



GENTLY

Games for Energy Efficiency Youth Literacy

Project Result 2

Board and Application games for energy efficiency maximisation

This document is also available in [German](#), [Greek](#), [Hungarian](#), [Lithuanian](#), [Romanian](#) and [Spanish](#)



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GENTLY

Games for Energy Efficiency Youth Literacy

1. Executive Summary

The primary goal of GENTLY is to leverage game-based learning to inspire active citizenship among young people. The game seeks to promote and encourage the adoption of energy-efficient behaviours, educate (in a non-formal way) young people on green deal initiatives, enhance awareness of environmental risks, and empower them to actively engage as environmentally well-informed and conscious citizens.

GENTLY focuses on three of the seventeen sustainability goals of the United Nations: Education, Sustainable Consumption and Production Patterns, and Taking Urgent Action to Combat Climate Change and its Impacts (<https://sdgs.un.org/goals>). The project aims to establish a framework that effectively addresses the necessary steps to accomplish these objectives.

The main scope of the project is to create a collaborative board and digital game to educate players on energy efficiency, green deal practices, and environmental conservation. Through cooperative gameplay, participants work together to accomplish objectives geared toward optimising green energy usage and reducing environmental impact.

The project partners consist of organisations with complementary backgrounds, experiences and skills. Professionals with relevant knowledge and expertise are collaborating for a common target to facilitate efficient and genuine education of young individuals. The project ran from Feb 2022 to January 2024, encompassing all stages of development, testing, and dissemination.

2. Introduction

In recent years, the utilisation of game-based learning, both in digital and analog formats, has surged, emerging as a powerful tool for formal and informal education. This method is becoming more and more well-known for its ability to impart knowledge in an interesting and fun way that is especially well-suited to the tastes of today's youth. Beyond simple amusement, game-based learning provides a means of cultivating social competencies including leadership, cooperation, critical thinking, and decision-making.

In line with this trend, the GENTLY project seeks to combat climate change and its effects, promote sustainable consumption and production practices, and address education as vital sustainability goals through the use of game-based learning. GENTLY aims to create a cooperative board game and matching digital game to encourage energy conservation habits and teach young people about green deal initiatives, foster an understanding of environmental risks, and empower young people to actively engage in matters of the environment.

The cooperative game created by GENTLY is a dynamic platform where players work together to overcome obstacles pertaining to environmental preservation and energy efficiency. With a focus on maximising energy efficiency and minimising environmental emissions, GENTLY's game rules enable players to think and make decisions together, taking inspiration from popular cooperative games like Pandemic and Mysterium.

GENTLY's strategy is noteworthy for its innovation since it goes beyond conventional board game forms by utilising digital channels, such as a mobile application. The goal of this adaptation is to improve accessibility and engagement, especially for younger people who are accustomed to using digital devices extensively (mobile phones, tablets, and laptops). Furthermore, GENTLY offers free downloading resources and bilingual editions, ensuring widespread accessibility and transferability throughout Europe and beyond.

In this endeavour, the consortium led by Fifty-Fifty collaborated closely to navigate the development process, from needs assessment and analysis to game implementation and dissemination. Through iterative stages of development, feedback, and refinement, GENTLY strives to create a comprehensive educational tool that effectively addresses the learning needs of young people while promoting active citizenship and environmental stewardship.

Background

In recent years, there has been a growing recognition of the urgent need to address environmental challenges and promote sustainable practices, particularly among younger generations.



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www.gently4youth.eu

Simultaneously, there has been a rise in the use of game-based learning as a dynamic and effective educational tool. Recognizing the potential of combining these two trends, the GENTLY project emerged as an innovative initiative to harness the power of gaming for environmental education and youth empowerment.

Initiated under the Erasmus+ Program, GENTLY seeks to address critical sustainability goals related to education, sustainable consumption and production patterns, and combating climate change. These goals align closely with the global agenda for sustainable development, highlighting the project's relevance and importance in contemporary societal challenges.

The genesis of GENTLY stems from the collective vision of a consortium of partners who recognized the transformative potential of game-based learning in engaging and educating youth about environmental issues. Leveraging their expertise in game development, education, and environmental advocacy, the consortium embarked on a journey to create an innovative educational tool that would foster active citizenship and environmental consciousness among young people.

The project's conceptualization was guided by extensive research and needs assessment, aimed at understanding the specific learning needs and preferences of the target audience. This thorough groundwork laid the foundation for the development of a cooperative board game and a corresponding mobile application, designed to make learning about energy efficiency, green deal practices, and environmental protection both engaging and accessible.

Throughout its development, GENTLY prioritised inclusivity and accessibility, ensuring that the game and its accompanying materials would be available in multiple languages and freely downloadable from the project's website. This commitment to accessibility reflects the project's broader mission to reach and empower young people across Europe and beyond, regardless of linguistic or geographical barriers.

As GENTLY progresses through its implementation phase, the consortium remains dedicated to refining and enhancing the educational tool, drawing on feedback from stakeholders and partners. Through collaborative efforts and iterative refinement, GENTLY aims to emerge as a leading resource for environmental education, empowering young people to become proactive agents of change in building a sustainable future.

Objectives

The GENTLY project endeavours to revolutionise youth education by harnessing the power of Game Based Learning (GBL) methodologies, by incorporating both traditional board games and modern online applications. This initiative seeks to empower young people to become proactive agents of change, particularly in addressing critical sustainability issues such as energy efficiency and climate change. By immersing youth in engaging and interactive gameplay experiences,



GENTLY aims to effectively communicate important messages, instil eco-conscious behaviours, and foster a deeper understanding of environmental challenges.

Aligned with three key sustainability goals outlined by the United Nations - Education, Sustainable Consumption and Production Patterns, and Climate Action - GENTLY endeavours to develop a holistic framework that addresses these objectives comprehensively. Through rigorous research analysis and close collaboration with youth workers, the project aims to design, test, and publish innovative game packages tailored to different skill levels, catering to both youths and those with fewer opportunities. These game packages will serve as dynamic tools for educating and empowering young people, equipping them with the knowledge and skills necessary to enact positive change in their communities.

Furthermore, GENTLY recognizes the importance of engaging various stakeholders, including companies, in the pursuit of environmental protection and sustainability. By involving companies in professional gaming experiences, the project aims to showcase actionable strategies for environmental stewardship while also supporting individuals facing socio-economic challenges. Through strategic partnerships and leveraging the collective expertise of its consortium partners, GENTLY seeks to develop a highly innovative and impactful suite of game-based learning resources.

The project's overarching objective is not only to inform and educate young people but also to provide comprehensive training opportunities for youth workers. By equipping them with the necessary tools and knowledge, GENTLY aims to enhance their ability to engage with diverse audiences and deliver quality training on energy efficiency and environmental conservation. Through a collaborative and multidisciplinary approach, GENTLY aspires to create a lasting impact, contributing to a more sustainable and equitable future for generations to come.

Scope

The scope of GENTLY is broad and inclusive, encompassing various dimensions of environmental education, youth empowerment, stakeholder collaboration, innovation, and sustainability. Through its holistic approach, GENTLY aims to catalyse positive change and contribute to building a more sustainable and resilient future for young people and communities not just in Europe, but worldwide.

First and foremost, GENTLY aims to reach a broad audience of young people across Europe and beyond, including those with fewer opportunities. By leveraging game-based learning methodologies, the project seeks to engage youths in an immersive and enjoyable educational experience. The scope extends to both formal and informal learning settings, encompassing schools, youth centres, and community organisations.

The project's thematic focus revolves around three key sustainability goals identified by the United Nations: Education, Sustainable Consumption and Production Patterns, and Climate Action.¹ Within these broad themes, GENTLY addresses specific issues such as energy efficiency maximisation, reduction of carbon footprint emissions, adoption of sustainable practices, and understanding the impacts of climate change.

However, GENTLY extends its scope beyond direct youth engagement to include the professional development of youth workers. Through training courses and resources, the project equips these facilitators with the necessary skills and knowledge to effectively implement game-based learning approaches and deliver impactful training sessions on environmental issues.

Furthermore, the project involves collaboration with a diverse range of stakeholders, including educational institutions, youth organisations, environmental NGOs, and businesses. By fostering partnerships and dialogue, GENTLY aims to mobilise collective action and leverage the expertise and resources of various stakeholders to achieve its objectives (as mentioned above).

GENTLY's main priority is innovation in both content and delivery methods, by leveraging digital technologies in order to create engaging and interactive game-based educational experiences. The project aims to develop a scalable model that can be adapted and replicated in different contexts and regions, thus maximising its impact and reach.

Finally, GENTLY's scope extends to dissemination activities to maximise the visibility and uptake of its educational resources. The GENTLY project has outlined a comprehensive strategy for dissemination and exploitation of its outcomes, that include the designing of platforms for professional communication and sharing project findings with stakeholders. Also, the design and management of a project website and the establishment of a Facebook page.

In addition, the dissemination of the project depends on media engagement, such as press releases, audio interviews, short video clips, and a video documentary throughout the project.

Moreover, the post-project dissemination will focus on generating concepts for future collaboration and evaluating project accomplishments. Results will be shared on the Erasmus+ Dissemination website, and an overview will be added to the SALTO Toolbox.

Finally, the project plans an international conference in Germany to present the overall project activities, outcomes, and promote further uptake. The conference features keynote speakers, workshops, and opportunities for feedback and adjustment.

¹ The 17 Sustainable Development Goals (SDGs), United Nations, Department of Economic and Social Affairs
<https://sdgs.un.org/goals>

3. European Young People requirements on environmental awareness and information across Europe

Introduction

In order to conduct an initial research on the user requirements of young people and the games we wanted to develop, we made an initial analysis of the status and facts concerning the countries which are represented in the consortium and are distributed all over Europe. The analysis of the findings is presented for each separate country in the following paragraphs.

Analysis

On December 11, 2019, the European Commission unveiled a pivotal initiative known as the European Green Deal, signalling a significant shift towards sustainable growth within Europe. This transformative strategy not only prioritises the reduction of emissions but also endeavours to reshape the EU into a fair, prosperous, and environmentally conscious society. At its core, the European Green Deal aims to forge a path where economic prosperity is harmonised with ecological sustainability, reimagining both production and consumption practices to operate in harmony with our planet.

