



THE BIG GAME: Immersive and Multidisciplinary STEM Learning through A Cooperative Story-Driven Digital Game

Code 2021-1-FI01-KA220-SCH-000024098

***R3. Digital Bank of Environmental STEM
Learning Objects***

Final report

Disclaimer

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INTRODUCTION

The BIG GAME project addressed three pressing needs identified at the European level: promoting STEM education, supporting digital transformation, and combating climate change. In response to declining interest in science subjects and deteriorating learning outcomes across Europe, there was a recognised necessity to enhance STEM education. While some individual STEM subjects have been integrated into secondary school curricula, they fall short of fostering the extensive multidisciplinary learning necessary for comprehensively exploring various scientific phenomena.

Furthermore, acquiring digital skills has become imperative for citizens amid the digital transformation. However, gaps in the digital skills of European teachers have been identified. Based on the background, identified needs, and contextual considerations, the project aimed to achieve the following objectives:

1. **Promoting STEM Education:** Foster interest and proficiency in science, technology, engineering, and mathematics (STEM) by employing a multidisciplinary learning approach. This involved problem-solving within environmental contexts through a serious learning game format.
2. **Supporting Digital Transformation in Education:** Facilitate digital transformation within schools by offering an online and hybrid learning model. Additionally, the project introduced a digital storytelling methodology and tools to enhance learning and collaboration within digital environments.
3. **Enhancing Digital Skills:** Address the digital skills gap among teachers and students aged 11-16. The project focused on ensuring a versatile accumulation of digital skills to navigate contemporary technological landscapes effectively.
4. **Raising Environmental Awareness:** Increase awareness of environmental and climate change issues and actively participate in combating climate change. This was achieved through immersive learning experiences designed to shape attitudes and inspire action.

The main results achieved are the following :

R1. The BIG_GAME Learning Concept and Model included the development of a digital game-based learning environment to create an experience based on a game world on the verge of an environmental catastrophe. It is structured as a series of missions involving environmental problems arising in the game's fictional world that should be solved.

Student teams (11-16 years old) submitted their projects outlining the best solution to tackle the problem. The best solutions were awarded and integrated into the Digital bank and the digital game environment.

R2. Handbook and Toolkit on the Digital Storytelling approach in STEM constituted a handbook on how to use the digital storytelling approach in STEM education and designed a set of learning scenarios to be used in the classroom.

It contains some experiences and good practices for using digital storytelling in STEM education and implementing the assessment modality in the classroom.

R3. Digital Bank of Environmental STEM learning objects is a platform in which the open resources created by the students have been collected and uploaded into “digital bank of open resources”. The best solutions proposed were used and integrated into the digital game-based environments and adjusted for the students’ competition inside the BIG_GAME school competition.

The digital bank continually evolves with updated learning scenarios contributed by students and teachers, facilitated by the active participation of all partners.

In this context, this report describes all the activities realised to achieve the results and outcomes expected from the training events and the competition. It analyses the results and provides feedback from participating teachers and students.

Finally, some recommendations underlining the strengths and weaknesses that emerged during the implementation phase are described to support any future implementation.

1. THE BIG GAME COMPETITION CAMPAIGN

To reach out widely to the national STEM education developer networks and encourage the participation of European schools, the consortium managed an effective social media campaign throughout Europe.

For the BIG GAME Competition Campaign, the partners created two videos (available at <https://youtu.be/5Q9krGL6DwQ> and https://youtu.be/J6y60ct_DvE) and fourteen images (some of which are displayed in the Figure below. All related pictures and posts from the campaign can be found on the project's Facebook profile at (<https://m.facebook.com/BigGame.Project>).



Figure 1. Some pictures designed and developed by partners.

Through the campaign's promoting and dissemination actions, schools (represented by teacher teams involved) were directed to the registration form (**Annex 1**), which provided access to register for the competition phase of the project.

Among the participating schools, the project team gave priority to the teachers working in secondary schools who had the willingness to develop multidisciplinary STEM learning, support the digital transformation by testing new digital teaching and learning methods and tools, contribute to the fight against climate change by experiencing attitude formulating learning experiences, as well as its interest in gaining experience and contributing to European cooperation in the context of school education.

The following requisites to invite the secondary school teachers were met:

- Command of English (B1-B2);
- Teaching in subjects related to STEM;
- The level of interest and motivation to carry out the BIG GAME activities;
- Full-time employers for at least one year in a school or working in other educational organisations involved in STEM teaching or interested in developing the STEM approach of the project's context in their organisation.

For students aged 11-16, the teachers selected prioritised admitting pupils who had learning difficulties, were at risk of exclusion or drop-out, had poor basic skills and a history of school failure.

2. THE TRAINING EVENTS

The project piloting team organised and managed a series of training events (in face-to-face and virtual modalities) to reach a high number of specialists/experts/educators in the training sector as well as secondary school teachers to exploit and promote through effective campaigns the European contest.

The training events took place in Finland, Italy, Romania and Estonia, involving 208 secondary school teachers, as illustrated in Figures 2,3,4 below.

