Robotics and Environment

Project title:	Robotics and Environmen
Teacher:	Despoina Pavlidou
Key words (max 5):	Policies, Energy, EU priorities, sustainability
Aims:	We wanted to expand the scope of our two Robotics teams. They are mixed teams of different level of expertise, boys and girls that use Robotics in order to solve real, actual problems a community may have. During the previous years, they worked on the topic of city waste and they have created a recycling bins with functionalities that would ensure maximum capacity, in-time collection, protection of citizens and assistance to citizens with physical disabilities. The project took more than a school year to complete but also got them thinking of the potential robotics present with students in solving more problems. It should be noted that we promote open license Hardware and Software and create our own tutorials as Open Educational Resources that can be shared within the community.
Learning outcomes:	Students were trained to work in groups in order to tackle issues. We have been equipping our school with funds that came from programmes we have been involved in for many years and we have trained staff & students in using technology to assist learning even when we could not be physically present at school. We have managed all that thanks to the European orientation and extrovert policies of our school. We have Robotics teams of different level of expertise, boys and girls that use Robotics to solve real, actual problems a community may have. They have been working on the topic of city waste and they have created a recycling bins with functionalities that would ensure maximum capacity, in-time collection, protection of citizens and assistance to citizens with physical disabilities. We have been using the Twinspace platform for all our previous and current programmes and teach students to use its tools efficiently.
Components of competences developed:	Students need autonomous training opportunities and this was an excellent one. Working in groups, they started with an everyday actual problem in order to solve it. Their problems stemmed from local issues and can grow in time. What was paramount was training to get information and establishing the appropriate routes of communication.
Materials:	We had a limited budget that was usually covered either by the Local Board of Education-a committee or when they managed to win a competition and supplies were usually given as a prize. It should be noted that Robotics are part of some school lessons in Informatics,

	Science classes and Foreign Languages. So far, we have been using small kits for our students and could not produce a permanent Robot since the equipment and materials need to be reused. We have created a Google Classroom in order to gather and disseminate materials within the team and we have been using WebEx to communicate during the pandemic.
Preparation:	Students were divided into groups and took on a responsibility. We needed teams in design, construction, mechanisms, coding, documentation and presentation. Students could join more than one group as long as they had the time. There was a group leader and a coach. The coach was actually an older student from C class that had been the group leader of the previous Robotics team and assumed coaching duties. There was plenty of material for the team to review and talk about during virtual and physical meetings. They drew plans, organized the material and came up with solutions to the problems that had come up. They built the robot and further documented their progress creating a series of videos as part of Open Educational Materials created and offered with Creative Commons license.
Resources:	You Tube tutorials GitHub repository Google Classroom eClass-3lyk.veroias Arduino forums https://www.euandu.eu/ http://www.europeanschoolnetacademy.eu/web/guest/courses
Tips for expected difficulties:	Students will probably insist on working with their friends only and may resist forming groups with others. However the educator should formulate groups with proportionate dynamic so that all fields of research can be covered. During the pandemic, students can work virtually but building the robot may have to wait until April 2021. Thanks to their dedication we had it up and going just in time for the dissemination activities.
Instructions (step by step):	Step 1. Form the teams. Disperse material and give guidelines. Present the timeline of the project. Answer questions. Step 2. Show them how to keep a project diary in a Google doc so they can attach it in the Google classroom. Teach them how to tweak security levels in Google drive.

