Innovation in Climate Change Education

INNO EDU CO_2

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Newsletter #1

The e-InnoEduCO_2 project

"School Scence e-Learning ONE HEALTH" (e-InnoEduCO2) is part of the Erasmus+ programme under KA226 for the years 2021-2023.

Innovation in Education on Climate Change

Concello de Outes

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

SEPA Grupo de Investigación Pedagoxía Social Educación Ambiental

CESGA Centro de Supercomputación de Galicia

universidade de aveiro

Agrupamento de Escolas de Aveiro

XXVI LO im. K.K. BACZYŃSKIEGO

ALEXANDRU IOAN CUZA UNIVERSITY of IAŞI

www.innoeduco2.org

CONSORTIUM: Concello de Outes (Project Coordinator) / Universidade de Santiago de Compostela / Centro de Supercomputación de Galicia / Universidade de Aveiro / Agrupamento de Escolas de Aveiro / XXVI Liceum Ogolnoksztalcace / Universitatea Alexandru Ioan Cuza

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WHAT IS THE OBJECTIVE OF e-InnoEduCO$_2$?

e-InnoEduCO2 is a **STE(A)M** (Science, Technology, Engineering, Arts & Mathematics) project that is aimed at enabling students to develop innovation-related skills and competencies to compensate for barriers and deficiencies resulting from the COVID-19 pandemic.

Through the development and implementation of e-lab and e-eco models linked to augmented reality, the aim is to strengthen the capacity of educational institutions to provide inclusive and quality digital education in science.

LATEST NEWS:

THE FIRST TRANSNATIONAL MEETING.

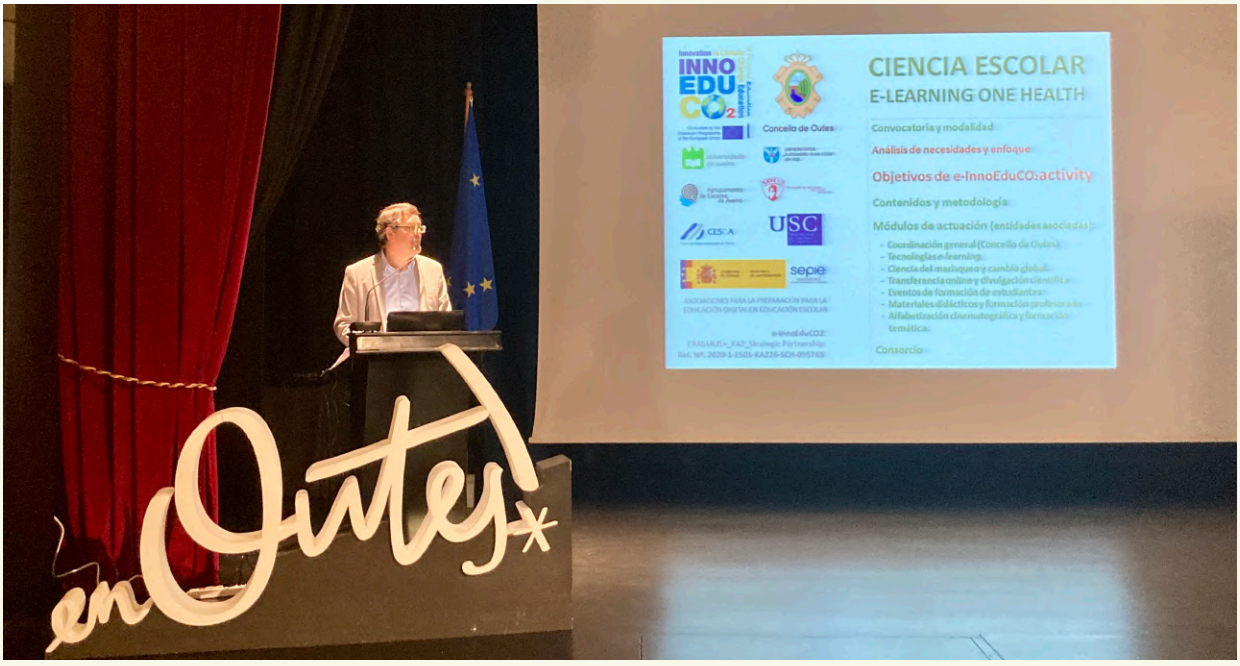
The first transnational meeting of the project took place in the Municipality of Outes (Galicia, Spain) on 3 and 4 June 2021. There, the partners reviewed the project objectives and agreed on the first steps to be taken. More information in the following link.

