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Track Your Atmosphere: Enhancing Digital and Environmental Competences by Developing Open Educational Resources for Technical VET.

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Introduction

In the framework of the ERASMUS+ program Key Action "Cooperation for innovation and the exchange of good practices" with an Action Type "Strategic Partnerships for vocational education and training", our project **Track Your Atmosphere (TRYAT)** was approved in august 2017 and is co-funded by the **EU**. The projects total duration is 35 months and the Kick-off meeting was held in Berlin on 18-20 October 2017. The participants to the project are teachers, researchers and the students (about 400) from three vocational schools and Research/University Institutes in Italy, France and Germany.
TRYAT combines Global Navigation Satellite Systems (GNSS) and monitoring of environmental data for Vocational Education and Training (VET). Permanent GNSS stations currently operate for geodetic purposes, e.g. earthquake and volcano monitoring. We want to capitalize and vulgarize the fact that they also offer a tool for a reliable remote sensing of atmospheric water vapour. In fact, due to the presence of water vapour in the troposphere the satellite signal is delayed. This enables us to compute the precipitable water, which as greenhouse gas plays a key role in weather forecast and prevention from extreme weather events.
In TRYAT the students become part of the measurement campaigns, in building their own low cost GNSS receivers & Meteo station as well as in evaluating & interpreting the collected data. The project is thus building bridges from forefront research to practical activity-oriented learning and from scientific measurement and analysis to open knowledge citizen science.
We think that the combination of a modern GNSS technology, present in every smart phone, and the use of real-time environmental data obtained for present research purposes are highly attractive for both students and teachers.
The objectives of our project are aimed at empowering VET learners in the fields of physics, electronics, electrical engineering, geo- and environmental engineering and ICT by means of an interactive learning platform and innovative learning materials.
The project includes 5 intellectual Outputs (O1 ÷ O5), each of them is illustrated in the following boxes.

O1 - Learning Plattform

Activity Leading Organisation:
Helmholtz Zentrum Postdam DeutschesgeoForschungsZentrum, GFZ

Start Date 01 – 11- 2017 **End Date 31 – 08 - 2020** **Languages** English, Italian, French, German

The Learning Web Platform is an interactive and versatile tool for our project goals. It helps learners, teachers, researchers and other involved personnel to crosslink, enhance intercultural teambuilding and work and learn together on the related technological and environmental issues.
The platform gives access to online real-time and archived data, online maps, evaluation and graphical visualization. Students can connect their home-made kit and the geodetic professional GNSS stations (ref. O2) throughout the platform and exchange geoinformation data.

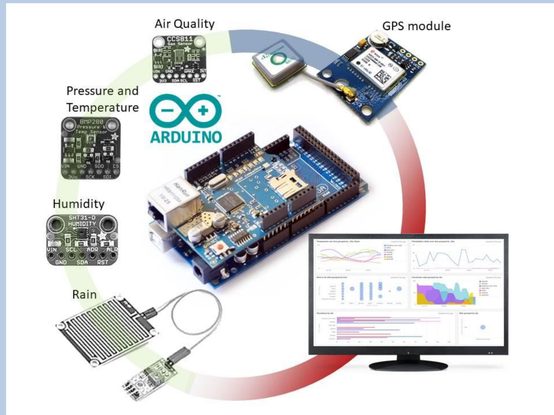
Today the Project webpage is online under http://tryat.osz-lise-meitner.eu/

O2 - Starter Kit and Installation Guide

Activity Leading Organisation
Istituto Nazionale di Geofisica e Vulcanologia

Start Date 01 – 03- 2018 **End Date 30 – 06 - 2019** **Languages** English, Italian

We propose a starter kit for the development of a system to acquire and manage data provided by a co-located GNSS & weather station. This approach gives the opportunity to test not only the technology, but also the concept in itself.
The idea of using Arduino offers the most flexibility for the cost. Once we built the kit, we plan to jointly install the home-made tool with a geodetic professional GNSS station, which is routinely used for studying ground deformation. An installation guide will be prepared for both GNSS and meteorological stations. Data collected with both stations will be first validated then analysed (ref. O1).



O3 - OER Learning Material 'Physical and Technical Foundations'

Activity Leading Organisation
Lise Meitner Schule

Start Date 01 – 10- 2017 **End Date 30 – 06 - 2019** **Languages** English, German, French, Italian

O3 is an interactive physics course where students learn the foundations of three relevant fields of the project: satellite technology, propagation of waves and physics of the atmosphere. The corresponding competences are elaborated for the use in different VET curricula. Students perform experiments with laser, microwaves and mechanical waves. They make measurements with their own Smartphone using the built-in sensors and the camera for documentation. They evaluate und present their measured data. Students learn about the socio-economic dimension of the addressed fields and describe and assess the importance of international cooperation for sustainable development.

O4 - OER Learning Material 'Informatics and Electrical Engeneering'

Activity Leading Organisation
Lycée Saint Cricq

Start Date 01 – 10- 2017 **End Date 31 – 12 - 2019** **Languages** English, German, French, Italian

We will develop an interactive learning unit ("learning environment") with focus on informatics and electronics. While in O2 the hardware (Arduino and sensors) and the server structure is readily given to the student (which makes it easier to try and modify the starter kit and data collecting) here the students are given just a problem, namely the collecting of environmental data. This problem is given to them in the form of an order from industry "Monitoring of renewable energy plant – measuring wind and sun strength as well as the electrical power".

O5 – Educational Video

Activity Leading Organisation
Helmholtz Zentrum Postdam DeutschesgeoForschungsZentrum, GFZ

Start Date 01 – 08- 2018 **End Date 30 – 08 - 2020** **Languages** English, German, French, Italian

The best way to interactively advertise the results of this project is through the visual media. For this we intend to create a series of videos in all the official languages of the participating countries. The videos will be up to 5 minutes long and will cover the scientific methods, used in order to achieve the results of the project, as well as the results themselves, and the work of the students to achieve the results. Different subtopics will be presented in short videos, as a desirable way of dissemination. Students from each of the participating institutions will take part in the process of the video content creation, as well as in the voice recordings in their languages. The Learning Plattform (O1), as well as YouTube (with a dedicated channel under CC BY license) are going to be the primary source of distribution of the results of this Intellectual Output.

Conclusions

Through the Open Educational Resources (OER) and especially the Learning Web Platform the outcomes of the project will be disseminated Europe-wide. This hopefully will lead to an intensive exchange and discussion within the communities of teachers, instructors and companies that provide professional training as well as implementation of the contents in the national curricula.