

Applications of educational narrative games: from health to sciences

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Abstract. Educational narrative games are an emerging form of learning that incorporates elements of storytelling and simulations focusing on the emotional connection between the student and the subject. They are an effective way to reinforce understanding of important complex concepts, provide context for new information and foster a culture for learning. Educators are enabled to create content that is more engaging and fun than traditional textbooks or lectures, which can be difficult for some students to follow. In addition, narrative games can be used in conjunction with other forms of education such as videos to help students retain information more easily.

In Technologos, we have successfully applied narrative games to address numerous societal problems in a variety of settings, ranging from sexual health education and digital literacy for aging populations to internet safety for young students and data science. For example, in one of our projects, Mindland, we use educational narrative games to teach mindfulness skills to youth. Through these games, students can learn how to be more aware of their own feelings and emotions, which can help them manage stress and anxiety, improve their focus and attention span, and improve their memory retention skills. In addition, with these skills they will be able to make better decisions when faced with stressful situations or making important decisions that affect their lives as well as those around them. Educational games have proven to provide better motivation, immersion and learning outcomes through adaptiveness to rich environmental settings, intrinsic imaginations and interaction with empathetic “non-playable” characters.

We believe that educational narrative games have a lot of potential for future development; they revolutionise how individuals learn while still being able to interact with others around them through gameplay.

Keywords: serious games, narrative games, health, sciences, interactive education, educational technology.

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1. Introduction

Serious games are games designed for a primary purpose other than pure entertainment. They are usually developed for training and teaching and include educational elements like learning or practicing a skill, growth and development, and cultivating a capacity to overcome challenges. They also include entertainment and gamification elements, like fun and playfulness, social connectivity, and rewards and punishment as a positive and negative reinforcement respectively. The player is committed to achieving a goal in game, while learning about different educational concepts. Serious games are not only used in education, but also scientific exploration, engineering, healthcare, management, politics and other industries.

Apart from learning and training, serious games can be used to trigger behavioural change and even to increase empathy. The foundational elements of serious games are: the story, gamification, immediate and individualised feedback, and learning as a goal. Among the advantages of serious games is the increase of engagement and motivation, the facilitation of profound reflection, the improvement of memorisation and retention, and often having a positive social cause and impact. Research has shown that serious games are more effective on self-reported learning outcomes of students than traditional classroom instruction (Bakhuys Roozeboom, 2017). Due to the learning effects and increased engagement that narrative and gameplay can offer, serious games can be considered an alternative pedagogical medium for attracting students with different needs and expectations (Garneli, 2017). It has even been shown that serious games can potentially be used in interventions that aim to alleviate depression (Abd-Alrazaq A, 2022). They also have the potential to improve verbal, nonverbal, and working memory in older adults with cognitive impairment (Abd-alrazaq A, 2022).

Narrative games is an emerging and promising form of learning. They are digital serious games that focus on and offer a great way of interactive storytelling and branching narratives., which is something widely used in the development of serious games in general. The player is often invited to interact with characters and different situations and make decisions that influence the development of the story. Storytelling can be a strong medium to transmit knowledge and key learning messages, as well as cultivate acceptance and empathy in players. Narrative games can even be inspired by real stories of people with a diverse background, that can contribute to cultivating empathy and understanding in players towards various social issues and marginalised communities.

Visual novels are a type of narrative game that has originated in Japan. They have educational potential through providing easy access to the subject matter, defamiliarising the familiar, using branching narratives and setting clear goals (Oygardslia, 2020). Even though serious games have been around for a while, there is a lot of space for experimentation with different mediums and methodologies to create immersive games and learning experiences that can be widely adopted both in educational settings and in the public.

2. Purpose

The purpose of this paper is to present projects developed by Technologos Research and Innovation Services in the field of education through serious games, and more particularly narrative games, showcasing how they can be applied in different social and educational sectors. The methodology of the design and development of the games will also be overviewed, particularly regarding the storyline and characters utilised in the games to make them more attractive and effective.

Narrative games and visual novels have educational potential and their future development should be pursued; they revolutionise how individuals learn while still being able to interact with others around them through gameplay.

In our research we experiment with different ways to make our games more effective and applicable to different fields for education and awareness raising. We explore different types of serious games and narrative games, different points of view, storylines, dialogues, graphics and aesthetics. We conduct research in how to create engaging characters and an environment that inspires players to interact with the information that is transmitted through the game experience.

Our mission is to contribute to unlocking the potential that different forms of serious games have in education, and not only for students. People of any age and background can benefit from having access to games that provide a fun and engaging way for them to learn something new and grow.

3. Methodology

Narrative design for video games has become a field of study within game design. While developing our narrative games, we use and experiment with different methods to make the games more engaging, interactive and effective in transmitting knowledge and even triggering empathy in players and learners. Although we tend to use multiple overlapping frameworks (e.g., narrative branching and string of pearls narrative), we find the following two narrative structures to be crucial in achieving effective narrative game design.

I. Empathetic Non Player Characters

Characters are vital to a story, as they create conflict and action, sometimes only within the main character, through their fears and doubts. Interesting characters keep the gamer playing and a high involvement can be reached by identification with the characters (Hohl, 2020). In addition, studies have shown that virtual characters in serious games can be an effective learning aid, causing heightened engagement and retention of knowledge (Gamage, 2018). Through the field of transportation theory, it has been shown that narrative transportation affects critical thought, beliefs, attitudes and intentions (Van Laer, 2014). In the next section, we will look at specific characters created for different projects that Technologos has developed.

II. Engaging and Interactive Storyline

In serious games, stories play an important role, as they help connect serious context with playing the game. Narration can be used to transport the training items, in the form of game action (Kampa A., 2016). The story can be presented in first-person (a narrative “I” who is part of the action), third person limited (the point of view of a single character), or omniscient (all knowing) perspective. Learning social skills means to be able to change perspectives and this could be done in serious games by choosing different characters. The most popular perspective is the narrating “I” perspective, that contains a high involvement by the player. The perspective or point of view in a game affects the player’s immersion and how they interact with the game. The relationship between the user’s freedom of interaction with the narrative experience, on story and discourse levels can impact the effectiveness of the game, and is therefore an important aspect that we consider during the game design process.

