PULCHRA

Participatory Urban Learning Community Hubs through
Research and Activation

EC Grant Agreement	No.824466
Project Acronym	PULCHRA
Project Title	Science in the City: Building Participatory Urban Learning Community Hubs through Research and Activation
Instrument	HORIZON 2020
Programme	Open schooling and collaboration on science education
Start Date of Project	01/09/2019
Duration	36 months

D2.2 User requirements

WP2	Coordination and Management
Due Date	31/12/2019
Submission Date	27/12/2019
Responsible Partner	NKUA
Version	1.0
Status	Final
Delivery Type	Report
Dissemination Level	Confidential

Table of Contents

Executive summary

This document is the deliverable D2.2 of the PULCHRA project, which addresses user requirements. It describes the identification of parties with interest to participate and/or follow the project's activities and the subsequent collection and categorization of the requirements in view of exceling the implementation of the project as far as enhancing its openness and developing the City Challenges Platform. In supporting the objectives above, the report also takes note of the existing literature in the field of the project, supplemented with additional direct input from PULCHRA partners.

Version History

Version	Date
0.1 First Draft	18/12/2019
1.0 Final Version	27/12/2019

1. Introduction

This document is the report on user requirements, deliverable D2.2 in the PULCHRA project. It has been compiled as part of PULCHRA Work Package 2 (WP2) on "Coordination and Management", with input from all PULCHRA partners.

The PULCHRA project as a whole works on the exploitation of the concept of open schooling in view of:

(a) Bringing new scientific knowledge for the city as an urban ecosystem and facilitating participation of citizens of all ages in scientific discovery;

(b) Building trust in the method of science through the own experience of participation, thus strengthening the awareness that building an own point of view and establishing own decisions on comprehensible evidences is personally and societally more effective than following propaganda;

(c) Establishing concepts to recognize the strong links of the natural environment, the built environment and the socio-economic environment. Understanding these links is essential to identify the own capacity to participate in shaping the own living environment. To this end PULCHRA aims at building a learning, exploring and activation network, which allows experiencing and understanding the urban ecosystem as living organism;

(d) Developing knowledgeable, innovative and participatory communities able to cope with and actively contribute to addressing current and anticipated challenges at the city scale. Taking note of the similarity of challenges arising from societal, economic and environmental change in most cities in Europe and worldwide, is essential to recognize the benefit from international collaboration in order to cope with these challenges;

(e) Exploring common issues related to the city as an urban ecosystem through specially designed City Challenges.

The open schooling concept will lead to building a participatory urban learning community, which particularly invites the urban youth, helps forming stewardship through establishing a sense for ownership and ability to contribute to liveable neighborhoods and reduces urban societal disparities by building points of access for science discovery and participation close to the residential areas.

In particular, PULCHRA builds bridges between schools and community stakeholders. It does so by building on successive actions for:

(i) understanding urban areas as social-ecological systems, and generate knowledge and guidance for better urban ecosystem management;

(ii) building a network and a platform (City Challenges Platform) to bring students, educators, scientists, practitioners, citizens, and policy and decision makers together;

(iii) developing the City Science Teams, i.e. mixed teams of stakeholders in view of co-identifying key issues and co-defining solutions for urban ecosystem management;

(vi) raising attention and public awareness of the importance of urban ecosystem management among the schooling community, scientists, policy makers, and general public (City Reporters).

All these activities are covered in PULCHRA by dedicated Work Packages (WPs 3-10), which correspond closely to the Tasks within Work Package 2. Accordingly, this report feeds into these other PULCHRA Work Packages.

2. Recognition of users

The identification of the potential users is the first important phase of a project, since once these parties are identified, their requirements and needs – as related to the project - are identified and captured. The success of a project depends heavily on partners' ability to meet the needs and requirements of users throughout the entire life of the project. In PULCHRA's user identification process, all the possible categories of potential users had to be considered such as education and parental community, universities and research centres, scientists and experts, NGOs, enterprises, local authorities, policy entities and general public. A first discussion about the type of users was made during PULCHRA's Kick-off meeting in Athens on September 2019 between all partners.

The key stakeholders of the PULCHRA project can be grouped in the following two categories as below:

Educational Sector	Community Sector
Schools	Local authorities
Teachers	Parents
Students	Enterprises
Researchers	NGOs
Universities	Policy makers

3. Methods of identifying user requirements

The task of this document is to define user requirements; the task reflects difficulties taken that in several cases, the users may not be able to identify their needs, at least in full detail. Most often, research into user requirements is done by surveys with questionnaires and/or interviews, but these need to be designed carefully, tested for their usefulness, adjusted, and then sent out to large target groups, so as to compensate for the low response rates. Given that many PULCHRA partners are/were involved in similar on-going/past projects a supplementary approach to the above was used, practically by assimilating previous experience of the partners in projects with similar characteristics with PULCHRA. In this way, experience as developed through EC funded projects was exploited.

Therefore the general approach was to:

1) Collect information on previous or ongoing projects that also deal with the issue of users requirements and extract relevant information and

2) Collect user requirements through questionnaires/personal interviews with potential users.

In order to homogenize the information gathered from the partners' previous experience and from the personal interviews from stakeholders, a "PULCHRA QUESTIONNAIRE" was prepared (Annex 1). The questionnaire consists of two parts and it is based on the main aspects of the PULCHRA project implementation and on the City Challenges Platform. The questionnaire was accompanied by a PULCHRA information sheet so as the potential users to obtain an understanding of the PULCHRA project and its objectives (Annex 2). The questionnaire was also made available online as a Google Form which can be found at:

https://docs.google.com/forms/d/e/1FAIpQLSelJhwbVexeUqkeUQHK70BXcrvW0jZ hZpAyx8TPdVIcpZY1jg/viewform?vc=0&c=0&w=1&usp=mail_form_link

The main inputs from the potential users regarding the PULCHRA project implementation aimed to recognize and thus identify the following:

- the themes of the urban issues that are considered attractive and interesting – by the users - as City Challenges themes,

- their role in the PULCHRA project; this is information which is strongly needed for the development of the City Science Teams,

- their expectations from the PULCHRA project, so as to optimize the implementation of the City Challenges,

- their availability for participation in the PULCHRA project, so as to optimize the organization of the City Challenges.

The main inputs from the potential users regarding the City Challenges Platform refer to the following:

- their expectations from the use of the City Challenges Platform, so as to optimize the architecture and the construction of the platform,

- the necessity for a mobile app linked with the City Challenges Platform, so as to define the level of interconnection between the PULCHRA mobile App and the City Challenges Platform,

- the interaction/communication between users of the City Challenges Platform, so as to define the communication modules in the platform,

- the main urban issues considered attractive and interesting for the PULCHRA online course, so as to define the online courses themes and objectives,

- any personal data to be shown in the City challenges Platform communication tools, so as to optimize the construction of the platform and also respect the GDPR provisions.

4. PULCHRA user requirements

4.1 Collection of previous projects

In this section requirements of users, which are similar to the PULCHRA potential users, gathered during previous projects implementation are presented. These requirements were gathered through the frequent interaction between the Partners and the Users for the project's needs.

