PULCHRA

Participatory Urban Learning Community Hubs through Research and Activation

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D7.1 City Challenges Platform

WP7	Design, development and population of the City Challenges Platform [including the web visualization platform and the app)]
Due Date	31/08/2020
Submission Date	12/10/2020
Responsible Partner	NKUA
Version	1.0
Status	Final
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Dissemination Level	Public

Table of Contents

Executive summary

This document is the report that supports Deliverable 7.1: City Challenges Platform of the PULCHRA project. The report describes all steps taken and stages implemented for the design, development, launch and release of the PULCHRA City Challenges Platform.

Version History

Version	Date
1.0 - Final	12/10/2020

1. Introduction

The PULCHRA project explores the open schooling concept in the theme "Cities as urban ecosystems", in view of creating new partnerships in local communities to foster science education for all citizens. Schools, in cooperation with other stakeholders will become agent of community well-being, taken that the theme to be explored encompasses the natural environment, the built environment and the socio-economic environment in cities.

The PULCHRA project is based on exploring selected themes (City Challenges) in an open school environment aiming to create know-how, built trust in the science approach based on own experience, facilitate skilled use of tools and support community building as they are based upon the identity of the communities in which they take place. The City Challenges Platform (hereafter Platform) is developed to facilitate the exchange of information and ideas between schools, stakeholders and partners of the PULCHRA network, promoting the open-schooling participatory focus of the project.

Work Package 7 aims to define the requirements of the City Challenges Platform in order to support open schooling and collaborations in science education, designing and developing the City Challenges Platform and app and populating the City Challenges Platform.

This document is related with Tasks 7.1, 7.2, 7.3 and 7.4 of the Work Plan. Task's 7.1 objective is to define the requirements of the City Challenges Platform in order to support open schooling and collaborations in science education. Task 7.2 is related to the development of the City Challenges Platform. Task 7.3 aims to populate the City Challenges Platform. Task 7.4 is related to the design and develops the Web visualization module aiming to develop web interfaces for project participants. This visualization platform will be amenable to young students, educators, scientists, members of civic groups, environmentalists, etc.

The development of the Platform was subcontracted to an external company as foreseen in the Grant Agreement and refers in particular to Task 7.4, although the subcontractor will also take care to secure the needed compatibility between Tasks 7.4 and 7.5 (the latter, the development of the mobile App of the project is developed by partner Corallia). In terms of Task 7.4, the technological and IT development of the City Challenges Platform needs specialized expertise and thorough knowledge of the IT tools which can support a flexible, open and interactive to the extent possible Platform.

All stages for the design, development, launch, test and final release of the PULCHRA City Challenges Platform are described in detail in the following sections of this document.

The stages of the City Challenges Platform Development are:

a) Planning - Definition of the Requirements
b) Technical specifications
c) Backend Development
d) Frontend Development
e) Testing
f) Preparing Launch
g) Release

The PULCHRA City Challenges Platform can be accessed at:

https://platform.pulchra-schools.eu

2. Planning - Definition of the Requirements

The Planning phase is the first and most important step of the Platform development process. During the planning phase, the development activities are defined, the timeline is created and the project team members are selected. The definition of requirements is the most important activity of this phase.

NKUA as the leader of WP7 and the responsible partner for this deliverable initiated the discussion about the definition of the development activities and all partners gave feedback. The following activities were defined :

-Definition of the Platform characteristics according to the project's aims and objectives

-Definition of user requirements

-Subcontracting administrative procedures

-Development of the backend and frontend of the Platform

-Internal testing of the Platform

-Publicly release of the Platform

Most of these activities include several feedback loops from partners at various stages to improve the user acceptance, operability and efficiency of the Platform.

The main characteristic of the Platform is the actively participation of schools and other stakeholders (universities and research centers, public and private sector bodies, central and public bodies local government, NGOs, members of the educational community, etc.). The Platform should encourage and help the participants to form work groups (Science Teams), which will deal with specific projects related to the urban environment. The way to create the working groups is as follows: the schools will select the members of the working group from a repository of stakeholders found in the Platform that best suit the theme of the project they have chosen. Stakeholders can request to join projects related with their interest. Information on the progress of the work will be posted on the Platform regularly. The Platform should be interconnected with the project's website (www.pulchra-schools.eu) although they fulfill different objectives of the PULCHRA project. The overall aim of the Platform is to develop an online environment for interaction and information, which will enhance synergies between different stakeholders, such as schools, businesses, local governments, NGOs, etc.

User requirements are defined with the help of Deliverable 2.2_User requirements. Specific questions were addressed through a questionnaire to potential participants and users of the Platform about their expectations from it. The results of Deliverable 2.2 related with the Platform follow:

Expectations from the City Challenges Platform

An important part of the PULCHRA project is the City Challenges Platform which will bridge partners, schools and stakeholders. The participants were asked about their expectation from the City Challenges Platform. Results indicate the need of the platform to support the school projects development, i.e. by the City Science Teams in the field of urban ecosystems (Figure 1). In addition, the need to interact among stakeholders is highly rated.
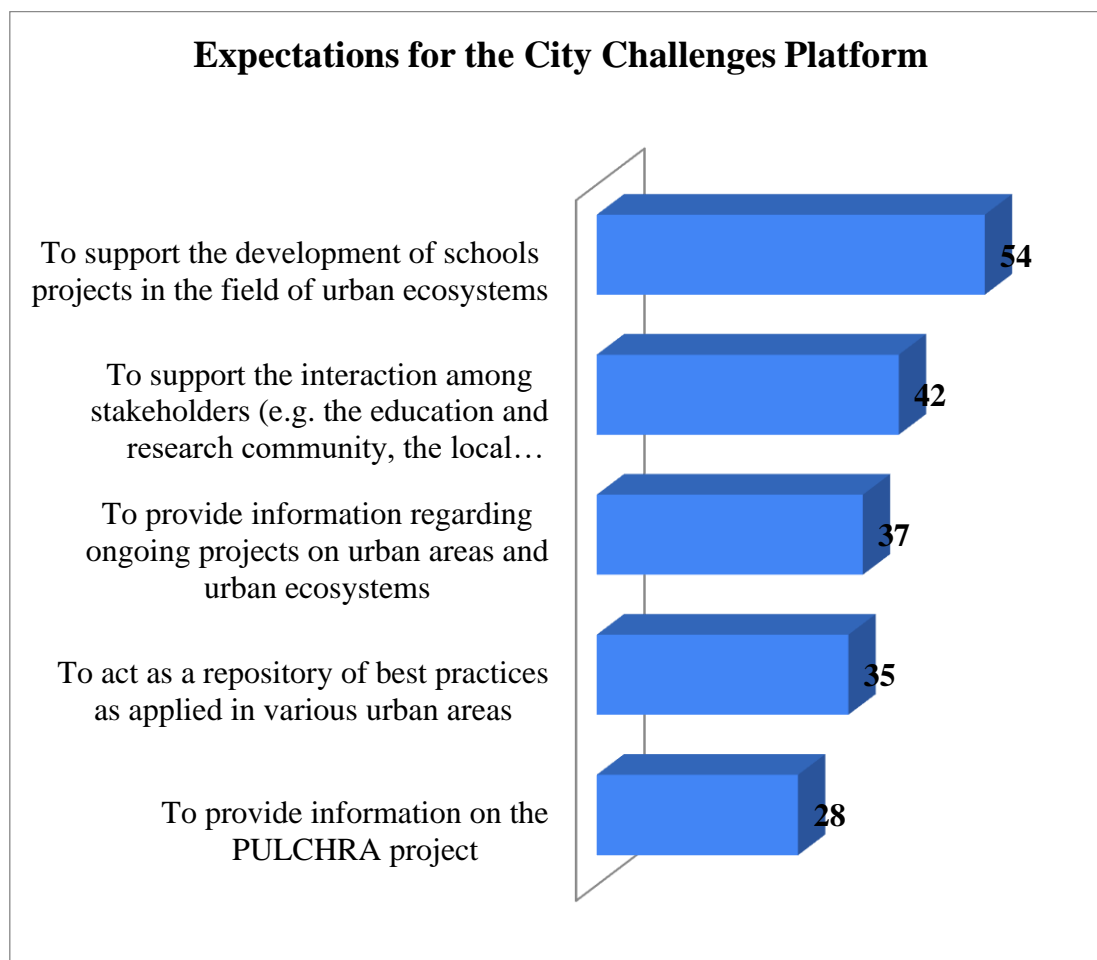
Expectations for the City Challenges Platform

To support the development of schools projects in the field of urban ecosystems	54
To support the interaction among stakeholders (e.g. the education and research community, the local…	42
To provide information regarding ongoing projects on urban areas and urban ecosystems	37
To act as a repository of best practices as applied in various urban areas	35
To provide information on the PULCHRA project	28

Figure 1. Users' expectations from the City Challenges Platform (number of responses; each user could provide two responses at maximum)

Upload material to the City Challenges Platform

A significant percentage of the participants stated that they are interested in contributing with material in the City Challenges Platform (Figure 2). The kind of material includes:

