



EDU+

PROJECT HANDBOOK

**Examples of Good Practices regarding the use
of digital tools in the classroom**



**Co-funded by
the European Union**

A+



The Partnership

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INTRODUCTION

The Internet and other technical developments have become indispensable to people's daily life, since they are used to meet a variety of needs and responsibilities. Apart from everyday life, they have also invaded education and teachers are required to be well educated in the use of digital and innovative educational tools as well as in new methodologies. Through these, they will be able to construct a more interactive and engaging learning environment, rendering their teaching approaches more effective.

An international collaboration between four organizations from three European countries that share the same concern has resulted in this project. Every partner organization aspired to raise the level of expertise and effectiveness of their instructors.

EDU+ was a project on the exchange of good practices and included three LTTAs in the following topics:

1st Activity: E-SCHOOL EDUCATIONAL GROUP provided a seminar to educators on the implementation of Gamification and Game-Based Learning (GBL) in Digital Education to increase students' motivation and encourage them to learn by doing.

2nd Activity: COMPARATIVE RESEARCH NETWORK EV provided a seminar to educators on Design Thinking as an Innovative Educational Methodology, which fosters problem-solving skillsets through digital education, thus engaging students in deep and divergent learning or thinking.

3rd Activity: ŞEHIT AHMET ÖZSOY FEN LİSESİ provided a seminar to educators on Digital Storytelling, an innovative educational method that utilizes interactive media empowering students with creativity, communication and digital literacy skills.



MODULE 1

Gamification and Game-Based Learning (GBL)

Introduction

The use of games in education has been examined for the past four decades. Individual and team sports, board games (e.g., chess), and games created by children have been used in education since the beginning of schooling. However, educational games used in the 21st century emerged between the 1950s and 1980s as alternatives to drill and practice, for enrichment activities, or as computer-assisted/programmed instruction systems.

Rapid changes in the workplace and society demand a new approach to educational issues in order to equip students to live and work in a digital, globalized, and multicultural world. The role of educators in today's world is more challenging and complex. Game-Based Learning (GBL) and Gamification are teaching approaches that foster motivation and engagement, enhancing students' learning, critical thinking and problem-solving skills.

As is commonly acknowledged, a game-based approach makes educational objectives and the learning process easier, more student-centered, entertaining, interesting, and more effective. Furthermore, games reinforce pedagogical principles such as individualization, feedback, active learning, motivation and socialization.

Game-Based Learning (GBL) is a method of learning that uses the concept of a game to achieve basic learning outcomes, whether they are translated into expertise, abilities, or attitudes. It is an efficient way of motivating students to strive for a common goal by encouraging them to learn by experimentation, practicing habits and thought patterns that can be quickly translated from a virtual world to real life. Even though they are not the same concept, the similarities between Game-Based Learning and Gamification lead to frequent confusion. The key distinction between the two is the incorporation of gaming mechanics with instructional content. GBL seamlessly blends the two, making the game a training tool.

Gamification, on the other hand, rewards completion of current training modules with gaming elements. The application of game mechanics in non-game situations to encourage desirable actions and generate learning outcomes is defined as gamification.

In this regard, it is deemed important that educators be equipped with the necessary skills, strategies, and resources to incorporate game-based learning and Gamification into their



teaching practices and thus increase their students' motivation and engagement into the learning activities.

This Module talks about the main principles of Gamification and Game-Based Learning (GBL) and its implementation in the classroom.

Unit 1: The role of Games in Education

According to the gamification and GBL theory in education, learners learn best when they are also having fun. Not only that, but kids learn best when they have objectives, milestones, and achievements to strive for, all while remaining enjoyable to the learner. Because video games include addictive features that entice and hook youngsters (and adults), it's only natural that we observe similar engagement results when these game-based components are applied to learning materials.

Gamification in learning is the use of game-based components such as point scoring, peer competition, teamwork, and score tables to increase engagement, assist students in assimilation of new information, and assess their understanding. It can be applied to school-based subjects, but it is also extensively employed in self-teaching applications and courses, demonstrating that the impacts of gamification do not end when we reach adulthood.

Gamification has been shown to be extremely effective in educational settings, e-learning settings, and even corporate training settings.

Gamification is efficient for the following reasons:

- Games cater to basic necessities (autonomy, value, competence etc.)
- Games can be social (for example, leaderboards or areas where high-scorers are presented so that participants feel acknowledged when they perform well. Players may be able to challenge their friends or ask strangers to play)
- Games encourage on-going participation (gamification helps retain users by encouraging them to keep playing and gain more points, rewards, or simply discover more information)
- It gives players (learners) control (they feel like they are in charge of their own learning journey, going from point A to point B).



- Gamification works because it elicits genuine, powerful human feelings such as enjoyment, intrigue, excitement, and accomplishment. Gamification is being used successfully by organizations, institutions, and household brands all around the world.

There are numerous demonstrated benefits to implementing gamification and Game-Based Learning (GBL) in the classroom, including:

- Students feeling like they have ownership over their learning
- A more relaxed environment in terms of failure, because learners may just try again
- More fun in the classroom
- Learning becomes visible through progress indicators
- Students may discover an intrinsic motivation for learning
- Students can explore different identities through different avatars or characters
- Students are often more comfortable in gaming environments, so they are more proactive and open to making mistakes
- Higher levels of student engagement and concentration
- Tasks are no longer only about filling out a worksheet - what are the broader, 'gamified' consequences?

Gamification and GBL in education can boost motivation and engagement. Immediate feedback and learning badges for successfully completing challenges are powerful game aspects that influence students' willingness to actively participate in gamified lessons.

Unit 2: Serious Games

Games that have the ability to educate players are referred to as “serious games”. They are focused on developing the skills and knowledge of their players and are also designed to look more like commercial videogames. The educational content of serious games is implicit in the gameplay and serves a purpose beyond just entertainment, thus they have the potential to render learning of academic subjects more student-centered, engrossing, enjoyable, interesting and thus, more effective and efficient. These types of games are frequently social in character, are governed by predetermined rules, and include multiple levels of increasing levels of difficulty through which students develop new skills and learn new tactics to overcome obstacles and arise successful while learning. In addition, educational games are those that encourage the development of critical thinking, logic and problem-solving skills, as well as the acquisition of knowledge, in an entertaining and engaging manner.

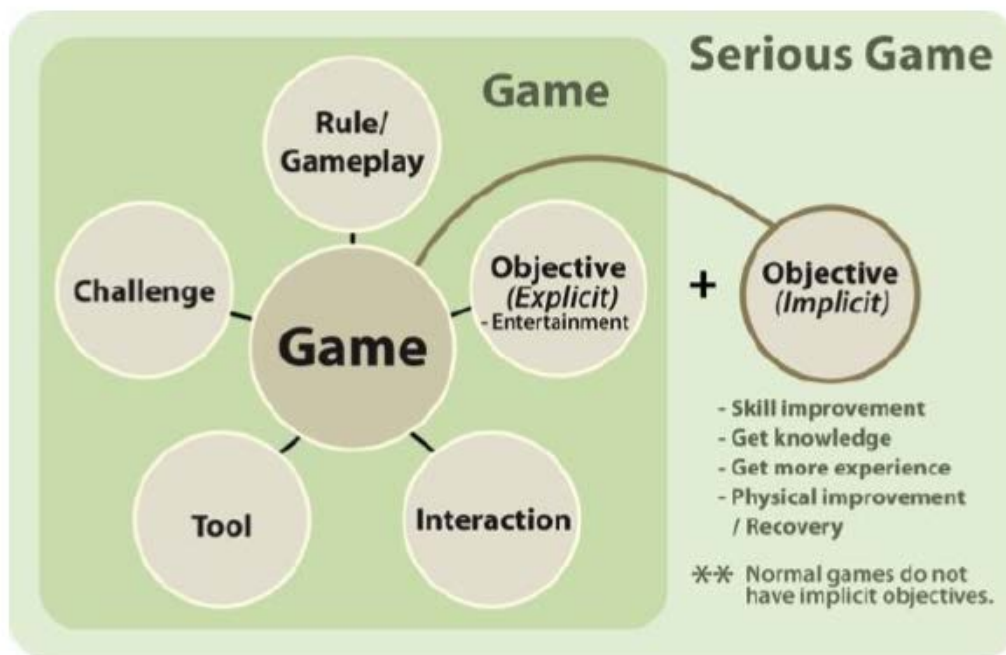


Illustration 1: The Functions of Serious Games, Source:

https://www.researchgate.net/publication/259167089_Serious_games_for_health, Access: 19-12-22

In general, serious games provide numerous benefits, promote education, and have a significant impact on contemporary life; therefore, they can be viewed as a constructive direction for education and society. It is commonly acknowledged that, in recent years, numerous studies have sought to define and highlight the benefits of this strategy. Research has shown that it has the ability to increase students' learning motivation and engagement, as well as to grow their minds and spirits, thereby improving their learning efficiency. Due to its fun and engaging teaching approach, pupils are eager to try them.

Moreover, serious games offer additional benefits to increase the learning experience of students, improve learning and teaching procedures, and promote active student-teacher interaction and communication. In addition to the benefits listed above, they offer students the following:

- Cognitive growth and digital literacy;
- Social-emotional growth and soft skills development;
- Enhanced decision making and problem-solving skills, as well as critical thinking;
- Improved collaboration and communication environment;
- Positively competitive environment;



- High self-esteem and autonomy;
- Progressive learning through experience;
- Rewarding feeling of progression and achievement;
- Feedback driven and student-centered learning.

Last but not least, when combining serious games/game-based learning with other learning techniques and approaches, such as cooperative learning, project-based learning, and problem-based learning, can further enhance and enrich the learning experience of students and increase the benefits they bring.

Unit 3: AR Games in Education

Augmented Reality (AR) strives to enhance the physical environment as experienced by a user's senses by including virtual items and information. Particularly, it generates a mixed experience in which actual and virtual items coexist in real-time with the use of computer programs. Since is an adaptable and interactive technology, it can be enhanced by combining it with other innovative technologies. When used in education it is capable of creating new learning environments and experiences and fostering an active and interconnected learning process since it mixes the real world with digital information. One of the main benefits AR has to offer is that it can enhance memory retention and motivation, thus breaking down formal education's obstacles and enriching and promoting high-quality education anywhere.

Multiple studies have demonstrated that it enhances student performance and learning outcomes. AR is characterized as a divergent cognitive process in which students learn by doing while, simultaneously, multiple formula or methods are suggested for the answer of the posed questions. It is an additional tool at the teacher's disposal that has the immediate effect of capturing the student's attention and employing the wow! effect.

Therefore, the instructor will have access to a tool that will enable him or her to potentially add additional content to what is being displayed, with the ability to:

- contextualize.
- stimulate the desire of learn more, which is the cornerstone to knowledge.
- enable interaction with the content.



Some subjects that Augmented Reality has been successfully applied to are: Science, ICT, Engineering, Mathematics (STEM) education, Language Learning, Sports and Physical Education, Vocational Education etc.

How does it work?

In order to get an additional element on our screen, we will need to install an augmented reality application. Typically, we will use the device's camera to focus on a marker that will be identified by the software, and this marker will activate the additional feature that has been preconfigured within the application. At that point, the digital element is superimposed upon the real world on the screen. As we can see, augmented reality technology is basically a combination of two technologies: machine vision and graphics engines.

Advantages

The systematic review of the 'reported benefits' of AR in educational settings reveals primarily two: Gains in knowledge and Motivation. Some studies have indicated additional advantages of augmented reality, including an increase in inventiveness, the formation of positive attitudes, heightened awareness, anticipation, and authenticity. AR facilitates emotional learning, while the WOW effect relates to information. Neuroscientific research confirms the influence of emotions on the teaching-learning process, demonstrating that augmented reality facilitates meaningful learning. This can result in enhanced verbal associations, memory retention, teamwork, and motivation. More specifically:

- **Student engagement and interest** soar when students are given the opportunity to create educational content. They can add curriculum information, build virtual worlds, and explore new hobbies using augmented reality technologies.
- An interactive **learning environment** allows for the implementation of hands-on learning strategies that can promote student engagement, enrich the learning experience, and motivate students to acquire and practice new skills.
- **Content understanding:** Existing augmented reality (AR) technology enables teachers to independently construct immersive educational experiences to ensure their pupils understand curriculum content.
- **Collaboration:** Because AR content is digital, it can be simply shared. For instance, a group of teachers may collaborate with their pupils to continuously improve the



content. Students are more motivated to learn in a collaborative learning environment since they are actively involved in the content creation process.

- **Memory:** Augmented reality is a fantastic tool for bringing lessons to life and assisting pupils in remembering crucial details.
- **Sensory development:** AR technology can assist educators in designing multisensory lesson plans. Instead of watching a presentation, students can engage in physical activities while interacting with the immersive virtual material that integrates an experiential learning approach. This strategy can aid in sensory development.
- **Cost-effectiveness:** Since smartphone almost every student owns a smartphone, which is already equipped with the hardware required to run AR apps, augmented reality in education is becoming more cost-effective to integrate.

Conclusions

Too much emphasis is placed on factual education and not enough on teaching students how to connect with others via cooperation and compromise through developing friendships and a sense of belonging to a peer group. Education also serves to prepare pupils for the future, apart from delivering fundamental knowledge. Students require a recreational activity that will provide them with a much-needed break from their monotonous routines. The fast advancement of technology and digitalization of daily life have altered students' learning needs and requirements. Education should be reformed and utilize contemporary techniques, methods and technologies so as to meet these new needs and requirements and promote a more interactive and engaging learning environment.

Gamification and Game-Based Learning can be employed as educational methodologies to increase students' well-being and self-esteem, as well as their soft skills, critical thinking, decision-making, and problem-solving skills, and mental and psychological balance. In conclusion, when applied in education properly and in a student-centered way, these methods can facilitate and enrich students' learning procedure, as a means through which interaction, cooperation, and communication can be encouraged and improved, and as an educational process that can instill interest in educational subjects, promote learning motivation, and active participation.



MODULE 2

Design Thinking

Introduction

Design Thinking is a problem-solving approach that puts focus on user needs and experiences. It involves empathizing with the user, defining the problem, ideating solutions, prototyping, and testing. It is a creative and iterative process that encourages collaboration, experimentation, and learning through failure.

Design Thinking can be applied to a wide range of challenges, from developing products and services to improving systems and processes. It is widely used in fields such as product design, user experience design, engineering, business, and social innovation. It involves a range of techniques and tools, including ideation, prototyping, and user testing, to address complex problems and find new solutions.



Illustration 2: World of Design Thinking - cloud, Source: <https://design-thinking.info/>, access: 18-07-23

Both method and process - helps to generate a consensus on the problem to be solved in no time at all, to develop user-oriented ideas for new products, processes or services and to grow together as a team in the process. Change of perspective, responsiveness, creativity and empathy for your team members and your customers are in the foreground. The method was



developed by the computer scientist Terry Winograd, Larry Leifer (Stanford University) and David Kelley (IDEO, Palo Alto). A few years ago, at Stanford University, as part of the Stanford Life Design Lab, design thinking also began to be applied to solving life and work problems. Research and implementation of this concept are supported by the Hasso Plattner Institute within the framework of the school in Potsdam.

There are many ways of describing and defining the design thinking method. Some of them refer to the stages of the process and their outcomes. The following descriptions are most commonly cited in the literature:

- 1) Double Diamond model - Design Thinking is presented as alternating cycles of divergent and convergent thinking. The two phases run one after the other.
- 2) Five- (or six) stage Design Thinking model - one of the most popular models, consisting of 5 stages: empathy, needs diagnosis, idea generation, prototyping, and testing.
- 3) McKinsey Design approach - this model is based on four values: analytical leadership, cross-functional talent, continuous iteration and user experience.

The design thinking process can be successfully used in career coaching, among others, as one of the methods to work with clients on their professional development and to support career change¹.

Design Thinking is an iterative process divided into six phases. In the first three phases (understand, observe, define perspective) we deal with the so-called design challenge - the problem to be solved and thus approach the actual needs of potential users and customers. From there you move - now as a problem expert - into the so-called solution space (generating ideas, prototyping, testing).

The aim is to use a customer-centered perspective to find customer-oriented solutions that are convincing from the user's perspective and bring real benefits. The basic principles are customer-centricity, multidisciplinary, team, space, process and time.

To prepare a training about design thinking we need to make it as hands-on and experiential as possible, which is allowing participants to apply design thinking principles in real-world scenarios. It should also encourage open discussion and feedback to facilitate learning and growth.