E-INNOEDUCO2 INFO DAY.

On 4 June 2021 the e-InnoEduCO2 Project was presented to the public in an event that took place in the Casa de la Cultura of the Council of Outes (the project leader). The event was attended by students and teachers from IES Poeta Añón in Outes and IES Virxe do Mar in Noia.

It began with the words of the Mayor of Outes, Manuel González. Then, José Antonio Caride, Professor of Social Pedagogy at the University of Santiago de Compostela presented the objectives of e-InnoEduCO2 and Francisco Sóñora, Director of the Climántica Project, presented the methodologies of e-InnoEduCO2. Afterwards, there was a brief presentation of each of the partners: the Universidade de Aveiro, the Agrupamento de Escolas de Aveiro, the Centro de Supercomputación de Galicia, the Universitatea Alexandru Ioan Cuza and the XXVI Liceum Ogolnoksztalcace.

The event concluded with the presentation of the 'Physics Show' by Fábrica Centro Ciência Viva of the Universidade de Aveiro.



PILOT TEACHER TRAINING COURSE ON INNOVATION IN CLIMATE CHANGE EDUCATION.

The "Seminar on Teaching Innovation on Climate Change" took place at Fábrica Centro Ciência Viva de Aveiro, University of Aveiro, from 3 to 7 September 2021 and was aimed at teachers from different educational levels in Portugal and Spain.

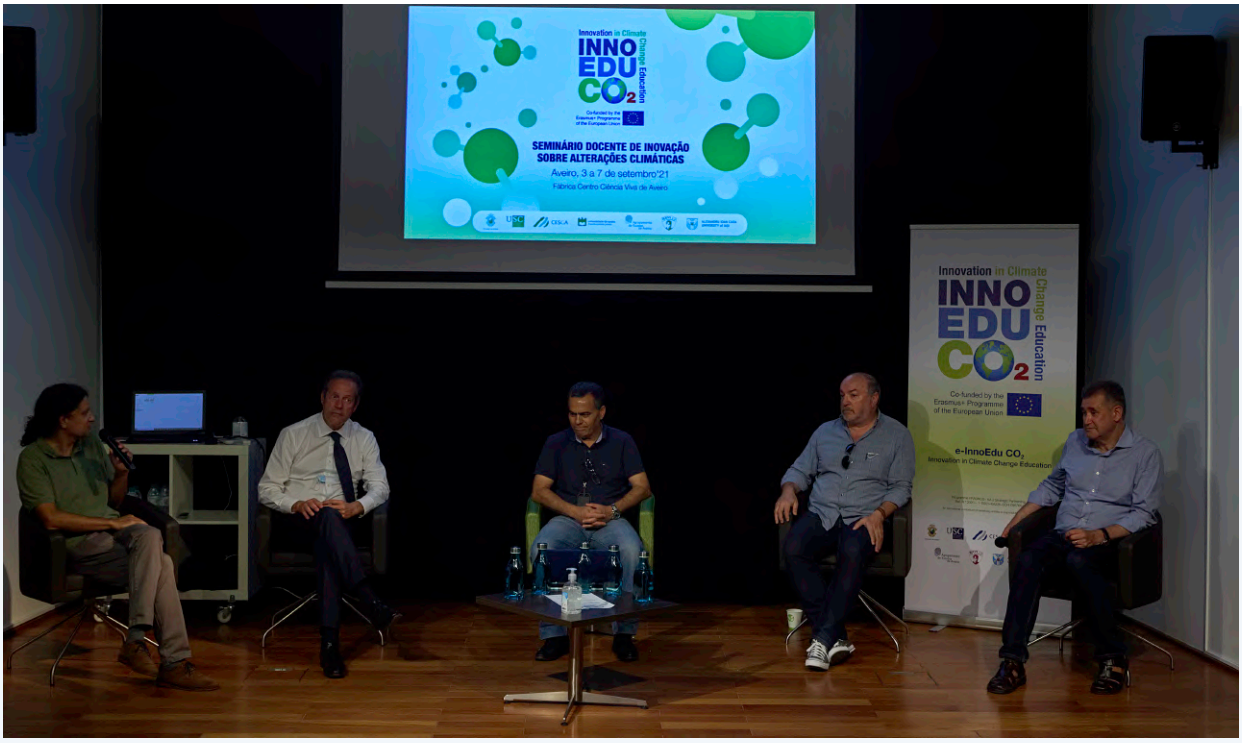
The aim of this event was to present methodologies, tools and strategies that allow the development of scientific dissemination projects and educational innovation programmes in a STEAM approach in order to communicate and raise awareness on issues related to climate change.

