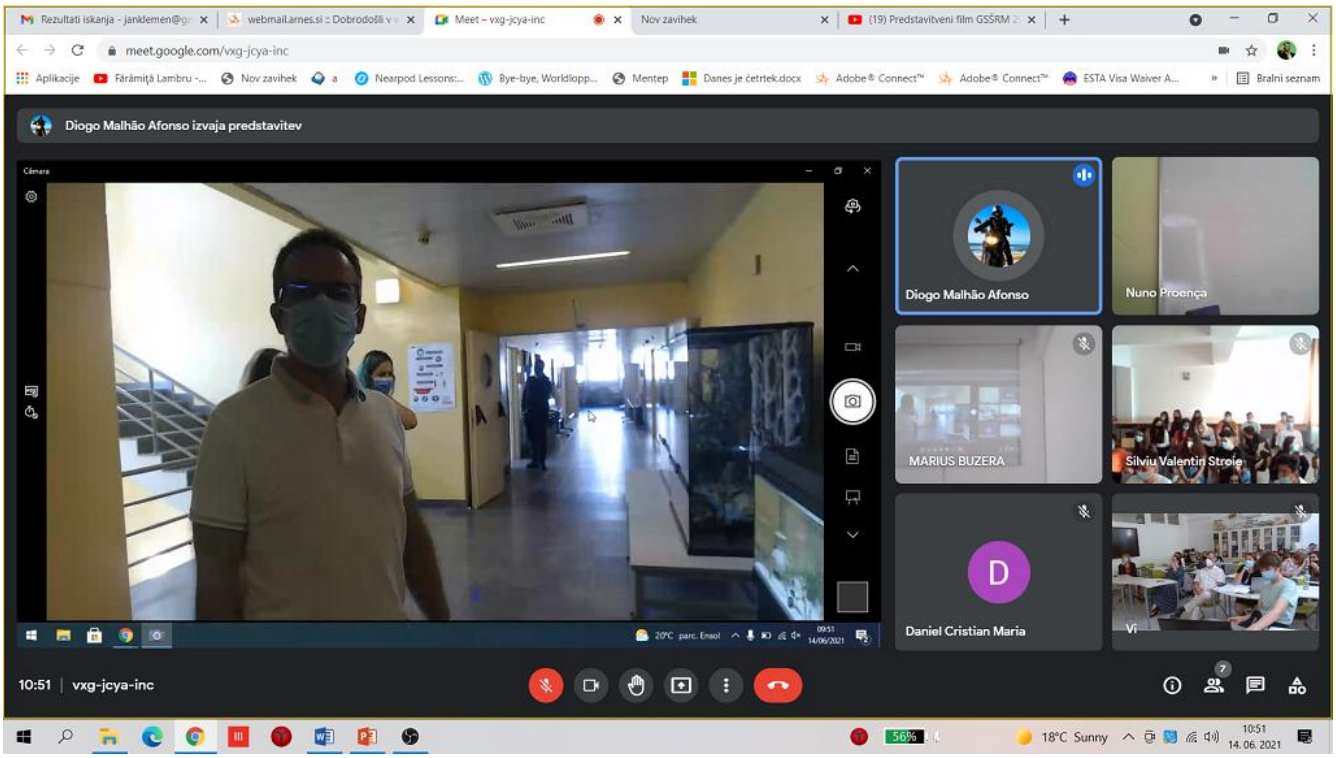
The activities of the C4 meeting were prepared during several online meetings that took place between January-June 2021. Also during this period, several preparatory activities were carried out that included both students and teachers, from the 4 partner institutions but also from other institutions such as Constantin Brâncuși University, Jiu Gorge National Park, Gorj Environmental Agency, specialists in the field of environmental protection from Kamnik, economic agents from Lisbon.
Given the situation caused by the Sars CoV2 virus and the fact that it was decided to hold a virtual meeting, a larger number of students and teachers from each unit were involved, and to respect the principles of digital pedagogy, during the activities students received different tasks and were grouped into several mixed teams, coordinated by teachers from the 4 partner institutions.
Due to the large number and the difficulty of the activities within the C4 meeting, the students having to go through a learning unit that capitalizes transdisciplinarity and integrates technology, they were previously trained for several months to know the laboratory equipment and technologies to be used.