4. Projects and Use Cases

The team at Technologos Research and Innovation Services has worked on various projects during the past three years, applying their expertise in digital educational interventions, and serious game and simulation development.

Even though the primary focus and specialisation of Technologos' team is in digital intervention in sexual health education, collaborations with organisations across Europe that come from different disciplines, enabled us to successfully apply our expertise across different domains and sectors, such as data science, mindfulness, internet safety and GDPR education. This experience gave us the opportunity to expand our knowledge and skillset to innovate in the area of serious games development.

Throughout all of our projects we have participated in, the participants from our interventions and end users of the projects have stated they benefit from those digital interventions and serious games, and believe they can benefit from such interventions in other topics apart from the one they tried.

In this section we will explore the projects and games developed by the Technologos Research and Innovation Services team in different areas of education (Table 1).

Project Name	Sector	Website	Logo
sGuide	Sexual Health Education	sguide.org	
Safe4Play	Sexual Health Education	safe4play-project.eu	
MindLand	Mindfulness	mind-land.eu	
Abacus	Data Science	abacus-games.eu	
DataShelter	GDPR Education	data-shelter.eu	
iSafetyApp	Internet Safety	isafetyapp.eu	

Table 1 Projects using serious games developed by Technologos

I. Sexual Health

The first area of research and game development for the Technologos team was sexual health education, as members of the team had academic experience in the field, using computer simulations to investigate a sex education intervention (Eleftheriou A, 2017). Sex education in and of itself is a controversial and difficult topic to teach to youth, and digital interventions offer enormous potential for young people's sex education. Literature shows that two-way, interactive and tailored education is a more promising form of education compared to traditional one-way passive education (Garneli, 2017) .

sGuide

sGuide is a digital sex education intervention developed by Technologos, which was funded by the Research and Innovation Foundation of Cyprus. sGuide gives young people the potential to engage with the world and their sexual interactions on a different layer (i.e., a digital representation) within which they can come to better understand the ramifications of their risk-taking sexual behaviour via a safer setting. sGuide was developed as an online platform, available in English and Greek, providing information and practice on a variety of topics in the form of infographics, videos, serious games, simulations and quizzes.

Each topic (Figure 1) has a “Learn” section, which includes text, videos and infographics, ending with an interactive game where the player can apply what they learned in a digital gamified setting. After the player has completed the game, they can move on to a quiz to test their current knowledge on the topic.

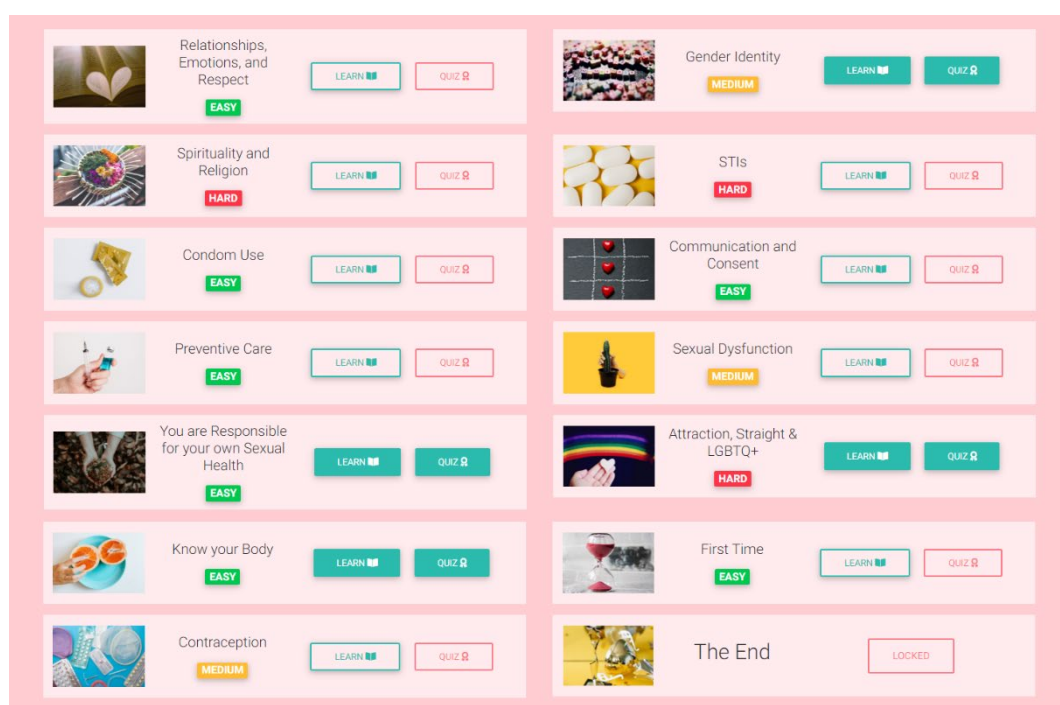


Figure 1 The topics offered in the sGuide sex education intervention.

The games developed for sGuide follow different formats, points of view, types of interaction and graphics, thus using a variety of learning methods and tools. The types of games used in the sGuide intervention are:

1. Narrative Games: The player follows the story of different characters and can interact by choosing what the character will say next, or what they will do, seeing the consequences of their decisions in the game's development (Figure 3).

2. First person view: The player sees the environment in first person view, and they are the main character of the story, choosing what they will say and how they will act in different scenarios (Figure 4).
3. Simulations where the player can input different parameters like the population, percentage of likelihood of having sex, condom use, percentage of people that have the HPV vaccine (Figure 2).
4. Quiz Format: The player is given a story and has to answer a question. For example, they can choose a contraception method for a couple's situation (Figure 5).



Figure 4 Simulation showing how condom use affects the spread of STIs (sGuide)..