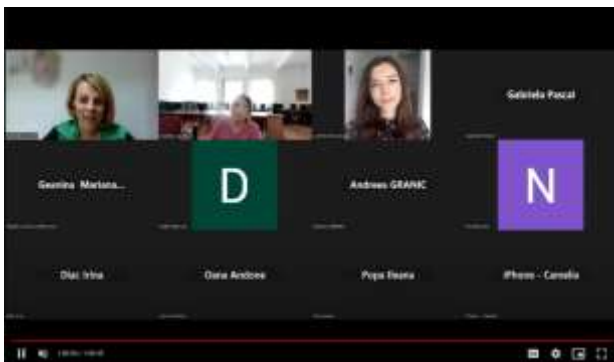


Figure 2. Some pictures of virtual and face-to-face training events organised by EUROED (Romania) on 20/10/2023 and 12/05/2023



Figure 3. Some pictures of face-to-face training events organised by Tartu International School (Estonia) on 24/04/2023 and by Joensuu Lyceum Comprehensive School (Finland) on 12/04/2023





Figure 4. Some pictures of face-to-face and virtual training events organised by EU-Track (Italy) at Fiera della Didacta on 10/03/2023 and in collaboration with I.C. Maria Montessori (Italy) during the STEM Discovery Campaign 2022 and 2023 on 13/10/2022, 13/10/2023, 05/04/2022 and 04/11/2023.

3. THE COMPETITION RESULTS

The project piloting team prepared, in collaboration with the Game team, the [Big Game Contest Rules](#), outlining an educational opportunity for students and teachers alike, focusing on environmental stewardship and problem-solving.

The competition was organised based on the following steps:

- Registering teachers receive login details one week before the game commenced so their teams could access the online Big Game platform.
- Once the game began, student teams engaged in three 10-day environmentally themed missions to avert potential environmental disasters.
- Guided by their teachers, students navigated the game environment, researched solutions, and submitted their findings using the provided templates (**Annex 2**), ensuring proper citation of sources and images.
- Teachers were encouraged to support students throughout the process, offering feedback and assistance as needed.

An Evaluation Committee, specially designated with experts in STEM education, environmental issues and digital game design, assessed solutions based on efficacy (would the proposed solution solve the problem), pragmatism (how practical, efficient and doable is the solution), scholarship (does the solution cite multiple relevant and reliable sources), and persuasion (is the solution clearly explained and presented well), and the results were released within four days of the mission's completion.

The game followed a structured schedule, with missions starting on designated Mondays and results unveiled before proceeding to the next mission. Each mission was structured as shown in **Annex 3**.

The competition was concluded with the announcement of winners on December 20th, 2023. These are the following teams: Hazel Tarantulas (FI), Green Elephants (RO), and Black Bobcats (RO), who received special winner's badges in the game environment as shown in the Figure 5.



Figure 5. Badge designed for the Winner Team

In addition, the evaluation committee recognised the teams that showed consistent performance and gained high star accumulation throughout the game, such as the teams Black Storks (RO), Teal Salamanders (IT), Yellow Dolphins (RO), Cyan Finches (EE), White Ants (IT), Cyan Giraffes (FI), Silver Crabs (EE), Amber Hawks (IT), and Silver Hornets (FI). However, as shown in the Figure below, each team received the BIG GAME badge as a memento for their participation in the BIG GAME competition.



Figure 6. Badge designed for all the Teams participating in the BIG GAME competition

In total, 121 teams from 27 schools across four countries participated in the competition. Specifically, 24 teams were from Romania, 6 from Italy, 19 from Estonia, and 72 from Finland. These teams submitted 270 mission solutions throughout the competition.

4. THE DIGITAL BANK

A collaborative effort between the University of Turku, EU-Track, and Tallinn University established a [Digital Bank](#) as the central hub for STEM education, emphasising environmental issues. It uses a cloud service such as Google Drive to provide a simple procedure for uploading and storing all the materials teachers and students submit.

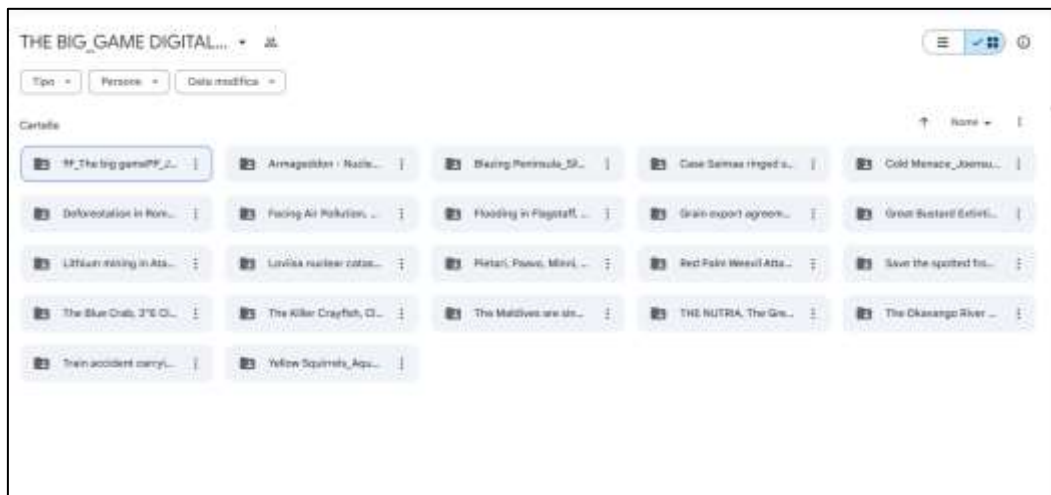


Figure 7. The Digital Bank implemented by using Google Drive

Additionally, the teachers and the students were invited to contribute to a digital bank containing educational resources for future use. Thus, teachers had the option to either select pre-designed missions or create their own.. This mission had to be prepared by using the scenario template used for the digital game submission and preparing a short descriptive video. All these materials had to be submitted to the evaluation committee through the email thebiggame.contest@gmail.com.

The evaluation process for the 14 scenarios submitted, each accompanied by a PowerPoint presentation and a video description, followed the guidelines outlined in the BIG GAME competition rules. The Evaluation Committee, the same for the BIG GAME competition, followed the following criteria to select the good practices among the learning scenarios prepared by the students: feasibility (*could the solution realistically be done in practice?*), effectiveness (*would the solution solve the problem?*), practicality (*does it make good use of our limited resources?*), and clarity (*is the solution understandable and well-presented?*).

These criteria assessed whether the solution could realistically be implemented, if it effectively addressed the problem, if it optimised limited resources, and if it was presented clearly and understandably.

Ultimately, the Digital Bank contains all the materials submitted by the student teams, comprising a total of 22 scenarios. Moreover, all the videos were published on the [BIG GAME YouTube Channel](#).

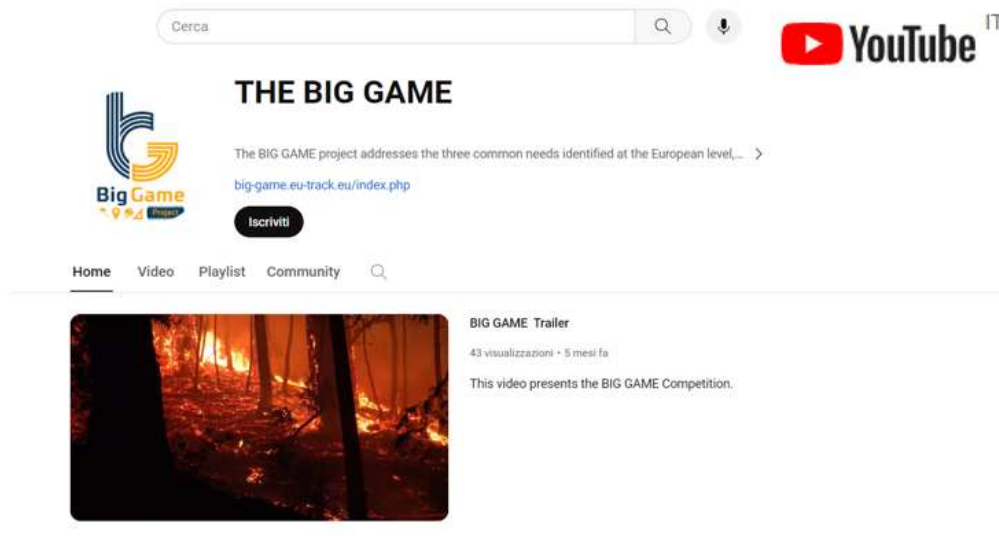


Figure 8. The BIG GAME YouTube Channel

In the end, the Evaluation Committee recognised not just 8 but 10 exemplary good practices due to the exceptional work accomplished by the student teams. The following teams designed the practices selected: TEAM CNME (Romania), Red Palm Weevil Attack (Italy), The NUTRIA -The Green Gang (Italy), Great Bustard Extinction - GRAY SKY (Romania), TEAM OKAVANGO (Romania), The Blue Crab - 3[^]E Class (Italy), Otso - Ahnaf, Kerttu, Milla, Samuli ja Lauri (Finland), Laura Metsävainio, Tinja Kokkonen, Matilda Peltomaa (Finland), Grade 6 students Tartu (Estonia) and Grade 6 students Tartu II (Estonia). As shown in Figure 9 below, these teams were awarded a special winner's badge in recognition of their achievements.



Figure 9. The Winner Team Badge for the best game mission selection

5. TARGET GROUPS' FEEDBACK

To collect feedback from the target groups (teachers and students), in addition the comments gathered during the face-to-face and virtual events, the project team designed two questionnaires, detailed in Annex 4 and 5.

5.1 Teachers feedback

The teachers responding comprised 62 people (37% from Romania, 11% from Finland, 50% from Italy and 2% from Estonia), of which 89% from Middle school and 11% from high school. In addition, the sample was made up of 84% female and 4,8% male, with 11% - of respondents who preferred not to answer the question.

