, with 73 percent of learners who complete courses reporting positive career-related outcomes. Institutions around the world use Coursera to upskill and reskill their employees, citizens, and students in fields such as data science, technology, and business.

Coursera's total revenue in 2023 was $635.8 million, up 21% from $523.8 million in 2022.

Country:

POLAND

Methodology of intervention:

Digital Storytelling

Links:

https://proscientiapublica.pl/wp-content/uploads/2024/03/Teaching_Guide_PL.pdf

https://proscientiapublica.pl/materialy-edukacyjne-educational-materials/podreczniki-i-przewodniki-manuals-and-guidelines/

https://epale.ec.europa.eu/sites/default/files/polish_teaching_guide.pdf

Title of the Good Practice: Labster Supports Ukrainian Students

Description of the Good Practice

The disruptions and displacements of war create challenges for Ukrainian educational institutions in maintaining course continuity and providing access to physical facilities.

In November 2022, Labster (in cooperation with the Ministry of Education and Science of Ukraine) donated its science learning platform to universities, colleges, schools and educational institutions in Ukraine. Labster's donation enables more than 4.5 million students in Ukraine to take immersive interactive science programs online or in-person using Labster's award-winning virtual science simulations. Educators can easily integrate Labster into their existing science courses and filter more than 300 of virtual lab simulations available by the level of education, courses and topics to enable efficient learning experience. In addition to providing access to its catalogue of simulations, Labster is also donating professional development training and technical support service to all science faculty and students.

The Labster donation of its cloud-based software platform empowers education institutions to integrate immersive interactive science labs into their curricula, online or in-person. Labster also provides professional development training webinars and technical support services to Ukraine science faculty and schools.

Multiple universities in Ukraine have already signed up for Labster's offering and started implementing Labster as part of their courses. With Labster, students can explore state-of-the-art laboratories from their internet browsers on desktop, laptop, and tablet computers (such as Chromebooks and iPads). The Labster catalog of 300-plus STEM curriculum-aligned virtual lab simulations in fields such as biology, biochemistry, genetics, biotechnology, chemistry, and physics use gamification techniques proven to boost student enthusiasm and engagement as well as learning outcomes

Promoter of the Good Practice

Country:

UKRAIN

Methodology of intervention:

Simulations

Links:
https://www.labster.com/ua/press-announcement

https://www.labster.com/news/ministry-of-ukraine-renews-labster

https://www.youtube.com/watch?v=yypd6WdFJa4

https://www.tech4goodawards.com/finalist/labster-keep-ukrainian-students-learning/

Labster (www.labster.com) is a 3D laboratory training software, which delivers interactive, virtualised laboratory simulations and courses across STEM and other subject areas to offer an immersive learning experience. Labster's team members are passionate about improving science learning, resulting in collaborations with over 3,000 leading educational institutions.

Labster is a finalist in the 2023 Tech4Good Awards in the Community Impact category for its commitment to Ukrainian schools and students.

Results of the Good Practice

Globally over 6 million students in high schools and universities in 100-plus countries have used Labster to perform realistic experiments, learn key science concepts, and practice their skills in a risk-free learning environment.

In Ukraine since the partnership launched in Fall 2022, many thousands of students have benefited from Labster's interactive virtual science lab simulations. The majority of Labster users in Ukraine so far are in higher education, as most large universities have rolled out the platform. More than 90% of the students surveyed have said they find Labster science simulations to be relevant to their programs.

The Labster team collaborated with local educators to create a totally new, Ukrainian-language Digital Teaching Certification to train STEM instructors on how to teach with science simulations leveraging gamification techniques. The Labster educational resources — which include simulations with embedded quiz questions, theory pages, animated science explainer videos, lab manuals, and lab report exercises — are adapted to the Ukrainian science curriculum and language.

Moreover, Labster is rolling out personalized learning in the form of the newly launched Customized Quiz Editor. Course creators can now tailor Labster simulations and assessments according to their learning objectives and unique needs of their students, including creating and editing their own original questions in the Ukrainian language.

The new Labster Administrator Dashboard available since Fall 2023 will increase the visibility of performance data and analytics to make adoption within Ukraine schools even easier. Administrators can quickly view usage stats for instructors, students, courses, and simulations, including time spent and average scores, that were previously available only to instructors directly using Labster.