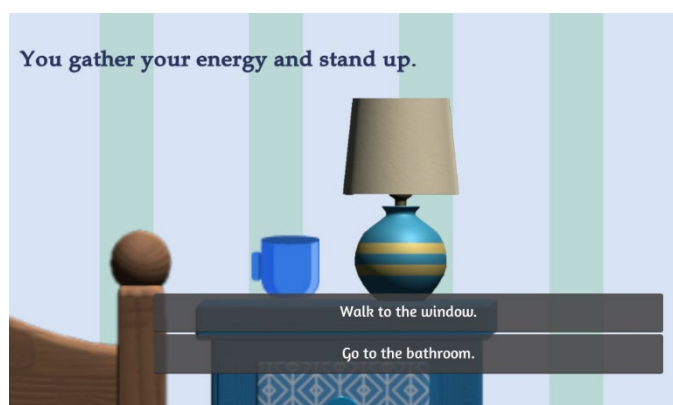


Figure 3 First person view game example (sGuide).

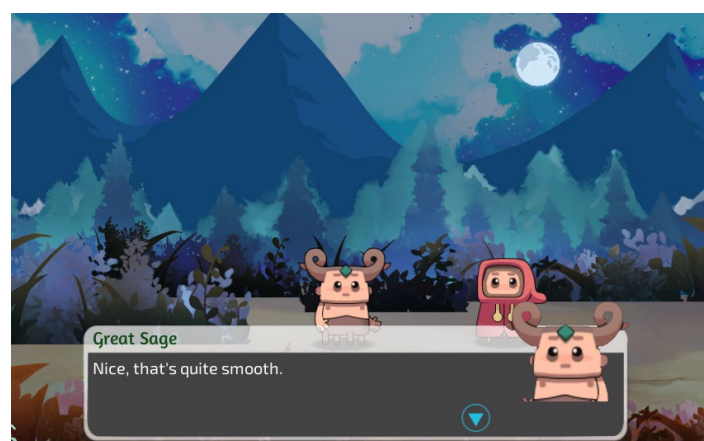


Figure 2 Narrative game example (sGuide).

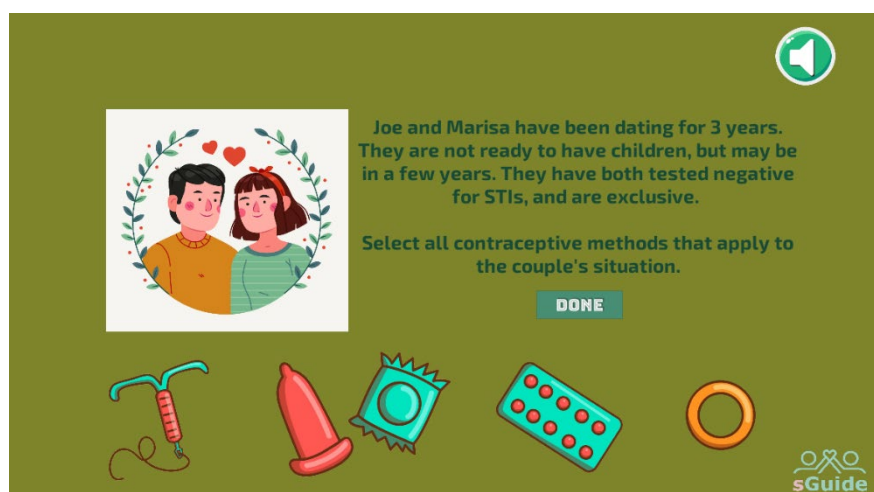


Figure 5 Quiz Format game example (sGuide)

In some of the games there was a continuing story with the same characters (camping games series). Feedback was collected from the users after playing each game, which was useful in the analysis conducted by the team to investigate how different types of games are perceived by players. It has been shown that narrative games (both from the first person and third person perspectives) offer increased opportunity for interactivity, which is one of the most important factors that contribute to the player's enjoyment of the game (Koulloufidou, 2022).

Even though sGuide has many different topics, they are connected using reward and gamification methods, providing incentives to players to complete all the topics. After each game, according to how well they did, the player receives condom badges and skill points (Figure 6).



Figure 6 Condom badges and skill points received in game (sGuide)

The player has a dashboard where they can view all their badges and skill points and keep track of how many they are missing (Figure 7).

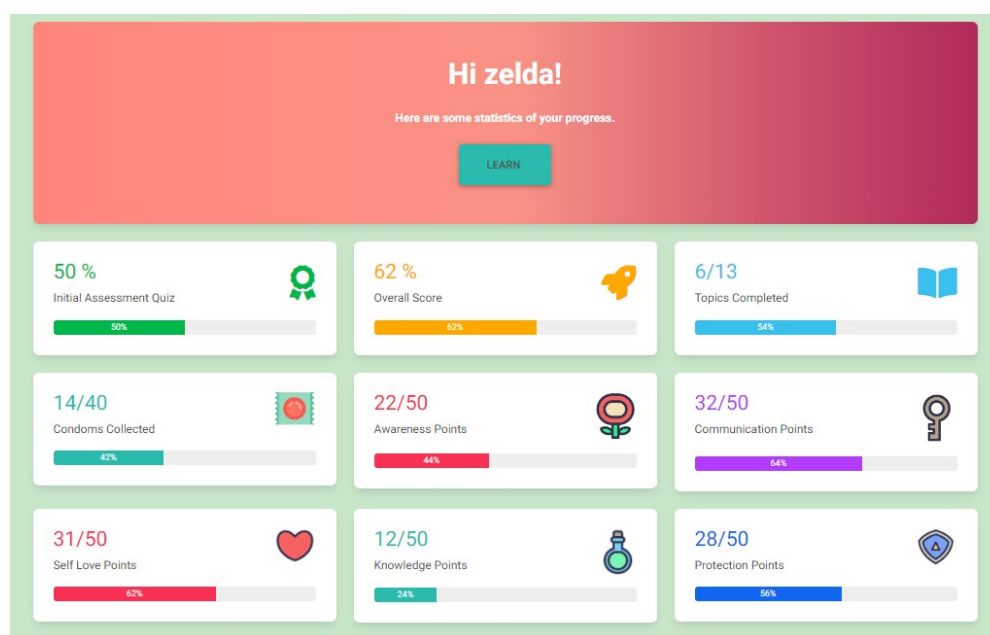


Figure 7 Player dashboard with badges and skill points (sGuide)

Safe4Play

Safe4Play is an innovative educational intervention for safe sexual and reproductive health, which was funded by the European Union. It was developed in cooperation with other partners from Europe. The intervention's concept is that the player enters a house where they have to solve a list of riddles by finding specific household items, which are the answers to the riddles. When the player clicks on each found item, they are presented with a minigame related to a sexual health topic. Technologos developed a series of minigames for each topic (Table 1).