## 1. Monday 14/06/2021

Participants were welcomed in a previously scheduled virtual room on Google Meet. Initially there was the presentation of the Portuguese school, and then all the participants from the other schools presented themselves. The partner institutions made multimedia presentations describing their educational institutions, using videos and photographs.
Following, a virtual tour was carried out by the host institution to show the school, it's facilities and the rooms where the activities would take place in the coming days. Portable cameras and computers were used, with some concern in detailing the different spaces of the school, since the session was virtual.
The coordinator of the Portuguese school made a presentation of the activities that will take place during the mobility week. A week focused on the theme of water quality, the use of digital collaborative work applications, and cultural activities to make our culture, language, and gastronomy known.
In the afternoon, the participants (teachers and students) were distributed in four online rooms to organize and work on the following themes: Press Conference; Lab Activities; Reporters Journal; and Cultural Room. Simultaneously, there was a coordinators meeting.
Students from each partner (working in a team) were given additional tasks to ensure the visibility of the project by writing a daily journal of activities - posted on a Padlet account, daily information posted on partner websites, and on the project website, preparation of articles for the local press and for the magazines of the 4 institutions. Also, they prepared daily movies

with the activities of the project, which were uploaded on youtube channels, the facebook pages of the institutions and participants.

*Slovenian team in the main classroom during the video conference*




*Google Meet as the working environment – presentation of the Portuguese school*

## 2. Tuesday 15/06/2021

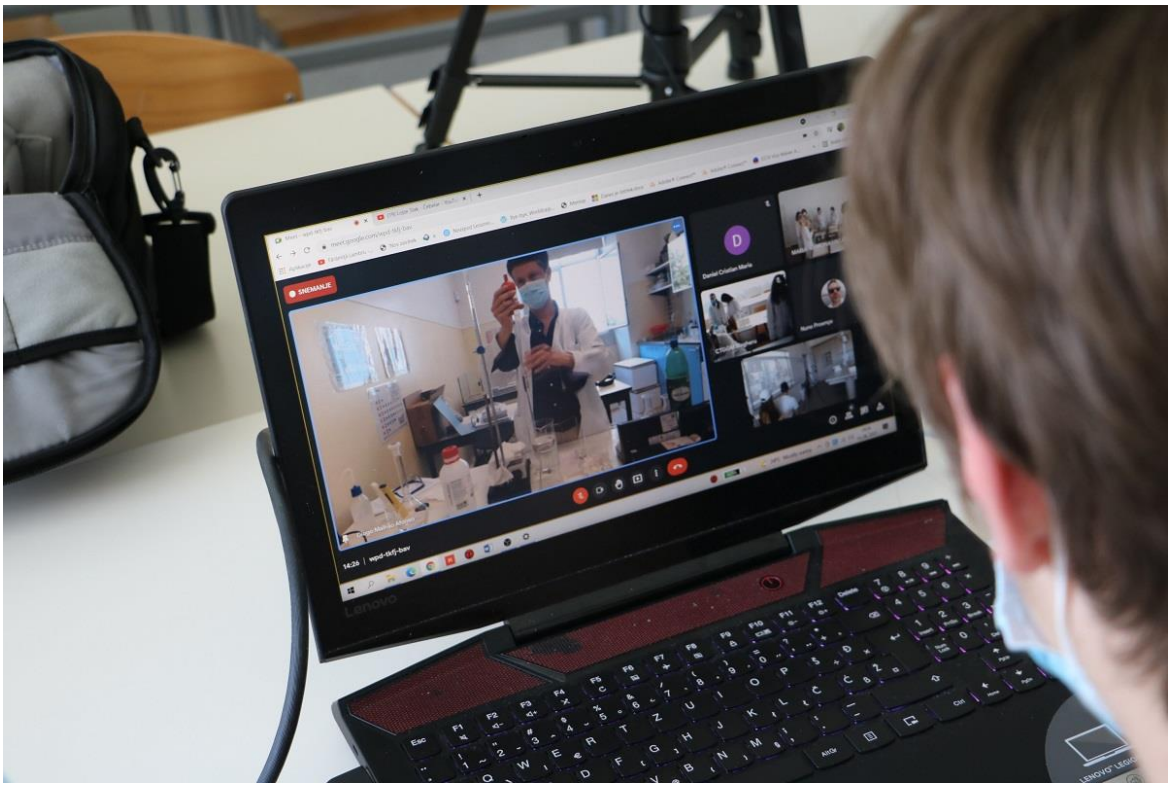
In the first part of the day the participants from partner schools took water samples on site, from lakes or rivers near their schools. Partner schools used different technologies, apps and devices. The activities were broadcasted live and all participants could follow the other's activities in a shared learning environment. In Portugal, the morning classes of the environmental studies course attended the video broadcasts as a learning moment.

In the case of the Portuguese school, water was collected from the Tagus River. Some students and a teacher left the school in the morning, with the appropriate KIT for analyzing different water parameters, with a camera and a laptop, to make live footage, both from the route to the collection point, as well as for demonstrate some analysis carried out by the river. Enough amount of water from the Tagus River was collected to bring to school to continue to identify other physical and chemical parameters (pH; NO2; NO3; hardness; conductivity; and others).

In the case of the Slovenian school, water from Kamniska Bistrica River was analyzed. All students and teachers left the school except part of the Reporters group, who followed the field broadcasts, recorded them and captured some screens for the later official reports. The first point was the fish pond in the upper flow of the river. About 20 water parameters were measured, some with removable Visocolor pack and others with the Vernier instruments. The samples were collected for the analyses in the laboratory. The second point was in the park just before the Kamnik city centre. The similar actions were done. The Reporters group transmitted the video in the common videoconference, recorded the bird view video using the

drone and took some photos. In the school Slovenian group added to the collection of samples for laboratory analyses the following ones: tap water, bottled water and aquarium water.
In the case of the Romanian school, the sampling and field analysis activities took place on the island of the Jiu River and followed on one hand, the determination of the same parameters as in the case of the other partners but with different equipment, and after the analysis, in the stage of presenting the results to be debated the possible differences. Specialized kits and mobile applications were used that can be used in the Mlearning process such as (Hanna, Visocolor, JBL Pro Scan, pH paper, pH meter, conductometer, mobile phones, drone). Arduino equipment and sensors were also used to determine temperature, humidity, air quality and noise level.
In the early afternoon, Professor José Rito, from the Portuguese school, made a laboratory presentation session on procedures for analyzing the chemical parameters of samples water collected in the morning.
In some online activities, teachers and students from partner institutions performed laboratory analyzes, using classical equipment and procedures, on the water samples collected in the morning, but also on the water samples collected from the tap and bottled still water sold in shops. The students briefly presented the results obtained during a conference. The students responsible for the dissemination of the activities wrote the diary of the day, articles for the local press and the film of the day with the activities carried out.

*Taking samples from Kamniska Bistrica River*



*Following the Prof. José Rito presentation*


*Laboratory analyzes of water samples*

## 3. Wednesday 16/06/2021

The first part of the day was dedicated continuing to carry out activities to the analysis of other water samples (river water; bottled water; fountain; aquarium water; tap water, water from the pond, among others) in online. Afterwards, and still during the morning, a presentation of the aquariums and paludariums, presentation of animals and plants in each of them and all procedures for maintenance and control of these artificial habitats, for the survival of the species, including water and environment specifications.

The students and teachers from the Slovenian school visited the Water Festival in the Kamnik Main Square early in the morning. Only some student reporters stayed at school and followed transmitted activities on the other participating schools. Students tried samples of spring water around Kamnik and filled in the special questionnaire about the quality. Teachers had meetings with the journalists from Kamnik and abroad. All together did and an interview with the biologist, an expert for more complex spectrophotometric water analyses.

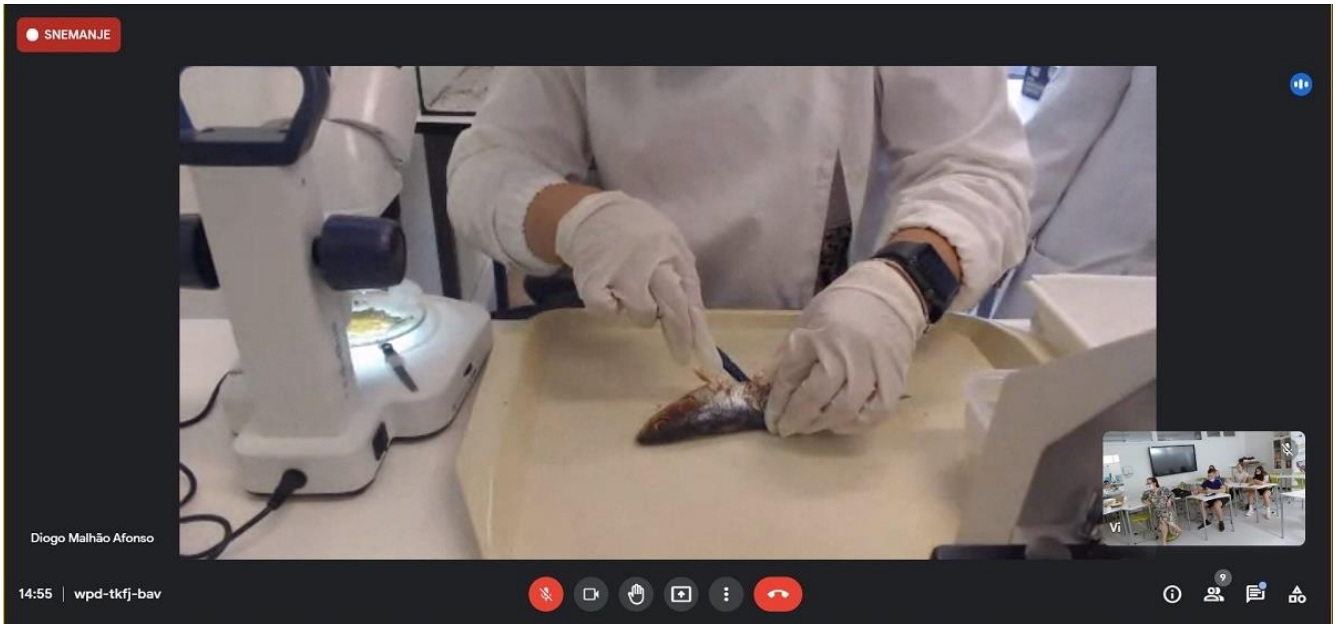
The Romanian students worked in the two chemistry laboratories of the institution, equipped with a video projector and a video camera in order to be permanently connected with the rest of the partners. They also prepared the diary of the day, the film of the day and other articles for the dissemination of activities.

After the lunch break, students at the Portuguese school, began presenting end-of-course project works or internship works in external entities, on a broad number of topics, related to environment protection.

Student André Silva presented an internship work carried out at the Center for Marine and Environmental Sciences of the Faculty of Sciences of the University of Lisbon, about Environmental Monitoring in Aquatic Ecosystems - Estuaries. Student Bruna Gameiro presented the end-of-course project: Endangered species – Iberian Lynx. Student Inês Sobreira did a laboratory session, where she opened a fish in search of microplastics. The presentations led to debates about similar activities carried out in the partner's countries and became a special learning moment for all participants.

At the end of the day, the students working together prepared the materials for presenting the results and conclusions obtained, materials for presenting the traditions and promoting the activities.

*From Water Festival in Kamnik*




*Finding microplastic in the fish*

## 4. Thursday 17/06/2021

In the first part of the day the participants presented the results of the analysis of different water samples and discussed results. Citeva din lucrarile prezentate: Device for assessing air quality, determination of temperature and atmospheric humidity and noise level, Volumetric methods of analysis for the determination of Calcium, Magnesium and Total Hardness, Using conductometer and pH-meter to determine conductivity and pH of drinkable/non-drinkable water, Using JBL PROSCAN App. determine chimical and phisoco-chemical properties of drinkable/nondrinkable water, Determining the water parameters using the Visocolor Kit**.**

After reaching conclusions and with all the sharing and learning elaborated, Quizzes and reports tasks were distributed.