Central to the success of the European Green Deal is the imperative of ensuring a just and inclusive transition to a climate-neutral economy, leaving no individual or community behind. Recognizing the crucial role of citizen engagement, the strategy underscores the need for active participation from EU citizens. Through ambitious climate and environmental objectives and inclusive participatory processes, the European Green Deal seeks to galvanise broad societal mobilisation against climate change and for environmental preservation. Among the key pillars of this landmark strategy are the European Climate Pact and the Just Transition Mechanism (JTM). The European Climate Pact serves as a vital platform for fostering awareness and mobilising societal support for climate action. It aims to engage citizens, cities, and regions in the collective effort to combat climate change and promote environmental stewardship. Meanwhile, the Just Transition Mechanism is designed to provide crucial support to EU regions that are most profoundly impacted by the transition to a climate-neutral economy. By ensuring equitable distribution of resources and opportunities, the JTM endeavours to safeguard the welfare of all citizens, ensuring that no one is left behind in the pursuit of a sustainable future.

In essence, the European Green Deal represents a bold and comprehensive roadmap towards a more sustainable and resilient Europe. By aligning economic growth with environmental

protection, fostering inclusive participation, and prioritising social justice, this visionary strategy seeks to forge a path where prosperity and sustainability go hand in hand, ultimately creating a brighter and more sustainable future for all Europeans.²

The ambitious objective of the JTM is to reshape the socio-economic future of entire regions in the EU. Given the magnitude of the envisaged change, next generations are a key stakeholder as the citizens who are expected to inherit what the JTM will build in terms of job opportunities, socio-economic conditions, infrastructures and environmental restoration. It is hardly conceivable that the future of a community is decided without the people who will live in it. The engagement of young people in the just transition is thus necessary to ensure the JTM achieves its objectives, serves the future of the communities it is supporting, and guarantees intergenerational justice in the decisions that are made.

Sustainable energy has an essential role in government strategies to build back better in the current economic crisis. Energy efficiency and renewable energy, for example, can deliver a significant number of jobs and provide multiple benefits, among others related to climate change mitigation. The young generation has lots of potential to contribute to the energy transition in many ways, for instance through engagement in decision-making processes at local and international level and as a skilled workforce supporting the development of renewable energy, energy efficiency and clean mobility value chains. Youth are emerging as an important source of talent for achieving energy access, renewable energy, energy efficiency targets, and already account for a substantial fraction of jobs in the renewables sector. At the same time, youth is increasingly engaging in climate change and energy transition issues.

One of the most pressing challenges for emerging economies is a shortage of jobs among the youth. Enhanced skills development and decent work opportunities for youth can be created in the sustainable energy and clean mobility sectors. Initiatives to develop business and technical skills and create jobs targeting the youth should be pursued more vigorously, with increased collaboration between the private sector and educational institutions to improve the quality and accessibility of training.³

Germany

According to a survey conducted by the German environment ministry (BMU) and the federal agency for nature conservation (BfN), the majority of young Germans are in favour of transitioning to clean energy. Among those aged 14 to 17, 66% support the move towards a clean energy

² Youth for a just transition - A toolkit for youth participation in the just transition fund, https://ec.europa.eu/regional_policy/en/information/publications/guides/2021/youth-for-a-just-transition-a-toolkit-for-youth-participation-in-the-just-transition-fund

³ International Energy Agency and International Monetary Fund (2020). Sustainable Recovery. A World Energy Outlook Special Report in collaboration with the International Monetary Fund. World Energy Outlook 2020

economy, while 32% are undecided, and only two percent oppose it. Support for the transition is higher among young people with higher levels of education (75%) compared to those with lower levels of education (42%). Additionally, the survey indicates that a significant portion of respondents (72%) believe that global biodiversity is declining, with a majority (61%) seeing the protection of nature as a political responsibility.⁴

Since the onset of the pandemic, over half of young people aged 14 to 24 report spending more time in nature than before, citing the need for distraction, stress relief, and exercise as primary reasons. Moreover, recent polls suggest that climate action has become a top priority for the German youth, with strong support for transitioning towards a low-carbon and nuclear-free economy.

Furthermore, the current situation in Germany concerning green energy practices seems to attract further attention from countries abroad. For example, German universities have seen a growing interest from foreign students in subjects related to energy transition. Both public and private universities in Germany have expanded their offerings to include courses on climate protection and sustainability in response to increasing global demand. The 18th Shell Youth Study⁵ indicates that young people consider climate protection and sustainability significant factors in their daily lives and career decisions, leading to a rise in enrollment in programs focusing on environmental protection, renewable energy, energy and environmental management, and waste management.

The Centre for Higher Education Development notes a trend among German universities between 2014 and 2019 to adapt and diversify their study programs to address emerging social issues. For example, RWTH Aachen University has revamped its raw materials engineering course to emphasise sustainable raw materials and energy supply. Additionally, Eberswalde University for Sustainable Development (HNEE) offers Germany's sole Biosphere Reserves Management master's program in English, attracting students from various regions including Jordan, Africa, South America, and Europe. The university's strong connections with organic farming, nature conservation, and environmental protection organisations provide students with valuable networking opportunities for future career prospects.

Furthermore, German universities are actively implementing climate-friendly practices within their campuses. This includes installing solar panels on rooftops, transitioning to renewable energy sources, and constructing new buildings according to passive house standards, as reported by Welt.⁶

⁴ Majority of German youth support energy transition – survey,
<https://www.cleanenergywire.org/news/majority-german-youth-support-energy-transition-survey>

⁵ 18th Shell Youth Study: Rising political engagement among young Germans
<https://www.hertie-school.org/en/news/detail/content/18th-shell-youth-study-rising-political-engagement-among-young-germans>

⁶ German universities attract foreign students with energy transition courses,
<https://www.cleanenergywire.org/news/german-universities-attract-foreign-students-energy-transition-courses>

Greece

Compared to other European countries, Greece has achieved a significant share of renewables in its energy mix and in parallel promotes various policies aiming to accomplish zero-carbon emissions by 2050. An important element of this procedure is the broader acceptance of renewables by the public.

Greece adopted a National Plan for Energy and Climate (NPEC) in December 2019 in order to combat climate change and protect the natural environment mainly through Renewable Energy Sources. Safeguarding energy supply and security against energy or geopolitical crisis incidents is an additional advantage of green electricity. According to the National Plan, decarbonisation i.e. the ending of Greece's reliance on lignite, is scheduled to be achieved by 2028, as a top priority, while Renewable Energy Sources (RES) are projected to reach the 65% of electricity production in 2030, becoming the main national energy source in Greece.

It is surprising thus that Greece on April 1st and 2nd 2022 covered, through green technologies, 67 and 68%, respectively, of its energy needs both at investing and demand level. 70% percent of the green energy derived from the wind, while concerning the total energy consumed, 47% derived from the wind, 14% derived from the sun and 6% derived from other RES.

Even though Greece is turning towards green energy, youngsters seem to be unaware of the European green energy policies. ILO & Cedefop studies show that despite the important steps that are made in the green transition, the effectiveness of the actions lags behind. This is partly due to lack of funding, but mostly to the lack of information and educational campaigns about green energy and its use towards the public and especially youth. Moreover, the piecemealness of the measures taken, in the deficit connection between environment and skills development policies, in weak coordination between the competent bodies, the lack of assets policies focused on green skills and specialised mechanisms for the diagnosis of needs, as well as the insufficient public support of workers for the development of skills in the context of the green economy are unbeneficial factors.

In an effort to amend this situation, certain programs approved by the Ministry of Education have taken place in order to familiarise children and especially youth about these policies. Since 2014, the program has been steadily receiving the approval of the Ministry of Education and Religious Affairs, while it has been attended by more than 2,500 primary and secondary school students all over Greece. It is implemented by our trained employees, while it is designed in such a way that 25 to 100 students can attend at the same time, either in person or online.

During the program, students have the chance to learn about sustainable development, Renewable Energy Sources and the circular economy, through two distinct educational modules: In the theoretical module, there were presentations about how renewables work, the different types

of energy and how they are converted into electricity. The practical module consists of games that are designed to promote knowledge, fair play and team spirit. By taking part in these games, students learn how to work as a team and to pool their individual abilities in order to find solutions, but also to respect the winner.

Sustainability, innovation, circular economy, and the ways to tackle climate change are issues that are at the top of the global agenda. They also have a significant impact on our daily lives, and especially on the future of children. “Energy on the Go” essentially expands students’ knowledge as it introduces them to Renewable Energy Sources and natural phenomena. The program introduces them to the world of renewable energy and enables them to understand complex concepts, while at the same time helping them to become environmentally aware citizens.

That initiative was fully in line with the 17 UN Sustainable Development Goals. The “Energy on the Go” initiative is aligned with Goal 4: Quality Education.⁷

Romania

In 2022, Romania secured 1.4 billion euros from the EU Modernization Fund to facilitate its transition towards cleaner energy sources. This funding will support the development of eight new solar parks and two electric power plants utilising gas turbines in combined cycle configurations. These projects aim to replace lignite with renewable energy sources and natural gas, thereby modernising the country's power systems, reducing greenhouse gas emissions across various sectors such as energy, industry, transportation, and agriculture, and improving energy efficiency.

One notable project involves the construction of one of Europe's largest solar parks in Arad County, Western Romania, with a capacity of 1,044 MW and a value of 800 million Euros. This solar park, scheduled for completion by March 2023, will feature cutting-edge energy storage solutions. Monsson Romania, a major renewable energy developer, has partnered with Rezolv Energy from the Czech Republic to execute this project.

Based on recent studies, youth in Romania seem to be aware of green energy and the European policies concerning these matters. More particularly, one of the main conclusions of these research is that young people in Romania with ages ranging from 15 to 24 years old are more aware of the impact of climate change and have a more pessimistic perspective than other generations who rate their optimism between 50% (older than 54) and 52% (25-54 years old). Such a gap can also be observed when rating pessimism among respondents from urban areas (56%) and rural areas (49%). When it comes to those born in Generation Z, the optimism rate is as low as 10%, followed by Millennials, aged 24-34 (14%) and 35-44 (16%), Generation X, aged 45-54 (21%) and Baby Boomers, over 55 years old (22%).

⁷ Energy on the Go: introducing Greece’s next generation to the world of green energy,
<https://www.enelgreenpower.com/media/news/2023/03/introduce-greek-students-green-energy>

When asked which frame of mind they wish would be prevalent amongst Romanians in 2035, 79% of the research participants prioritised environmentally friendly practices, marking an increase from the 2021 study (64%). However, empathy has been invoked by fewer respondents (29%) compared to last year (35%), with similar shifts observed when it comes to diversity (29%, compared to 35% in 2021), honesty (41%, from 48%), initiative (25%, from 31%) and ambition (16%, from 31% in 2021).

Those within the Young Millennials age group (25-34 years old) attribute the most importance to the negative consequences on agriculture, air pollution, desertification, floods and loss of biodiversity, marking an increase of 7-9% compared to other age groups. When asked about the impact numerous activities have on the environment, waste has been identified as the top answer, followed by product packaging methods. The textile industry has been perceived as the least dangerous to the environment. While the same ranking has been observed in the 2021 study, the perception of the effects caused by what were considered the most dangerous activities for the environment has decreased by 12% for waste and 8% for packaging.