Country:

UKRAIN

Methodology of intervention:

Simulations

Links:

https://www.labster.com/ua/press-announcement

https://www.labster.com/news/ministry-of-ukraine-renews-labster

https://www.youtube.com/watch?v=yypd6WdFJa4

https://www.tech4goodawards.com/finalist/labster-keep-ukrainian-students-learning/

Title of the Good Practice: Switzerland founds simulation centres for medical training in Ukraine

Description of the Good Practice

In Ukraine, medical students graduate with theoretical knowledge but often lack practical experience. This gap is addressed through simulation centres, made possible by the Ukrainian-Swiss Medical Education Development Project and Swiss funding. Six centres have been opened in Lviv, Rivne, Ternopil, Zhytomyr, Kharkiv, and Chernivtsi. These centres feature three simulation rooms: Room 1 focuses on medical skills training with manikins and equipment; Room 2 allows instructors to supervise; Room 3 enables students to review recorded training videos to identify improvements. These centres help students acquire essential competencies in clinical settings.

Promoter of the Good Practice

Ukrainian-Swiss Medical Education Development Project, conceptualized by the Swiss Agency for Development and Cooperation (SDC, donor), the Swiss Tropical and Public Health Institute (Swiss TPH, implementing agency), and the Ukrainian Ministry of Health (beneficiary) healthcare workers and related managers.

MEDICAL EDUCATION DEVELOPMENT
UKRAINIAN-SWISS PROJECT

Results of the Good Practice

The project invests over UAH 15 million in six simulation centres, focusing on equipment, facility upgrades, and enhancing professors' skills, IT, and resources like literature and English proficiency. These centres provide future doctors and nurses with hands-on practice using mannequins in realistic scenarios, allowing students to repeat exercises and learn from mistakes without consequences. As V. Pokhmurskyi, Chief of the Medical Simulation Centre at Lviv Medical Academy, stated, "Here we can make mistakes, but in hospitals, we can't." The centres also improve the evaluation system by recording and tracking students' skill performance.

Country:

UKRAIN

Methodology of intervention:

Simulations

Links:

https://mededu.org.ua/en/

https://mededu.org.ua/en/news/a-simulation-center-for-training-medical-students-has-opened-in-lviv/

https://rubryka.com/en/2023/12/02/symulyatsijni-tsentry-dlya-medykiv/

https://www.pravda.com.ua/eng/news/2023/12/2/7431353/

Title of the Good Practice: Stories Not from Textbooks

Description of the Good Practice

on the YouTube channel “Pedan Can". It is implemented by the “Learning The “Stories Not from Textbooks” project, launched on the “Pedan Can”, is part of the “Learning Together” initiative, in collaboration with TV presenter Oleksandr Pedan and the NGO UMIND. The project highlights the New Ukrainian School, a modern and safe educational space promoting values like respect, trust, and love for the country. It features stories of teachers, parents, and students who remain dedicated to education despite challenges, such as Yuliia Balaniuk, who taught during blackouts, and 8th graders from Bucha developing a construction debris management project. The project showcases stories of resilience, including Tymur, who continued his studies online during the occupation, and Artem Zakharov, a teacher from Mariupol who now teaches in Kyiv after his school was bombed.

Promoter of the Good Practice

Learning Together is a collaborative project that was started by Finland and Ukraine in July 2018, and was joined by the EU in late 2018. The project is co-financed by the Ministry for Foreign Affairs of Finland and the EU and implemented by FCG Finnish Consulting Group Ltd in cooperation with the University of Helsinki.

Results of the Good Practice

The Learning Together project aims to improve education quality in Ukraine, particularly for national minorities learning Ukrainian as a second language, and to shape perceptions of the education system. Through the video project, part of the "Value of Education" campaign, it highlights the impact of the New Ukrainian School (NUS) reform and showcases the efforts of proactive school principals, innovative teachers, and supportive parents. Jarkko Lampiselkä, Chief Technical Advisor, emphasizes that these efforts will help build a holistic, modern Ukrainian school system.