Measurements data
Educational material
Project reports
Case studies
Publications / scientific papers
Material related to enterprises
Links to ongoing research projects
Citizen science projects
School material
Photographs for Science reporters
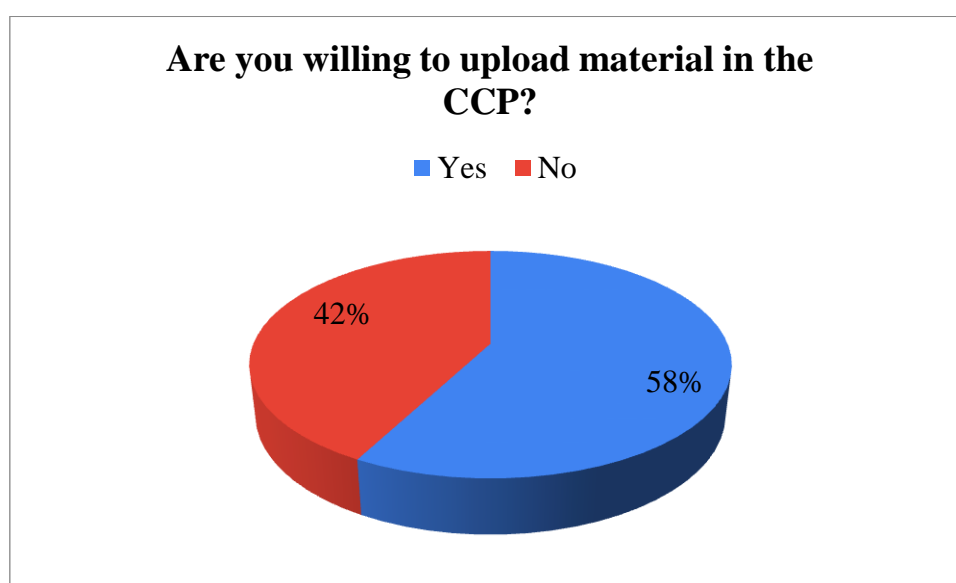
Figure 2. Willingness to upload material in the City Challenges Platform

Communication within the City Challenges Platform

The preferable tool for communication between the PULCHRA participants and within the City Challenges Platform is a Chat Forum (Figure 3). Private messaging is another option as well as tools that were proposed by the responders like Facebook and e-mail.

Communication tools

■ Chat Forum ■ Private messenger ■ other

15%
48%
37%
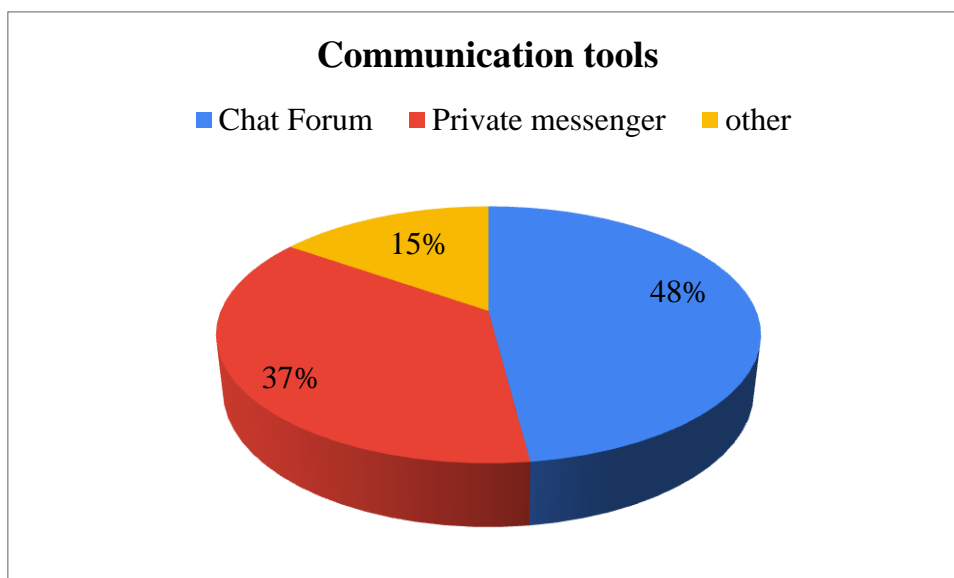
Figure 3. Preferable communication tools

9. Online course about urban ecosystem within the City Challenges Platform.

The project will develop free distance open learning online courses. High percentage (70%) of the participants was interested to take part in these courses (Figure 4).

Interested to participate

■ Yes ■ No

33%
67%
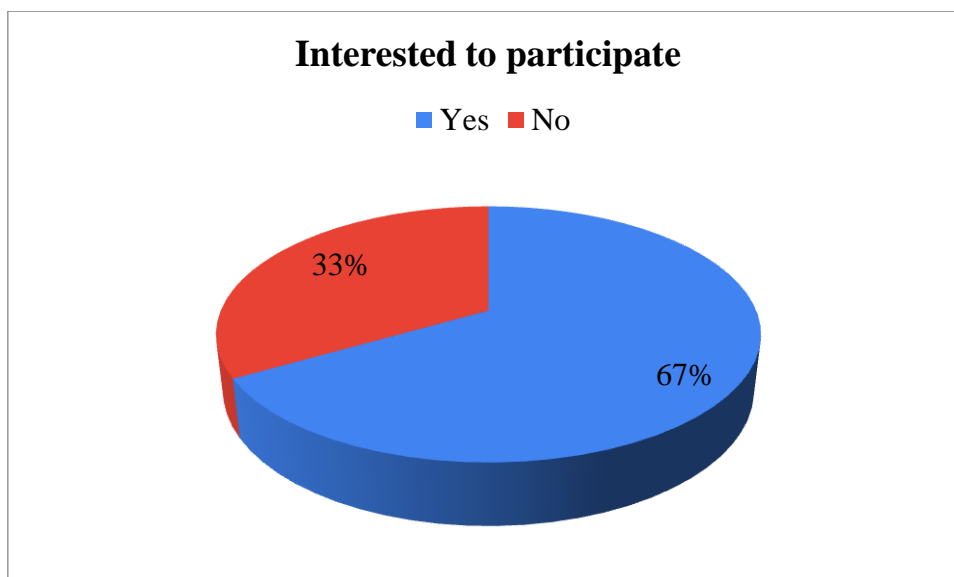
Figure 4. Interest to participate in the online courses

Personal data in the City Challenges Platform.

The participants were asked which personal data they prefer to be publicly available in the City Challenges Platform for communication purposes between the different stakeholders. Their responses indicate that their e-mail account can be more convenient for them to appear in the City Challenges Platform instead of their name or their phone number (Figure 4). Some of the participants stated that they do not wish any personal data to appear in the City Challenges Platform, a fact which needs to be dealt carefully as it may result in difficulties as far as the interactive and collaborative nature of the City Challenges Platform are concerned
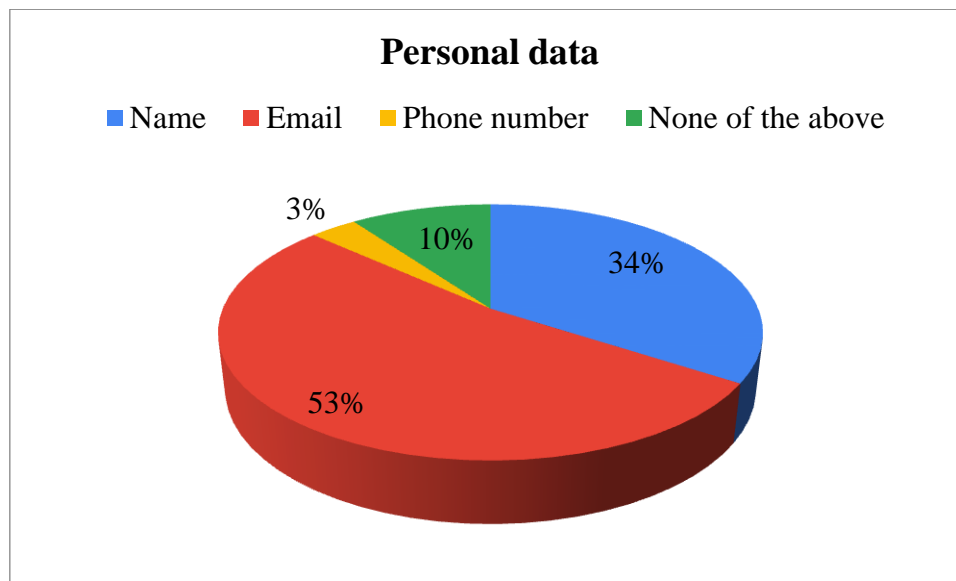
Figure 4. Personal data preferences for communication purposes.

Based on the above results the first technical specifications of the Platform were drafted and the subcontracting procedures were initiated. Several feedback iterations between the subcontractor and the NKUA team followed so as to define the specific features of the Platform. Most of the discussion was devoted to the communication between participants inside the Platform considering that many users of the Platform are from the educational sector including young students. Safety concerns and workload management for moderating the communications between the participants led us to the decision to abolish the development of a communication feature inside the Platform but to guide the participants to communicate through e-mails or telephone directly between them.

3. Technical specifications

After the conclusion of the planning phase the following technical specifications were given to the subcontractor:

General specifications

- The aim of the service is to develop an online environment for interaction and information, which will enhance synergies between different stakeholder groups, such as schools, businesses, local governments, NGOs, etc. The design and development of the platform will be based on the methodology developed within the project.
- In the methodology, students are treated as "researchers" and interact with other groups, who will support the implementation of the project chosen by each school. Local authorities, for example, can describe how issues of interest relate to the needs and priorities of the city, academic institutions can provide, scientific guidance and data, and so on.
- The development of the platform will be based on the open source content management system (CMS: content management system) WordPress. WordPress is a simple content management system that can be used to build any type of website.

Functions / Modules

The various functions and modules of the Platform will be easily managed by novice users. The functions will be accessed through appropriate menus and controls. The basic functions that will be supported according to the specifications are described below.