Almost half of the respondents consider that the difficulty in reducing the effects of climate change is caused by the lack of strict enough policies which would be effective in changing people's behaviour. A third of the respondents pinpoint resistance to change as the reason when it comes to consumer behaviour. Furthermore, according to the study, 63% of Romanians believe they are more involved in combating climate change than the government or local authorities. One third of respondents named the absence of infrastructure as the top reason for the lack of selective waste management. The other cause, invoked by the same number of respondents, is people not knowing how to properly sort waste.

Although 51% of the people interviewed had no idea that Romania, according to the Paris agreement, has promised to cut down on the greenhouse emissions by 2050, they are willing to make sacrifices in order to protect the environment: without any significant gaps between groups in terms of gender, habitat space or age, the vast majority of Romanians (70%) declare they support additional taxation of polluting products.

Renewable energy is mentioned by 75% of the subjects when asked which form of energy should be prevalent in Romania, by far favoured to any other potential energy source. Closely related to this mindset, the most invoked solution for reducing the effects of climate change has been increasing the renewable energy sources ratio, followed at a significant distance by lowering greenhouse emissions produced by cars and green investing in the private sector, both of which were named by half of the respondents.

Eco-friendly attitudes are the most popular answer among Romanians when asked what measures companies should adopt, followed by fair pay as an incentive for qualified personnel and health benefits, which are preferred especially by Young Millennials, aged 25-34 (68%, compared to the average 59% across all age groups). Generation Z, however, values more than other generations,

educational development through skill refinement courses (55% of those aged 15-24, compared to the average of 41% for all other age groups).⁸

Furthermore, the same initiative that took place in Greece, also organised educational activities in Romania and invested in training students and, implicitly, future generations of engineers specialised in electrical, mechanical, and mechatronic engineering by modernising infrastructure and laboratories dedicated to the study of green energy.⁹

Cyprus

The situation in Cyprus, however, seems to be completely different. For example, there are activists' groups of youngsters that are actively engaged in matters of climate change and the environment. Based on statements given by their members they "*challenge adult notions of the pandemic as exceptional, by drawing attention to the everydayness and continuity of the climate crisis. At the same time, they retain hope, rooted in their willingness and capacity to act collectively to bring about change*".¹⁰ In their interviews, the heads of this organisation state that engagement with the issue of climate change presented a unique opportunity to delve into the dynamics of activism among young people of Cyprus hailing from a society marked by political divisions. These youths, whose political horizons are often constrained by the territorial and political divisions of their island, found themselves organizing around a cause that transcends local boundaries while deeply impacting their immediate surroundings.

In January 2020, they embarked on a study of the Youth for Climate movement (Y4C). Their goal was multifaceted: they sought to comprehend the underlying motivations driving these young activists, understand the intricate ways in which they organised themselves, explored their preferred methods of activism, and scrutinised their approaches to gaining recognition and legitimacy within the Cypriot social and political landscape. Their methodological approach was primarily ethnographic, encompassing participant observation, in-depth individual interviews, and focus group discussions. Additionally, they conducted textual analyses of their social media posts and local media coverage pertaining to youth climate activism.

⁸ 75% of Romanians believe renewable energy sources should be prevalent, according to study conducted in preparation for the Climate Change Summit
<https://www.thediplomat.ro/2022/09/30/75-of-romanians-believe-renewable-energy-sources-should-be-prevalent-according-to-study-conducted-in-preparation-for-the-climate-change-summit/>

⁹ Enel Green Power Romania invests in education and modernizes the laboratory dedicated to the study of green energy together with the faculty of engineering in Reșița,
<https://www.enelgreenpower.com/media/press/2021/09/enel-green-power-romania-invests-education-modernizes-laboratory-dedicated-study-green-energy-faculty-engineering-resita>

¹⁰ Spyros Spyrou writes on Ethnographic Explorations with Young Climate Activists in Cyprus,
<https://www.qmul.ac.uk/clpn/news-views/blog/items/spyros-spyrou-writes-on-ethnographic-explorations-with-young-climate-activists-in-cyprus.html>

However, their meticulously planned ethnographic study was swiftly confronted with unforeseen challenges as the COVID-19 pandemic brought Cyprus to a standstill by mid-March 2020. Adapting to the new circumstances, they swiftly pivoted their research methodology to accommodate online interactions with the young activists. Remarkably, their adeptness with technology facilitated seamless continuation of our research activities, prompting the group to capitalise on the unprecedented historical context presented by the pandemic.

Through extensive discussions with these young climate activists, they gained invaluable insights into their personal trajectories as activists, the driving forces behind their activism, their efforts to foster grassroots movements devoid of hierarchical structures, their chosen strategies for climate action, and their adept utilisation of social media platforms to amplify their voices in the political arena.

Their perspectives on climate change exhibited a nuanced understanding of the multifaceted factors contributing to the crisis, including the intersection of human activity with the historical trajectory of capitalist development, characterised by rampant overproduction and overconsumption.

This emerging ethos of inclusivity and collaboration among young activists signals a paradigm shift in the landscape of social movements, necessitating further research to explore the implications of such solidarity for intergenerational relations in contemporary struggles for social and environmental justice.¹¹

Furthermore, the Republic of Cyprus promotes initiatives for youth engagement in climate change matters and green energy¹² and together with the European Union have organised volunteering projects. One of these projects, named YAS! -Youth for action and sustainability -was a 12-month volunteering project which aimed to involve young people in promoting and raising social awareness about the Sustainable Development Goals in the community of Cyprus. They addressed the global challenges we face, including those related to poverty, inequality, climate, environmental degradation, prosperity, peace and justice. For each category of SDGs they raised awareness through the organisation of various workshops like upcycling, recycling, intercultural communication, human rights, advocacy, peacebuilding, gender equality, inclusion, etc. They also organised educational seminars, open discussions, debates, conferences and public interventions on environmental, economic and social issues on a local, European and International level.¹³

¹¹ Eleni Theodorou, Spyros Spyrou and Georgina Christou (2021), There is no Plan(et) B: youth activism in the fight against climate change in Cyprus, Paper No. 166, Hellenic Observatory Discussion Papers on Greece and Southeast Europe,

<https://www.lse.ac.uk/Hellenic-Observatory/Assets/Documents/Publications/GreeSE-Papers/GreeSE-No166.pdf>

¹² Republic of Cyprus, Second voluntary national review, Sustainable Development Goals (SDGs) (2021), https://sustainabledevelopment.un.org/content/documents/282512021_VNR_Report_Cyprus.pdf

¹³ YAS! -Youth for action and sustainability - Cyprus, https://youth.europa.eu/solidarity/placement/20930_en

Spain

Respectively, the situation in Spain seems to be quite the same, if not more organized, concerning the youth participation in actions concerning green energy and climate change. The Youth for Climate (Spain) is a youth collective established in 2019 within the worldwide youth climate movement. Brings together Fridays for Future, Extinction Rebellion and other smaller groups. Based on the information gathered from their website,¹⁴ they are a very active group that organises plenty of actions to alert the youth of Spain about matters of the green economy. For example The “nARTure” project, supported by European Union funds, concluded at the end of 2023. A year in which almost 130 young people have committed themselves to fight climate change and to build more supportive, just and inclusive societies through art.¹⁵

Moreover, there are initiatives taken on a municipal level to raise awareness in youth and the people of Spain in general, concerning green energy. One of them, the Molina de Segura, a Youth Climate Participatory Budget. It aims to raise students’ awareness on tackling the effects of climate change and get them involved in proposing and implementing ecological initiatives. The dramatic effects of flooding in the city in the previous year constituted an opportunity for the municipality to introduce the idea of a greener participatory budget that could address the challenges of climate change. Since then, inspiring projects based on students’ proposals were voted on and implemented.¹⁶

Since its inception in 2015, the municipality of Molina de Segura has been actively engaged in Participatory Budgeting (PB), a process that empowers citizens to directly influence decision-making regarding public spending. However, despite the potential for PB to address various community needs, including environmental and climate-related concerns, less than 2% of successful proposals have been dedicated to these critical issues. Recognizing the need to enhance environmental sustainability within the community, the Town Council took proactive measures to reinvigorate citizen involvement in environmental decision-making.

To achieve this goal, the municipality opted to reactivate the Municipal Council for Environment, a citizen-based advisory body comprising experts, volunteers, and political activists with a vested interest in environmental issues. This council serves as a platform for fostering collaboration, exchanging ideas, and providing input on environmental policies and initiatives.

¹⁴ Juventud Por El Clima, <https://juventudxclima.es>

¹⁵ Europe – The “nARTure” ecological education project has formed more than 100 people in 2023
<https://www.infoans.org/en/sections/news/item/19871-europe-the-narture-ecological-education-project-has-formed-more-than-100-people-in-2023>

¹⁶ In Molina de Segura, a Youth Climate Participatory Budget to mainstream climate action into a city-wide participatory budgeting process, Case Study,

https://www.climate-chance.org/wp-content/uploads/2022/04/bt2022_cas-detude_espagne_molina-de-segura_eng.pdf

Moreover, the municipality recognized the importance of engaging young people in addressing climate change, as they are both the inheritors of future environmental challenges and powerful agents of change. In a groundbreaking move, the Town Council decided to allocate the entire Youth PB to initiatives proposed by 14 to 15-year-old students aimed at tackling the impacts of climate change. This decision underscores the municipality's commitment to amplifying youth voices and empowering them to take meaningful action on environmental issues.

The launch of the first-ever Youth PB for climate change in early 2020 marked a significant milestone in Molina de Segura's efforts to promote environmental stewardship among its youth population. Information sessions held in schools utilised visual materials to vividly illustrate the global and local effects of climate change, fostering greater awareness and understanding among students. Drawing inspiration from successful initiatives like the Portuguese Lisbon Green Seal PB tailored for schools, Molina de Segura aims to harness the creativity, passion, and energy of its youth to drive positive environmental change within the community.

By combining grassroots involvement through the Municipal Council for Environment with targeted youth engagement through the Youth PB for climate change, Molina de Segura is laying the groundwork for a more sustainable and resilient future.

These initiatives not only empower citizens to play an active role in shaping their community but also demonstrate the municipality's commitment to addressing pressing environmental challenges through inclusive and participatory approaches. Spain has made significant strides in renewable energy development, with supportive government policies and incentives to promote clean energy production and consumption. Initiatives such as subsidies for renewable energy projects and targets for increasing renewable energy capacity have contributed to greater awareness and acceptance of green energy among youth.