Most participants teach Biology (56%), Mathematics (42,2%), Geography (34%), and languages (50%), as shown in the following Figure 10.

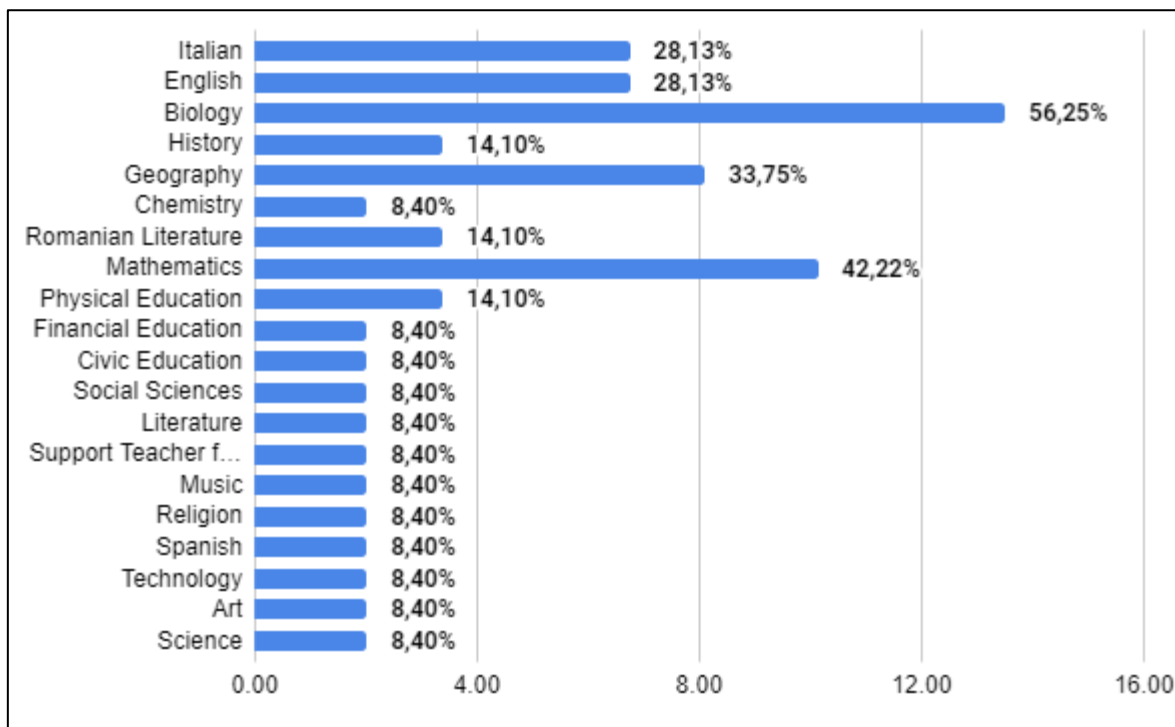


Figure 10. Subjects taught by respondents

Based on the responses provided, it's evident that the BIG GAME materials have been highly valuable for working with students, with almost half (47%) describing them as extremely useful and one quarter (27%) finding them useful.

The positive feedback highlights several key points: the materials introduced new scenarios related to environmental issues, served as a useful starting point for discussions, and facilitated teamwork and collaboration among students.

The structured format of the materials was praised for its clarity and accessibility. Additionally, respondents appreciated the simplicity and effectiveness of the materials, noting their utility in developing knowledge and transversal skills.

While there were some initial challenges, such as clarity regarding video production, overall, the materials were deemed sufficient and effective in motivating students and fostering engagement with the subject matter.

Regarding the training events organised by the project team, they have been perceived as valuable by most respondents, with 31% finding them extremely useful and 29% considering them useful.

The positive feedback highlights several key points: the training events provided valuable information and clarification on project objectives and formats, facilitated the exchange of ideas among teachers, and helped understand and address difficulties encountered during the project.

Additionally, the events were noted for their effectiveness in guiding teachers' work with students and improving solutions. Some respondents also appreciated the clarity of instructions provided during the events.

However, there were also some neutral and negative responses, with a few indicating that they did not participate in the events or did not find them applicable to their situation.

The training events have played a significant role in supporting teachers and enhancing their effectiveness in working with students on the BIG GAME project.

Teachers' opinions on the ease of use of the Game Environment vary among respondents. While 32% found it « absolutely easy » to use and another 31% found it « easy », a significant portion (34%) remained neutral on the matter. However, a small percentage found it «difficult » (2%) or « absolutely difficult » (1.6%). This mixed feedback suggests that while a majority found the Game Environment easy to navigate, there is still room for improvement to address the concerns of those who found it challenging (Figure 11).