-User Management

A key part of the platform will be the user management system. The system will support user creation and role assignment. The roles that will be least supported are:

  a. Platform Manager
  b. Project partner
  c. School
  d. Stakeholder
  e. Guest

All registered users will have the same rights on the platform, as long as they belong to the same level (role). Users can be registered in the Platform from the project partners or by themselves. In the latter case the platform administrator will distribute the registration requests to the respective partner (i.e. depending the country of the participant), who in turn will check / approve or not the requests. The platform will

provide the basic functions related to user management, ie enable / disable, modify profile, modify / retrieve password.

The administrator will have access to all the functions of the platform. The project partners will have the opportunity to post material, such as e.g. documents, images, media files, using a password.

-Presentation

Different menus will be available to present the content of the platform. More specifically, there will be:

• Participants lists (schools, partners, stakeholders) which will lead to corresponding pages with more information for each participant through a drop down menu in which the individual participants will be listed following a specific template

• Projects list, which will lead to a corresponding page with more information about the progress of the work (completed, in progress, etc.) and presentation of the completed work following a standard presentation of the work.

• Cartographic mapping of the schools participating in the project

-Creating Science Teams

For the participants of the School projects, the following possibilities will be available:

• creating distinct - by participating school and by participating partner country - working groups (Science Teams and Science Reporters) among those registered on the platform

• posting material / information (made, image, map, diagram, video, presentation, etc.) by the members of the working group

-User support tools

Tool menus will be created to support the participants, such as:

• Online courses

• Educational material

• Repository of material (eg scientific texts, reports, etc.)

• Visualization tool - Visualization tool, for which the data to be visualized will be given in a standard format, e.g. measurement data from sensors

• Remote Sensing tool - Remote Sensing tool, which will provide access to Copernicus program data

• Project News (News)

• News / Posts by work teams (Science teams and Science Reporters)

-Services

In addition to the development of the platform itself, the following services will be provided:

• Correction of application abnormalities (bugs).

• Application updates (service updates, hotfixes) of the software.

• Technical support, in matters related to the platform.

• Maintenance and improvement of the Program Website

4. Backend Development

During the backend development phase, NKUA had continuous access to the under development backend system, in order to ensure the successful implementation of the technical characteristics. Screenshots of the delivered backend system of the Platform follow, along with a brief description of each of the main backend characteristics.

- The structure and usability of the backend system allows the efficient and uninterrupted operation and management of the platform by the PULCHRA partners and especially the leading partner of this Deliverable (NKUA).

- The backend system supports new user creation and role assignment in a very easy and efficient way.

- Partners can deactivate immediately an account that abuses the terms and conditions

- Registration is open to everybody but partners have the responsibility to activate the new user

- Every media (image, video, pdf, etc) that is uploaded in the Platform must be approved by a partner before published to ensure that no abusive material is uploaded to the Platform.

- Each user type will have its customized menu related with the activities in the Platform. For example a school can create a project from the backend system but a stakeholder cannot create a project.

5. Frontend Development

The frontend system of the Platform (Figure 5) is the most important aspect of it in terms of user experience. All the information collected in the backend system should be presented to users and the general public in a modern and functional way. All PULCHRA partners agreed that the Platform must be aesthetically connected with the PULCHRA website (www.pulchra-schools.eu), so the design of the Platform followed the website's design while having its own identity.
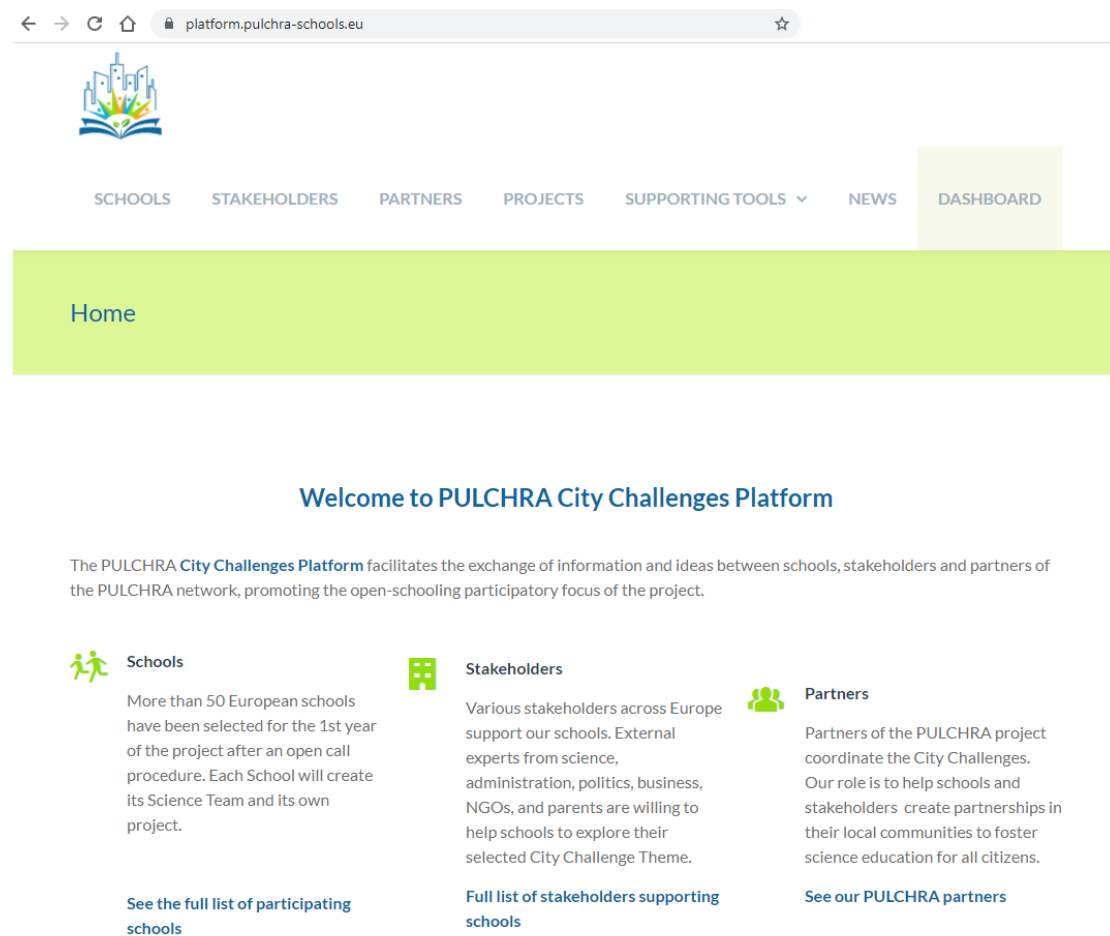
Figure 5. Home page of the PULCHRA Platform

The user of the Platform can find the list of schools participating in the project and search schools by their country or their selected City Challenge theme (Figure 6). Each school has its own profile page (Figure 7).

Figure 6. Participating schools list and search options

Figure 7. Schools profile page

The list of stakeholders participating in the project can be found under the Stakeholders menu. As in the previous case search options are available so users can search for a stakeholder by its country, City Challenge them, contribution role or its member type (Figure 8). Each stakeholder has its own profile page (Figure 9).

Figure 8. Stakeholders list and search options

Figure 9. Stakeholders profile page

School projects are listed under the "PROJECTS" menu. Users can search for projects by country or City Challenge theme and each project has its specific page. This is the most interesting part of the Platform because this is the place where Science Teams will present their project's progress, results and communication and dissemination activities (Figure 10)
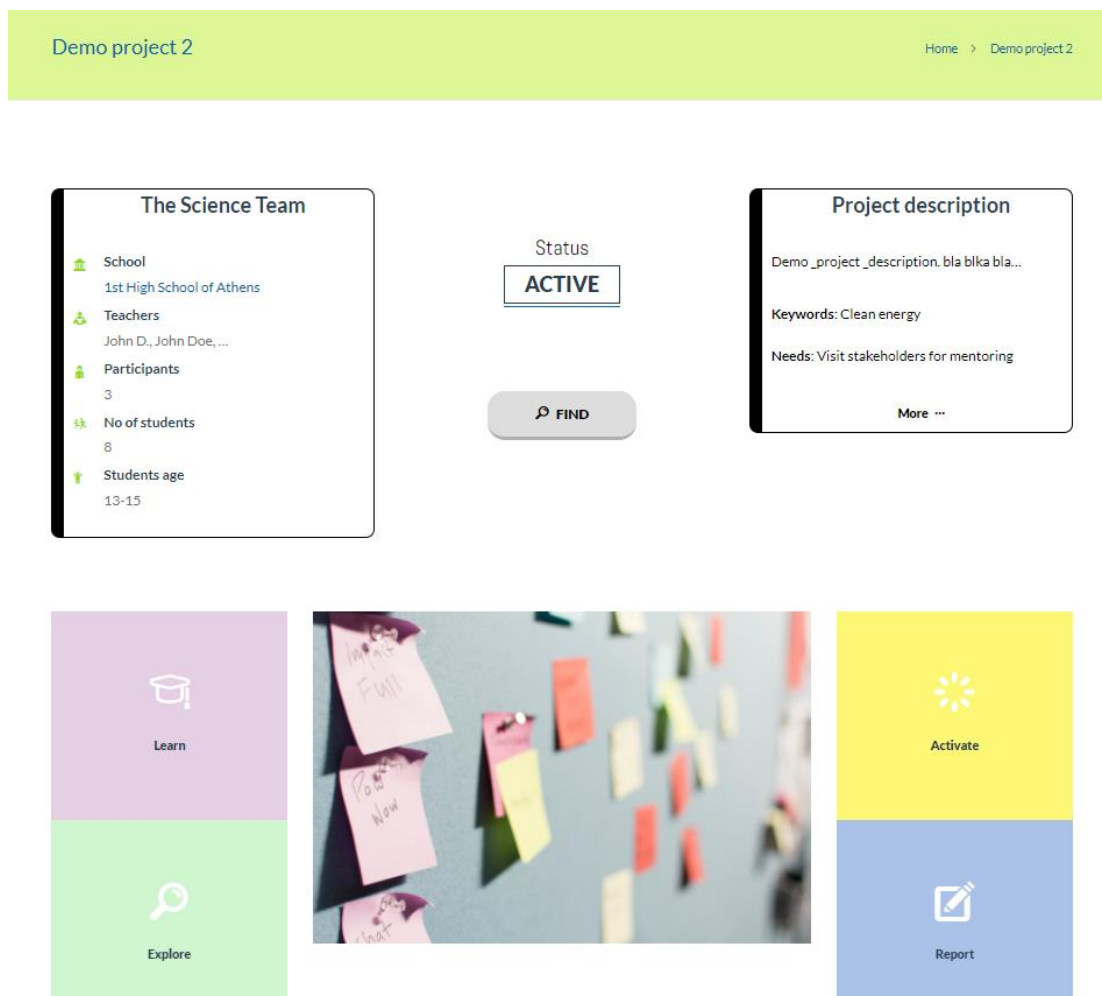
Figure 10. Project page

The Platform includes supporting tools for all participants such as educational material, open distance learning courses and visualization tools. All these tools can be found under the "SUPPORTING TOOLS" menu (Figure 11). The educational material has been created by PULCHRA partner and corresponds to Deliverables 6.1 & 6.2. Also the open distance learning courses have been created by the PULCHRA partners and correspond to Deliverables 8.1 & 8.2.

Figure 11. Supporting tools offered in the Platform

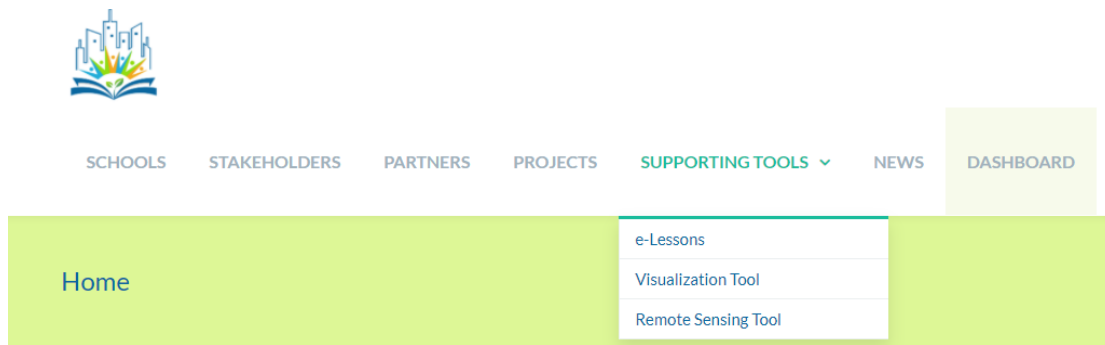Users can use the Visualization tool sub-menu to input measurements of environmental parameters (i.e. air temperature data, air quality data, etc) and easily produce and export graphs (Figure 12). Science team members can use this tool to improve the presentation of their project results an upload the measurements in their project page.
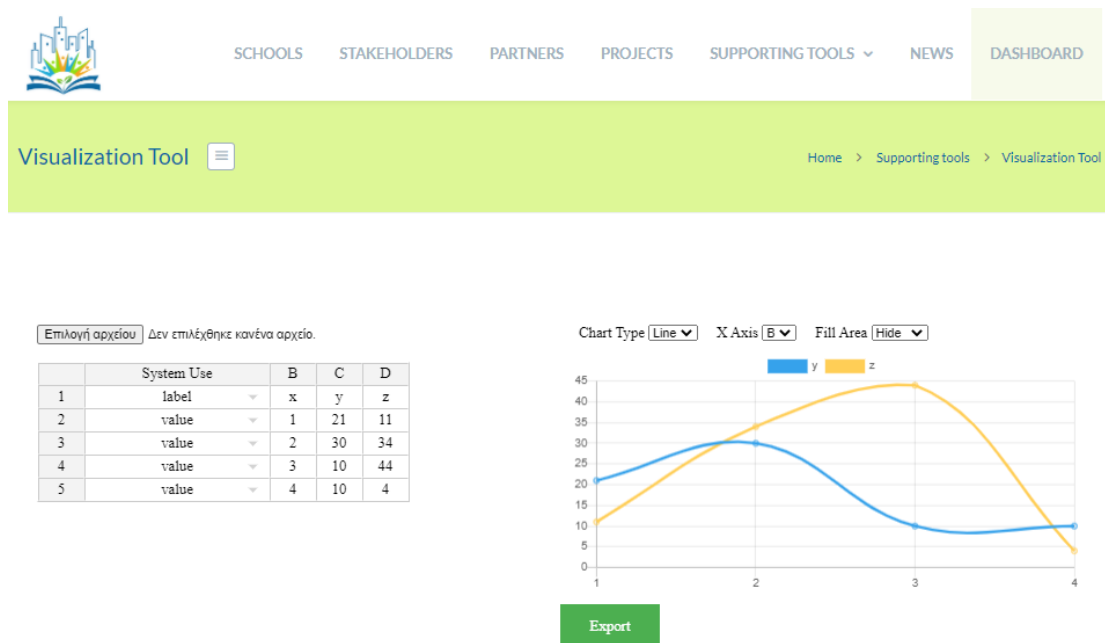