There is a broader cultural shift towards sustainability and environmental consciousness in Spain, driven by concerns about climate change, pollution, and resource depletion. Many young Spaniards prioritise environmentally friendly practices in their daily lives, including energy conservation and the use of renewable energy sources.

Lithuania

Despite ranking second among European countries in energy poverty, Lithuania is striving to achieve energy independence by 2030 through the development of renewable energy sources. This initiative not only positions Lithuania to reduce its reliance on external energy sources but also holds the potential to alleviate poverty within the country.

As of 2021, approximately 22.5% of the population in Lithuania experienced energy poverty. However, the country is actively pursuing strategies to address this issue by bolstering its energy

independence and promoting the use of renewable energy within its borders. In 2022, Lithuania took a significant step towards energy autonomy by discontinuing energy imports from Russia.

Lithuania's commitment to renewable energy is underscored by its National Energy Independence Strategy, which outlines ambitious targets for achieving full domestic electricity production from renewable sources by 2030. Furthermore, the country has set a long-term goal of attaining climate neutrality by 2050.

Vilnius in Lithuania has been named by the European Commission as the European Green Capital for 2025. The European Green Leaf 2025 awards for smaller cities went to Viladecans, Spain and Treviso, Italy. Vilnius will receive a prize of €600,000 (US\$631,617) and Viladecans and Treviso will receive €200,000 each to support their sustainability efforts.¹⁷ The jury praised Vilnius' "down to earth approach" and said its motto "Vilnius – the greenest city in the making" is guided by a clear vision and tangible actions.

They recognized that the Lithuanian capital has reduced emissions through measures such as increasing renewable energy sources and renovating heating infrastructure. The city aims to become climate-neutral by 2030. The judges also said that Vilnius' use of technology for citizen engagement and participation is innovative. This includes an app for citizens to engage in city management and planning.

However, the shift towards green energy in Lithuania began earlier. More specifically, the Lithuanian Children and Youth Centre's Sustainable Schools' program began in 2013 to promote and create awareness about sustainable development through developing school communities that are better able to manage and develop their own resources. The program was among nominees for the 2018 UNESCO-Japan Prize on Education for Sustainable Development (ESD), part of UNESCO's wider work on ESD.

The Lithuanian program, based in Vilnius, works through the formation of Green Teams of ten people in educational establishments which can include everyone from teachers, students and parents to administrative staff. So far, 139 educational institutions ranging from kindergarten to non-formal settings have signed up to the program to learn how to improve the quality of life for future generations.

According to Project Manager Lina Blazevičute, the program began modestly five years ago with a website allowing schools to assess their eco footprint. Initially, schools and universities focused on simple sustainability initiatives like reminders to conserve energy and water. However, they have since progressed to more ambitious projects such as creating food gardens and promoting sustainable transportation. For instance, a school conducted a comprehensive study on cycling safety around its premises, leading to municipal improvements that encouraged more students to bike to school.

¹⁷ Vilnius named European Green Capital for 2025,
<https://cities-today.com/vilnius-named-european-green-capital-for-2025/>



GENTLY
Games for Energy Efficiency Youth Literacy

www.gently4youth.eu

Each participating school and university kick off the program with a themed conference featuring sustainability experts and attend several teacher training sessions per year. The participating units develop a yearly plan with guidance from the program, submitting reports at the end of the year detailing their achievements and participant engagement.

Innovation plays a crucial role in bridging funding gaps, with schools implementing creative approaches to sustainability education. For example, a kindergarten experiment demonstrated biodegradability by burying an apple core and sweet wrapper, showcasing the importance of eco-friendly practices. Schools and universities have established food and herb gardens after workshops on greenhouse construction and sustainable farming.

The program emphasises the importance of making sustainability engaging and enjoyable for children, relying on teachers to deliver effective lessons. Encouraging outdoor exploration, even in urban settings, exposes children to biodiversity and enriches their understanding of the environment. Structured biodiversity hikes attract thousands of participants, further promoting environmental awareness.¹⁸

To facilitate citizen engagement, the Government of Lithuania operates an official website called "My Government," which provides valuable information from public institutions. One notable feature of this website is the "E-citizen" section, dedicated to fostering dialogue between society and the government. Here, citizens can participate in consultations, engage in the legislative process, and contribute to non-governmental activities. The concept of a "Smart Society" is emphasised in Lithuania's long-term development strategy, Lithuania 2030. While climate change is only tangentially addressed in this document, it is nonetheless crucial for public participation, as it aims to enhance democratisation and engagement among Lithuanian citizens.

Climate Week, organised annually by the Ministry of Environment since 2019, serves as a platform for discussions among scientists, politicians, public figures, and the general public on strategic goals and measures for Lithuania's climate change policy across various sectors.¹⁹

Non-governmental organisations (NGOs) play a significant role in climate change actions in Lithuania. Organisations like the Lithuanian Fund for Nature work on environmental education and collaborate with national, municipal, and scientific institutions to preserve wildlife and natural resources. The government also recognizes the importance of NGO involvement in climate policy development, as evidenced by initiatives like the Climate Policy Group and financial incentives aimed at encouraging NGO participation in climate-related activities.

¹⁸ Imagination and energy help schools in Lithuania turn sustainability ideas into action,

<https://www.unesco.org/en/articles/imagination-and-energy-help-schools-lithuania-turn-sustainability-ideas-action>

¹⁹ CCE Country Profile: Lithuania, Monitoring and Evaluating Climate Communication and Education (MECCE),

https://mecce.ca/country_profiles/cce-country-profile-lithuania/

Hungary

As elsewhere in Central Europe, Hungary confronts critical environmental protection prerogatives in the context of climate change, energy security, public health, economic development, and democratic integrity. As part of a broad-based country portfolio to support citizen participation in decision-making and in connection with its global commitment to improving environmental governance and resilience, NDI designed a pilot environmental initiative gathering several dozen leaders of Hungarian youth organisations, civic groups and professional bodies to analyse key issues and to set and advocate for responsive policies.

The preliminary findings suggest that there is a discernible upward trend in environmental consciousness among the younger demographic. However, when examining their grasp of key concepts such as sustainability and familiarity with alternative energy sources, alongside their anticipations for the future, the Hungarian sample did not demonstrate a significant correlation between their opinions. Nonetheless, it was evident that they exhibit an openness towards environmental issues and display a keen interest in renewable energy sources.

Approximately half of the participants demonstrated a commendable understanding of sustainability, particularly with regards to the three-pillars model. Interestingly, there was a slight skew towards higher knowledge levels among male respondents. Moreover, the inquiry into their outlook for the future was perceived as profoundly important by a substantial majority of respondents.

In the Hungarian sample, respondents reported undertaking similar environmental conservation measures within their households, albeit with differing priorities. However, there emerged notable gaps in understanding pertaining to terms such as "green economy," "blue economy," and "non-growth," with many participants exhibiting limited knowledge of the terminology and its practical implications.

Recognizing the significance of education in fostering informed decision-making and promoting sustainable practices, the authors underscore the importance of enhancing young people's awareness regarding sustainable energy utilisation. They advocate for introducing concepts such as the green economy and non-growth theories into educational curricula, positing that an expanded knowledge base in these domains may engender a more favourable attitude towards sustainability and, subsequently, inspire proactive actions towards a greener future.²⁰

Leading environmental groups like the Center for Sustainable Communities and Green Policy Centre are part of the initiative, as are grassroots youth groups representing the country's sizable

²⁰ Katalin Takács-György, Szilvia Domán, Antalné Tamus, Elena Horská and Zuzana Palková (2015), What Do The Youth Know About Alternative Energy Sources – Case Study From Hungary And Slovakia, *Visegrad Journal on Bioeconomy and Sustainable Development*, Vol 4 (2015): Issue 2 (October 2015), <https://sciendo.com/article/10.1515/vjbsd-2015-0009>

Roma communities. Habitat for Humanity joined in the initiative bringing a global perspective. Many participants are directly affected by environmental challenges.

Participants prioritised climate issues in the context of economic insecurity, public health, and youth education in connection with Hungary's commitments as part of an EU framework to achieve carbon neutrality by mid-century.

NDI supported participants in their organisational and advocacy strategies and skills development, which they in turn applied in creating policy reform priorities. Those priorities were discussed with the local municipality and national policymakers, including youth politicians, and include channelling state energy subsidies to families below the poverty line; retrofitting housing for energy efficiency; offering teacher training on environmental sustainability; and enabling environments for climate-based advocacy and litigation.

The initiative is already showing results. The town of Szombathely, for example, is engaging the Sustainable Communities Foundation to pilot environmental education in local schools. The Lightbringers Association is working with a range of stakeholders to install solar panels in homes in Roma communities that do not have access to the electrical grid. Ms. Aranka Rostás from the Lightbringers Association said: "Energy poverty is one of the biggest problems facing poor people in the world today. This project gave space for grassroots community activists to meet decision makers as equal partners and think together about solutions to our problems. Thanks to this initiative ... (we got help with) fundraising for a project to install solar panels on the houses of families who do not have access to electricity and thereby bring light to those families."

Members of parliament participated in this initiative and are using these grassroots efforts to inform their environmental legislative agenda at the national level. The Hungarian chapter of the European Democracy Youth Network (EDYN) is also getting involved in supporting broad-based environmental education.²¹

²¹ Supporting Environment Policy in Hungary, <https://www.ndi.org/our-stories/supporting-environment-policy-hungary>

4. Best Practices Guide on environmental application games

Overview

In recent years, educators and researchers have been looking for new and innovative ways of instructing students. There have been many schools of thought regarding how best to teach and many different tools for teachers to use. However, one new tool that has taken some time to take root has been the game as a means of teaching.

This is partly because, for years, games were associated with entertainment and wasted time. Over the past few years though, there has been a steady growth in the use of game-based learning, which has led to a new and effective means of teaching in the classroom.

Game Based Learning (GBL) is the use of games to enhance the learning experience. Incorporating game-based mechanics, visual design, and thinking into a course can help organisations improve learner motivation and engagement. Learners who are engaged are more inspired to succeed. A highly interactive gaming experience is something that many learners are already comfortable with. They can proceed at their own pace and get immediate feedback about their progress.

In a game-based environment, learners work towards a set goal. A risk-free setting encourages experimentation by letting them choose their own actions. They can even repeat a step if they need to. Instructors can determine the scope and depth of the gaming experience, implementing game-based learning that fits unique needs and objectives.

According to the education group Educause, game-based learning is becoming much more popular now that people are more familiar with technology and familiar with how games can be used in the classroom. Today, game-based learning is occurring at the highest levels of education, including universities and schools of business.²²

Game Development

Educational games were becoming increasingly popular thanks to parents who were increasingly looking for ways to educate their children. While game-based learning is best conducted in the classroom, where teachers can provide guidance and instruct students toward learning goals, parents want their children to learn outside of the classroom as well.

²² Game-Based Learning: What Is It? GBL vs Gamification: Types and Benefits, <https://www.teacheracademy.eu/blog/game-based-learning/>

For this reason, the past decade saw an explosion in the development of education games, digital and non-digital. People were also increasingly more interested in training themselves as well, leading to the growth of brain training games. Taken all together, this increase in demand had led to an increasing number of games meant to educate as well as entertain, many of which could be adapted to the classroom.

However, perhaps one of the biggest drivers of game-based learning has been the lower costs to educate people associated with new technology. In previous years, print based materials have required parents to constantly replace those materials with new ones as students worked their way through them. Modern technology can condense print materials to apps, provide access to extensive, informative resources, and eliminate the need to constantly replace materials with new ones.

Before introducing an educational game to any classroom, educators should plan for a responsible integration process. These seven steps can help with the integration of game-based learning in the classroom:

1. **Define Clear Learning Objectives:** Before introducing any digital learning games, educators need to establish precise learning objectives that align with the curriculum. These objectives should outline the specific skills or knowledge areas that the game is intended to address. By defining clear learning objectives, educators can ensure that the selected games are not only engaging but also directly contribute to achieving educational goals.
2. **Choose High-Quality Games:** With an abundance of educational games available, it's essential for educators to discern between high-quality and low-quality options. High-quality digital learning games offer educational value, accurate content, sound pedagogy, and alignment with educational standards. Educators should carefully vet potential games to ensure they meet these criteria and provide meaningful learning experiences for students.
3. **Provide Thorough Instruction:** Prior to launching any online game-based learning activities, educators should provide comprehensive pre-game instruction to students. This includes clearly communicating the learning objectives, teaching relevant concepts, and explaining how the game complements the existing curriculum. By setting clear expectations and providing context for the game-based learning experience, educators can maximise its effectiveness in the classroom.
4. **Promote Collaboration and Communication:** Classroom gamification often involves dividing students into teams, fostering collaboration, and encouraging communication among peers. This collaborative approach not only enhances engagement but also cultivates skills such as creative thinking, idea exchange, strategic planning, and problem-solving. Post-game discussions further reinforce learning objectives and facilitate knowledge sharing among students.

5. **Balance Game-Based Learning with Traditional Instruction:** While game-based learning can be a valuable addition to the classroom, it should complement rather than replace traditional instruction methods. Educators must strike a balance between game-based learning activities and other forms of instruction to ensure comprehensive coverage of the curriculum. This balance may vary depending on the subject matter, grade level, and individual classroom dynamics.
6. **Monitor Student Progress:** One of the key benefits of game-based learning is the immediate feedback it provides, allowing educators to monitor student progress in real-time. Educators can use this feedback to offer timely guidance, corrections, and reinforcement of learning objectives. By closely monitoring student progress, educators can identify areas for improvement and provide targeted support to individual students as needed.
7. **Reflect and Evaluate:** After implementing game-based learning activities, educators should take the time to reflect on their effectiveness and evaluate their impact on student learning outcomes. This involves assessing whether the games are achieving their intended goals, meeting educational requirements, and engaging students effectively. Educators may also solicit feedback from students to gain insights into their experiences and preferences regarding game-based learning.

Board Games

Board games can be a very effective means to promote active learning when children “are engaged in some activity that forces them to reflect upon ideas and how they are using those ideas”, based on the results of a large meta review and effects analysis of twenty-seven studies conducted in educational settings that specifically compared the knowledge of children both before and after they were provided an active board game-based learning instruction versus a passive form of learning instruction such as a lecture. Studies that included children aged four to twelve strongly suggested board games were an effective tool to encourage active learning and the retention of knowledge. They also found that board games helped increase students’ motivation for learning and even lead to positive changes in behaviour.

These studies covered different types of mathematical and scientific knowledge, but overall, the majority consisted of traditional, positional race games in which players progress along a pathway by rolling dice and by answering questions about whatever topic a teacher wished to teach players, all of which produced a sole winner.

Inside or outside a classroom, games—including board games—can be a form of active, playful learning, alongside free play and guided play. All of these foster learning because they engage children in meaningful and socially interactive fun.

Such guided play can help children learn as well as, if not better than, traditional forms of teaching. During children's board game play, researchers suggest, guided play might be incorporated by teachers or parents asking open-ended questions that help children think more deeply about what the roll of dice or the spin of wheels can introduce the element of chance and help reduce adult control even as children maintain a sense of agency and control in guided play.²³

Application Development

Developing educational board games as applications requires careful consideration of both educational principles and game design elements. Therefore, there are a few steps to be followed. Firstly, start by identifying specific learning objectives that align with educational standards or curriculum goals. These objectives will guide the content and mechanics of the game.

Secondly, the designer must conduct research to ensure that the game's content is accurate, age-appropriate, and aligned with educational standards. Consult with educators or subject matter experts to verify the accuracy and relevance of the content.

The next step includes determining the game mechanics and rules that will drive gameplay while reinforcing the educational objectives. Consider how players will interact with the game, the structure of the game, and any challenges or obstacles they will encounter.

Then the designer has to develop engaging content, including game assets, illustrations, animations, and audio elements. Ensure that the content is visually appealing and supports the educational concepts being taught.

Furthermore, there are integrated interactive features such as quizzes, puzzles, mini-games, and simulations to be considered that engage players and reinforce learning objectives. These features should be seamlessly woven into the gameplay to provide a cohesive learning experience.

Subsequently, playtesting must be conducted with target audiences to gather feedback on the game's usability, educational effectiveness, and overall enjoyment. Use this feedback to iterate on the game design and make improvements as needed.

The game is accessible to all players, including those with disabilities or special needs. Consider factors such as text size, colour contrast, audio descriptions, and alternative input methods to make the game inclusive and accessible to a wide range of players.

²³ Daniela K. O'Neill and Paige E. Holmes, (2022), The Power of Board Games for Multidomain Learning in Young Children, American Journal of Play, volume 14, number 1, <https://files.eric.ed.gov/fulltext/EJ1357958.pdf>

Players' progress, such as scoring, achievements, and progress bars, must be monitored. This allows players to monitor their performance and provides feedback on their learning achievements.²⁴

Game-Based Learning

Gamification for game-based learning involves integrating game elements and mechanics into educational activities to enhance engagement, motivation, and learning outcomes. Here's a detailed guide on how to implement gamification effectively for game-based learning:

You should start by defining clear learning objectives that align with educational standards or curriculum goals. These objectives will serve as the foundation for designing gamified learning activities.

Take into consideration the age, interests, and preferences of your target audience when designing gamified learning experiences. Tailor the game elements to appeal to the interests and motivations of the learners.

Select game mechanics that support the learning objectives and engage learners. Common game mechanics used in gamified learning include points, badges, levels, leaderboards, quests, challenges, and rewards.

The designer must implement progression systems that allow learners to advance through levels or stages as they demonstrate mastery of the learning content. Provide feedback and encouragement to motivate learners to progress and achieve their goals.

The goals and objectives of the gamified learning experience to learners must be clearly explained. The educator-designer should understand what they need to do to succeed and how their progress will be measured. Then, the designer must provide immediate feedback to learners on their performance and progress. Positive feedback and rewards can reinforce desired behaviours and encourage continued engagement.

Elements of collaboration and competition should be incorporated in order to encourage interaction among learners. Group-based activities, team challenges, and friendly competitions can motivate learners to work together and strive for excellence.

Gamified learning experience must be adapted to the individual needs and preferences of each learner. Offer choices, customization options, and adaptive learning pathways to accommodate different learning styles and abilities.

²⁴ About Game Based Learning (GBL),

<https://community.d2l.com/brightspace/kb/articles/2874-about-game-based-learning-gbl>

The use of storytelling techniques to create immersive narratives that captivate learners is encouraged, as engaging narratives can enhance motivation and make learning more memorable and meaningful.

Educational Strategies

Uniqueness: The key element of GBL success is the motivation and the engagement that students feel when they take part in such a learning experience. Learners feel more like they entertain themselves rather than learning. There are objectives, rules and goals which creates a sense of competition to all the participants. **Immediate feedback:** One very important element, from which both the learners and educators are benefited, is the immediate feedback they receive through the gaming procedure. In comparison with coursework where the students wait for days until they get a grade, through game-based learning they get immediate results for their decisions.

In addition, students can learn about the long-term effect that some of their actions may have in real life, because in these games, the process is determined from their own decisions.

On the other hand, educators receive rapid feedback by watching how their students react and feel while they are playing. They can also easily understand some personality characteristics of students. For example, the “achiever” is a student who wants to be on top and the “socializer” the one who performs better in teams using his communication skills. It is also a good opportunity to discuss with the students the most common wrong decisions after the game, which promotes the learning from mistakes theory.



In Greece GBL seems to be implemented only in some exceptional master or bachelor programs. In particular this teaching method is used in Ionian University, in the bachelor department of sound & colour arts, at test level. In this department, students are requested to end a game at intervals in order to pass some courses. Ionian University in cooperation with Texas University provides open tools for the construction and the usage of such digital games in higher education in Greece.

Furthermore, the Gamelearn platform has been broadly integrated in the business and educational GBL contexts, mainly through start-ups, in several European countries, including Germany, Greece, Spain and Czech Republic. In Greece, the Wide Learning startup has applied Gamelearn within its moodle-based eLearning solutions to increase e-learning courses completion rates and provide its clients with engaging video-based GBL experiences.

Engagement Techniques

The best way to drive learner engagement is to entice them to go on a personalised journey with you. Instead of following a predetermined course through the game (by, for example, using templates), design game-based learning to deliver an experience that's based on learner preferences. This approach could involve techniques such as personalised game paths, customised characters and avatars, and learner-selected difficulty levels.

How do popular television shows motivate their viewers to come back for more, week after week and month after month? They weave a compelling story each week. For maximum impact, design your game-based learning strategy around a digital story with a purpose, rather than using a multitude of disconnected single narratives.

The designer of the game must make learning the primary objective by giving learners multiple opportunities to "lose" without the dreaded "game over" consequence. This approach encourages them to return to the game with new strategies and different approaches with the objective of learning from failure.

There's no better way to foster learners' motivation than by promoting, encouraging and guiding them continuously and instantly throughout their game-based learning experience. Unlike end-of-game "win or lose" feedback, instant feedback enables learners to self-check and take remedial action while in the game.

Where possible, include team games as part of your game-based learning strategy to foster competition and promote collaboration.

Finally, with the proliferation of mobile gaming, it makes sense to pay special attention to what makes gaming mobile-friendly, including small footprint games, download-friendly content and greater attention to interactivity.

5. Environmental Facts And Hazards

Overview

Environmental hazards in Europe present a complex array of challenges affecting the continent's ecosystems, communities, and overall well-being. A major focal point is air pollution, largely propelled by industrial activities, transportation, and agricultural practices. This environmental issue gives rise to heightened levels of pollutants such as particulate matter and nitrogen dioxide, with detrimental implications for respiratory health. The repercussions extend to both urban and rural populations, highlighting the broad and interconnected impact of these hazards on diverse communities. As Europe navigates the intricate web of environmental challenges, understanding the dynamics of air pollution becomes paramount for effective mitigation and sustainable practices. By addressing these hazards, communities can work towards safeguarding public health, preserving ecosystems, and fostering a resilient and environmentally conscious society. Beyond air pollution, Europe faces a broader array of environmental hazards that can be categorised into several key areas. Climate change stands as a pervasive challenge, marked by rising temperatures, altered precipitation patterns, and an increased frequency of extreme weather events. These changes disrupt ecosystems, endanger biodiversity, and pose risks to critical sectors such as agriculture and infrastructure.

Categorization Of Hazards

Air Pollution

Water pollution, driven by industrial discharges, agricultural runoff, and inadequate waste management, further compounds environmental challenges. This category of hazards compromises water quality, jeopardises aquatic ecosystems, and poses threats to human health through the contamination of drinking water sources.

Land degradation and deforestation emerge as significant issues, stemming from unsustainable land use practices, urban expansion, and intensive agriculture. These hazards result in soil erosion, biodiversity loss, and the depletion of arable land.

Natural disasters, including floods, wildfires, and heatwaves, have become more frequent and intense due to climate change, leaving a trail of destruction that affects communities, infrastructure, and ecosystems.

Understanding these categorizations is essential for devising comprehensive strategies to address the interconnected environmental challenges faced by Europe. Initiatives like GENTLY, focusing on game-based learning, play a crucial role in raising awareness, fostering sustainable practices, and empowering communities to navigate and mitigate the impacts of these diverse environmental hazards.

Specifically regarding air pollution is a formidable environmental challenge confronting Europe, casting a pervasive shadow over public health and ecological balance. Rooted in a tapestry of human activities, including industrial processes, transportation, and agricultural practices, the issue demands nuanced analysis to comprehend its multifaceted impact. Industrial activities stand as a significant contributor to air pollution, releasing a cocktail of pollutants such as particulate matter, sulphur dioxide, and nitrogen oxides into the atmosphere. These emissions, often stemming from factories and manufacturing units, escalate the overall pollution burden.

Transportation, a cornerstone of modern life, significantly adds to the complexity of air pollution. Vehicle emissions, encompassing a mix of nitrogen dioxide and carbon monoxide, permeate the air from bustling city streets to rural highways, leaving a palpable imprint on air quality.

Agricultural practices, while essential for sustenance, are not exempt. The use of fertilisers and pesticides releases pollutants into the air, further contributing to the intricate web of air pollution sources.

Particulate matter, a key player in this environmental drama, consists of minuscule particles suspended in the air. These particles, varying in size, can infiltrate the respiratory system, posing a substantial threat to human health.

Nitrogen dioxide, another notorious pollutant, is a byproduct of combustion processes, prominently emanating from vehicles and industrial activities. Its presence in the air is linked to respiratory problems, adding to the public health toll.

Sulphur dioxide, emitted from burning fossil fuels in power plants and industrial facilities, further exacerbates air quality degradation. Additionally, ground-level ozone, formed through chemical reactions involving pollutants, contributes to respiratory issues and harm to vegetation.

The environmental consequences of air pollution are profound. Ecosystems suffer as pollutants harm plant life, reduce crop yields, and contribute to forest degradation. Beyond local impacts, some pollutants, such as black carbon, contribute to global warming, adding a layer to the broader challenge of climate change.

Human health bears a considerable burden. Long-term exposure to air pollutants is associated with respiratory diseases, including asthma and chronic obstructive pulmonary disease. Moreover, cardiovascular problems are on the rise, with air pollution recognized as a significant risk factor.

In tackling air pollution, a comprehensive approach is imperative. Regulatory measures, technological advancements, and heightened public awareness form the triad of solutions.

Initiatives like GENTLY, emphasising education and awareness through game-based learning, contribute to nurturing a society capable of understanding and addressing the intricacies of air pollution. As Europe confronts this environmental foe, a collective and informed effort becomes paramount to secure a healthier and sustainable future.

Water Pollution

Water pollution in Europe stands as a pressing environmental challenge. The sources are diverse, stemming from industrial discharges, agricultural runoff, improper waste disposal, and the infiltration of pharmaceuticals and chemicals into water bodies. The consequences of water pollution propagate in ecosystems, demanding a comprehensive analysis of its various dimensions.

Chemical pollutants, ranging from pesticides and fertilisers to heavy metals and industrial chemicals, find their way into water bodies, posing risks not only to aquatic life but also to human health. The silent infiltration of these contaminants into the water cycle underscores the intricate nature of the problem.

Nutrient pollution, characterised by the excessive presence of nutrients like nitrogen and phosphorus, is a significant concern. Often originating from agricultural runoff, it can trigger eutrophication, fostering harmful algal blooms that disrupt the balance of aquatic ecosystems and lead to oxygen depletion in water.

The environmental consequences are stark. Water pollution disrupts the delicate equilibrium of aquatic ecosystems, impacting fish, plants, and various organisms. The decline of biodiversity and the collapse of aquatic habitats are distressing manifestations of this disruption, emphasising the urgent need for mitigation.

Beyond ecological ramifications, the contamination of drinking water sources poses a direct threat to human health. The presence of chemical contaminants and pathogens transforms water, a life-sustaining resource, into a potential vector for waterborne diseases. This dual impact on ecosystems and human well-being underscores the interconnectedness of environmental health.

As Europe grapples with the multifaceted challenges of water pollution, addressing its root causes and implementing effective remediation strategies become imperative. Regulatory measures, sustainable agricultural practices, and heightened public awareness are crucial components of a holistic approach to safeguarding water resources. Initiatives focused on education, like GENTLY, contribute to building a society capable of understanding, addressing, and preventing the complex issue of water pollution, ensuring a sustainable and healthy future for all.

Deforestation

Exploring deforestation, a global environmental dilemma, intricately weaves together a tapestry of interconnected issues that extend beyond the mere loss of trees. Driven predominantly by human activities, such as agricultural expansion, logging, and infrastructure development, deforestation poses multifaceted challenges with profound consequences for biodiversity, climate stability, and the overall health of our planet.

At its core, the clearing of forests for economic gain and immediate needs reflects a short-term mindset that undervalues the critical role forests play in maintaining ecological equilibrium. Forests, often referred to as the "lungs of the Earth," act as vital carbon sinks, absorbing carbon dioxide during photosynthesis and releasing oxygen. The disruption of this delicate balance contributes significantly to climate change, as the stored carbon is released back into the atmosphere upon deforestation.

The ecological impacts of deforestation are extensive. Beyond the loss of habitat for countless species, the act disrupts soil integrity, leading to erosion and negatively impacting water quality. The intricate web of life that thrives in forests is irrevocably altered, challenging the resilience of ecosystems.

Indigenous communities, intimately connected to these forested landscapes, bear the brunt of deforestation. Their traditional lands often become targets for resource extraction, jeopardising their livelihoods and eroding the cultural significance embedded in these environments. Recognizing and respecting the rights of indigenous communities is pivotal for developing conservation strategies that are both effective and equitable.

Mitigating deforestation necessitates a holistic approach. Stringent conservation policies, sustainable land-use practices, and reforestation initiatives are critical components of a comprehensive strategy. Equally important is the need to shift towards sustainable alternatives that meet global demands for resources without compromising the health of our forests.

In essence, addressing deforestation requires a paradigm shift—a collective commitment to valuing and preserving our forests as integral components of a healthy planet. As we navigate the complexities of this environmental challenge, the path forward involves fostering a sustainable coexistence between human development and the preservation of our invaluable ecosystems.

Climate Change

We intentionally reserved the topic of climate change for the conclusion, as it stands as the primary motivation behind the creation of the game. Climate change, an existential challenge confronting humanity, transcends the confines of scientific discourse to become a defining narrative of our time. At the heart of this global dilemma lies a cascade of interconnected events



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fueled by human activities, notably the combustion of fossil fuels, industrial processes, and widespread deforestation. It's a narrative written in the rising concentrations of greenhouse gases—carbon dioxide, methane, and nitrous oxide—trapping heat in the atmosphere and steering our planet towards a future of uncertainty.

The manifestations of climate change are visible in altered weather patterns, manifesting as intensified hurricanes, prolonged droughts, and unprecedented heatwaves. The gradual rise in sea levels, a consequence of melting ice caps and glaciers, poses an imminent threat to coastal communities. The delicate equilibrium of ecosystems unravels, leading to the loss of biodiversity, the endangerment of countless species, and disruptions to the fundamental services these ecosystems provide.

The urgency of addressing climate change cannot be overstated. Vulnerable communities, often residing in regions least responsible for the emissions causing climate change, disproportionately bear the impacts. The cascading effects of a changing climate reverberate across borders, blurring the lines between local and global challenges.

Amid this backdrop, initiatives like the GENTLY game emerge as beacons of innovation and education. The game recognizes the transformative power of knowledge and engagement, offering a dynamic platform for young minds and youth workers to delve into the intricacies of climate change. By honing in on energy efficiency, green deal actions, and sustainable practices, the game serves not only as an educational tool but as a catalyst for behavioural change.

More than just a game, GENTLY is a response—an active effort to equip individuals with the tools needed to confront the complexities of climate change. It aligns with a broader movement that envisions a world where education is the linchpin for positive action. The game becomes a conduit for nurturing a generation not only well-versed in the challenges posed by climate change but actively engaged in forging solutions.

6. Green Deal Practices

Definition And Context

As players navigate the virtual landscapes of GENTLY, they embark on a journey that transcends the digital confines, symbolising a commitment to a sustainable and resilient future. In parallel, initiatives on the global stage, such as the Green Deal introduced by the European Union, echo this commitment. The Green Deal serves as a comprehensive framework, steering the region towards a more sustainable, low-carbon, and resource-efficient economy. Analysing the Green Deal practices in Europe not only provides insights into the multifaceted approach taken to address climate change but also underscores the interconnected nature of endeavours aimed at fostering economic growth and ensuring social inclusivity. Together, these initiatives represent brushstrokes on the vast canvas of global change, contributing to the broader masterpiece of human adaptation and stewardship of our planet.

At its core, the Green Deal is an ambitious effort to decarbonize the economy, with the overarching goal of achieving climate neutrality by 2050. This involves a shift towards renewable energy sources, enhanced energy efficiency, and the gradual phasing out of practices detrimental to the environment. By focusing on the energy sector, the Green Deal aims to create a more sustainable foundation for economic growth.

Another significant aspect of the Green Deal is its emphasis on transitioning towards a circular economy. This paradigm shift involves minimising waste, promoting recycling, and redefining product design to prioritise sustainability. The circular economy concept not only addresses environmental concerns but also fosters innovation, resource efficiency, and the creation of green jobs.

Sustainable agriculture is also a key component of the Green Deal. By promoting environmentally friendly farming practices, reducing the use of harmful pesticides, and supporting agroecology, the initiative seeks to transform the agricultural sector into a model of sustainability. This approach not only benefits the environment but also ensures the long-term viability of food production.

In essence, the Green Deal practices in Europe reflect a commitment to a comprehensive and interconnected vision of sustainability. By addressing environmental challenges while fostering economic prosperity and social well-being, the Green Deal positions the European Union as a leader in the global effort to combat climate change and build a more sustainable future.

In the realm of energy, the Green Deal advocates for a transition to a sustainable and renewable energy system. This involves increasing the use of renewable energy sources, improving energy efficiency, and fostering innovation in clean technologies.

A central focus of the Green Deal is the promotion of a circular economy. Policies in this domain aim to minimise waste, encourage recycling, and ensure sustainable resource use. The objective is to transform production and consumption practices to be more environmentally friendly.

The Farm to Fork Strategy is an integral component, emphasising sustainable and resilient agricultural practices. This involves promoting responsible farming methods, reducing the use of harmful pesticides, and supporting agroecology to ensure the long-term viability of food production.

Additionally, the Green Deal incorporates policies and initiatives across various sectors, including transportation, biodiversity, and sustainable finance. The collective impact of these policies is to drive a holistic and integrated approach toward a more sustainable, low-carbon, and resource-efficient European economy.

Central to the Green Deal is the promotion of renewable energy sources, marking a decisive shift away from traditional fossil fuels. This strategic transition underscores a commitment to fostering a sustainable energy landscape, tapping into wind, solar, and other clean energy technologies.

Energy efficiency emerges as a pivotal focus, with initiatives designed to enhance the overall sustainability of energy consumption. Upgrading buildings, industries, and infrastructure forms an integral part of this approach, ensuring a reduction in overall energy demand.

A significant sustainable action is the advocacy for a circular economy. This transformative model prioritises waste reduction and recycling, encouraging the extension of product lifespans and sustainable consumption patterns. By minimising waste, the Green Deal contributes to enhanced resource efficiency.

In agriculture, the Farm to Fork Strategy embodies sustainable practices, steering towards environmentally friendly farming methods. This includes a reduction in pesticide usage, promotion of organic farming, and an emphasis on agroecology. Such initiatives aim to align agricultural practices with principles of sustainability and long-term food security.

Furthermore, the Green Deal places a strong emphasis on biodiversity protection. Initiatives such as reforestation projects and conservation efforts underscore a commitment to preserving and restoring natural ecosystems, contributing to the overall health and resilience of the environment.

Sustainable Actions - Renewable Energy

In essence, the sustainable actions embedded in the Green Deal reflect a comprehensive approach to addressing environmental challenges while fostering economic prosperity and social well-being. By integrating these actions, the European Union strives to lead the way in global efforts to combat climate change and build a more sustainable future.

The Green Deal in Europe underscores a significant commitment to advancing renewable energy sources, positioning them at the forefront of sustainable initiatives. This strategic emphasis aims to reshape the energy landscape, promoting environmental sustainability and addressing the pressing challenges posed by climate change. The overarching goal is a decisive move away from conventional fossil fuels in favour of cleaner alternatives like wind, solar, and other environmentally friendly technologies. This transition aligns with the broader vision of reducing carbon emissions and cultivating a resilient and sustainable energy future for Europe. The Green Deal's focus on renewable energy signifies a pivotal step towards a greener and more environmentally conscious energy sector, marking a transformative shift in how energy is produced and consumed across the continent.

Circular Economy

The Circular Economy component of the Green Deal in Europe represents a strategic commitment to transformative practices that minimise waste and maximise resource efficiency. At its core, this sustainable initiative seeks to redefine product design, consumption patterns, and waste management. The Circular Economy approach emphasises the reduction of waste generation by promoting recycling, extending the lifespan of products, and encouraging sustainable consumption habits. By prioritising these principles, the Green Deal aims to create a more regenerative and environmentally responsible economic model. This paradigm shift not only addresses environmental concerns but also serves as a catalyst for innovation and the creation of green jobs. The Circular Economy initiative within the Green Deal reflects a holistic strategy that goes beyond linear production and consumption models, envisioning a more sustainable, resilient, and circular economic system for Europe.

Biodiversity Conservation

The Biodiversity Conservation aspect of the Green Deal in Europe exemplifies a committed effort to preserve and restore natural ecosystems. This sustainable initiative recognizes the vital role of biodiversity in maintaining the health of the environment and ensuring the resilience of ecosystems. By emphasising biodiversity conservation, the Green Deal seeks to address the threats posed by habitat loss, pollution, and climate change.

Underlying this initiative is a multifaceted approach that includes reforestation projects, habitat restoration, and the protection of endangered species. These efforts contribute to the overall health and balance of ecosystems, fostering biodiversity and enhancing the natural capacity of ecosystems to adapt to environmental changes.

Biodiversity conservation within the Green Deal is not just about protecting individual species; it's a holistic strategy that acknowledges the interconnectedness of all living organisms. The initiative recognizes the intrinsic value of biodiversity while understanding its crucial role in supporting ecosystem services, such as pollination, water purification, and climate regulation.

In essence, the Biodiversity Conservation element of the Green Deal reflects a commitment to preserving the richness of natural life. It goes beyond merely mitigating the loss of species; it aims to create a harmonious coexistence between human activities and the diverse array of life forms, contributing to the overall sustainability and resilience of Europe's ecosystems.

Renewable Energy Transition

The Green Deal prioritises a significant transition to renewable energy sources, such as wind, solar, and other clean energy technologies. This practice aims to reduce dependency on fossil fuels, mitigate greenhouse gas emissions, and foster a more sustainable and resilient energy system. By investing in and promoting renewable energy, the Green Deal seeks to transform the European energy landscape, contributing to climate goals and long-term environmental sustainability.

7. GENTLY Package For Game Based Learning

The GENTLY game has been produced in three different formats: as an analogue board game, a digital version which can be played on the computer and a special version adapted for the visually impaired. The representation of countries within the project team in all corners of Europe facilitated the selection of relevant topics that are actual and of interest for young people in each country.

The game took the form of a fun guessing game with questions and answers. Players need to reply correctly to questions related to the environment of seven European countries. The first to answer correctly, one for each country is the winner. The questions prepared give info on how environmental pollution impacts everyday life on a local and national level, how they relate to climate change in different contexts, present actions and solutions to tackle the problem locally and internationally and relate to green deal practices.

The cards reflect environmental problems as well as green practices at the seven respective countries from where the project's partners were coming . They give information on how environmental pollution impacts everyday life on a local and national level, how they relate to climate change in different contexts, present actions and solutions to tackle the problem locally and internationally and relate to green deal practices. The appendix presents the question cards in English, German, Spanish, Lithuanian, Romanian, Greek and Hungarian highlighting the correct answer in each of them.

Young people from the seven participating countries have tested the game and given their feedback so as to revise and take into consideration suggestions on the design, implementation and rules. The game and its rules have been translated from English into German, Spanish, Lithuanian, Romanian, Greek and Hungarian in order to reach as many young people as possible locally.

Learning Objectives

The project GENTLY has started with the goal to raise awareness especially from the young generation around the environmental deterioration and the climate change. The European Green Deal, which has been formulated from the European Commission (2019) has set als objective towards the first climate-neutral landmass by 2050. Furthermore GENTLY focuses on three out of seventeen sustainability goals that have been defined by the United Nations (2015) namely goal number 4 'Education', goal number 12 'Sustainable consumption and Production patterns' and goal number 13 'Taking urgent action to compact climate change and its impacts'.

The young generation will be affected the most by the next decades from the consequences of environmental deterioration. That includes several environmental challenges to face such as the overpopulation which increased the demand on diminishing resources,, the accumulation of waste which trigger health risks for the humans, the ocean and air pollution which destroys ecosystems, the global warming with disastrous consequences for our planet and the loss of biodiversity which can potentially lead to a breakdown of our ecosystem.

The learning objectives of the GENTLY project is to provide young people and young workers with crucial knowledge, skills, and awareness around climate change. The project places emphasis on three important learning goals. Firstly, it seeks to enhance participants' research and analysis capabilities. Secondly, it aims to foster creativity and strategic thinking among participants. Furthermore, GENTLY places an emphasis on community engagement and environmental awareness as a learning objective. This particular objective aims to encourage participants to actively engage with their communities and promote environmental consciousness.

Lastly, the project underscores the importance of leveraging the collective expertise and skills of its partner organisations. By exploiting the experience and competencies of the project partners, GENTLY aspires to create a highly innovative and valuable game-based learning package.

The incorporation of board games and applications at the same time represents a well designed strategy for educating young individuals. By merging the classic appeal of board games with the technological features of applications, the project introduces an inventive and interactive learning experience.

Utilising materials like the board, country cards, pawns, and dice, the game creates a tangible and visually stimulating environment. The inclusion of country-specific questions enhances the educational aspect, enabling players to deepen their knowledge of climate-related issues in various regions. The interactive aspect comes to life as players use the application component to respond to questions, receive feedback, and explore additional multimedia content.

User Interface And Experience

The GENTLY project's User Interface (UI) and User Experience (UX) design aims to provide an inclusive and captivating learning environment.

In the board game, the design is visually intuitive, featuring clear and distinct components like country cards, pawns, and dice. This approach ensures that participants of varied backgrounds or

familiarity with such games can engage with the educational content, while they also have fun when playing.

The digital version of the game enhances the overall user experience by providing real-time feedback and multimedia content. The application's user interface is designed so as to be user-friendly and serve as a seamless extension of the board game.

The thoughtful UI and UX design in the GENTLY project exemplify a user-centric perspective, emphasising engagement, and educational effectiveness. The synergy between physical and digital components creates a holistic and immersive learning environment aligned with contemporary educational trends and making the project suitable for a broad range of participants.

Interactive Features

The GENTLY project incorporates various interactive elements to create a lively and engaging learning atmosphere. An impactful feature is the inclusion of country-specific questions within the board game structure, enriching participants' understanding of climate challenges across different regions while promoting cultural awareness. Additionally, the integration of a mobile application enhances interactivity by providing real-time feedback, multimedia content, and extra information related to the game's questions, effectively bridging traditional board gaming with modern interactive learning methods.