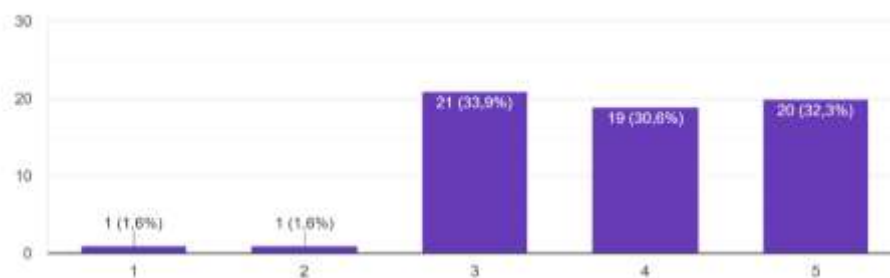


Figure 11. The easy use of the Game Environment

Based on the responses provided, the BIG GAME approach is perceived to have a positive impact on students' development of various skills:

- **Analytical thinking:** 66% of respondents believe that the BIG GAME approach helps develop analytical thinking skills to a high or very high extent.
- **Problem-solving:** 71% of respondents believe that the BIG GAME approach helps develop problem-solving skills to a high or very high extent.

- **Reasoning:** 69% of respondents believe that the BIG GAME approach helps develop reasoning skills to a high or very high extent.
- **Creative thinking:** 73% of respondents believe that the BIG GAME approach helps develop creative thinking skills to a high or very high extent.
- **Collaboration capacity:** 783% of respondents believe that the BIG GAME approach helps develop collaboration capacity to a high or very high extent.
- **Investigating sources:** 68% of respondents believe that the BIG GAME approach helps develop investigating sources skills to a high or very high extent.
- **Research skills:** 66% of respondents believe that the BIG GAME approach helps develop research skills to a high or very high extent.
- **Communication skills:** 77% of respondents believe that the BIG GAME approach helps develop communication skills to a high or very high extent.
- **Critical thinking:** 68% of respondents believe that the BIG GAME approach helps develop critical thinking skills to a high or very high extent.
- **Storytelling skills:** 63% of respondents believe that the BIG GAME approach helps develop storytelling skills to a high or very high extent.

As can be seen, the majority of respondents have underlined that the BIG GAME approach has a significant impact on students' educational path. It helps students build a strong base for intellectual growth and academic success by teaching important analytical, problem-solving, and critical thinking skills. Additionally, its focus on creative expression and storytelling encourages innovation and helps students understand the importance of narrative in explaining complex concepts. Furthermore, working together in this approach not only improves teamwork and communication abilities but also fosters a sense of community and shared responsibility among students.

Moreover, by encouraging students to explore diverse sources and undertake research, the BIG GAME approach promotes independent inquiry and a thirst for knowledge. This multifaceted approach to skill development equips students with the tools they need to excel academically. It empowers them to shape their learning attitudes and contribute meaningfully and actively to society.

Therefore, the widespread agreement on its effectiveness highlights the BIG GAME approach as a powerful force in education, equipping students with the skills and confidence to tackle future challenges and opportunities.

To what extent do you think using the BIG GAME approach helps students develop the following skills?

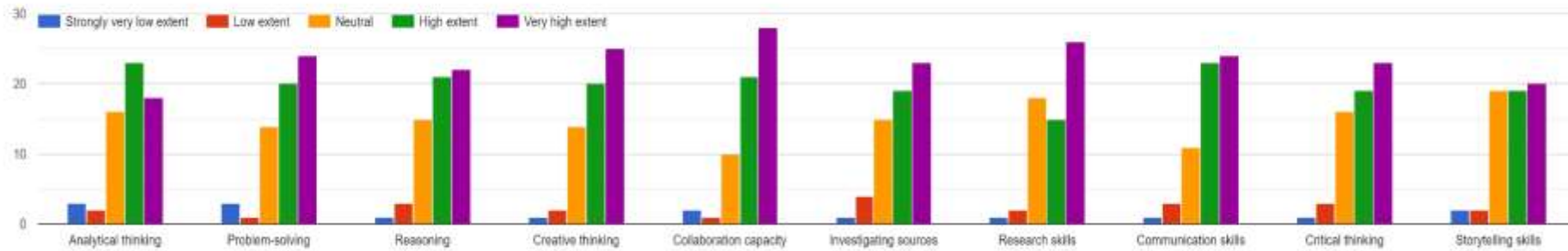


Figure 12. The skills development supported by the BIG GAME approach

The results show that the BIG GAME approach has predominantly positively influenced students' attitudes towards environmental issues. A combined 80% of respondents either agree or strongly agree that the approach has positively changed their perspectives. Only a small percentage, 4%, disagree with this notion, while 17% remain neutral. This indicates that most respondents perceive the BIG GAME approach as effective in fostering a heightened awareness and concern among students regarding environmental issues, thus reflecting its potential as a catalyst for positive behavioural change and environmental stewardship.