Figure 12. Visualization tool of the Platform

A special feature of the visualization tools that was developed for the Platform is the Remote sensing tool (Figure 13). Users can use this special visualization tool to work with Sentinel-2, Landsat and MODIS satellite data. The tool is modified for the educational needs of schools meaning that the satellite data have been preprocessed and specific band combinations are available for visual interpretation. Detailed user guides for these two visualization tools will be available to users.
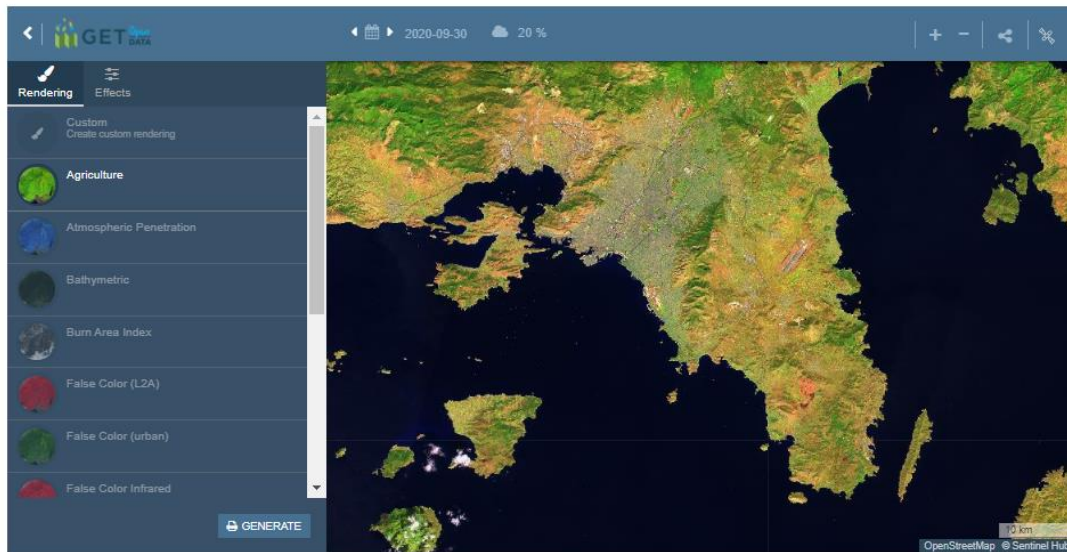
Figure 4. The remote sensing tool of the Platform

6. Testing

The subcontractor delivered the first draft version of the Platform to the leading partner (NKUA) and extensive testing was done by the members of NKUA. Various bugs and errors were identified and resolved leading to a second draft version of the Platform.

NKUA introduced the second draft version of the Platform to PULCHRA partners through a 2-hour online demonstration and partners were asked to test the Platform and give their feedback on technical and design issues. NKUA collected all comments and suggestions and informed the subcontractor. The subcontractor resolved all technical issues and the design of the Platform improved.

The testing phase was completed successfully and the preparations for the official launch of the Platform followed.

7. Preparing Launch

Before the official release of the Platform user guides for all participants were prepared in English and uploaded on the Platform. It's in the discretion of each PULCHRA partner to decide about the translation of these user guides in their national language. Video instructions were also prepared and uploaded in the project's [Youtube channel](#).

[User guide for schools](#)

[User guide for stakeholders](#)

[User guide for partners](#)

8. Release

The official release of the PULCHRA City Challenges Platform was decided to be the 1st October 2020 just after the 2nd PULCHRA project meeting. Partners were informed by NKUA that the Platform is officially ready to welcome the PULCHRA project participants.

Schools selected to participate to the PULCHRA project should be registered from the respective partner in order to immediately populate the Platform to the educational community. Also each partner should take all necessary action in order to ensure that at least 20 stakeholders from each country register to the Platform by 31/10/2020. Population of the Platform is very crucial for the successful implementation of the City Challenges so all partners should populate the Platform continuously.