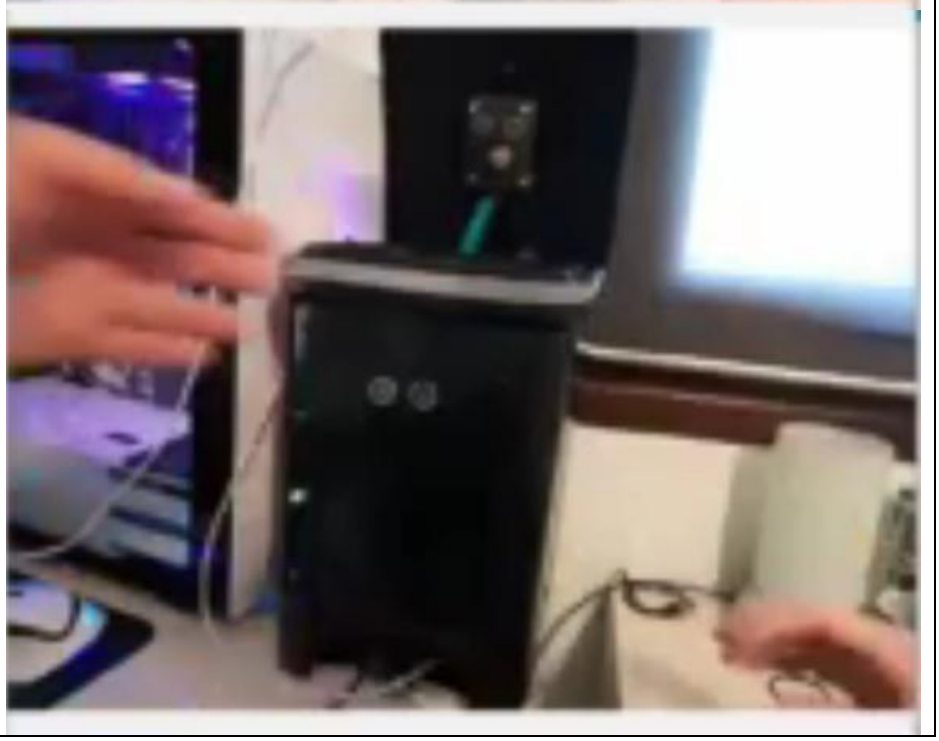
	Each team selects the area they will work in. Present the resources to the class, agree on the timeline of the working progress. Step 3 Help groups organise their work: through virtual and physical meetings, tutorials and demonstration. Step 4. The presentations will be reviewed and corrected if necessary. Students inform each other on their progress. They build the robot and complete all phases of the documentation. Step 5. After presenting the project to the whole school, we will present a simulation in the local City Hall, aided by the local T4E Ambassador with officials and parents invited to attend. Step 6. Students should be encouraged to take part in National Robotics competitions and Conferences.
Debriefing:	Students worked in a differentiated learning environment and were taught how to employ communicative, research, evaluation and presentation skills and abilities. They were in charge of the quality of their work, respect timelines, focus on problem-solving techniques and decided on the best ways to showcase their own work and progress. It was also an opportunity to reflect on the future of the EU and detect issues that have not yet received enough attention and should become the focus of future research and discussion.
Evaluation:	Our teams exchanged ideas, participated in virtual meetings and formed a plan. The teachers assisted them in every step of the way. Then they completed an inventory of what equipment they already had and what they needed. However, there is a long distance to cover between planning and implementation. They needed an original idea and a way to materialize their plan. We kept regular meetings, recorded our progress, produced Open Educational Resources and presented our Robot in local, regional and national held Conferences.
Dissemination of results:	We believe in transparency and social awareness, so we encourage participation in actions undertaken by the local City Council, and we maintain a school site with several hundred thousand visitors, hosting information on activities, competitions, regulations and Calls for

	action by various organisations. Some of our former students can find it an excellent opportunity to include the projects as part of their post-graduate research since we will be able to distribute questionnaires and do follow-up activities planned and implemented under both our guidance and assistance. Our school can help both current students as well as former ones. We build strong community bonds this way.
Social media:	We used our school's site at http://3lyk-veroias.ima.sch.gr/autosch/joomla25/ the eTwinning platform where we host another project and the school's Facebook account. Part of the presentations was uploaded in our school's YouTube channel.
Project Results	Our teams logo:  Our Team's Poster:


ΠΟΥ ΘΑ ΚΑΤΑΛΗΞΕΙ ΑΡΑΓΕ...
Canva
SYN
THE
SIS
Φτιαγμένο για να φτάσει μακριά. Που θα καταλήξει όμως στο τέλος και πως ενδιαφέρει όλη τη γη..Γι'αυτό στο 3ο ΓΕΛ Βέροιας, η ομάδα μας δημιουργησε τον (i)Bin

Our lab:


i-Bin
SYNTHESIS
3οΓΕΛ ΒΕΡΟΙΑΣ

	Photos of the i-bin:  

	
Open Educational Resources	Our proposed circuit plan: