

STE(A)M IT STORIES OF IMPLEMENTATION

Title of your Story

Implementation of the Learning Scenario “The pollution and the Greenhouse Effect (The Earth is in danger! Let’s protect our planet!)”

Name of the Author(s)

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The Learning Scenario Implemented

Add below the link to the learning scenario you implemented in your class. The link must directly point to the resources on Scientix Repository and STE(A)M IT Website.

<http://www.scientix.eu/resources/details?resourceId=28401>

<http://steemit.eun.org/the-pollution-and-the-greenhouse-effect/>

The Implementation Context

Briefly describe the context of your implementation, specifying what subject(s) you chose to implement the learning scenario in, how those subjects relate to STEM careers, what was the students’ age(s), the size of the group, previous familiarity with real life scenarios, what real-life questions did you choose to address, etc. We aim to gather stories of **classroom implementation**, so the context must appropriately reflect this. (maximum 300 words).

The authors of the LS are teaching Physics, Chemistry, Biology and English to 13-15 age old students, whereas our Italian team is made up of Art, Physics, Biology and Chemistry teachers whose common group of students is 18-19 years old. Furthermore, we implemented the LS between February and April 2021, when secondary students in our Italian Region were attending online lessons. That’s why we made the following adaptation:

— the LS provides the engagement of local experts on the issue of pollution, we didn’t organize that because of the Covid19 emergency restrictions.

— Art: we choose to have students reflecting on the following topics:

- “Saving the environment and relaunching the economy-A few decades of intensive industrial exploitation were enough to destroy the balance of a billion-year-old planet. The bill is very high, in terms of climate change and pollution (credits <https://www.corriere.it/native-adv/eni-longform03-salvare-ambiente-e-rilanciare-economia-con-la-riconversione.shtml>)” ;
- “Industrial conversion, when old factories are reborn to new life - Transforming themselves into museums, coworking spaces and shopping centers, they restore dignity and prestige to the areas in which they are located (credits



https://www.edilportale.com/news/2016/04/progettazione/riconversione-industriale-quando-vecchie-fabbriche-rinascono-a-nuova-vita_51326_17.html)”;

- “Industrial Archeology - Industrial architecture in Milan and in Europe. Projects of wonderful architecture with a thriving past, recovered from a future of neglect”(credits <https://www.architetturaecosostenibile.it/argomenti/tag/archeologia-industriale>);
- “The second life of EXPO 2015. What will become of pavilions and green areas? - After the Expo has closed its doors, they are faced with pavilions to be reused and recycled.” (credits <https://www.architetturaecosostenibile.it/architettura/progetti/seconda-vita-expo-2015-padiglioni-543>);

The STEM careers that were mostly related to the LS implementation were: environmental engineer, environmental architect, environmental biologist, environmental chemist, physicist of the atmospheric environment, meteorologist.

The real-life questions we choose to address were:

- How it works the atmosphere on Earth and how it affects the weather conditions?
- What can we do for prevent the climate change?
- The pollution in our town (and in all our Earth as well) will conduct to an increasing of greenhouse effect gases. What will be the consequences and what we have to do to stop it?
- Is it possible to convert and recovery brown fields in green fields?

The Narrative

What did you do? Describe how you used the selected learning scenario in your teaching. For example, what was the structure of the lesson activities; did you make any adaptations to the resources? Did you include any online activities in the implementation? (maximum 200 words).

In Art lessons students worked on the following topics:

- Pollution and the greenhouse effect. Soil consumption VS urban regeneration;
- Virtuous conversion in the name of COLOR (Centrale Mazzoni) and GREEN AREAS (Emscher Park);
- Virtuous conversion in the name of "rationalist" (Tate Modern) or "expressionist" (Campus Luigi Einaudi);
- Virtuous conversion under the banner of ECLECTICISM (Les Docks de Marseille) and INDUSTRIAL GIGANTISM (Beghi Civic Library in La Spezia)”.