The inaugural session took place on 3 September, in the auditorium of Fábrica, and was attended by the Mayor of Aveiro, Ribau Esteves, the Vice-Rector of the University of Aveiro, Artur Silva, the Director of the Agrupamento de Escolas de Aveiro, Vitor Marques, the Director of the Climántica Project of Universidade of Santiago de Compostela, Francisco Sónora Luna, and the Director of Fábrica Centro Ciência Viva, Pedro Pombo.

The seminar, in hybrid format, was attended by 9 Spanish, 1 Polish and 11 Portuguese teachers from the Aveiro School Grouping, and 21 teachers in online format from 6 American countries: Brazil, Mexico, El Salvador, Panama, Argentina and Peru.

The scientific programme included a tour of Aveiro, with field trips to Costa Nova beach, Mira beach, São Jacinto Nature Reserve, the salt pans of the Ria de Aveiro and a visit to the Municipal Environmental Interpretation Centre, courses with environmental researchers and STEAM Workshops.

This initiative was integrated into e-InnoEduCO2 by strengthening the capacity of schools for STEAM teaching and training in Environmental Education, in order to provide inclusive digital education through the STEAM-ICT e-learning model, adapting distance learning to the curricular needs of scientific experimentation.

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AVAILABLE THE e-InnoEduCO2 e-LEAFLETS

The e-leaflets of the e-InnoEduCO2 Project are already published on the project's website.

In these e-leaflets there is a presentation of the general and specific objectives of the project, as well as of the consortium and the main results and mobility activities that will be carried out during the development of the project.

The e-leaflets are available in the following languages:

- Spanish.
- Gallego.
- English.
- Portuguese.
- Polish.
- Romanian.

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Ciencia escolar e-learning ONE HEALTH: e-InnoEduCO$_2$

ERASMUS+ KA2 Strategic Partnership

Ref. Nº. 2020-1-ES01-KA226-SCH-095765

Consorcio:

Concello de Outes
GALICIA, SPAIN

Universidade de Santiago de Compostela
GALICIA, SPAIN

Fundación Pública Galega Centro de Supercomputación de Galicia
GALICIA, SPAIN

Universidade de Aveiro
PORTUGAL

Agrupamento de Escolas de Aveiro
PORTUGAL

Universitatea Alexandru Ioan Cuza din Iași
ROMANIA

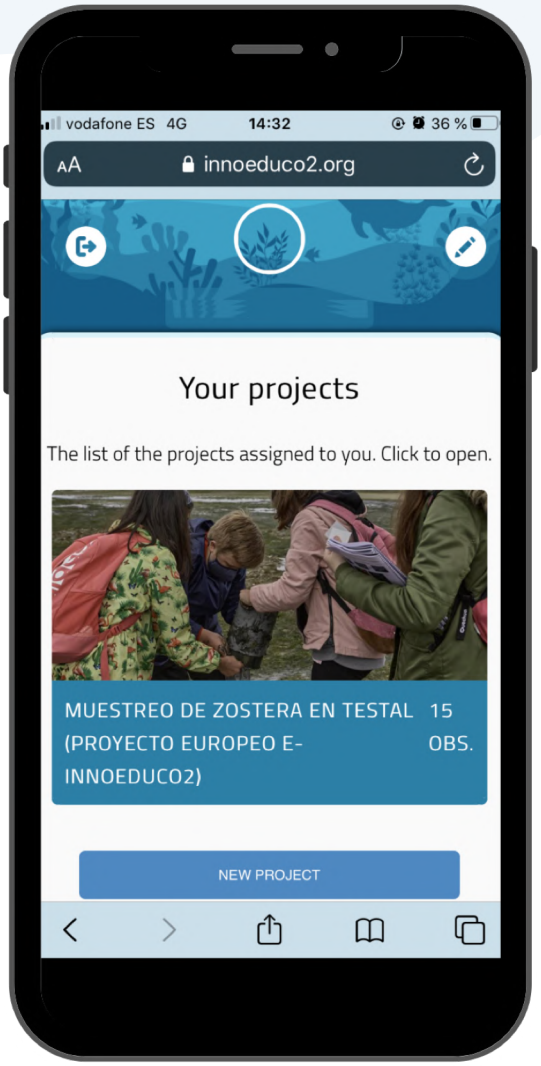
XXVI Liceum Ogolnokształcace
POLAND

AVAILABLE THE APP FOR COLLECTING SCHOOL SCIENCE FIELD DATA: e-INNOEDUCO2

The mobile application, developed by the e-learning division of the Galician Supercomputing Centre, allows the collection of all kinds of geolocalised multimedia data and real-time weather conditions for school science projects.

The development of the App, available in its first version since April, allows teachers to design a personalised school science project that benefits from structured and geolocalised field data collection.

Students, using their mobiles or tablets, can easily take data (photos, texts, numerical data, videos), which will also automatically collect the coordinates to geolocate the sample and the weather conditions at the time. This tool can then be viewed and downloaded for joint analysis in the classroom.



The App was tested in April, during the first pilot test of the project, investigating the status of the marine plant Zostera sp. on the Testal shellfish bank.

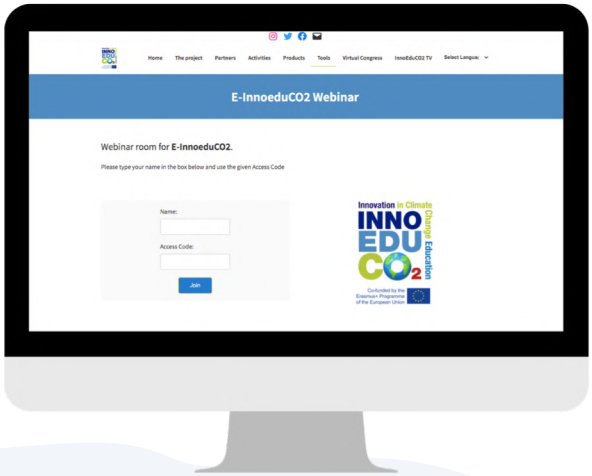
This test resulted in proposals for improvements and new functionalities that will be available in the next version in June.

The e-InnoEduCO2 App is available at www.innoeduco2.org/app/ in the PWA (progressive web application) format, which facilitates its use, installation and updating without the need to install it through the official Android or IOS shops.

DISTANCE LEARNING SYSTEM AVAILABLE

The tool for distance classes, developed by the e-learning division of the Galician Supercomputing Centre, is now available on the project's website.

The designed webinar system allows the broadcasting of remote classes with a chat system, a shared whiteboard and the possibility of recording the classes.



FIRST SCHOOL SCIENCE RESEARCH OF THE e-InnoEduCO2 PROJECT IN GALICIA.

First phase of the e-InnEduCO2 School Science model: fieldwork.

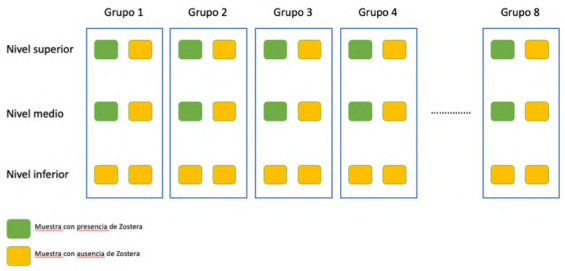
A group of students from the 4th year of ESO formed by 20 students from IES Poeta Añón in Outes and 19 from IES Virxe do Mar in Noia started on the beach of Testal on Friday 1st April the model research in the Atlantic of school science of the e-InnoEduCO2 project.

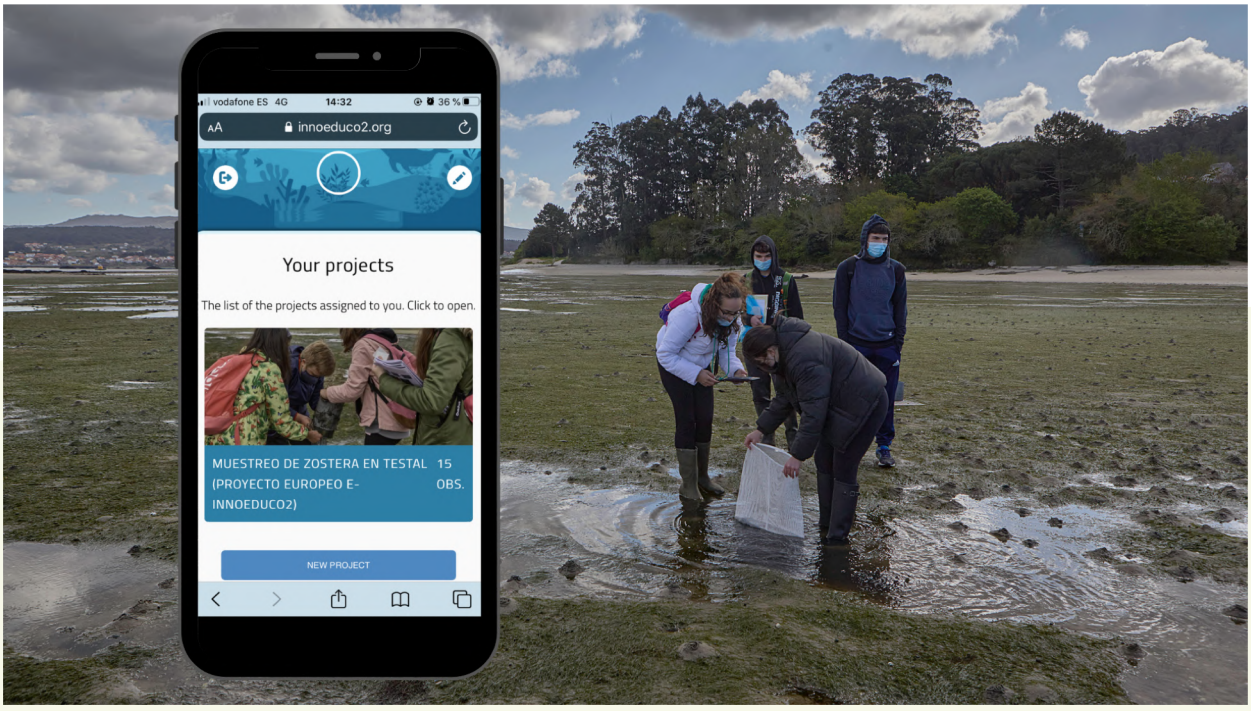
With this activity, students will explore the importance of seagrass meadows for fishing, shellfishing, climate change and human health. Based on this general idea, they will carry out research to obtain data and images that will help scholars of the oceans with seagrass meadows of the Zostera species to understand the function of these ecosystems, which provide us with benefits in the Atlantic, in the Baltic and in the Black Sea. The activity was coordinated by the University of Santiago and developed by the Faculty of Ecology of the University of Vigo and the pilot schools: IES Poeta Añón and IES Virxe do Mar. These two schools and the University of Vigo are the non-formal partners responsible for promoting the school science models.