After the lunch break, students at the Portuguese school, continued presenting end-of-course project works or internship works in external entities, on a broad number of topics, related to environment protection. Student Bruna Gameiro presented an internship work on water usage in urban green spaces. Student Diogo Afonso presented his end-of-course project: Renewable energies with fuel cells and hydrolysis. Finally, student Eliana Proença presented her end-of-course project: CBO water quality.

At the end - there was a question and answer session in which students and teachers from the partner institutions asked questions and a series of debates took place.

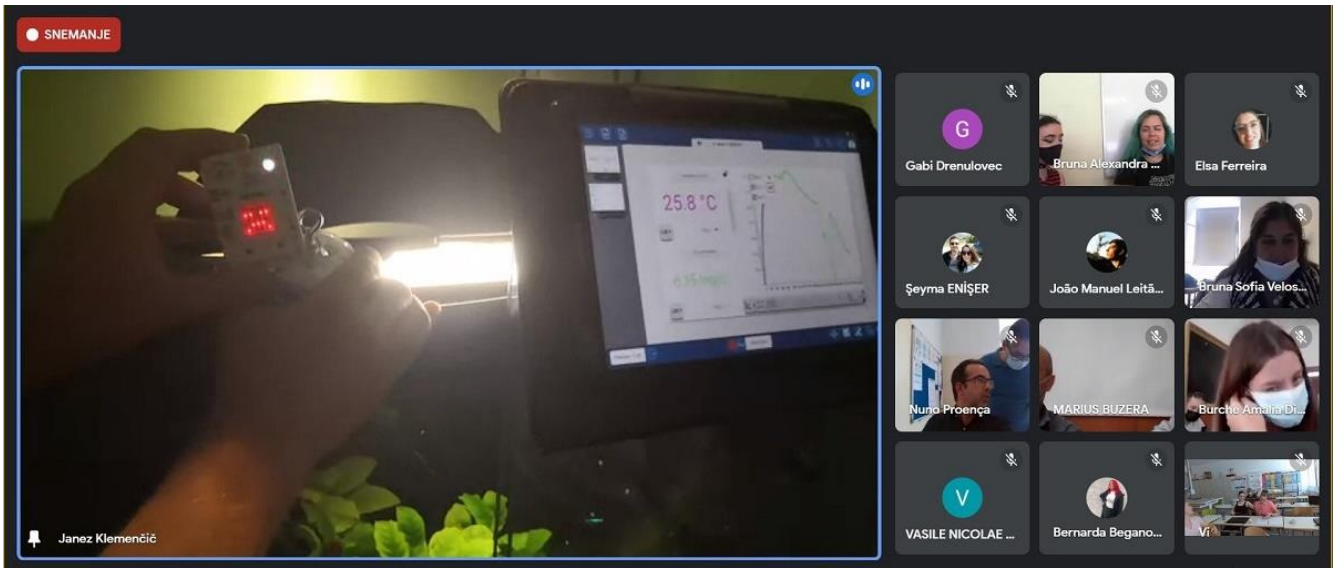
Slovenian group presented, how to use Pasco code.node microcontroller for the measurements of the temperature and the dissolved oxygen in the aquarium water, important for the living conditions of animals. Second group presented the activities and photos from the Water Festival in Kamnik last day, while the third group our involvement in the environmental project Pirates of plastic together with German, Italian and Portuguese schools.

The Romanian partner presented some of the results obtained in the process of integrating Mlearning activities and integrating its own technology in the classroom (BYOD) in the teaching / learning / evaluation activities of tehnical subjects.