Based on the diverse feedback provided, it's clear that the BIG GAME approach offers numerous strengths in enhancing students' learning experiences:

1. **Engagement and Enthusiasm:** Many respondents noted the remarkable enthusiasm and engagement of their students during BIG GAME activities, citing instances of collaboration, critical thinking, and problem-solving.
2. **Critical Thinking and Collaboration:** The approach is acclaimed for creating a framework that fosters critical thinking and collaborative skills among students.
3. **Empathy and Creativity:** Some respondents highlighted the stimulation of empathy towards nature and the cultivation of creativity as notable strengths of the approach.
4. **Problem Identification and Solution:** The BIG GAME method is recognised for its effectiveness in helping students identify pressing problems and imagine long-term solutions.
5. **Exposure and Research:** It provides exposure to environmental issues and encourages students to conduct research in a fun and engaging manner.
6. **Interdisciplinary Skills:** The approach is credited with developing interdisciplinary skills such as analytical thinking, communication, and research.
7. **Motivation and Curiosity:** It motivates students to explore new knowledge, collaborate, communicate, and approach the world innovatively.
8. **Real-world Application:** The activities allow students to think outside the box, imagine scenarios, and apply useful information to analyse and solve real-world problems.

While the strengths of the BIG GAME approach are apparent, there are also areas for improvement identified by respondents:

1. **Time Constraints:** Many respondents expressed concerns about time constraints, noting that the activities can be time-consuming and require additional sessions or better time management.
2. **Difficulty Level:** Some respondents mentioned that specific scenarios or tasks were too complex or required extensive research, leading to potential boredom or frustration among students.

3. **Technical Challenges:** There were technical challenges, such as difficulties with logging in, accessing materials, or submitting work, which affected the smooth execution of the activities.
4. **Evaluation and Feedback:** Some respondents expressed concerns about evaluating student work, particularly in video format, and providing meaningful feedback within the given constraints.

While the BIG GAME approach offers valuable opportunities for student engagement and skill development, addressing these identified weaknesses could further enhance its effectiveness and usability in educational settings.

5.2 Students feedback

Regarding the students involved, the number of respondents to the final questionnaire was 239. The results show that 9% were placed in the 10-11-year-old category, 44% in the 12-13-year-old category, 33% in 14-15 and 13% were more than 15 years old (Figure 13). Only a small percentage (1,3%) decided to select “I prefer not to answer”.

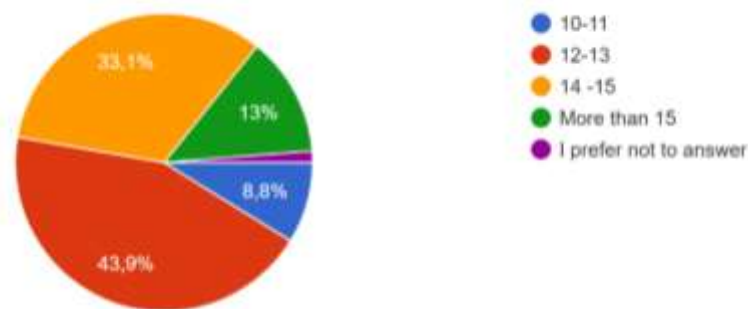


Figure 13. The students' age

Additionally, the data distribution showed that men and women accounted for 48% of the total, with 4% choosing not to disclose their gender preference. Based on the comprehensive feedback received (Figure 14), the experience of engaging with the BIG GAME approach varied across different dimensions among respondents. A significant majority disagreed that the experience was boring (72%), indicating a lack of monotony in the activities, and a substantial portion agreed that it was entertaining (44%), suggesting successful engagement with the content. A notable percentage found the experience « challenging » (45%), indicative of the approach's ability to stimulate critical thinking and problem-solving skills. At the same time, others (11%) have perceived it as daunting.

Moreover, most perceived the experience as interesting (79%) and enriching (65%), highlighting the approach's effectiveness in providing engaging and valuable learning opportunities. These insights collectively underscore the multifaceted nature of the BIG GAME

approach, which captures participants’ interest, challenges them intellectually, and enriches their learning experiences.

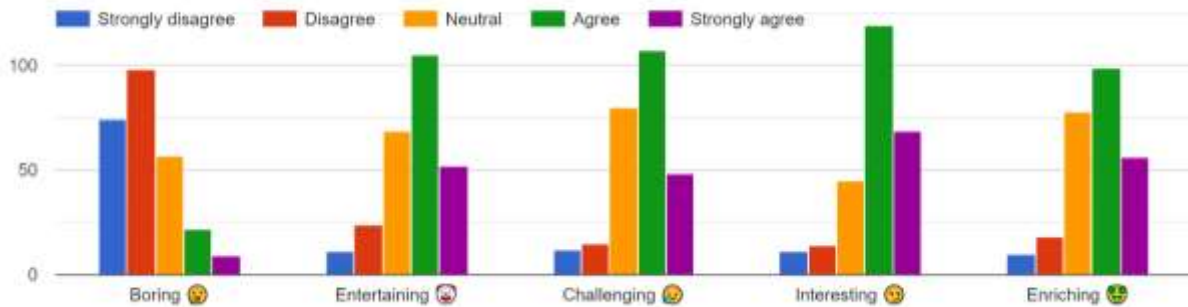


Figure 14. The students’ feelings towards the BIG GAME experience

The activities most liked by the students encompassed a range of collaborative and problem-solving tasks, including brainstorming, researching, and group work, particularly in the initial phases of the project. The students appreciated the opportunity to engage in hands-on activities such as creating scenarios and filming videos, allowing them to apply their creativity and teamwork skills effectively.