Game	Used in topics
Game Show (Figure 8)	- Heat Destroys Condoms - Using condoms consistently and correctly - Window period for STIs
The Worst Play Ever (Figures 9, 10)	Treatment of STIs
Catch that Bug (Figure 11)	Scabies and crabs
Human Papillomavirus (HPV) Simulation (Figure 12)	STIs prevention
Miss Conception	- Oral Sex and STIs - Contracting an STI

Table 2 Games developed for each topic (Safe4Play)

An important feature of this project is accessibility and localisation. Apart from English, all the games were translated in Greek, Arabic, and French.

The Game Show and Miss Conception games follow the format of questions with multiple choice answers and True or False statements respectively. The Game Show is embellished with images corresponding to each question and each option the player selects, as well as with a “presenter”, the condom character (Figure 8) who guides the player and gives feedback.

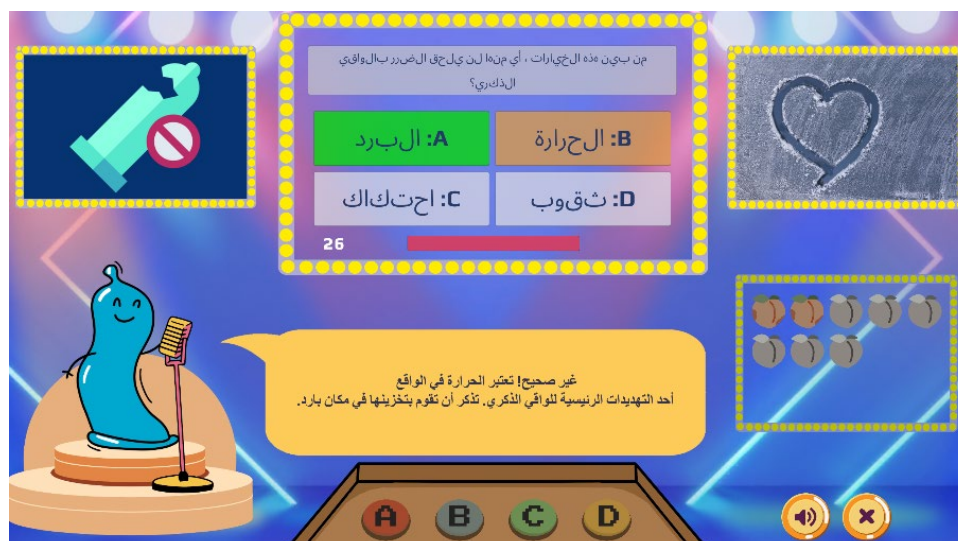


Figure 8 Game Show in Arabic (Safe4Play)

In the Miss Conception minigame, apart from explanations given after each question, the player is provided with external links and resources relevant to their country.

The Worst Play Ever game was created in the form of a digital play, where the actors are the different STIs (gonorrhea, HIV, chlamydia, syphilis, mycoplasma, herpes, crabs) (Figure 9). The setting is a war between humanity and the STIs, through which the player learns the symptoms that each STI causes. Throughout the play, the “actors” forget their lines, and the player has to whisper the correct lines to the actors (Figure 10). All the STI characters were designed with inspiration from how the different viruses and parasites look like in reality under the microscope. The methodology that was followed in the design of this game was to have STIs as non-player characters (NPCs) to facilitate the learning process, as players can associate the character traits of the STI characters with the information and symptoms of the actual STIs. This approach makes it easier and more organic for players to digest and retain information about these concepts, while they are having fun with the story and not actively



Figure 10 The Worst Play Ever (Safe4Play)

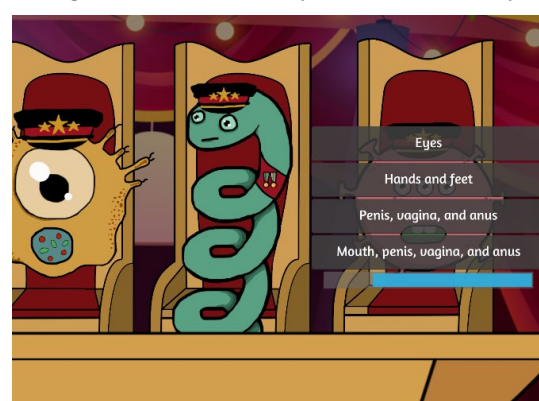


Figure 9 Player Interaction in the Worst play ever (Safe4Play)

focusing on remembering the correct answer.

The Catch the Bug minigame has a more action-based format, as the player has to handle a net using a mobile joystick to catch parasites, specifically crabs and scabies. Every time the player successfully catches a parasite, they are presented with a fact about that parasite and its symptoms when contracted. The player also has to avoid bombs, an element that introduces a challenge to the game that keeps the

player engaged (Figure 11). Throughout our research, we have come to understand that the right amount of challenge in a game can increase engagement of the players and keep them interacting with the game for longer. One method that we used to test this concept was to give the game to students of different ages and watch their behaviour, reactions and performance while playing this game, and then subsequently adjusting the game based on their experience, to achieve an optimal level of challenge and enjoyment.



Figure 11 Catch that Bug (Safe4Play)

In the HPV Simulation, the player selects certain parameters before the simulation begins:

- Male and female population
- Likelihood of having sex in each interaction
- Population percentage that has the HPV vaccine

They then watch as the simulation unfolds through a simulated seven-day period, as the characters interact. At the end of the simulation, they see how many people contracted HPV, and can see the positive difference that the HPV vaccine makes in the spread of the virus.

Game-like simulations are a great way to break down complicated concepts and processes, like the spread of infections in populations, and show which factors can affect a process (e.g. use of condom) in a more practical and visual way.



Figure 12 HPV Simulation in French (Safe4Play)

I. Mindfulness

Mindfulness is paying attention to our experience in a way that allows us to respond rather than react, in a non-judgemental way. It is a quality of inner-stillness that is always available, even when our life or circumstances feel out of our control and chaotic. It is possible to be aware of everything in our experience, including anything we experience through our five senses, as well as our thoughts and emotions. Similar to any process in life, if we are to actually learn anything beyond what our body automatically does for us, we need to express interest in it. And this is what mindfulness is, interest in Mind, the nature of intelligence and source of who we actually are. When we observe our thinking we start being blatantly aware of its automatic nature. We begin to discover that we cannot consider thinking as who we are, as our intelligence, and thus it makes no sense to actually identify with the thought process mechanism. More importantly, we discover for ourselves that by noticing the thoughts we can actually let them go, and eventually even alter their nature.

Many studies show that practicing mindfulness also reduces stress. In 2010, Hoffman et al. conducted a meta-analysis of 39 studies that explored the use of mindfulness-based stress reduction and mindfulness-based cognitive therapy. The researchers concluded that mindfulness-based therapy may be useful in altering affective and cognitive processes that underlie multiple clinical issues.

Many young people, especially those coming from refugee and immigrant communities don't have access to mindfulness tools, which can prove valuable for the development of self-awareness, understanding and regulation of emotions, sound decision making, and healthy relationship and communication skills. A well-rounded education should provide such tools that can help young people navigate their way in the world, find their purpose and take initiative with confidence, while being able to connect with other people in a healthy and respectful way. Currently in Europe, neither mindfulness nor self-awareness are being taught to youth in a systematic way, even though in the past years many schools are starting to adopt mindfulness programmes. Adding to the above points, more and more people are exposed to the digital world, as at year-end 2017, there were 465 million unique mobile subscribers in Europe, equivalent to 85% of the population (GSMA, 2021).

MindLand

MindLand's aim was to create a digital intervention focused on self-awareness, that provides mindfulness training to youth through curated material, interactive exercises and prompts to help youth investigate their inner lives. MindLand offers a set of tools that are readily available to its users, like educational videos and meditation exercises that can help youth when dealing with uncertainty and fears due to unforeseen circumstances, or simply due to the stresses of everyday life. MindLand offers a guided experience for youth to deal with difficult emotions, become more mindful of the beliefs that influence them, and build self-esteem to help them take more initiative and learn to choose what influences them when dealing with fears and uncertainty. An important objective for MindLand was for the intervention to be inclusive and accessible to youth from any socioeconomic background. This was done by aiming for digital transformation of a mindfulness course, and by using localisation and translating the content to languages that are useful for youth facing various crises today in the world.

The MindLand intervention is available in English, Ukrainian and Arabic. It includes mindfulness meditations, educational videos, text content, voiceovers, personalisation, a virtual journal to take notes and a fun character that guides the user through the process, providing an aesthetically pleasing digital

environment. It was important during the design of the game and the graphics to create an environment that is visually and emotionally consistent with the rest of the experience of going through the content. In MindLand, users found the graphics and environment to be relaxing, calming and relevant.

A character named Uni was created especially for this project, embodying a guide in the form of a cute enlightened forest creature. It guides the player through all of the content and activities, and meditates with them. The progress of the player when going through each topic is shown on the top left corner of the screen. At any time, they can go to the practice screen and do a meditation exercise, as explained in the material (Figure 13).

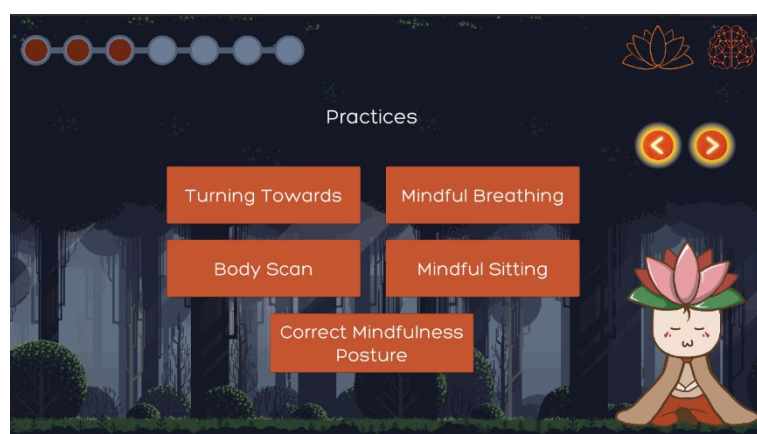


Figure 13 Character Uni meditating with the player (MindLand)

At several points of the intervention, the player is asked to make a choice that fits their individual experience, and the material after that is adjusted to their answer, making MindLand a more personalised intervention (Figure 14). The player can also take notes in a virtual journal to complete the healing process thoroughly (Figure 15). Feedback from users indicated that the elements of making a choice and keeping notes in a journal made them feel more connected with themselves, and made the process feel more personal and useful to the issues they wanted to tackle by using MindLand.

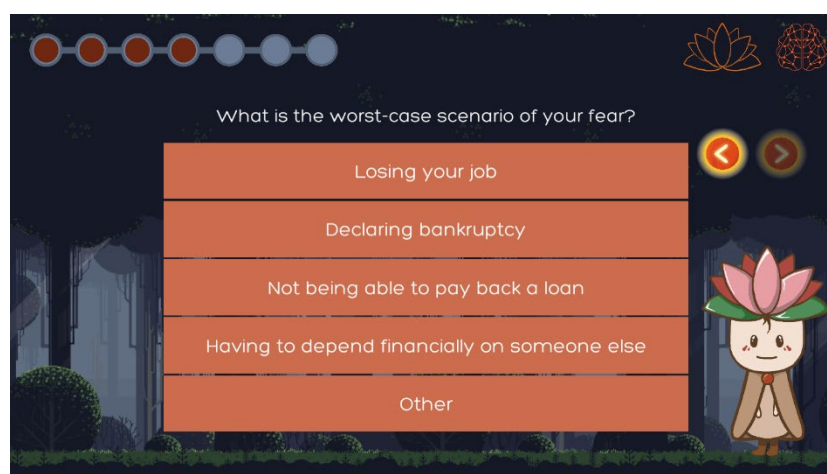


Figure 14 Personalised choices (MindLand)