Country:

UKRAIN

Methodology of intervention:

Digital Storeytelling

Links:

https://mon.gov.ua/eng/news/proyekt-navchayemos-razom-spilno-z-oleksandrom-pedanom-zapuskayut-youtube-proyekt-istoriyi-ne-z-pidruchnikiv-pro-cinnist-osviti

https://www.eeas.europa.eu/delegations/ukraine/eu-finnish-%E2%80%9Clearning-together%E2%80%9D-project-and-oleksandr-pedan-are-launching_en?s=232

https://cs.detector.media/community/texts/185308/2023-03-31-istorii-ne-z-pidruchnykiv-gromadska-organizatsiya-umind-razom-z-oleksandrom-pedanom-stvoryly-serial-pro-tsinnosti-osvity/

https://nushub.org.ua/lt/en/news/stories-which-are-not-from-textbooks/

https://www.youtube.com/watch?v=JFNZDTLuQ2I&t=8s

https://www.youtube.com/watch?v=9SO6-RpRk1Q

***Title of the Good Practice:* Simulation**

Description of the Good Practice

One example of a simulation used in Germany for learning in the automotive sector is the **Virtual Automotive Factory Simulation**. This simulation is designed to train employees in automotive manufacturing processes, focusing on optimizing production workflows and improving problem-solving skills. It allows participants to interact with a digital replica of a factory, experiencing real-time production line management, inventory control, and troubleshooting without the risk of real-world consequences.

This virtual environment mimics tasks such as assembly line coordination, quality control, and managing resource allocation. Learners can experiment with different production strategies and assess outcomes, which helps them understand complex manufacturing processes. This simulation is used by automotive companies and training centers to enhance practical skills, reduce training costs, and improve decision-making abilities.

The use of such simulations aligns with Industry 4.0 principles, incorporating digital tools and automation into training programs, ensuring that workers are well-equipped with the necessary skills to operate in advanced automotive production settings.

Virtual Reality (VR) in Vehicle Design:

Volkswagen's Virtual Engineering Lab employs VR applications to facilitate vehicle design. Designers utilize VR glasses to interact with digital prototypes, enabling them to modify shapes, materials, and components virtually. This approach streamlines the design process and allows for immediate evaluation of design changes.

Virtual Reality Training for Assembly Processes:

Volkswagen has implemented VR training for assembly processes, including tasks like door and brake installations. These simulations allow trainees to practice procedures in a controlled virtual environment, improving efficiency and safety.

Country:

GERMANY

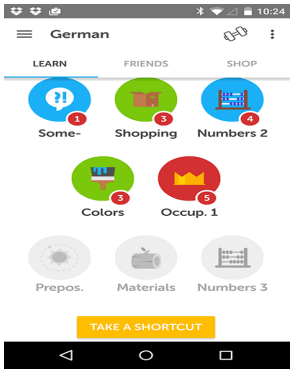
Methodology of intervention:

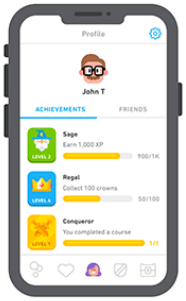
Simulation

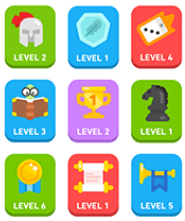
Links: DISPACE and DEKRA and Volkswagen and VR for Assembly Process

Title of the Good Practice: How Gamification helped Duolingo became the #1 Language Learning App

Description of the Good Practice







Over 1.2 billion people globally are learning languages, often to gain better opportunities, but many face high costs. Duolingo offers free, fun, and bite-size lessons that feel more like a game, making learning easier and more engaging. Its method, based on implicit learning, helps learners discover language patterns naturally, while explicit instruction is available for certain concepts. Machine-learning algorithms personalize lessons, tailoring difficulty levels for 500 million users. Duolingo focuses on real-life goals, such as ordering in a restaurant, and offers interactive stories, podcasts, and practice in reading, writing, listening, and speaking. Test questions track progress and improve courses. Duolingo also offers the affordable Duolingo English Test, accepted by thousands of institutions worldwide.

Test questions are embedded throughout the courses to measure how learners are progressing — and to show where Duolingo can improve. The results are used to develop new and better courses.

In addition to its language learning app core platform, the company created the Duolingo English Test, an affordable and convenient language certification option that is accepted by thousands of institutions worldwide.