Additionally, the students found value in activities that required critical thinking and exploring solutions to environmental problems. Conversely, the activities least favoured were often related to individual tasks, such as writing, recording videos, and synthesising information. Some participants expressed difficulties with specific phases, citing challenges with formulating final answers and translating content.

Overall, while collaborative and interactive activities were highly regarded, individual tasks and logistical aspects posed challenges for some participants.

The students’ opinions regarding whether participation in the BIG GAME project changed awareness towards environmental issues varied. While a small percentage (3%) strongly disagreed or disagreed, the majority either agreed (34%) or strongly agreed (25%) that their awareness had increased (Figure 15).

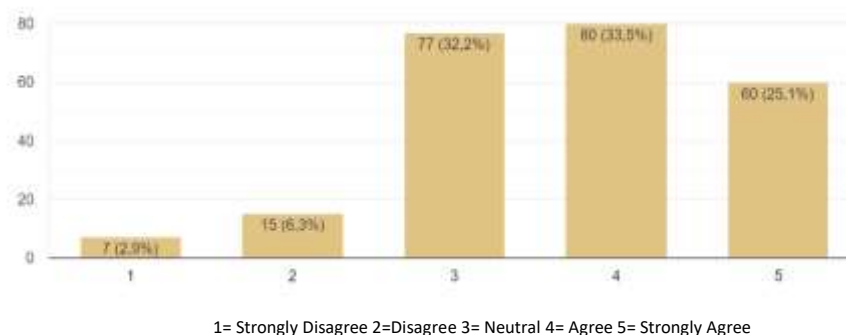


Figure 15. Impact of students’ participation in the BIG GAME project on awareness of environmental issues

Some students noted that the project enriched their knowledge and changed their actions towards the environment, while others mentioned gaining new information and realising the seriousness of environmental problems.

However, there were also responses indicating uncertainty or no change in awareness, with reasons ranging from already being environmentally conscious. Overall, the project seemed to positively impact many participants' awareness of environmental issues, with some experiencing significant shifts in perspective.

6. CONCLUSIONS

In conclusion, teachers highly appreciated the BIG GAME materials, especially for their ability to encourage discussions and teamwork among students. They praised the structured format for its clarity and effectiveness in facilitating learning.

Despite general acclaim, some teachers faced initial challenges, such as understanding video production, indicating a need for additional training and resources to ensure full implementation.

While most respondents found the project's training events valuable, providing crucial information and clarity on objectives, some felt the events were not applicable to their context, suggesting a necessity for tailored training opportunities to meet diverse needs.

Students exhibited high levels of engagement with the BIG GAME activities, especially in collaborative and problem-solving tasks, effectively fostering critical thinking, collaboration, and creativity among them. Furthermore, the approach positively influenced students' awareness of environmental issues, with many reporting increased knowledge and a deeper understanding of the seriousness of such problems through their participation in the project. Hence, for future implementation of the BIG GAME approach and methodology, the following recommendations should be taken into account :

1. **Tailored Training and Support:** Provide additional training and resources to address the challenges identified by teachers, ensuring they feel fully equipped to implement the materials effectively in their classrooms.
2. **Continued Skill Development:** Emphasise skill development through engaging and interactive activities while exploring ways to deepen students' understanding of environmental issues and their role in addressing them.
3. **Open Feedback:** Maintain open feedback and regularly solicit input from stakeholders to identify areas for improvement and implement necessary changes to enhance the overall effectiveness and impact of the BIG GAME project.

ANNEX 1 – The registration form for the BIG GAME competition

THE BIG_GAME Contest Competition Registration

This is the form to register your school and your teams' students to the competition organized in the framework of THE BIG_GAME project (cod. 2021-1-FI01-KA220-SCH-000024098).

The target group is 11-16 years old students' teams from Europe.

Contact E-mail *

La tua risposta

Country: *

Scegli

School Name *

La tua risposta

If you are applying for the BIG GAME COMPETITION, please, specify the number of the students' teams are going to manage...

La tua risposta

If you are applying only for the BIG GAME DIGITAL BANK, please, specify the student team name...

La tua risposta

DECLARES to be aware that the data provided will be processed in compliance with the EU Regulation 2016/679 "General Data Protection Regulation" and with the current national laws concerning personal data protection. The interested party may exercise the rights referred to in art. 13 GDPR 679/16.

DECLARES to accept THE BIG_GAME Contest Rules and Instructions.

Avanti

Cancella modulo

ANNEX 2 – The scenario/mission solution template



Immersive and Multidisciplinary STEM Learning Through A Cooperative Story-Driven Digital Game
EU 2021-2-001-4-001-000000000

Scenario's Title _____

Team's Name _____

School Name _____ Country _____

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Problem Description

Please describe clearly the environmental issues and by using text + images



Proposed solution/s

*What are the steps to be taken?
Please, describe clearly by using text + images*



Expected outcome

*What are the solution's benefits?
Please, describe clearly by using text + images*



Requirements

*What kind of equipment and resources are required?
Please, describe clearly by using text + images*



Risks and limitations

*What are the solution's risks and cost?
What could go wrong?
Please, describe clearly by using text + images*

Links to resources

Please insert the links to the resources used.