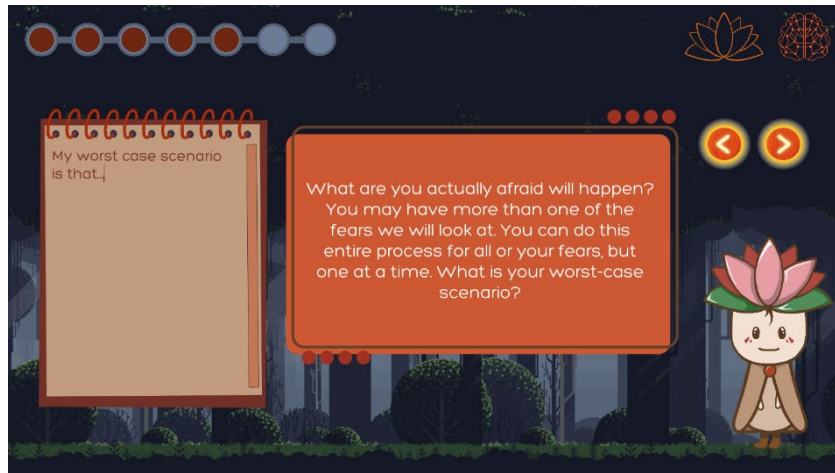


Figure 15 Journal for player to take notes (MindLand)

II. Data Science

Data Science is a relatively new field in tech where complex business problems are solved through data analysis. Data scientists are often experts who understand both the IT and business worlds. With more and more companies around the world, recognizing the importance of interpreting big data to get insights that will boost their revenue, many employers are willing to dig deeper into their pockets to hire data scientists.

Due to the rapid technological innovations in IT, the skills of IT graduates do not match market needs. There is also an alarming shortage of data experts both globally and in the EU, with this lack of core intermediary expertise having created a chasm between e-infrastructure providers and scientific domain specialists. Data specialists accounted for far less than 1% of total employment in most Member States.

Abacus

With the introduction of Abacus, Data Science will not be for the well-trained data scientists only, as people will better communicate with experts and will better understand data thanks to Abacus. Smart companies, organizations and local communities will ensure that many of their members will be able to speak the language of data and use it to improve their quality of lives. By empowering citizens and employees with these fundamental skills, industries and the society in general will realize tremendous levels of innovation and efficiency.

More specifically, the Abacus intervention offers a collection of narrative games and quizzes in the topics of artificial intelligence, complex algorithms, quantum cryptography, digital signatures, encryption and protocols (Figures 13,14, 15). The player has to participate in the characters' discussion about these topics and is given immediate feedback indicating if their answer was correct or not. Immediate feedback is given by changing the colour of the scene and using sounds that are correlated to correct or wrong answers.

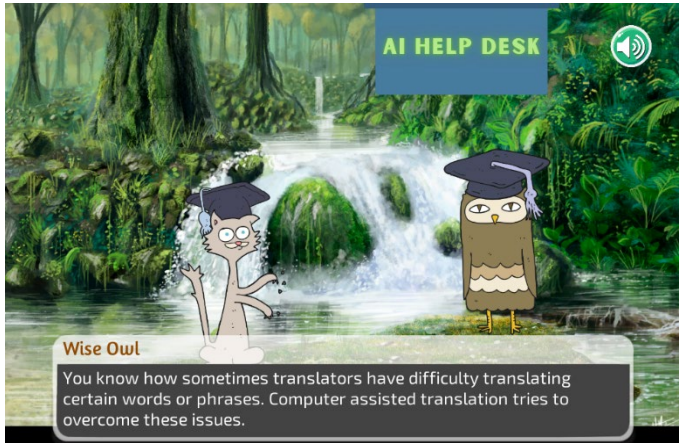


Figure 18 Artificial intelligence game (Abacus)

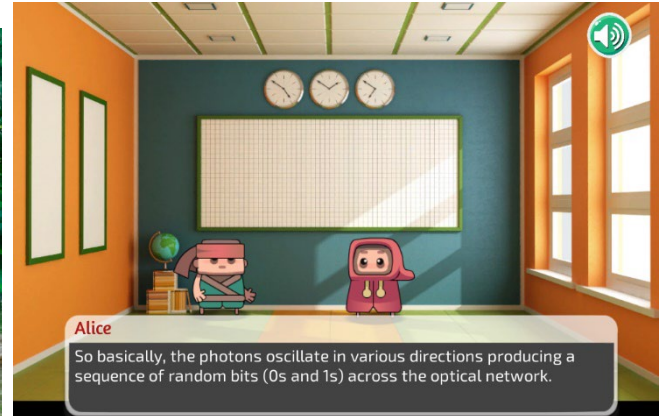


Figure 16 Quantum Cryptography game (Abacus)

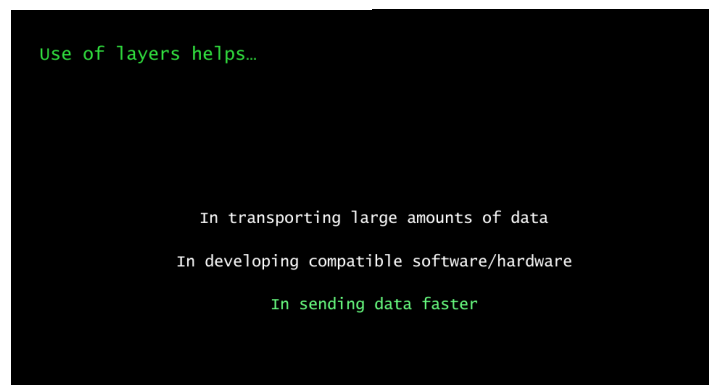


Figure 17 Text based adventure game on protocols (Abacus)

III. GDPR Education

In the past decades, the scope of required skills related to digital transformation is growing uncontrollably, something that can prove overwhelming for youth and students who are transitioning to the workforce, but also for organisations that need to continually adapt and evolve. Understanding GDPR and figuring out its complexities has been a challenging task for organisations, especially to smaller ones that don't have easy access to trainings and seminars.