Country:

Globally / Internationally

Methodology of intervention:

Gamification of Learning

Links:

https://en.duolingo.com/course/en/ru/Learn-English

https://strivecloud.io/blog/gamification-examples-boost-user-retention-duolingo/

https://www.businessofapps.com/data/duolingo-statistics/

https://www.thedrum.com/news/2017/10/26/gamification-the-key-duolingo-success-says-product-manager-gilani-canvas-conference

https://www.researchgate.net/publication/284517271_The_case_for_using_DUOLINGO_as_part_of_the_language_classroom_experience

Promoter of the Good PracticeDuolingo is an American educational technology company, founded in 2011, that produces learning apps for learning 40+ languages through quick, bite-sized learning and gamification and provides language certification.

Results of the Good Practice

Duolingo, used by both wealthy individuals and public school students in developing countries, tailors its educational system to each student through technology, offering a private tutor experience. The platform improved results using five gamification tactics:

1. **Mascot in Notifications**: Duo's friendly push notifications increased daily active users by 5%.
2. **Badges**: Introduced to boost user referrals, badges increased referrals by 116%.
3. **Instant Feedback**: Immediate corrections provide control and support improvement through positive reinforcement.
4. **Leaderboards**: Encourage competition and social interaction, fulfilling social status needs.
5. **Streaks**: Drive persistence and user retention, boosting day 14 retention by 14%.

From 2017 to 2020, Duolingo's revenue grew from $13 million to $161 million. Since March 2022, Duolingo has offered free access to its premium version for Ukrainians and is donating advertising revenue from Ukrainian learners to Ukraine.

Country:

Globally / Internationally

Methodology of intervention:

Gamification of Learning

Links:

https://en.duolingo.com/course/en/ru/Learn-English

https://strivecloud.io/blog/gamification-examples-boost-user-retention-duolingo/

https://www.businessofapps.com/data/duolingo-statistics/

https://www.thedrum.com/news/2017/10/26/gamification-the-key-duolingo-success-says-product-manager-gilani-canvas-conference

https://www.researchgate.net/publication/284517271_The_case_for_using_DUOLINGO_as_part_of_the_language_classroom_experience

Title of the Good Practice: Make learning awesome with Kahoot

Description of the Good Practice

Kahoot! is a platform that allows individuals and organizations to create, share, and host engaging learning sessions, both in-person and virtually, on any internet-connected device. It offers free and paid plans for classroom, workplace, or personal use. With the Drops apps, language learning becomes immersive, while Actimo engages employees. Kahoot! sessions are hosted on a common screen, such as a whiteboard or projector, and participants use a device to answer questions. The game encourages interaction by requiring players to frequently look up from their devices.

Kahoot! users gather around a common screen such as an interactive whiteboard, projector, or a computer monitor. The site can also be used through screen-sharing tools, like Zoom or Google Hangouts. The game design is such that the players are required to frequently look up from their devices.

Promoter of the Good Practice

Kahoot! is a Norwegian online game-based learning platform (released in 2013). It provides learning games, also known as "kahoots", which are user-generated multiple-choice quizzes that can be accessed via a web browser or the Kahoot! App.

Results of the Good Practice

The literature review in Wang, Tahir (2020) shows that Kahoot! positively impacts learning performance, classroom dynamics, attitudes, and reduces students' anxiety. Used by over 8 million teachers and hundreds of millions of students and families, Kahoot! is also popular in 97% of Fortune 500 companies. It has hosted hundreds of millions of sessions with 10 billion participants across 200+ countries. Kahoot! serves 1.4 million paying users and has offices in Norway, the US, UK, France, Finland, Estonia, Denmark, Spain, and Poland.

Country:

Globally / Internationally

Methodology of intervention:

Gamification of Learning

Links:

https://kahoot.com/company/

https://link.springer.com/article/10.1007/s10639-021-10459-6

https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-023-04379-x

https://www.emerald.com/insight/content/doi/10.1108/JRIT-07-2021-0051/full/html

https://www.researchgate.net/publication/326494480_Results_of_the_use_of_Kahoot_gamification_tool_in_a_course_of_Chemistry

https://www.researchgate.net/publication/353646098_Kahoot_as_a_Gamification_Tool_in_Vocational_Education_More_Positive_Attitude_Motivation_and_Less_Anxiety_in_EFL

https://www.sciencedirect.com/science/article/pii/S0360131520300208

https://www.prnewswire.com/news-releases/kahoot-has-a-strong-positive-impact-on-students-learning-outcomes-shows-new-research-302087878.html

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Website: LCIC

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Website: Lviv University

SBH Nordost GmbH – Germany

Website: SBH-Nordost

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