The fieldwork began early in the morning of Friday 1st April with an explanation in the Noiés sandy beach under the direction of the Professor of Ecology of the University of Vigo, Dr. Emilio Fernández. Then, divided into 8 groups, the students took samples at three tide levels, analysing areas covered with Zostera vegetation and areas devoid of vegetation to demonstrate the ecological importance of this species.

To upload the data, the students used a mobile application located on the Erasmus+ project website (www.innoeduco2.org) where students upload the data obtained in the field using their own mobile devices. This platform was developed by the Galician Supercomputing Centre (CESGA), technological partner of the project.

Those responsible for the project at CESGA followed the development of the school research in situ, advising the students and taking notes to improve the app. Each group incorporated geolocalised information for later analysis in the IES laboratories, as well as videos and images of the main experimental details to be used in the online didactic material to be developed by the e-InnoEduCO2 Project.

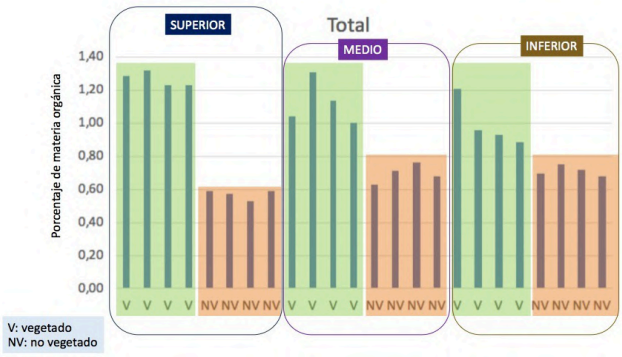




Second phase of the e-InnEduCO2 School Science model: laboratory work

a) Analysis of organic matter content in the plots studied, graphical representation and analysis by students

Prior to the work of the two schools in the laboratory at the University of Vigo, using the appropriate equipment, the percentage of organic matter in the sediments of the different samples was calculated. The data were presented in the following graph:



In the previous day's group discussion, prior to the laboratory work, they found clear differences in the organic matter of the sediment in the 3 zones based on the analysis of the graph: the upper zone has been little fragmented by human activity, the middle zone is already very damaged (fragmented by human action) and the lower zone has no grassland at all.

This analysis guided the students towards an ecological understanding of the need to maintain the grasslands without fragmentation. This analysis of the graphs allowed students to understand the concept of natural variability of measurements.

From this analysis it was discussed why less organic matter appears in the unvegetated upper part than in the other parts.

The students understood that it was because in these less fragmented grasslands the organic matter is less evenly distributed because the plants retain it effectively where they are, with less reaching where there is no vegetation in that upper area.

At the bottom, where there is virtually no vegetation, the organic matter is distributed evenly, which is why more organic matter appears in the unvegetated grassland at the bottom than in the unvegetated surfaces at the top. Thus, they were able to understand that the Zostera works like a comb retaining particles. Using the example of a comb, they interpreted a fragmented grassland as a comb with missing teeth. They took the opportunity to explain that isotope data have shown that the matter it retains is of planktonic origin, i.e. it does not accumulate either terrestrial matter or dead Zostera itself, but effectively combs the sea and therefore plays an important filtering role.

b) Analysis of the organic matter content in the plots studied, graphical representation and analysis by students

On 22 April, the samples that were defrosted the previous day were analysed. In this analysis, the animals associated with the Zostera were removed and, by placing the individuals classified by zoological groups on filter paper, it could be seen that where the grassland was less fragmented, the diversity of zoological groups was greater. The biomass was also separated and left to dry in order to calculate the dry biomass.

In the discussion of the results, a relationship was found between the decrease in plant biomass in the fragmented meadows and also the decrease in animal biodiversity with the greater fragmentation of the seagrass meadows.

Third phase of the e-InnEduCO2 School Science model: presentation of arguments with conclusions giving answers to the main research questions.

With the evidence from the field and laboratory work, each working group prepared a presentation to relate the data to the conclusions that answered one to four questions. The presentation was held on Friday 6 May 2022.