Repercussions and penalties for organisations that don't comply with GDPR are extremely serious. A 2021 survey by McCann FitzGerald showed that 80% of companies say that they are compliant with GDPR. However, 9% say that they still do not log personal data breaches, while 21% say they do not conduct reviews of records of data processing activity. Only 51% of organisations reported conducting third party risk assessments, and just 36% require the completion of questionnaires by third-parties confirming compliance.

It has also been challenging for graduates and new hires, that apart from their own area of work, they find an additional stressor in being up to date with such important regulations that intrinsically affect their workplace and its processes. In addition, students may not be aware of what GDPR entails for their rights around their own data. In general, many citizens and professionals still believe that GDPR is an IT regulation, rather than one that has implications in most activities of individuals and organisations.

DataShelter

DataShelter aims to decomplicate GDPR and make it more approachable to students. By providing them with an engaging and immersive GDPR training, their confidence will be increased when applying and interviewing for jobs. In addition, on a practical level, their employability will actually be enhanced, as for employers nowadays it is a major attribute to have people that are familiar and can work on the organisation's processes with GDPR in mind. Having a stable foundation, young employees can then go on to deepen their knowledge and apply it in different situations that may arise in the workplace.

In addition, DataShelter can equip students with the capacity to understand the implications of GDPR on their own data as customers, users, students or employees, making them aware of their rights and choices in digital spaces, enhancing their digital readiness and resilience as citizens.

DataShelter strives to include young people with challenging backgrounds and fewer opportunities as participants, to offer them access to this training and ways to improve their employability and digital skills. The DataShelter intervention uses innovative methods of teaching, such as serious games, simulations, videos and infographics. The material is available in English and Greek.

Some of the narrative games used in the DataShelter project present different scenarios where GDPR has to be applied, to simplify real life situations for students as subjects and future employees. The player has to assess each situation and scenario and make the correct decisions according to the GDPR. One example is a scenario where a customer calls a company to complain and asks for personal details of an employee. The player has the role of the receptionist, deciding how to reply to the customer with GDPR principles in mind (Figures 19, 20).

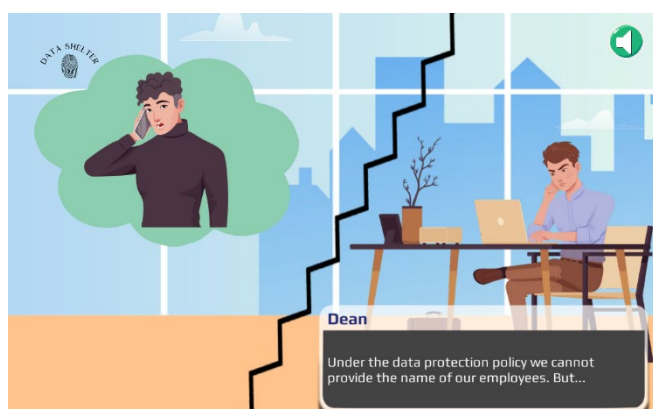


Figure 20 Narrative game for GDPR Education (DataShelter)

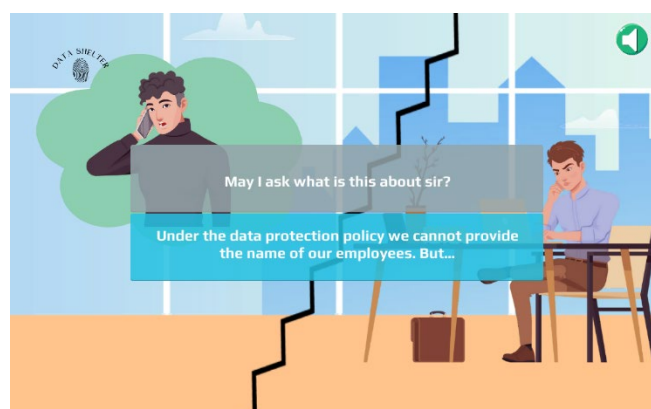


Figure 19 Making choices in narrative game for GDPR Education (DataShelter)

Another example of a scenario presented is when an employee finds a USB device outside their workplace and has to decide how to handle the situation: if they will take it to the IT department, if they

will insert it in their computer, and so on. The ending of the story changes according to the player's decisions throughout the game (Figure 21).



Figure 21 Storyline of narrative game for GDPR education (DataShelter)

IV. Internet Safety

The internet has been identified as a (potentially) very valuable avenue for comprehensive, interactive and youth-friendly education (Simon L, 2013), with online sites offering a wide range of innovative, youth-friendly ways to engage young people in education. For example, young people worldwide are using the internet to access information on sexual and reproductive health and rights. New social media platforms have emerged that facilitate online digital interactions with young people, which fill a much-needed gap.

An advantage of serious games as a means of learning about internet safety is that they allow users to train for decision-making situations where the wrong choice may be inherently dangerous or involve some risk, such as in a grooming scenario, that might be life-threatening for the victim.

iSafetyApp

The main objective of the iSafetyApp project was to create a serious game that will teach students Internet Safety skills, featuring personalisation using Artificial Intelligence methods.

Using the expertise of the different partners the consortium created a cutting-edge game that can measurably increase the ability of students to stay safe in the internet. The target group is defined as students roughly between 12 and 18 years old. A second target group consists of teachers who will be given concepts and materials for implementing the game as a training tool in the classroom.

The consortium created this learning approach in order to help weaker learners who might not be doing well in a formal school setting. The game is seen as a tool that can be used in support of class work in order to activate students in a non-traditional manner and help them acquire essential skills that they are not learning in the usual school programs. The consortium can also benefit from different experiences in the different countries when optimizing the game concept. This is especially relevant when creating a game that can equally appeal to girls and boys and when specifically targeting disadvantaged learners with learning difficulties because their situations can be vastly different in different societies.

The Technologos team created mini games, videos (Figure 22) and infographics (Figure 23) with educational material on internet safety, making the content more attractive to students.