The interactive nature of GENTLY extends to the gameplay itself, encouraging active participation as players answer questions and make strategic decisions based on dice rolls. The flexibility to move in different directions on the board, combined with the unpredictability of dice outcomes, introduces strategic elements and maintains a dynamic and engaging gameplay experience. Features like 'black boxes' and the option to select a country card in the middle of the board contribute to the interactive aspect by adding surprise elements and choices, enriching the overall gaming experience.

In summary, GENTLY utilises interactive features to transform the learning process about climate change into a collaborative and enjoyable journey. By seamlessly blending traditional and contemporary elements, the project ensures that participants not only gain knowledge but also actively engage with the content, fostering a profound understanding of environmental issues and sustainable practices in an interactive and immersive manner.

Board Game Set-Up: Rules and Materials

The board game is played as described here:



Each player selects a pawn colour and places it on the board, with country cards placed nearby, featuring unique questions for each nation. Players progress by rolling dice and moving pawns, accordingly, answering questions from nation-specific cards to collect one card per nation, aiming to win by obtaining all seven cards.

The materials and rules of the game are as following

Materials:

1 board, 7 sets of cards (1 set of cards per country), 4 pawns, 1 dice

Turn Order:

The player that gets the highest number on the dice will start. Then take turns clockwise.

Setup:

Place the country cards next to the board, facing the table (you should not be able to see the questions). Important: don't mix the cards from different countries. Take the pawn that has the same colour as the board's corner closest to you. Then, place your pawn in the middle.

Movement:

You can move your pawn according to the number that appears on the dice. You can move forward or backward, but just to one direction each time. Two players cannot be in the same box.

How to play:

Throw the dice and move your pawn to the according box. Take the country card according to the country that appears on the left side of the box (looking to the board). Give the card to the player on your right and let them read it to you. If you guess the question correctly, take the card and place it on your corner on the board (same colour as your pawn). You can throw the dice again. If you guess incorrectly, you lose your turn. If you fall in one of the black boxes, you can throw the dice again. If you fall on the middle of the board, you can choose the country card you wish.

How to win:

To win the game you will have to collect 7 cards, one card per country. You collect cards by answering the questions correctly.

End:

The game ends when one player has collected the 7 cards.

The overall settlement of the Board game is depicted in Figure 1.



Figure 1: Board Game

The pawns developed for the game have a distinguished shape so that they can be even used by visually impaired persons. The material used is recyclable in accordance with the scope of the project. Pawns and dice used are presented in Figure 2 and 3 accordingly

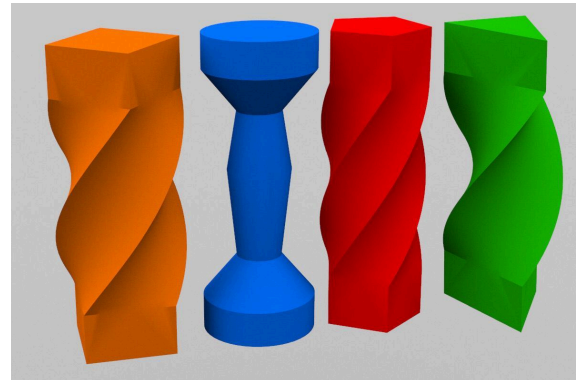


Figure 2: Pawns of the game



Figure 3: Dice of the game

Digital Game

The incorporation of board games and applications within the GENTLY project represents a well designed strategy for educating young individuals about climate change and sustainable practices by using informal education methods. By merging the classic appeal of board games with the technological features of applications, GENTLY introduces an inventive and interactive learning experience.

The interactive aspect comes to life as players use the application component to respond to questions, receive feedback, and explore additional multimedia content.

This integration aligns with the project's broader objectives of enhancing professional development and empowering young individuals to act as change agents when facing environmental problems.

For transferring the game on its digital twin we selected to work with UNITY. Unity is a cross-platform game engine supporting a variety of platforms and giving the possibility to users to create both 2D and 3D environments.

The game created is a multiplayer game, allowing up to 4 persons to play simultaneously. Users after downloading and installing the game on their computer enter a virtual space where they can play it, applying the developed rules and playing with the cards as they are at their analogue version. It is available for Windows, Apple and Linux operating systems.

Players initiate the game by creating or joining virtual lobbies and starting once all participants are present. Using the mouse to navigate the game board and the SPACE key to roll virtual dice, players progress through the game by answering environmental questions correctly to collect cards representing different nations, with the objective being to obtain one card for each nation before winning.

Impressions both from the virtual space and the game itself are given at Figures 4 and 5



Figure 4: Virtual space for playing the Game



Figure 5: Digital GENTLY game

More impressions from the digital game are given at the following screenshots





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George

Your Turn!

George: 0/7

Q. How do you think community bicycle use has changed in Budapest in 1 year? How much did the number of daily uses increase from May 2022 to May 2023? (Approximately 4,500 people used it daily as of May 2022)

A) to 6700 per day
B) to 9500 per day
C) to 11500 per day
D) to 13200 per day

A B C D

LEAVE

George

Your Turn!

George: 1/7

Q. Which sector holds the most responsibility for water pollution in Greece's aquatic environment?

A) Industrial pollutants
B) Agricultural chemicals such as fertilizers and pesticides
C) Sewage and wastewater discharges
D) Municipal waste

A B C D

LEAVE



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George: 1/7

George
Your Turn!

Q. What was the average range of air pollution in Munich in 2020?
A) 54 micrograms of NO2 per cubic meter
B) 40 micrograms of NO2 per cubic meter
C) 10 micrograms of NO2 per cubic meter
D) 3 micrograms of NO2 per cubic meter

A B C D

LEAVE

George: 3/7

George
Your Turn!

Q. How much natural area is protected in Spain?
A) 16 millions land hect, 8 million sea hect.
B) 16% of the land area and 8% of the sea area.
C) 20% of the land area and 10% of the sea area.
D) 80% of the land area and 2% of the sea area.

A B C D

LEAVE

8. Evaluation

Iterative Approach of the Game Development

By developing the game we have followed the principles of iterative game design and a participatory approach by involving users in order to make it more enjoyable and friendly to young people. The improvements made were related to the rules, time needed to accomplish a successful game round, the design of pawns, dice and cards especially in respect to inclusion and accessibility for visually impaired.

Playtesting at the early stages of developing the game from an initial small group of test users has helped a lot to assess the interactions, evaluate the fun factor of the game, observe the emotional responses and make necessary adaptations. At the later final stages the refinements were related mostly on the coherence and grade of difficulty of the set of questions as well as the general flow of the game.

Ultimately, both the board and digital games developed for the GENTLY project serve as effective tools for raising awareness of environmental issues among young people and motivating them to pursue sustainable actions. Through interactive gameplay, players explore viable solutions offered by the green deal framework and gain insight into regional and global environmental issues.

Feedback received

After each training session (one in Greece and one in Cyprus), the participants answered a questionnaire form, in order to evaluate their overall experience from the training activities. Several conclusions can be made from the data obtained from the questionnaires used for the training sessions.

General participant satisfaction: It appeared that participants were content with a number of the training sessions' elements. High percentages of affirmative answers to questions about the well-planned daily schedule (81.3% True), engaging content (93.8% True), distinct session objectives (81.3% True), and a welcoming environment in the group (100% True) demonstrate this. Additionally, participants thought the training room was appropriate (100% True) and that the location choice was good (93.8% True), demonstrating that the surroundings promoted learning. Learning outcomes: Most participants (75%) and (62.5%) said they learned new skills and knowledge. Some did, however, feel that the new skills were not as strong (12.5% said it was not true at all), which could indicate areas where skill development strategies could be strengthened.

Effectiveness of the trainers: In general, participants thought the trainers were capable of promoting engagement and interaction (87.5%) and well-prepared (81.3%). Regarding the application of intriguing methods and techniques, there were differing opinions (75% True, 18.8% Somewhat true, and 6.2% Not at all true), suggesting that some participants might have preferred more captivating strategies.

Logistics and support: Positive feedback was given to the organisers and support staff, as every participant found them to be helpful (100%). This suggests excellent logistical support, which probably enhanced the participants' overall satisfaction.

Areas for improvement: Even though the majority of comments were encouraging, there is still room for development. For example, the effectiveness of the sessions could be improved by addressing the concerns expressed by the 25% of participants who found the training material to be either "Somehow true" or "Not at all true." Furthermore, feedback on learning new skills and comprehending game mechanics points to the need for more specialised and practical teaching methods.

Multiplier Events' Results

The dissemination events held across Germany, Greece, Lithuania, Cyprus, Hungary, Romania, and Spain marked significant milestones in showcasing the outcomes of the GENTLY Project. The events aimed to present the final products and results of the project to a diverse audience, including the general public and representatives of organisations involved in the project actions. Various dissemination tools, including flyers, posters, newsletters and the project website, contributed to reaching a wider audience. The events, conducted in each respective country, featured presentations, demonstrations of project outcomes, and open discussions on future exploitation and dissemination possibilities. Positive results emerged as stakeholders and organisations engaged in constructive dialogues, expressing interest in potential partnerships for similar initiatives. Overall, the dissemination events effectively showcased the project's success and fostered partnerships for sustainable youth development across diverse European contexts.

9. Conclusion

The feedback received from the training and evaluation events as well as from the dissemination activities was in the majority positive and enthusiastic. Young people had fun, reported that they learnt new things and were eager to play it with their friends and families. This feedback was applied also for the digital one as well as the version dedicated to the visually impaired.

Based on our experience from developing and testing the GENTLY game our conclusion is that non-formal learning through the developed game promotes energy efficiency practice, provides motivation for everyday practices and volunteering, educates the youth and makes available information and insights on green practices that can be used both at the everyday life as well as in working spaces. At the same time fosters an understanding of environmental danger and empower them to become active citizens. Used not only in educational settings but as an entertainment it can achieve significant effects and support life-long learning.

10. Appendix

The appendix presents the question cards in English, German, Spanish, Lithuanian, Romanian, Greek and Hungarian highlighting the correct answer in each of them.

English cards

<https://gently4youth.eu/print/grid/en/general>

German cards

<https://gently4youth.eu/print/grid/de/general>

Spanish cards

<https://gently4youth.eu/print/grid/es/general>

Lithuanian cards

<https://gently4youth.eu/print/grid/lt/general>

Romanian cards

<https://gently4youth.eu/print/grid/ro/general>

Greek cards

<https://gently4youth.eu/print/grid/gr/general>

Hungarian cards

<https://gently4youth.eu/print/grid/hu/general>