As 4 working groups were formed in each school, each group gave a 10-minute presentation on one of the above topics in which the context, hypothesis, objective, methodology and sampling design, results, interpretation and conclusions were presented. After each presentation, the teachers had 10 minutes to ask the group questions and pose challenges related to their research. The questions they answered were as follows:

1. Investigate the relationship between the existence of vegetation (both coverage and Zostera biomass) and the tide level (upper, middle and lower) on animal diversity (number of species) measured in the Testal. Which is the most relevant factor conditioning animal biodiversity? Please formulate an argument to justify your answer.

2. Which factor is more relevant to explain the organic matter content of the sediment: vegetation or tide level? Justify your answer on the basis of the data obtained. How could the results obtained be explained?

3. From the results obtained, explain the relationship between tide level and vegetation biomass for the following ecosystem services: habitat generation that supports biodiversity, provisioning (food: cockle/clam) and carbon capture capacity. Justify your answer and explain the reasons that, in your opinion, lead to the results you obtained.

4. Differences in the organic matter content of the sediments were detected between vegetated and non-vegetated areas. Are these differences significant? How do you know?

CALL FOR VIRTUAL CONFERENCE CLMNTK22-e-INNOEDUCO2

From 31 August to 4 September 2022, the V International Youth Campus on Climate Change CLMNTK22- e-InnoEduC02 will take place in Aveiro, in the framework of the Erasmus+ e- InnoEduC02 project. This event will bring together students aged 11 to 18, teachers and researchers from different regions of Spain, Portugal, Poland and Romania, as well as Latin American and African countries, seeking to find creative and educational responses to the problem of climate change.

The University of Santiago de Compostela (USC) and the University of Aveiro (UA), based on the collaboration of more than a decade through their platforms for scientific dissemination, share once again this challenge.

The international virtual congress CLMNTK22-e-InnoEduCO2, is now available for participation at: www.congresovirtual.climantica.org and applications can be submitted individually or in pairs, accompanied by their supervising professors.

The best projects will be selected and their authors will have the possibility to participate in this international meeting.

During the ONE HEALTH Campus, contents and methodologies that support the development of digital projects developed within the call will be addressed, as well as face-to-face workshops, guided tours, rehearsals and innovative training focused on empowering students to act against climate change. In addition, school science research will be carried out using the technological advances developed in the project.

Throughout these days, young people will participate in workshops on storytelling, singing, dance and theatrical and musical improvisation, visual arts, holography, school science, robotics, photography, video and social networks.

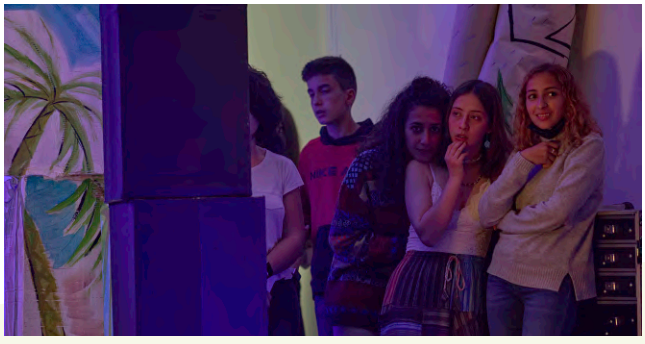
All this under a STEAM training programme that combines art, science and technology to raise awareness of the climate emergency among young people and research on educational responses to climate change.

As part of this International Youth Campus, students will be challenged to produce a musical performance combining theatre, music, dance and visual arts, as well as short films to raise environmental awareness on climate change and school science research.

Simultaneously to the campus, and embedded in the project, there will also be the "Teacher Training Seminar", accredited teacher training with workshops, field trips and symposia for face-to-face participants, and in online formats, with the use of the project tools, which enables the participation of other teachers in different countries.

The closing event, with the final presentation of the musical show and the short films produced by the students, will take place at the Renato Araújo Auditorium, in the Rectory Building of the University of Aveiro, at 11am.

This event will be open to the community, where it will be possible to learn about the work developed in this International Youth Campus under the Erasmus+ e-InnoEduCO2 project.



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