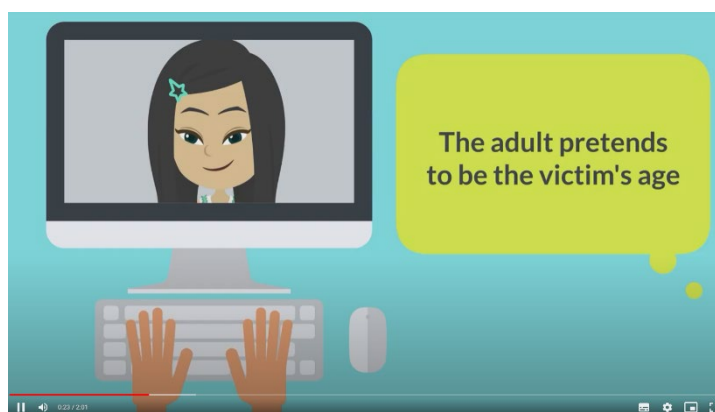


Figure 22 Video on Internet Safety (iSafetyApp)

BAD IMPACT OF SOCIAL MEDIA YOU SHOULD BE WARN

Social media is fun. Apart from being entertainment, many positive benefits can be obtained from social media, such as connecting with friends, using it for online business, learning new things, and others. On the other hand, social media can cause negative things when we are not wise in using it.



Addiction

Anything in excess is not good, including social media. It can be more addictive than cigarettes and alcohol. It has a powerful magnet for many people that leads to them checking it all the time without even thinking about it.



Expectations

Seeing the success, achievements, and all the advantages that other people have. Social media forms unrealistic expectations of life and friendships in our minds. Many use it as motivation, but many also feel insecure or inferior to themselves.



Consumptive Behavior

Using social media unwisely also leads to consumptive and wasteful behavior. In social media, we can easily find various interesting items that we want to have, so it doesn't matter whether we really need them, we are tempted to buy them.



Affect Mental Health

Spending too long on social networking sites could lead to poor mental health. Social media lets you see the carefully selected best parts of everyone else's lives, which you then compare to the negatives in your own life. Anxiety and insecurity are the most mental health problem caused by social media.



Conflict and Bullying

Sometimes, social media becomes a place of hatred and criticism of someone. These online attacks often leave deep mental scars and even drive people to hurt themselves or take their own lives, in some cases. In social media, we are free to express our feelings but you have to pay attention to the existing limitations.

ONLINE SEXUAL HARASSMENT

Online sexual harassment is any unwanted sexual behaviour online. It can make a person feel threatened, exploited, coerced, humiliated, upset, sexualised or discriminated against.

WHERE

Anywhere online (social media, games, messaging apps).
Publicly, privately, or both at the same time.

HOW

Uses images, videos, posts, messages, memes, emojis
Includes a variety of different behaviours.
Can overlap with offline experiences of sexual harassment or discrimination.

EXAMPLES

- Bullying someone for online behaviour outside common gender stereotypes.
- Body shaming by embarrassing someone for the way their body looks (e.g. mean comments).
- 'Sexting' someone by sending them an unsolicited nude or nearly nude image, or sending real or fake photos of the victim to others.
- Sharing online pornography, whether as a link or image, because it was seen by the sender as 'funny'.
- Using offensive language against someone based on their gender identity or sexual orientation.

HOW TO STOP IT

- Do not forward messages, photos or videos that might hurt other people.
- Do not send messages when you don't agree with the content.
- If a person or incident on the internet doesn't seem right or makes you feel uncomfortable inform an adult that you trust.
- If you suspect that a friend or classmate is an online sexual harassment victim then you should inform an adult that you trust.
- Do not respond to online harassment or cyberbullying because that might make it worse.
- Don't be ashamed if you fall victim to online harassment. It is not your fault!

HELP

You can address any online sexual harassment or cyberbullying incident by calling the help line 1480.

Source: <https://www.childnet.com/help-and-advice/online-sexual-harassment/>

Online safety guidelines

STRONG PASSWORDS

Quick tips for creating and saving your online passwords

ADD VARIETY

Use uppercase, lowercase, characters and numbers.

DO NOT RECYCLE

Do not use the same password for all of your accounts.

DO NOT USE PERSONAL INFORMATION

Avoid using birthdates or names from your loved ones.

MAKE IT LONG

Use passwords longer than six characters when possible.

CHANGE OFTEN

Make sure to review your passwords and change them frequently.

USE A MANAGER

Password management apps and sites can help keep track.

Visit our site www.isafetyapp.eu for more!

iSafetyApp

Figure 23 Infographics on Internet Safety (iSafetyApp)

5. Conclusion

Serious Games are becoming increasingly popular as educators begin to unlock their capabilities. At the same time learners are more used to games in their everyday life and technology grows to be ever present around us.

On the other hand, serious games have potential that can be tapped into not only by educators, but also by researchers, activists and creators from any field, that aim to raise awareness for a specific issue or highlight the experiences of marginalised people and communities. By now, serious games should be perceived not only as digital educational tools, but creative media that can affect people's empathy, understanding and awareness, and have a positive impact in society.

It is therefore important to actively move into more interactive and engaging methods of transmitting knowledge and experience to people, taking advantage of the creative media and digital technologies that are continuously being developed.

In this paper, it has been shown that there are no limits in areas or sectors where serious games can be used to have a positive impact on learners and the wider public, and benefit anyone regardless of their background or capabilities. We firmly believe that narrative games, and the art of storytelling within them, have tremendous potential to impact players in profound ways. This is because stories are inherently relatable, and can be used to make lessons more engaging, memorable, and easily understood. By immersing players in the game's narrative and allowing them to identify with its characters, these games have the power to create a lasting impact on players, shaping their perspectives and experiences in powerful ways. We have investigated different ways of designing a narrative game, and how graphics, interactivity, characters and challenge levels can influence a player's experience and increase their engagement and effectiveness of learning. As a part of our ongoing research, we are focusing on the concept of branching narratives and their ability to empower players with creative agency. By allowing players to make choices that shape the story, branching narratives promote an interactive and engaging learning experience that is far from passive. We believe that this approach can be particularly effective in enabling players to practice and apply new concepts in a way that is both meaningful and enjoyable, ultimately leading to a deeper understanding and retention of the material.

At Technologos Research and Innovation Services, we continuously strive to be at the forefront of research and development in serious games, investigating different types of games and interactive education methods, and applying them in new areas and sectors.

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