In Physics, in order to adapt the LS to the Italian curricular path, the radiation topic was connected to the "black body problem", students worked on comprehension and reflection activities through guiding questions and videos

<https://www.youtube.com/watch?v=z0PnF-0HFHQ> ,

https://www.youtube.com/watch?v=sUp_WZKZID4&t=61s ,

<https://www.youtube.com/watch?v=7hxYGaegxAM&t=6s> . Furthermore students

brainstorming was shared through the following Padlet:



https://padlet.com/carmelita_cipollone/500qea742xhp . Then students explored the Phet Colorado virtual lab experience on greenhouse effect and did a classwork. In Science (Biology and Chemistry) rather than the expected lab experiment on photosynthesis, was realized an activity on the role of CO₂ in the photosynthesis process.

The Collaboration Process

How did the collaboration with other teachers go? Please, describe how was working together with the other teachers and what was the approach to carry out the lesson(s). (maximum 150 words).

The collaboration was extremely interesting for all of us, as it allowed us to recognize the same rigorous approach in solving a problem both in art and in science subjects; our interaction was crucial both when we planned activities to be implemented and when we compared the achieved results. We worked in synergy, we shared a timetable to plan our activities and we managed to respect it. The collaboration, as happened last year, was fruitful and, at the same time, training.

Learning Outcomes

What did you achieve? Describe the main learning outcomes you achieved with the implementation of the Learning Scenario. Tell your reader about anything that supports your case for achieving these learning outcomes. For example, students' view, or any other evidence¹ that illustrates the benefits and impact of using this Learning Scenario? (maximum 300 words)

We got along well with the activity scheme suggested in the LS: group reflection activities, experimental group activities, individual reflection activities. Concerning contents, we managed in finding a suitable adaptation of topics and activities in order to coherently insert the LS in the curricular path planned at the beginning of the school year and expected for students attending the Italian Liceo Scientifico.

In our opinion the experimental approach is always successful, we appreciated the resources provided by the authors, they were well selected and developed.

We believe that one of the main learning outcomes concerns the opportunity to reflect on the importance of the consequences of the actions of the individual in the community. By sharing their reflections on the concept of sustainability connected with the territory and the environment in which they live, students realized how precious the soil and the atmosphere are, as irreplaceable assets of the inhabitants of the Earth and for the Earth itself. Here there are some learning products: <https://formazione.dascanio->

¹ Remember to refer to the point 6 of the guidelines.



my.sharepoint.com/:f/g/personal/carmelita_cipollone_liceodascanio_edu_it/EnCY73CjKmJDoFCRSY26cnsB3m2d1iKINsaGQAyaGTqhMA?e=bvkbZV

Teaching Outcomes

What did you, as a teacher, get out of teaching with a STE(A)M IT Learning Scenario and resources? How did the usage of the STE(A)M IT Learning Scenario go? What should teachers and students watch out for to make effective use of a Learning Scenario created to support the integrated STEM approach? Please also describe your experience in collaborating with teachers of other subjects. What was different from traditional teaching? What advice would you give to another teacher planning to implement the same Learning Scenario about the achievement of the desired learning outcomes? (maximum 300 words).

The STEAM approach helps in achieving knowledges based on real life experiences. In order to succeed, on one hand teachers must constantly have students feedback, on the other hand students are expected to actively participate with their curiosity and cooperation.

The main difference from the traditional approach is the overturning of the knowledge process, which in this case starts from the lived experience following the principles that regulate phenomena and processes. Our advice to teachers interested in the STEAM approach is to plan comparison and collaboration between teachers and with students, planning lessons for collaborative activities.

Challenges

Did you face many challenges? If yes, how did you address them? Tell us more about your implementation issues, obstacles (practical or in relation to your school's organization/resources/environment), communication and planning issues, lack of knowledge, attitude towards STEM, etc. What did you do to overcome these challenges? (max. 200 words)

The main challenge was to connect art and science subjects to the same topic. We realized that actually that is just a mental obstacle, due to the prejudice of the lack of communication between the humanities and scientific disciplines. We managed to overcome this difficulty changing our approach to knowledge, starting from the concrete analysis of a real situations, analysing which aspect are closely linked to Science and which one are closest to humanistic and artistic studies. We grasped thanks to the collaboration among us.

Another challenge we had to face was the Covid 19 emergency situation. We implemented the LS through online lessons in videoconferences on MS Teams platform; furthermore we



shared resources among us and with students and collected students homework through the Moodle platform www.formazionedascanio.it .

Thank you!