A list of previous or on-going projects that were taken into consideration follows, along with the extracted information as needed for shaping the PULCHRA user requirements:

4.1.1 MASS and GLOBE projects in Greece

Motivate and Attract Students to Science (MASS), http://www.mass4education.eu/

Experience from the implementation of this project (Comenius project in science education) in Greece comes from the continuous interaction with teachers and students during visits of the schools at the National and Kapodistrian University of Athens for mentoring and from university staff visits to schools in order new methodologies to be applied.

The schools requirements (related to PULCHRA questionnaire) were: The urban issues that are closer to the school curriculum are urban heat, air quality and greenery. Their role in such projects is to participate in the Science teams. Their expectations from this type of projects relate to the cooperation between schools, Universities and research centers, the interaction of schools with the local society, the link to other science education programs and to link schools with the local authorities. Schools can participate only during the school year and only during the working hours. Schools are willing to host events and to dedicate 2-4 hours per week to such projects. They prefer to communicate via the simplest way.

The teachers requirements (related to PULCHRA questionnaire) are: The urban issues that are closer to the school curriculum are urban heat, air quality and greenery. Their role in such projects can be both mentoring and participating in the Science teams. Their expectations from this kind of projects are the cooperation between schools, Universities and research centers, the demonstration and use of innovative educational approaches, the link to other science education programs and the development of school to school projects. They are available to participate only during the school year and only during their working hours. They are willing to attend events and to dedicate 2-4 hours per week on such projects. Teachers were interested in the use of online material so a platform would be very useful for them.

Global Learning and Observations to Benefit the Environment (GLOBE), https://www.globe.gov/.

Experience from the implementation of this project (international science and education program) in Greece comes from the continuous interaction with teachers and students during visits of GLOBE schools to the National and Kapodistrian University of Athens for environmental science experiments.

The Globe teachers requirements (related to PULCHRA questionnaire) are: The urban issues that are closer to the GLOBE schools interest are urban heat and air quality. Their role in such projects can be as participants in the Science teams. Their expectations from this kind of projects are the cooperation between schools, Universities and research centers, to promote citizen science activities and the development of school to school projects. They are available to participate only during their working hours and they are willing to attend events and to dedicate 2-4 hours per week on science projects. Globe teachers were interested in the use of online material and the PULCHRA platform, as they are already familiar with the GLOBE online platform. They also showed interest in taking part in online courses about urban ecosystems.

4.1.2 MASS and GLOBE projects in Latvia.

Bernu Vides Skola has a long term cooperation experience with schools in different environmental education and science related projects, like MASS (Motivate and Attract Students to Science) and GLOBE. From our previous experience in the implementation of this kind of projects in Latvia the teachers preferences (related to PULCHRA questionnaire) are:

1. Urban issues closely connected to the school curriculum are Air Quality and Greenery. For those teachers who look for innovations, Urban Heat and Urban Expansion would be also interesting.

2. Regarding role in the project most teachers would choose to be a member of the school team to implement the PULCHRA related project and participation in the activities of the project.

3. Regarding expectations from the project there will be wider range, but mostly to support the interaction of schools with the local society, to facilitate the cooperation between schools and Universities and research centers, to link schools with the local authorities, to provide state of the art information on urban ecosystems, to demonstrate and use innovative educational approaches and to develop school to school projects.

4. Regarding working time hours there will be opposite opinions for the different schools – some teachers could spend working hours for the project, some not. But as we would like to promote open schooling and different kind of science learning (which is learning process) and taking into account that teachers are extremely busy and could not find a time for extra activities, we would promote to use working hours

for the project. 0-2 hours per week would be the most appropriate dedication time of teachers.

5. Regarding expectations from City Challenges Platform most teachers would prefer to support the development of schools projects in the field of urban ecosystem and to act as a repository of best practices as applied in various urban areas

6. The majority of teachers would see mobile version of the platform important to them.

7. Usually teachers are not willing to upload their materials in the platforms, but some do.

8. Usually teachers in Latvia do not use web communication tools in different platforms, they use social media (Facebook or Instagram) for this.

9. In the online courses mostly they would like to see Background information on the urban environment, Information on urban ecosystems and nature based solutions and Guidelines for project development.

10. Most teachers would be interested to participate in an online course about urban ecosystems if translation to Latvian is available. 1-2 per week is the more appropriate time.

11. We think that teachers would only agree to share their name and e-mail at the most, but most probably they would love to not show their contacts in an open site.

4.1.3 CIVIS and Go Outside projects in Czech Republic.

- CIVIS project focused on civic and social competence supported by European Union. Our experience from the implementation of this project comes from the continuous interaction with teachers. Their requirements (related to PULCHRA questionnaire) are: Working hours is convenient for them and they could dedicate up to 2 hours every week. In most schools, the maximum achievable is the combination of two lessons i.e. 1.30 - 2 hours. Teachers have observed some barriers including a lack of understanding of concepts such as sustainable life / development or comprehensive awareness of the environment and its problems. So they expect from a project like PULCHRA to provide state of the art information on urban ecosystems, to develop educational material on urban ecosystems, to demonstrate and use innovative educational approaches, to develop an open dialogue on the value of cities as urban ecosystems and to raise awareness on the importance of urban ecosystems. Another barrier is the need for detailed methodologies, teacher cooperation and seminars. Teachers feel the need for support in the expertise of the curriculum for more demanding topics and in special (more challenging) methodologies such as inquiry-based science education or active citizenship. So an online course about background information on the urban environment, on Information on urban ecosystems and

nature based solutions and Projects and case studies on urban ecosystems and NBS as implemented at the European and international level could be very useful for them.

- Go Outside program, implemented by TEREZA, Educational Center with the support of the Czech Ministry of the Environment. It is an educational program that focuses on motivating parents and encouraging families to spend as much time as possible with their children outdoors. From our previous experience with the parental community involved in this project their requirements (related to PULCHRA questionnaire) are: The length and frequency of the activities are crucial for their participation in the activities of the project. Most parents would prefer a 2-4 hours dedicated time each week. Parents find very useful any online package of information and materials so the City Challenges Platform is necessary for them. Communication is also highly desirable for parents because it acts as a daily reminder for them. E-mail and Facebook communication is the best way to keep them activated. A Facebook group is an important part for some of the parents. Those who use it are mainly looking for inspiration and encouragement, or a group helps them to identify daily tasks. Unfortunately only a small part of parents made their own contributions so uploading material in the City Challenges Platform is not expected.

4.2 Collection of questionnaires

More than 100 questionnaires were addressed to a mix of potential users. A total of 90 questionnaires were collected either online or offline. The analysis of the gathered information resulted in the following results:

1. User category

As expected the majority of the gathered questionnaires were from the school community (Figure 1). Schools have a vital role in the PULCHRA project given that the vast majority of the implementation of the projects takes place in the schools facilities. Also universities and research centers were easy to reach out for gathering their requirements, due to their continuous interest in European projects. Questionnaires from all other categories were gathered also but unfortunately in smaller amount. Two education experts, an environmental association, two freelancer workers and a government employer were the persons which appear in the user category "Other". Generally the response rate and percentage for each category indicates that the consortium has already attracted a wide interest in the educational community and now should focus on the attraction of persons from local authorities, policy makers, parents and enterprizes in the PULCHRA project.
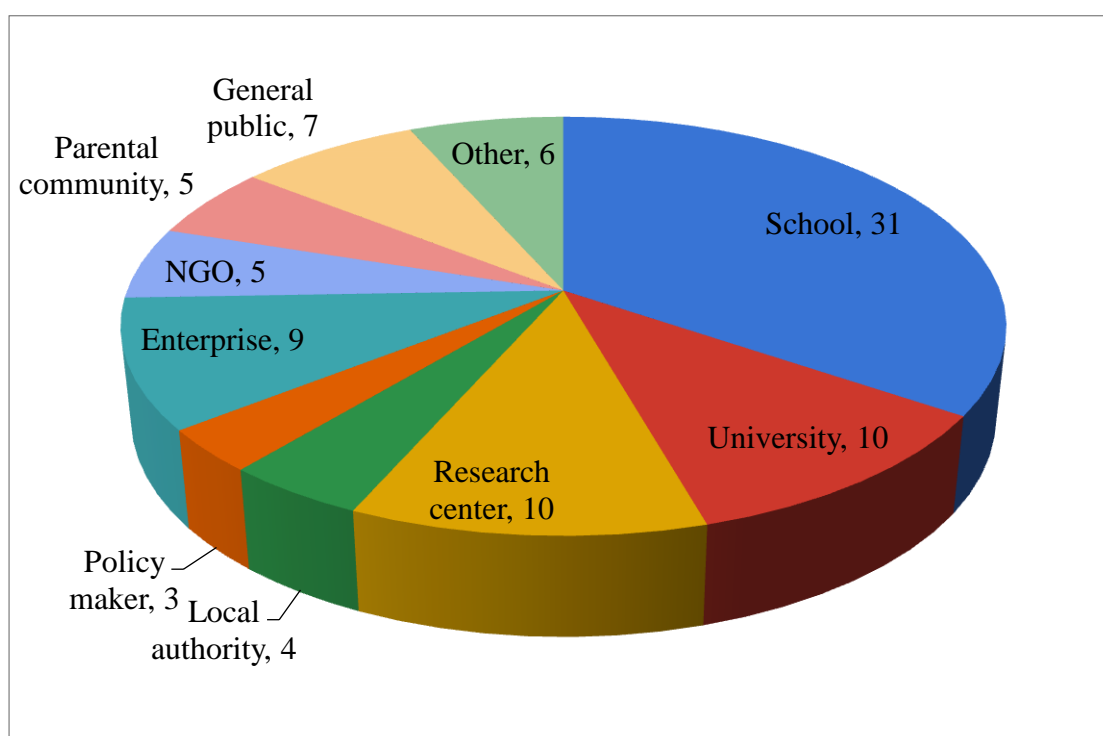
Figure 1. Participants' categorization

2. Urban issues to be considered in PULCHRA

All proposed urban issues as listed in the attached questionnaire attracted the interest of the participants (Figure 2). Results show that all these issues shall be considered as City Challenges themes in WP5, as the answers are almost evenly distributed among the urban issues. The urban issues that are listed in the "Other" category and were proposed by the responders are: Waste management, recycling, urban biodiversity, water pollution, water infiltration, urban floods, urban climate change and urban ecology. All eight answers came from eight different types of stakeholders and they will be taken into account under the City challenges themes preparation in WP5.
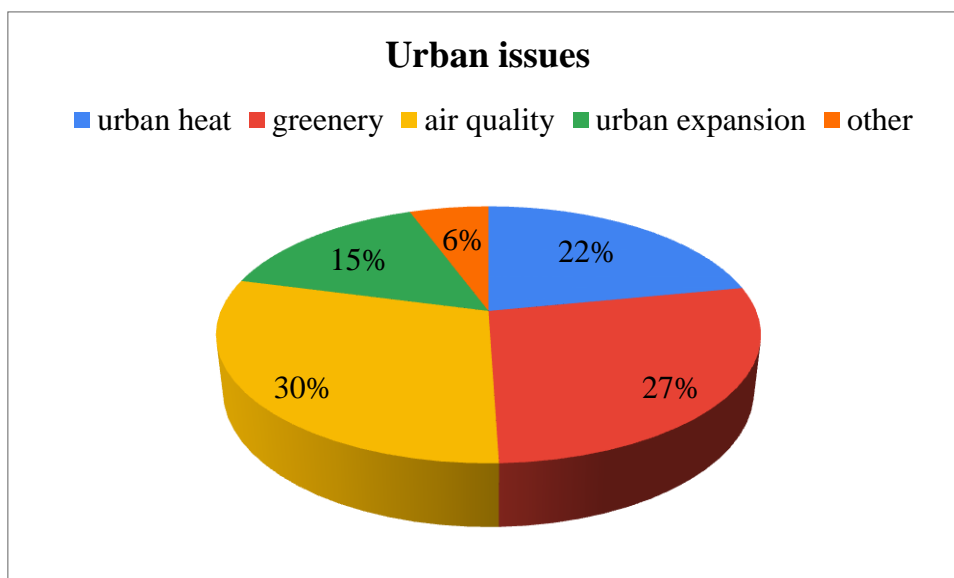
Figure 2. Percentage of responses per urban issue

3. Role in the PULCHRA project

Most of the participants are willing to actively participate in the PULCHRA project with a variety of roles (i.e. mentoring, member of the Science teams and participation in the activities). Twenty four percent of the participants, belonging in all categories except schools, want just to observe the implementation and the results of the project (Figure 3), while the majority of the schools want to participate as members of the Science teams and to participate in the activities of the project. Most of the universities and research centers want to act as mentors.
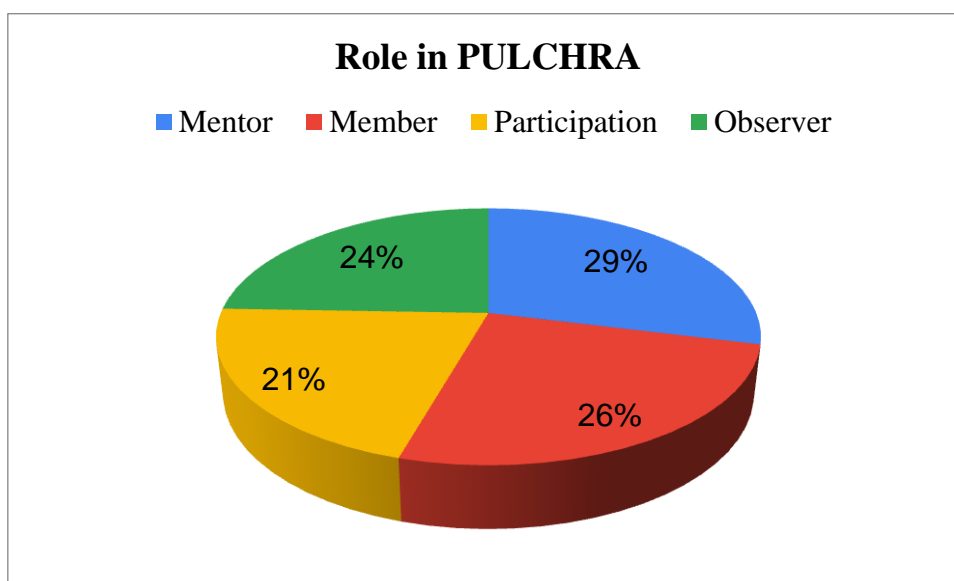

Figure 3. Expected role in the PULCHRA project in percent (%)

4. Expectations from the PULCHRA project

The user requirements procedure highlighted the participants' expectations from the PULCHRA project (Figure 4). The promotion of citizen science activities and the enhancement of the cooperation between schools and universities or research centers are the main expectations of the participants.
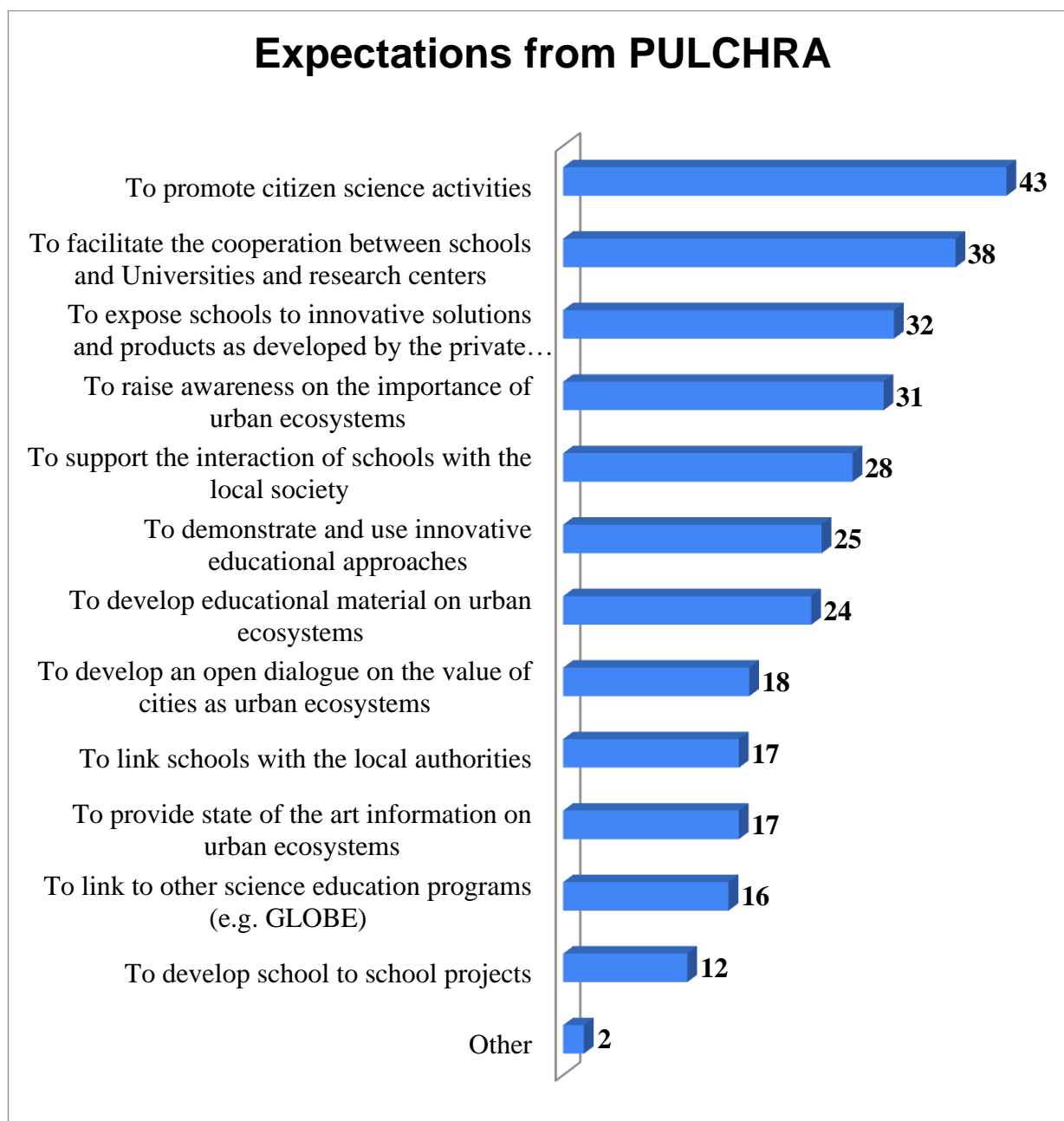
Expectations from PULCHRA

Expectation	Responses
To promote citizen science activities	43
To facilitate the cooperation between schools and Universities and research centers	38
To expose schools to innovative solutions and products as developed by the private…	32
To raise awareness on the importance of urban ecosystems	31
To support the interaction of schools with the local society	28
To demonstrate and use innovative educational approaches	25
To develop educational material on urban ecosystems	24
To develop an open dialogue on the value of cities as urban ecosystems	18
To link schools with the local authorities	17
To provide state of the art information on urban ecosystems	17
To link to other science education programs (e.g. GLOBE)	16
To develop school to school projects	12
Other	2

Figure 4. Users' expectations from PULCHRA (number of responses; each respondent could provide three responses at maximum)

14

5. Participation in the PULCHRA project

Participants were asked if working hours are convenient for them so as to understand their availability for the implementation of the City Challenges. Most of them are available during their working hours and they don't prefer to spend their free time for the project activities (Figure 5). This is also the experience from past projects (section 4.1) which indicated that schools prefer to implement project activities during school hours.
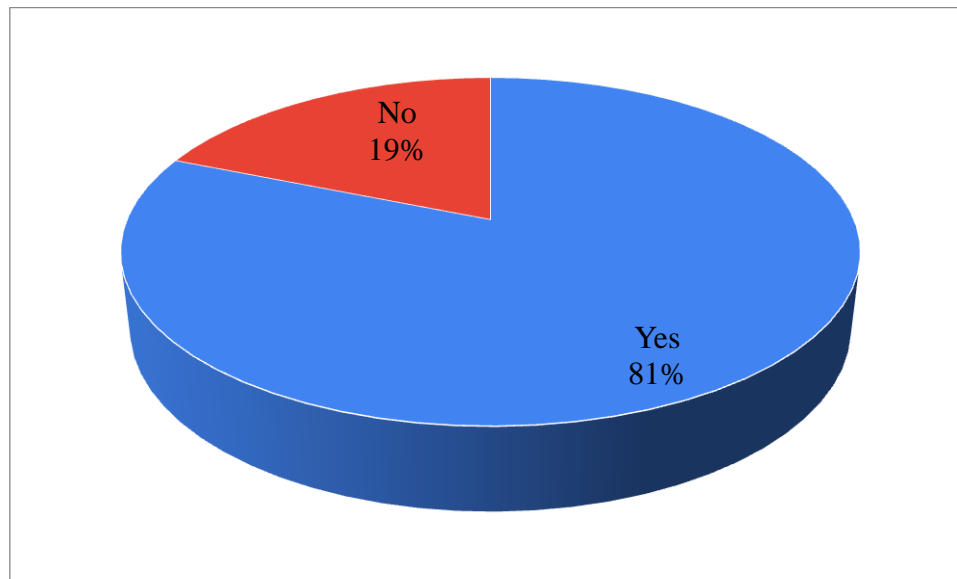
Figure 5. Participants' convenience of working hours

In addition participants asked about their preference to host or to attend a PULCHRA activity (Figure 6). Most of them prefer to attend a PULCHRA activity but there were an encouraging number of schools that are willing to host a PULCHRA event.
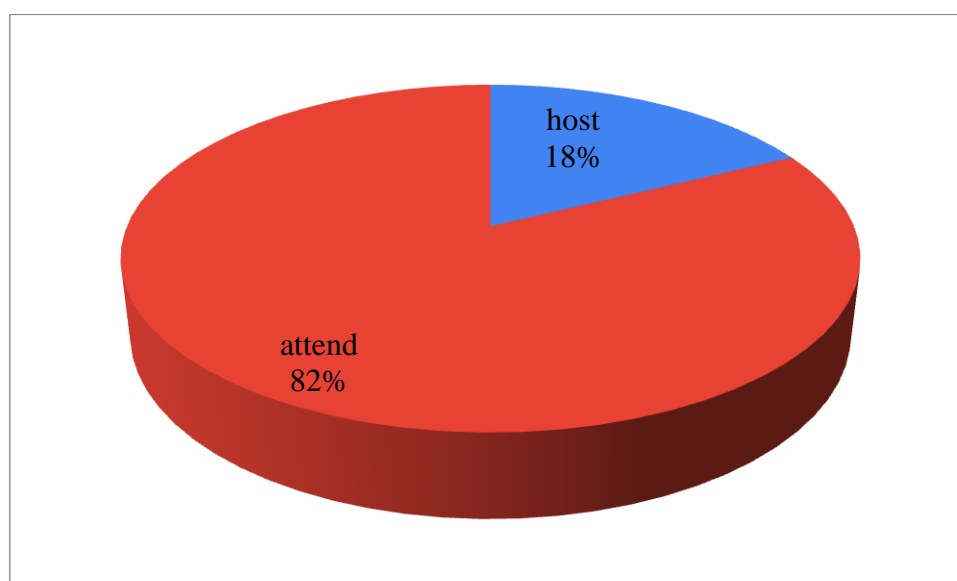
Figure 6. Users' preference on hosting or attending a PULCHRA activity

Regarding the amount of time that the users are willing to dedicate to the PULCHRA's activities, the majority of the participants responded that a maximum of 2 hours weekly is their preferable dedicated amount of time (Figure 7). This is an important issue for consideration taken the needs of the project.
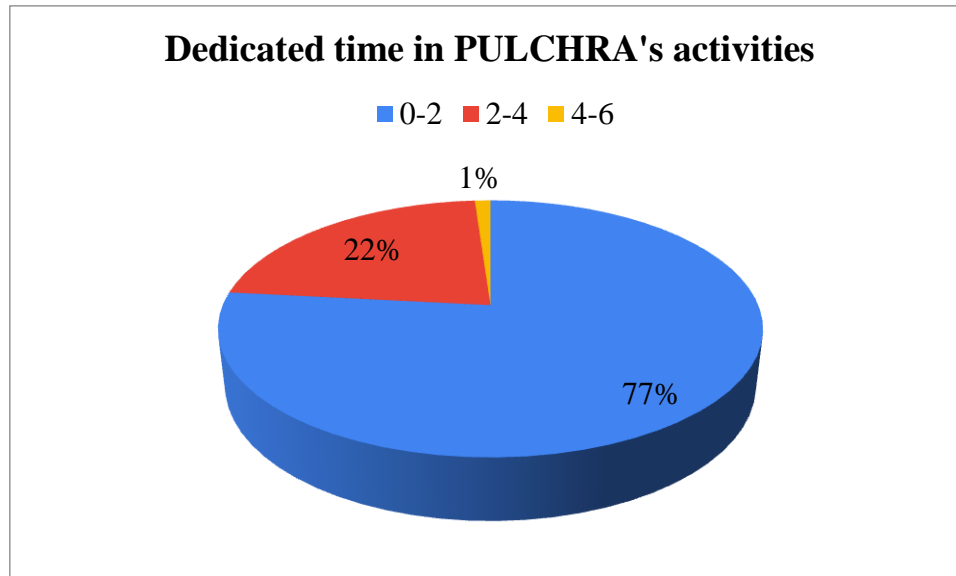
Dedicated time in PULCHRA's activities

- 0-2
- 2-4
- 4-6

1%

22%

77%

Figure 7. Amount of time the participants are willing to dedicate in PULCHRAs' activities.

6. 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 8). 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 8. Users' expectations from the City Challenges Platform (number of responses; each user could provide two responses at maximum)

7. Mobile version of the City Challenges Platform and upload material to the City Challenges Platform

A mobile application connected with the City Challenges Platform will be developed under WP7. Most of the users were positive about a PULCHRA mobile application (Figure 9).
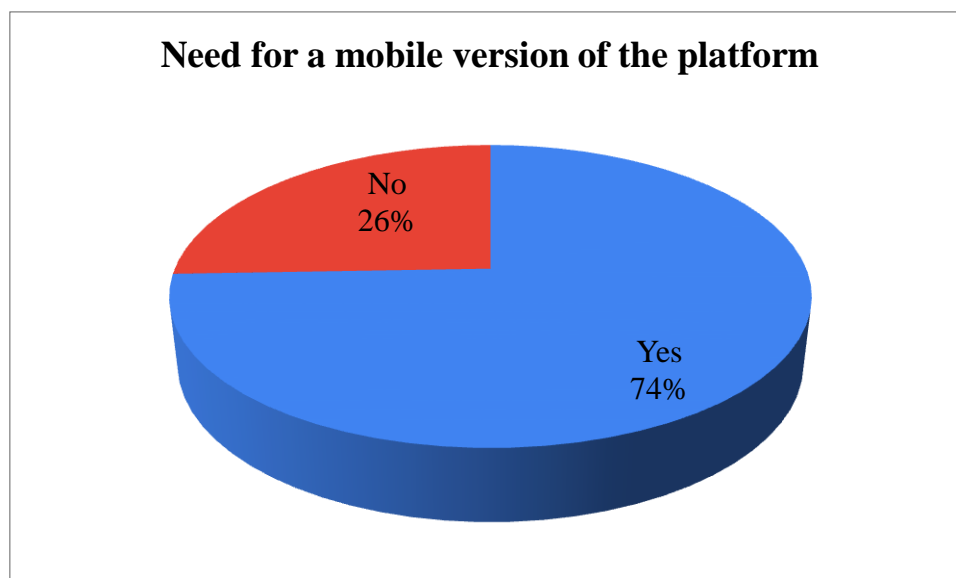
Figure 9. Need for a mobile version of the City Challenges Platform

A significant percentage of the participants stated that they are interested in contributing with material in the City Challenges Platform (Figure 10). 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

Are you willing to upload material in the CCP?

■ Yes ■ No

42%

58%
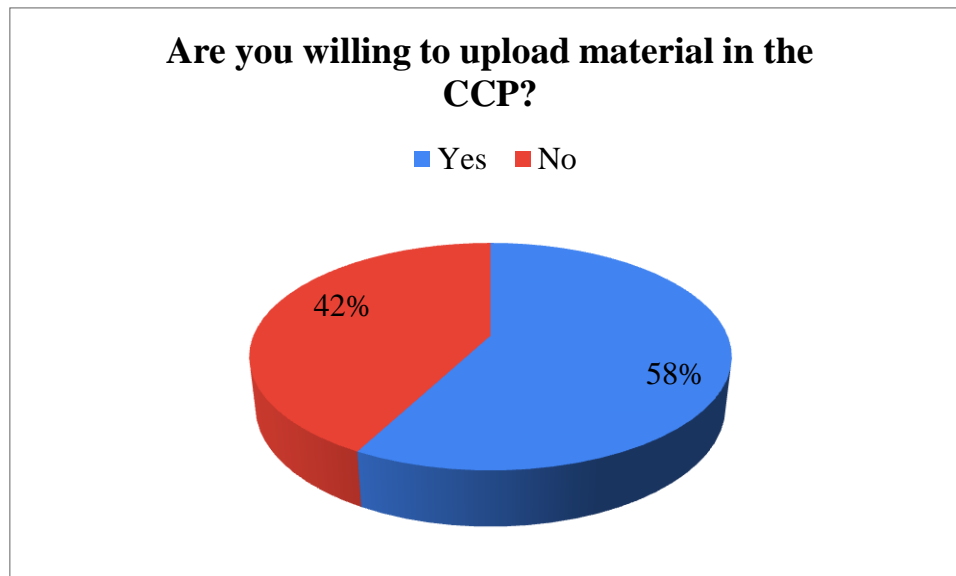
Figure 10. Willingness to upload material in the City Challenges Platform

8. 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 11). Private messaging is another option as well as tools that were proposed by the responders like Facebook and e-mail. All of the above will be considered in the design and development of the City Challenges Platform in WP7.

Communication tools

■ Chat Forum ■ Private messenger ■ other

15%

48%

37%
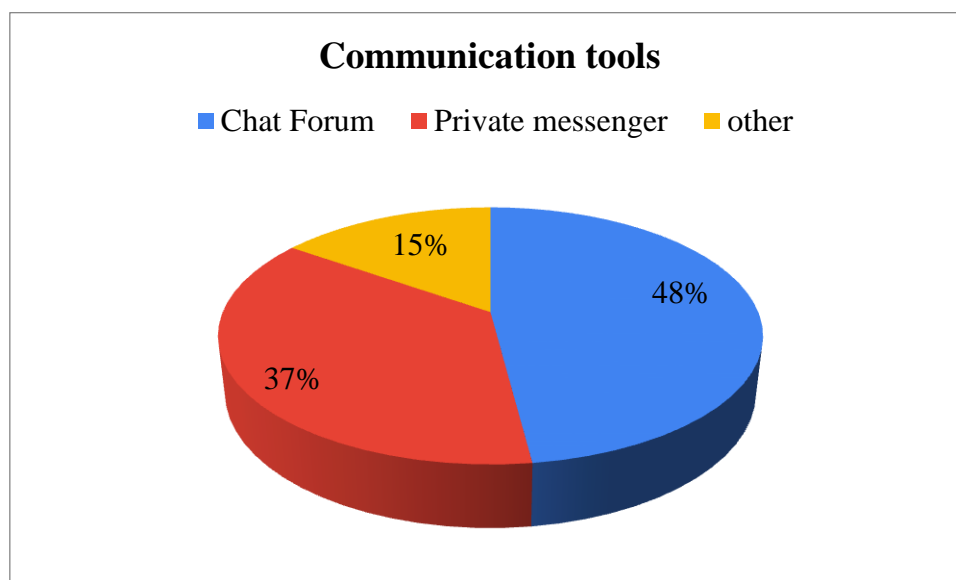
Figure 11. Preferable communication tools

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 12).
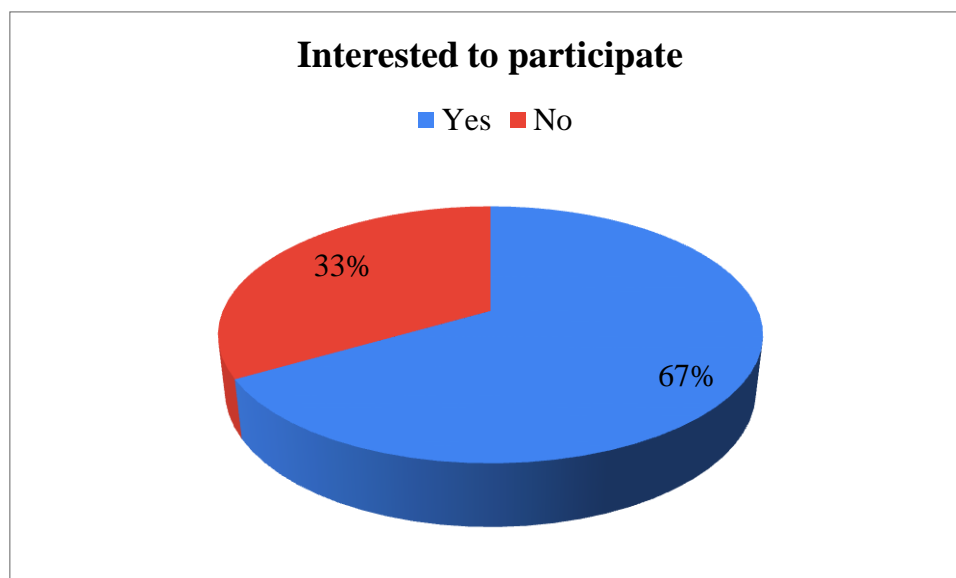
Figure 12. Interest to participate in the online courses

The requirements of the participants regarding the online courses themes that will be developed in WP8, were collected. Results indicate that urban environment and nature based solutions are the most interesting themes according to the participants' responses (Figure 13).
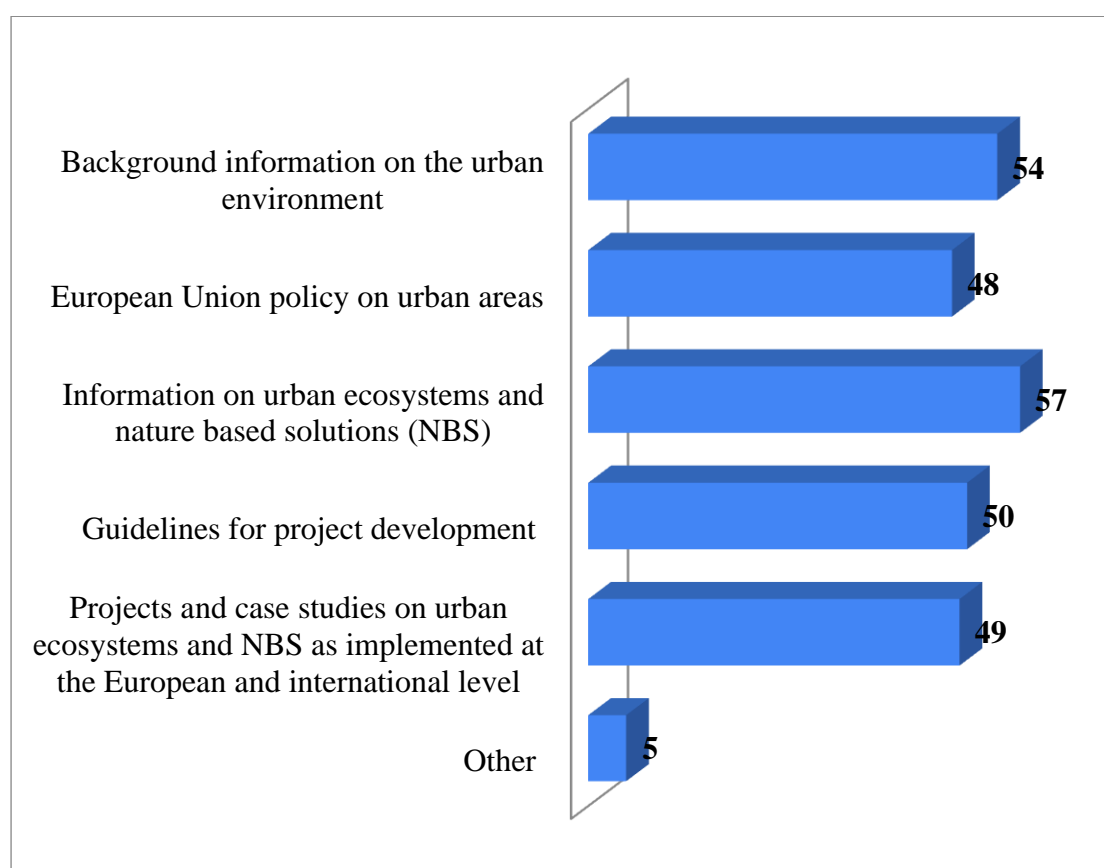

Figure 13. Courses to be included in the distance open learning online courses (number of responses)

The majority of the participants are willing to dedicate 1-2 hours per week for these online courses. This will be taken into consideration when designing and developing the courses in WP8 (Figure 14).
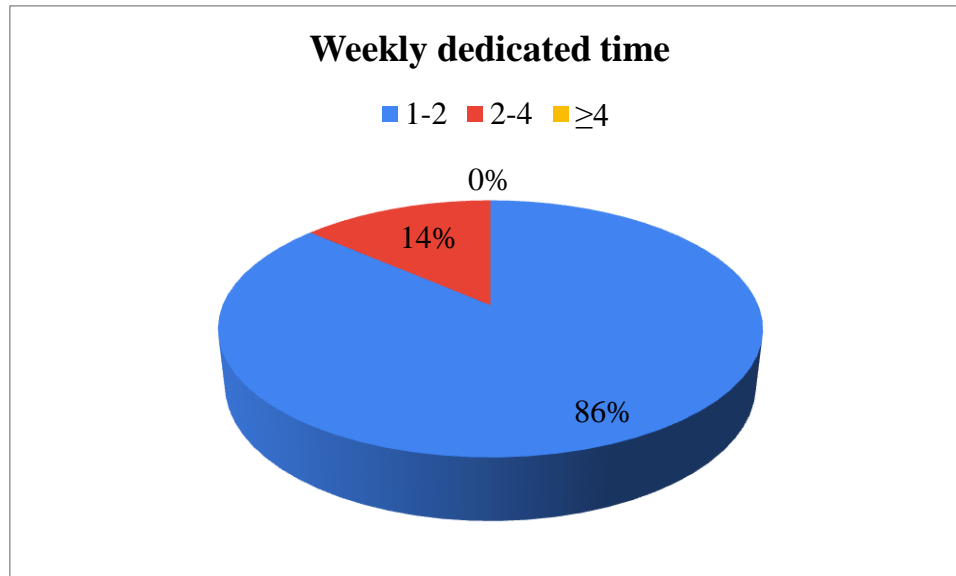
Figure 14. Amount of time the participants are willing to dedicate in the online courses

10. 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 15). 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
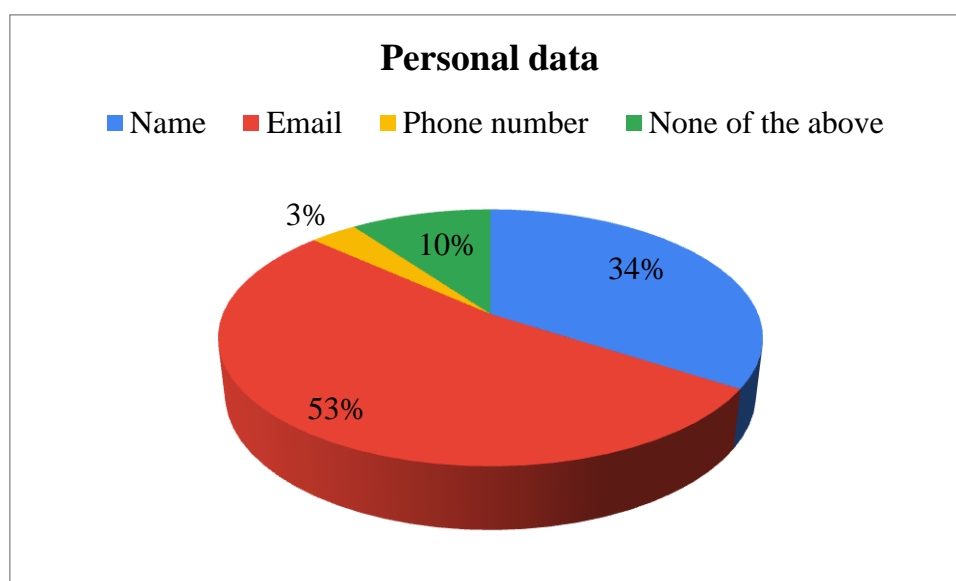
Figure 15. Personal data preferences for communication purposes.

The Science in the City: Building Participatory Urban Learning Community Hubs through Research and Activation- The PULCHRA project

PULCHRA QUESTIONNAIRE

User category	☐ School ☐ University ☐ Research center ☐ Local authority ☐ Policy maker	☐ Enterprise ☐ NGO ☐ Parental community ☐ General public ☐ Other (please specify) ………………………….

A)Project Implementation

- Which <u>urban</u> issues should the PULCHRA project consider?

☐ urban heat
☐ greenery
☐ air quality
☐ urban expansion
☐ other (please fill)………………………………………………

- Which may be your preferable role in PULCHRA?

☐ Mentor (i.e. help the development of school projects with my expertise)
☐ Member of the school team to implement the PULCHRA related project
☐ Participation in the activities of the project
☐ Observer (i.e. just follow the project)

- What may be your expectations from PULCHRA? (**you may tick three choices at the maximum**)

☐ To support the interaction of schools with the local society
☐ To facilitate the cooperation between schools and Universities and research centers
☐ To expose schools to innovative solutions and products as developed by the private sector
☐ To link schools with the local authorities
☐ To provide state of the art information on urban ecosystems
☐ To develop educational material on urban ecosystems
☐ To demonstrate and use innovative educational approaches
☐ To develop an open dialogue on the value of cities as urban ecosystems
☐ To develop school to school projects
☐ To raise awareness on the importance of urban ecosystems
☐ To link to other science education programs (e.g. GLOBE)
☐ To promote citizen science activities

☐ Other (please specify)…………………………………………………
………………………………………………………………………………………
………………………………………………………………………………………
………………………………………………………………………………………
………………………………………………………………………………………

- In the event that you participate to the activities of PULCHRA

a) are working time hours convenient for you ☐YES   ☐NO

b) how much time are you willing to dedicate per week ☐0-2 ☐2-4 ☐4-6

c) would you prefer to ☐host or ☐ attend a PULCHRA activity (event, lecture, interview, etc.). [You can select both]

B) City Challenges Platform (you may tick two choices at the maximum):

- What would you expect from the City Challenges Platform?

☐ To provide information on the PULCHRA project
☐ To support the development of schools projects in the field of urban ecosystems
☐ To support the interaction among stakeholders (e.g. the education and research community, the local authorities, the private sector, NGOs, citizens)
☐ To provide information regarding ongoing projects on urban areas and urban ecosystems
☐ To act as a repository of best practices as applied in various urban areas
☐ Other (please specify)……………………………………………
………………………………………………………………………………………
………………………………………………………………………

- Is a mobile version of the City Challenges Platform important for you?

☐ YES ☐ NO

- Are you willing to upload material to the City Challenges Platform as related to your activities (measurements, project reports and case studies, publications, etc)? ☐ YES ☐NO

If yes, what kind of material? …………………………………………..
....
....
....

- Is communication with other participants/stakeholders via the City Challenges Platform important for you? ☐YES ☐NO

If yes which method of communication do you prefer:
☐ Chat forum
☐ Private messaging
☐ Other (please specify)……………………………………………………

- The PULCHRA project will develop an online course about urban ecosystems. What would you like this course to include in terms of urban

ecosystems? (**you may tick as many choices as you wish**)

☐ Background information on the urban environment
☐ European Union policy on urban areas
☐ Information on urban ecosystems and nature based solutions (NBS)
☐ Guidelines for project development
☐ Projects and case studies on urban ecosystems and NBS as implemented at the European and international level
☐ Other ……………………………………….

- Are you interested to participate in an online course about urban ecosystems?
  ☐ YES   ☐ NO

If yes how much time would you dedicate?
☐ 1-2 hours/week
☐ 2-4 hours/week
☐ ≥4 hours per week

- Which personal data would you like to appear in the City Challenges Platform for communication purposes?

☐ Name
☐ Email
☐ Phone number
☐ None of the above

THE PULCHRA PROJECT

PULCHRA aims to explore the open schooling concept in the theme "Cities as urban ecosystems" and in view of creating new partnerships in local communities to foster science education for all citizens. The open schooling concept provides an open and inclusive learning environment. It supports the development of innovative projects and provides points of access for all members of society. Student projects meet real needs of the community by drawing upon local expertise and experience. Through this approach, students learn to understand and reflect upon their place in the world. The approach strengthens collaboration and mutual mentoring. Schools, in cooperation with other stakeholders will become agent of community well-being, taken the theme to be explored encompasses the natural environment, the built environment and the socio-economic environment in cities.

The PULCHRA project targets the exploitation of the concept of open schooling in view of bringing new scientific knowledge for the city as an urban ecosystem, by facilitating participation of citizens of all ages in scientific discovery, by building a learning, exploring and activation network, by developing knowledgeable, innovative and participatory communities and by exploring common issues related to the city as an urban ecosystem through specially designed City Challenges.

The PULCHRA consortium consists of twelve (12) partners from ten (10) EU Member States (Greece, Czech Republic, Cyprus, Germany, Ireland, Italy, Latvia, Poland, Romania, and Sweden) that collectively constitute a team fully capable of achieving the project objectives."

The specific objectives of the project are
- To develop and use a **City Challenges Platform** (including web based interaction and visualization modules) amenable to students, parents, educators, citizens, scientists, local administrators including a collaboration feature allowing experts to guide non-experts in terms of the interpretation of findings.
- To develop **the City Science Teams** (see Figure 1) with the participation of teachers and students, parents, professionals from the business community, scientists, local administrators, citizens, etc.
- To develop open source educational e-material, e-guidelines and smartphone app for analyzing the urban ecosystem and challenges demonstrating in detail the links between the cities as urban ecosystems and science (physics, chemistry, biology, geography, mathematics, materials science and informatics) and technology.
- To "**Experience Science**" through the organization of **two pilot City Challenges,** also open to the general public**,** in the science fields as related to the cities as urban ecosystems. **Indicative** themes to be explored are: "Converting school yards to open green spaces", "Use of Earth Observation for the study of the urban ecosystem", "Nature based solutions for climate mitigation plans at the

neighbourhood scale", "New materials for the built environment in urban ecosystems", etc.

- To organize and implement, in coordination with local research centres, Universities and scientific associations, open activities, also in support of the City Challenges, to students, parents and citizens in general, under the theme "**Meet the scientists – Introduce science in the city – approach the city as an urban ecosystem**".
- To bring real life projects as related to cities as urban ecosystems in the classrooms through focused collaborations with professionals and enterprises.
- To motivate students towards new technologies, mainly the use of Earth Observation (Copernicus program and Sentinel missions) and navigation tools, etc.
- To report the concept of the city as an urban ecosystem, as well as Challenges, finding and solutions to the public through the **City Reporters** action.
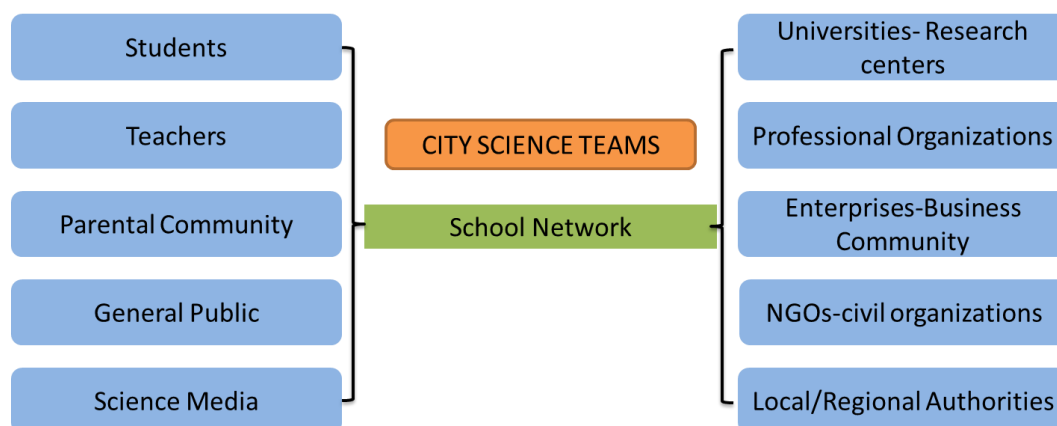

Figure 1: Schematic representation of the City Science Teams