The students made the diary of the day, the film of the day and other materials and information. At the end of the day, they prepared the materials for the cultural preparation.


| NR.crt | Water | pH paper | pH-meter | JBL |
|---|---|---|---|---|
| 1. | River water | 8 | 8.30 | 7.6 |
| 2. | Fountain water | 7 | 6.8 | 7.4 |
| 3. | Aqua Carpatica | 7 | 7.2 | 7.6 |
| 4. | Smart Water | 7 | 7.5 | 6.0 |
| 5. | Dorna | 7 | 7.5 | 7.8 |
| 6. | Tap water | 6 | 6.3 | 7.0 |

*Presentation of water analyzes results*




*Measurement of temperature and dissolved oxygen in the aquarium water with Pasco code.node instrument*

## 5. Friday 18/06/2021

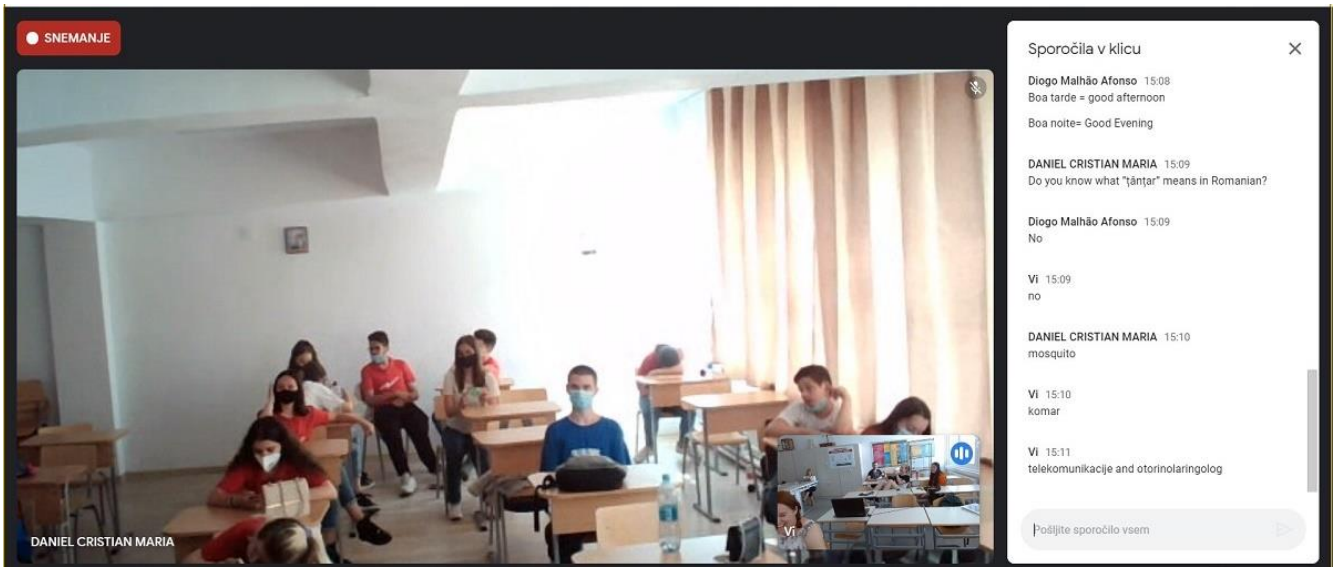
In the morning the participants did an evaluation activity: A Kahoot! quiz for students with multimedia content was used, it had over 50 participants. The themes of the questions were about water quality, apps, devices, collaborative work applications and cultural, language and gastronomy of the participant.
After that, each partner school showed a presentation of its culture and country.

After the lunch break cultural activities began: Learning Portuguese and comparing different cultures. Participants learned some Portuguese words and sentences and discussed differences and similarities in their cultures and habits.
The week ended with a farewell to all participants.
The students prepared materials for the journal of the day, the film of the day, but also materials and information for the partners' websites, the local press.
After the farewell, the coordinators had an online conference. aspects related to the week of activities, forms of dissemination and the results of the project were discussed.

At the end of the 5 days of activities, but also of many other days of preparation of these activities, resulted an impressive number of materials to be capitalized by the partner institutions in their instructional process but also to be prepared to be disseminated among other institutions in the partner countries.

For your consideration.
Written by Nuno Proença, project coordinator


*In the national folk costume*




*Cultural exchange – learning words and phrases*


*Cultural group*

*Group of reporters*


*Farewell at the late Friday afternoon*