¹ <https://www.lovelyjob.pl/design-thinking/>, access: 18-07-2023



The training about design thinking should be structured and interactive. For example, a 5 days training can be built from:

Day 1) Overview of design thinking: The training begins with a brief introduction to the concept of design thinking, its history, and the key principles behind it.

Day 2) Empathy and User Research: The training emphasizes the importance of empathy and user research in design thinking and explores different methods for gathering insights about users.

Day 3) Ideation and Prototyping: The training covers techniques and tools for generating ideas and prototyping in design thinking, including brainstorming, sketching, and prototyping.

Day 3) Collaboration and Teamwork: Design thinking requires collaboration and teamwork. The training should teach participants how to work effectively in teams, how to communicate ideas efficiently and effectively, and how to build upon each other's ideas.

Day 4) User Testing and Feedback: The training shows participants how to gather feedback from users, how to analyze the feedback, and how to incorporate it into the design process.

Day 5) Mindset and Attitude: Last but not least, the training emphasizes the mindset and attitude required for design thinking, such as curiosity, empathy, creativity, collaboration, and the willingness to fail and learn.

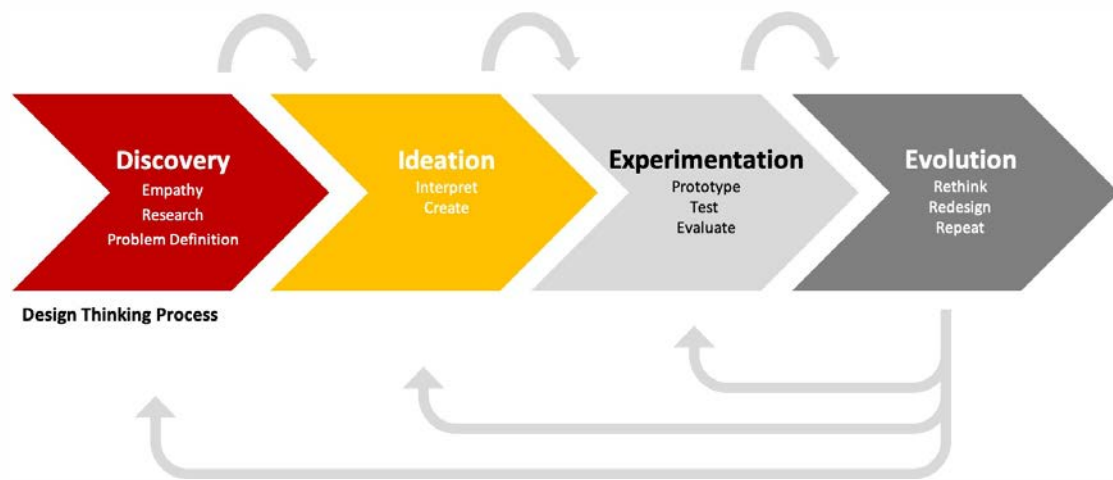


Illustration 3: The Design Thinking Multi-Stage Model, source: [https://www.celt.iastate.edu/instructional-strategies/teaching-strategies/design-thinking/;](https://www.celt.iastate.edu/instructional-strategies/teaching-strategies/design-thinking/) Access: 17-07-23



Unit 1: Design Thinking in Education

Design Thinking is a problem-solving approach that is widely used in the business world to create innovative solutions. However, its application is increasingly being seen in education as well. Design Thinking is a human-centered approach that focuses on understanding the needs and experiences of people. In education, this approach can help educators create learning experiences that are tailored to the needs and interests of students, which leads to greater engagement and improved learning outcomes. It emphasizes collaboration and co-creation, as it brings together participants from different backgrounds and perspectives to solve a problem. In education, this approach can help create a learning environment that fosters teamwork and encourages students to work together to come up with innovative solutions. It encourages participants to think critically and creatively, challenging assumptions and rethinking traditional solutions.

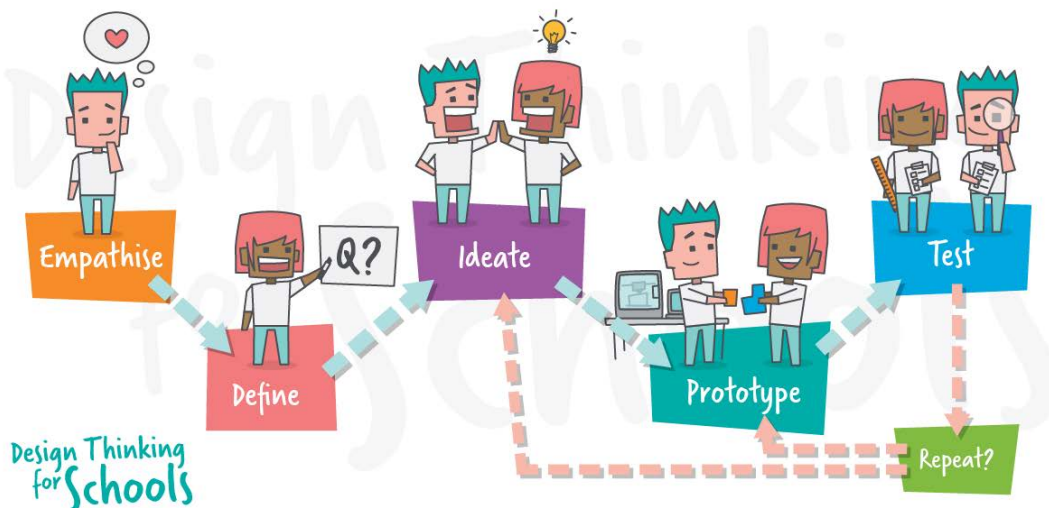


Illustration 4: Design Thinking for Schools, source: <https://www.makersempire.com/what-is-design-thinking-a-handly-guide-for-classroom-teachers/>, access: 18-07-23

In education, this approach can help develop the critical thinking skills of students, preparing them to tackle complex problems and face new challenges in the future. This approach is inherently innovative, as it encourages participants to think beyond existing solutions to create new and better ones. In education, it can help foster a culture of innovation,



encouraging students to think creatively and use their imagination to solve problems and create new opportunities.

Design Thinking can play a valuable role in education by encouraging collaboration, empathy, critical thinking, and innovation, all of which are essential skills for success in the modern world.

During the project EDU+ we created a training for teachers, which consisted of 5 days dedicated to: understanding and observing, identifying perspectives and ideas, building prototypes, pitching and presenting, testing and feedback. The participants should learn what design thinking is by experiencing it and doing.

In the training, which was a part of the EDU+ project and which took place in Berlin, participants used real problems from the life of a Berlin school: Möwensee Grundschule. CRN built the course exactly with the described principles of the method. We visited the school first to learn and to get to know the school, teachers, pupils and its challenges (UNDERSTANDING and OBSERVING). Then we worked together in 2 groups to find solution and build prototypes for 2 real challenges (DEFINING PERSPECTIVES, FINDING IDEAS and DEVELOPING PROTOTYPES):

- 1) how to help students recognize their second language as a resource?
- 2) how to raise awareness of the 'pupil's budget' among students and their families?

Two prepared solutions (Day of Language and off-line/ on-line suggestion box) have been presented to Berlin's school teachers, who gave us their feedback and who will test those prototypes (TESTING)). The course was created to give the introduction to the methodology and to use it in the classroom as a problem-solving approach.

Methodology

When designing a methodology for implementing design thinking at schools, the following steps should be considered:



- 1) **Analyze and Understand the Problem:** Begin by identifying the challenge that students need to solve and understanding why it matters. This should involve exploring the needs of the users, stakeholders, and the wider community.
- 2) **Empathize with Users:** Once the problem has been identified, students should empathize with the users by understanding their experiences and challenges. This can involve conducting interviews, observation, and fieldwork.
- 3) **Define the Problem:** The next step involves defining the problem based on the insights gathered from users. Students should formulate a problem statement that captures the essence of the challenge.
- 4) **Ideate:** This is the brainstorming phase, where students generate a range of ideas and solutions to the problem identified earlier. This approach should encourage creativity and exploration, and students should be encouraged to take risks and think outside the box.
- 5) **Prototype:** Students should be encouraged to develop prototypes of their ideas. These can be paper prototypes, model building, digital prototypes or other materials relevant to the design challenge.
- 6) **Test:** Students should test their prototypes by getting feedback from users and stakeholders before iterating on and refining their solutions.
- 7) **Implement:** Once the solution is finalized, students should implement it as a solution to the original problem.

By following a structured design thinking methodology, students can develop a mindset of creativity and innovation, learn how to approach problem-solving, think critically, and reflect on their progress. This can help students develop essential 21st-century skills, including communication, collaboration, and innovation, which they can take with them throughout their lives.

Benefits

Enhanced creativity: Design thinking can help teachers and students to develop creativity and innovation that leads to new solutions to problems.

Improved problem-solving: Design thinking encourages teachers and students to identify problems from different perspectives and come up with solutions that are effective and efficient.



Better collaboration: The process of design thinking requires collaboration between students and teachers, which can lead to a more productive dialogue and exchange of ideas.

Higher student engagement: As students are given a chance to explore problems and brainstorm solutions, they feel more engaged in their learning process.

Increased empathy: Design thinking encourages students and teachers to understand the perspectives of others, which can increase empathy and improve relationships.

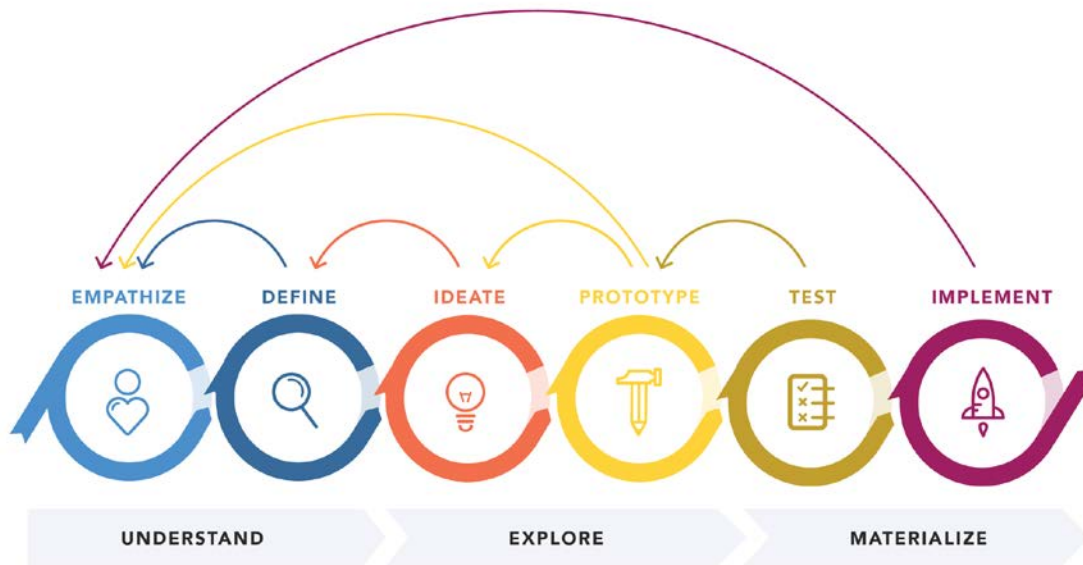
Cost-effective solutions: Design thinking encourages teachers to create solutions that work not only for one student but can be scaled and used by multiple students, reducing costs.

Better learning outcomes: By utilizing the design thinking model in the curriculum, teachers can create engaging and interactive learning experiences that lead to better learning outcomes.

Unit 2: The Design Thinking process

The design thinking process typically involves the following five stages:

- 1) Empathize:** This stage focuses on understanding the users and their needs, by observing, listening, and talking to them. The goal is to gain insight into their experiences, behavior, motivations, and pain points.
- 2) Define:** Once you have gathered enough information about the users, you can define the problem or challenge. This involves synthesizing the insights gathered from the previous stage and framing the problem statement in a clear and concise way.
- 3) Ideate:** The ideation stage is all about generating possible solutions to the problem or challenge. This can be done using various brainstorming techniques, such as mind mapping, sketching, prototyping, or role-playing.
- 4) Prototype:** In this stage, you create rough or low-fidelity prototypes of the potential solutions. These prototypes can be physical or digital, depending on the nature of the challenge. The goal is to test and refine the solutions in a cost-effective way.
- 5) Test:** The testing stage involves putting the prototypes in front of actual users, to gather feedback, iterate and refine the solutions based on the feedback received. This helps to ensure that the final solution meets the needs of the users and solves the problem effectively.



DESIGN THINKING 101 NNGROUP.COM

Illustration 5: Design Thinking Stages, Source: <https://www.nngroup.com/articles/design-thinking/>, access: 18-07.23

Unit 3: Design Thinking Tools and how to make it digital?

Some **tools** of design thinking that are dedicated to work at schools are for example **empathy mapping**. This is a tool to understand the mindset and needs of students, teachers, and other stakeholders of the education system. Another useful instrument used during the design thinking process can be **brainstorming**, which helps to generate a large number of ideas and solutions to a problem. In the middle stage of design thinking the **prototyping** should be introduced to create a hands-on, tangible representation of an idea to test and refine it. Found solutions should be **tested by users** to gather feedback from students, teachers, and other stakeholders on prototypes, to inform future iterations. This can be visualized on a **storyboard** and communicate ideas in a narrative form. Another useful tool during Design thinking could be **journey mapping**, which is a technique for visualizing the experience of students, teachers, and other stakeholders through a particular process or system. This process can be supported by **mind mapping** (a way to organize ideas and concepts to identify relationships and connections among them) or **rapid experimentation** (an approach to quickly test and iterate ideas in a low-risk environment.)



Design Thinking can be introduced and implemented in the digital form. It is useful if the teams are not in the same place and the process should be done online. How should it look like?

Following steps need to be taken:

- A) **Define the learning objectives:** Determine the specific goals and outcomes you want to achieve through the digital training. Clearly define what participants should be able to learn and apply by the end of the training.
- B) **Choose a digital platform:** Select a suitable digital platform for hosting the training. There are several options available, such as video conferencing tools (e.g., Zoom, Microsoft Teams, Google Meet), learning management systems (e.g., Moodle, Canvas), or online collaboration platforms (e.g., Miro, Mural).
- C) **Adapt content for digital delivery:** Modify the training content to suit a digital format. Break down the training into modules or sessions that can be delivered online. Consider incorporating multimedia elements like videos, interactive presentations, and digital resources to enhance engagement.
- D) **Provide pre-training materials:** Share relevant resources, reading materials, or videos with participants before the training to familiarize them with design thinking concepts and terminology. This will help create a foundation for understanding during the training sessions.
- E) **Interactive online sessions:** Conduct live virtual sessions where participants can actively engage in the training. Use video conferencing tools to facilitate real-time interactions, discussions, and activities. Encourage participants to ask questions, share their insights, and collaborate with others in breakout rooms.
- F) **Virtual collaboration tools:** Leverage digital collaboration tools like Miro, Mural, or Google Jamboard to facilitate ideation, brainstorming, and prototyping activities. These tools allow participants to collaborate in real-time, share ideas visually, and work together on virtual whiteboards.
- G) **Case studies and simulations:** Incorporate case studies or simulations that simulate real-world design challenges. Participants can work individually or in groups to apply design thinking principles and solve these simulated problems. Provide feedback and guidance during the process.
- H) **Online discussions and forums:** Create online discussion forums or chat groups where participants can continue the conversation, ask questions, and share their reflections outside of the live training sessions. This promotes ongoing engagement and peer-to-peer learning.



- I) **Post-training resources:** Provide post-training resources such as handouts, templates, or additional reading materials that participants can refer to after the training. These resources will serve as references for applying design thinking in their work or projects.
- J) **Evaluation and feedback:** Implement a mechanism to collect feedback from participants to assess the effectiveness of the digital training. Use surveys or online feedback forms to gather insights, suggestions, and improvements for future training sessions.

It should be remembered to adapt and customize the digital training to the specific needs of our participants and the learning objectives. We need to engage participants through interactive activities, virtual collaboration, and ongoing support to ensure an effective and meaningful design thinking training experience in a digital format.

Conclusions

Design Thinking is a problem-solving approach that focuses on user needs and experiences. It involves empathizing with users, defining the problem, ideating solutions, prototyping, and testing. It can be applied to a wide range of challenges, from developing products and services to improving systems and processes. It is used in various fields such as product design, user experience design, engineering, business, and social innovation.

Design Thinking is a creative and iterative process that encourages collaboration, experimentation, and learning through failure. It emphasizes customer-centricity, multidisciplinary, and a user-centered perspective. The design thinking process typically consists of stages such as understanding, observing, defining perspectives, generating ideas, prototyping, testing, and implementing solutions. It can be effectively used in education to create learning experiences tailored to the needs and interests of students. It fosters critical thinking, collaboration, creativity, and innovation skills.

When implementing design thinking in education, it is important to analyze and understand the problem, empathize with users, define the problem, ideate solutions, prototype, test, and implement the final solution. It offers benefits such as enhanced creativity, improved problem-solving, better collaboration, increased student engagement, increased empathy, cost-effective solutions, and better learning outcomes. Design Thinking tools that are



commonly used in education include empathy mapping, brainstorming, prototyping, user testing, storyboarding.





MODULE 3

Digital Storytelling (DST)

Introduction

In recent years, the rapid advancement of digital technologies has significantly transformed various aspects of society, including education. As digital cameras, computers, scanners, and other easy-to-use software have become accessible to educators, enabling them to benefit from the digital world, the use of new technologies in education is continuously increasing.

The impact of new technologies on the educational environment has been extremely positive, as they have provided educators with the opportunity to increase their knowledge and abilities, thereby raising the educational standard. Evidently, the incorporation of such technologies into the classroom has increased student motivation, engagement, and thus educational outcome and achievement. One novel approach gaining prominence is digital storytelling, which combines the art of storytelling with digital tools and platforms to create immersive narratives. Digital storytelling has the potential to enhance educational experiences by developing learners' creativity, critical thinking, and communication skills, thereby engaging them in deep and meaningful learning.

Digital storytelling is, at its core, the use of technology to convey stories. There are numerous methods to tell digital stories, such as through text on a website or social media platform, narration and images in a video, or narration in a podcast.

Digital narratives are narratives designed to transport the listener or reader on a journey, not merely a presentation of facts with accompanying images. Digital stories, like novels and documentaries, have a plot, protagonists, and themes.

Stories are extremely potent instruments. They can appeal to the human mind in distinctive ways. Digital stories can establish a connection between the student and the content when used in education. Designing and communicating information requires students to increase their content knowledge, visual, auditory, oral language, creative, and critical thinking skills. Meaningful interpretation of an experience enhances communication for both the author and the audience.



Considering this, it is essential to equip educators with the expertise, strategies, and resources to integrate digital storytelling into their teaching practices and thereby increase student motivation and engagement in the learning process.

This Module provides the main principles of Digital Storytelling, highlighting the need to explore the transformative potential of digital storytelling as an educational tool.

Unit 1: The process of Digital Storytelling (DST)

Digital stories encourage students to become content creators as opposed to mere consumers. Digital stories can be created in all subject areas and at all grade levels by weaving together images, audio, text, and voice while incorporating the 21st century skills of creating, communicating, and collaborating.

To achieve this, Samantha Morra suggests that students go through the following Digital Storytelling Process:

1. Come up with an idea

Digital stories begin with an idea just like any other story. This concept could be a lesson topic, a chapter heading in a textbook, or a classroom inquiry. Digital narratives may be either fictional or nonfictional. Once the educator or the student has an idea, they need to concretize it by writing a proposal, crafting a paragraph, creating a mind map, or using any other pre-writing tool.

2. Research/Explore/Learn

Whether they are writing a fictional or nonfictional digital story, students must conduct research, investigate, or learn about the topic to develop a solid informational basis. As they delve deeply into a topic, students learn both about validating information and information bias during this process. At this point, organization is key. The educator can use mind maps to help students retain information. Equally effective are outlines, index cards, and online note-taking tools. If students can digitally organize their information, the next stages become much simpler.

3. Write/Script



When attempting to write a story, it is strongly advised that students utilise the two prior stages, as a blank sheet of paper can induce anxiety and bring students to a dead end. If students have extensively researched and explored a topic, the body of the script should flow naturally. This is also the time to make literary decisions. Ask students to decide whether they will write in the first, second, or third person. Motivate them to expand their vocabulary. Provide them with access to dictionaries and thesauruses.

4. Storyboard/Plan

Good stories begin with a solid script, but they do not end there. This is the point at which we transition to visual media literacy. Storyboarding is the first step in comprehending audio and visual content. It is the plan or blueprint that will govern image, video, and sound-related decision-making. Simple storyboards contain only space for images/video and the script. More complex ones may even include transition space and background music.

5. Gather/Create images, video and audio

These are the elements that bring the stories to life. Using the storyboards as a guide, students will collect or create images, audio, and video. Everything they select will influence and establish the tone of their digital narrative. The educator can introduce concepts such as visual hierarchy, tone, and illustration. This can create an opportunity to discuss Copyright, Fair Use, and Creative Commons. During this step students should record themselves reading their scripts. It is usually observed that students rewrite their scripts as they record, becoming aware of their errors and poor word selection.

6. Put It All Together

During this phase of development, students determine if their storyboard needs to be revised and if they have sufficient materials to complete their masterpiece. During the creative phase, they combine images, develop unique transitions between segments, and incorporate music and sound effects. Educators can provide students with a checklist to help them comprehend what is required for a completed assignment and how to exceed expectations during this phase.



7. Share

Sharing online has become deeply integrated in our culture and thus educators should include in the learning process. When sharing students' content with a larger audience frequently motivates students to produce their finest possible work.

8. Reflection and Feedback

It is essential to allow time for reflection and feedback, as they contribute to the development, refinement, and enlargement of educational experiences. Students are encouraged to both reflect on their own work and offer feedback to others. Blogs, wikis, discussion forums, and student response systems or polling tools can be utilized to help students.



Illustration 6: 8 Steps to Great Digital Storytelling, Source: <https://edtechteacher.org/8-steps-to-great-digital-storytelling-from-samantha-on-edudemic/>, Access: 20-07-23

Unit 2: Types of Digital Stories

There are several types of digital stories, but the main types can be categorized into the following three categories: 1) personal narratives - accounts of significant events in an individual's life; 2) historical documentaries - tales that investigate dramatic events that help



us comprehend the past, and 3) tales designed to inform or instruct the viewer on a particular concept or practice.

Personal Narratives

Creating a personal narrative is one of the most common motivations for developing digital stories. This narrative style has numerous educational advantages. Students can develop an appreciation for the hardships faced by their fellow students using personal narratives. This narrative can be utilized to facilitate discussions on contemporary topics such as racism, multiculturalism, and globalization. A student who constructs such a narrative can also benefit from sharing it with others, thereby bridging the gap between themselves and their classmates through the use of information. This type of personal narrative can also be a useful instrument for addressing the emotional family issues described in the story.

Digital Stories that Examine Historical Events

Although many personal narratives can include historical information to provide context, a distinct type of digital story can be created from historical materials that students may investigate in the classroom.

Stories that Inform or Instruct

And while it can be argued that all digital stories inform (and possibly instruct), there is room to establish a separate category for stories that reflect instructional material in content areas such as mathematics, science, health education, and instructional technology.

Combinations of these three techniques can be used to create stories, such as autobiographical stories that use historical information as a backdrop for a personal narrative.

Unit 3: The benefits of DST in education

When digital storytelling is used by students, it provides a strong foundation in many different types of literacy, including information literacy, visual literacy, technological literacy, and media literacy. Summarizing the work of several researchers in this field, Brown, Bryan and Brown (2005) labeled these multiple skills that are aligned with technology as “Twenty-First Century Literacy,” which they described as the combination of:

- **Digital Literacy** -the ability to communicate with an ever-expanding community to discuss issues, gather information, and seek help;



- **Global Literacy** -the capacity to read, interpret, respond, and contextualize messages from a global perspective;
- **Visual Literacy** -the ability to understand, produce, and communicate through visual images;
- **Technology Literacy** -the ability to use computers and other technology to improve learning, productivity, and performance;
- **Information Literacy** -the ability to find, evaluate and synthesize information.

Digital storytelling can be used to reinforce subject matter, share an experience or present some new information in a creative and engaging way. It can be assigned as homework, utilized for student group projects in the classroom, or be a holiday project. Giving students a small assignment or even asking them to produce a short, 30-second video report on a recent movie they watched could be a good place to start. Another assignment that would interest many of them would be to make a video on their own lives. Digital storytelling requires various tools to create the story, including a computer. An internet connection, a camera or a video recording tool, a voice recorder or microphone, a music keyboard and a scanner can also be used. These tools can enhance and bring life to a digital story.

When given the opportunity to participate in multiple steps of designing, creating and presenting their own digital stories, students increase a full complement of literacy skills, including:

- **Research Skills:** Documenting the story, finding and analysing relevant information;
- **Writing Skills:** Formulating a point of view and developing a script;
- **Organization Skills:** Managing the scope of the project, the materials used and the time it takes to complete the task;
- **Technology Skills:** Becoming proficient with a range of tools, such as digital cameras, scanners, microphones and multimedia authoring software;
- **Presentation Skills:** Deciding how to best present the story to an audience;
- **Interview Skills:** Finding sources to interview and determining questions to ask;
- **Interpersonal Skills:** Working within a group and determining individual roles for group members;
- **Problem-Solving Skills:** Learning to make decisions and overcome obstacles at all stages of the project, from inception to completion; and
- **Assessment Skills:** Gaining expertise in evaluating their own and others' work.



Conclusions

Education is the cornerstone of progress and societal development. The future of education lies in its ability to adapt and evolve in response to the changing needs of society. By shifting the focus from content delivery to skill development, embracing technology, adopting student-centered approaches, cultivating lifelong learning, encouraging interdisciplinary connections, and promoting equity and inclusion, education can effectively prepare individuals to navigate the complexities of the 21st century.

The Digital Storytelling Methodology in education can significantly enhance student engagement. The combination of multimedia elements, interactive features, and personal storytelling enables students to connect with the content on a deeper level. The captivating nature of digital storytelling motivates students to actively participate in the learning process, fostering a sense of ownership and enthusiasm. It also improves learning outcomes, as students who engage in such activities exhibit improved comprehension, retention, and application of knowledge. The immersive and multisensory experience facilitates the integration of information, making it more meaningful and memorable. Finally, the creative aspect of digital storytelling encourages critical thinking, problem-solving, and communication skills development.

Thus, when this method is implemented properly, it empowers students to become active creators of knowledge and enhances their overall learning experience.



CLOSING REMARKS

EDU+ was a transnational project that sought to have a direct impact on educators in the partner countries (Greece, Germany, and Turkey) and beyond. The project facilitated the implementation of three Training Activities for educators on three different teaching approaches: **Gamification and Game-Based Learning**, **Design Thinking** and **Digital Storytelling**. The trainings equipped the participating educators with the knowledge and tools necessary to enhance their digital literacy and readiness. They are now able to apply the new methodologies in their classrooms in order to transform their students' learning environments into ones that foster active participation, creativity and collaboration. Through the use of interactive education, students can engage in profound and divergent learning or thinking, which leads to a deeper comprehension of the provided learning content.

This Handbook is comprised of the tools, methodologies, and materials used during the three Training Activities. Its purpose is to raise educators' awareness of our project's innovative approaches and to enable interested parties to study them in order to update their teaching strategies and digital skills and incorporate them into their teaching routines.



EDU+

Digital Education Tools to foster Innovation

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