Thank you for attention!



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ANNEX 3 – Mission structure

An example: Operation “Black Ice”

Mission statement

On March 3rd, 2030 (Sun) at 3:30 am, a research vessel (The Vassa flying a Swedish flag) and an oil tanker (The MT Dolviken, flying a Norwegian flag) collided near the Norwegian island of Andøya in the Arctic circle. Due to the impact, the hull of the oil tanker was pierced, resulting in an oil spill into the sea. By following the Shipboard Oil Pollution Emergency Plan, MT Dolviken crew were able to locate the damaged tank and stop the spill within an hour; however, by that point, a significant quantity of oil was spilt into the sea. Both ships’ crews were then evacuated by air rescue.

The situation is time sensitive due to the oil leak happening in a natural reserve less than 4 km away from the Bleiksøya cliff, home to one of the largest surviving sea puffin colonies. The fishing village of Bleik, a popular bird-watching destination, is also nearby.

The UN Anti-Apocalypse Force (UNAAF) has been activated to address this threat. You can be on site by 6 am local time. What is your course of action?

Location and environmental conditions

5 km off the coast of Andøya island in the Arctic circle, part of Norway’s Skogvoll natural reserve. The closest settlement is the fishing village of Bleik (population 500), and the sea puffin colony on the Bleiksøya cliff is 4 km away. It is possible to airlift to the site from Harstad in 20 minutes.

Due to the icy waters, navigation is difficult, and since the ice is breaking, the spill can spread fast and reach both the cliff and the nearby village of Bleik, affecting local fisheries and tourists.



ANNEX 4 – Teachers' Questionnaire

Dear Teacher,

We kindly ask you to fill in the following questionnaire, prepared for the data collection after the participating of your students in the competition inside the *BIG GAME - Immersive and Multidisciplinary STEM Learning through A Cooperative Story-Driven Digital Game* project.

Thank you in advance for your collaboration in this task that only requires a few minutes, and we hope you will help the *BIG_GAME* Project Team improve the project results and their impact.

BIG GAME Project Team

General Information

1. Country:

2. Gender

- Female
- Male
- I prefer not to answer

3. Please, specify the grade of your students:

- High school
- Middle school

4. Which subject are you teaching?

The BIG GAME approach perception inquiry

1. How useful have been the BIG GAME materials provided (e.g., contest rules, learning scenario template in ppt format) to work with your students?

1=Absolutely not useful, 5 =Extremely useful

Absolutely not useful

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Extremely useful

Please, explain the motivation of your choice:

2. How useful have been the BIG GAME training events organised (e.g., webinar, in presence training session) to work with your students?

1=Absolutely not useful, 5 =Extremely useful, 6= Not applicable

Absolutely not useful 1 2 3 4 5 *Extremely useful*

Please, explain the motivation of your choice:

3. Was the Game Environment easy to use?

1=Absolutely difficult, 5 =Extremely easy

Absolutely difficult 1 2 3 4 5 *Extremely easy*

4. To what extent do you think using the BIG GAME approach helps students develop the following skills?

	Strongly Very low extent	Low extent	Neutral	High extent	Very high extent
Analytical thinking					
Problem-solving					
Reasoning					
Creative thinking					
Collaboration capacity					
Investigating sources					
Research skills					
Communication skills					
Critical thinking					
Storytelling skills					

5. Do you think the BIG GAME approach has changed the students' attitude towards environmental issues?

1=Strongly disagree, 5 = Strongly agree

Strongly disagree

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strongly agree

6. Please, provide your opinion regarding the *strengths* of the BIG_GAME approach for your students:

Strengths

7. Please, provide your opinion regarding the *weaknesses* of the BIG_GAME approach for your students:

Weaknesses

ANNEX 5 – Students’ Questionnaire

Dear Student,

We kindly ask you to fill in the following questionnaire prepared for the data collection after participating in the competition inside the *BIG GAME - Immersive and Multidisciplinary STEM Learning through A Cooperative Story-Driven Digital Game* project.

Thank you in advance for your collaboration in this task that only requires a few minutes, and we hope you will help the *BIG_GAME* Project Team improve the project results and their impact.

BIG GAME Project Team

General Information

1. Country:

2. How old are you?

- 10-11
- 12-13
- 14 -15
- More than 15
- I prefer not to answer

3. Gender

- Girl
- Boy
- I prefer not to answer

The BIG GAME project perception feedback

4. The experience was...

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Boring 😞					
Entertaining 😄					
Challenging 😬					
Interesting 😊					
Enriching 🧠					

Please, express your overall judgement on the activities carried out.

a. Which phase of the activities did you like most?

b. Which phase of the activities did you like least?

5. Do you think your awareness towards environmental issues has changed after having participated in the BIG GAME project?

1=Strongly disagree, 5 =Strongly agree

Strongly disagree

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Strongly agree

Please, explain:
