



**OPEN
SCIENCE
HUB**

**EMPOWERING CITIZENS
THROUGH STEAM
EDUCATION WITH
OPEN SCHOOLING**

DELIVERABLE 5.3

Baseline Study



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Abstract	The Baseline Study is a report detailing the current aims of each OSHub partner regarding impact evaluation. How the tools in D5.2 have been further developed, how partners aim to implement the tools, the data they will contribute to the overall evaluation of the OSHub project.
Keywords	OSHub, Open Schooling, Questionnaire, Survey, Interviews, Feedback, Feedback Forums, Observation Tools, Reflection Tools, Evaluation.

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0.2	30 November 2020	Brendan Owens	TCD	Internal Review
0.3	30 November 2020	Sanne van Gammeren	ULEI	External Review
0.4	01 December 2020	Maria Vicente	ULEI	External Review
0.5	02 December 2020	Shaun Ussher	TCD	Final Draft

LIST OF ACRONYMS

ACRONYM	DEFINITION
CSA	Coordination and Support Action
DEI	Diversity, Equity and Inclusion
GA	Grant Agreement
H2020	Horizon 2020
IOS	Inclusion of Self
NGO	Non-Governmental Organization
OSHub.Network	Open Science Hub Network
OSHub	Open Science Hub
BS	Baseline Study
STEM	Science, Technology, Engineering and Mathematics
STEAM	Science, Technology, Engineering Art and Mathematics
TCD	Trinity College Dublin
ULEI	University of Leiden
WP	Work Package

EXECUTIVE SUMMARY

The OSHub.Network Baseline Study (BS) is Deliverable 5.3 (D5.3) from the coordination and support action (CSA), OSHub.Network, grant agreement (GA) 824581. This report details how each local OSHub location aims to contribute data to the baseline study of OSHub.

Originally deliverable 5.3 aimed to produce micro data sets gathered at events post kickoff of each local OSHub. Due to restrictions for the COVID-19 pandemic the OSHub.Network kickoff date was postponed from May 2020 until late November 2020. Due to this, the opportunity to obtain micro data sets was unavailable and the timeline of data collection for WP5 has been rearranged accordingly.

Each local OSHub is, at the time of writing, currently coordinating the individual launch of their Hub. The following documentation details the situation of each OSHub, how they will implement the tools described in D5.2, the data they will contribute to the overall evaluation of the project and finally how the data will be visualised, contributing to the Impact Evaluation Toolkit (D5.4).

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1. INTRODUCTION

1.1 Background: about OSHub.Network

The Open Science Hub Network (OSHub.Network), a consortium of nine partners across Europe, engages schools and local stakeholders in research and innovation as a tool for sustainable community development.

More specifically, the OSHub.Network is establishing a European network of community hubs – OSHubs, in communities that traditionally do not engage with research and innovation due to various barriers, geographical location, socio-economic status, or ethnic minority group background. OSHubs inspire, empower and engage citizens – from school children to senior citizens – in STEAM (Science, Technology, Engineering, Arts and Mathematics) learning and research opportunities, grounded on collaboration with societal agents.

As such, local OSHubs work as mediators in their local communities, positioning schools as active agents for collaboration between civil society, enterprises, research institutes, and families. This is performed by promoting an open schooling approach grounded in community-based participatory research practices: throughout this process, schools and communities identify local relevant challenges, which are then be transformed into relevant research and innovation projects, led by students and teachers, in collaboration with local stakeholders.

The OSHub.Network is developing a common methodological framework, that allows each OSHub to identify and analyse local needs, issues, opportunities and relevant actors, in order to address socio-economic, geographical, gender equity issues, and untapped growth potential. Inspired by the “Mission-Oriented Research & Innovation in the European Union”¹ approach, developed by Mariana Mazzucato, OSHub.Network will define a set of Open Schooling Missions, aimed at addressing local relevant challenges linked to the Sustainable Development Goals. These Open Schooling Missions will then constitute the basis for the creation and development of the open schooling projects, enabling real collaboration across communities. Importantly, to ensure diversity, inclusion and sustainability, in each OSHub location, there will be a local management board with representatives from local stakeholder groups – schools (including students), families, research institutes and universities, enterprises, industry, media, local governments, civil society organizations and wider society – which will be involved in all key processes and decisions regarding local OSHub programmes and initiatives.

By supporting local schools and communities with the tools and network to tackle relevant challenges, OSHub.Network aims to create local impact while simultaneously promoting an active global citizenship attitude, thus contributing to community development, innovation and well-being. To

1 Mariana Mazzucato (2018), Mission-Oriented Research and Innovation in the European Union – A problem solving approach to fuel innovation-led growth’, European Commission, Retrieved from: https://ec.europa.eu/info/sites/info/files/mazzucato_report_2018.pdf

encourage usage and maximise impact in Europe and beyond, all resources, products and solutions developed by OSHub.Network will be fully based on Open Standards, such as open education, open technology, open science, open hardware, open design and open architecture. Also, OSHub.Network will create an online platform to share OSHub expertise, resources, and best practices with all OSHubs, their partners and the communities they serve. To ensure the legacy and reach of the project, all OSHub.Network resources will also be shared on existing large online educational repositories, and relevant national networks and repositories.

Finally, OSHubs will develop a legacy and sustainability plan, and will work closely with local governments, to ensure that each local OSHub has the tools and resources to continue beyond the lifetime of the project, and that the Open Schooling approach is incorporated in the school vision and organizational structure.

By the end of the project, it is expected that the OSHub.Network will have impacted 25 000 students, 1 250 teachers and 4 000 members of the community, through involvement in more than 150 school-university-industry-civil society partnerships in open schooling projects and activities.

In the long-run, we envision OSHubs as education brokers in their local communities, supporting local school networks to incorporate Open Schooling in their vision and organizational structure, leading to sustainable quality of education. Most particularly, OSHubs will facilitate the bridge between the needs and realities of schools and their local context and resources, as well as brokering for implementing national/regional policies, passing along signals from schools when policies are failing and advocating for context-sensitive policies.

1.2 Purpose of this report

The purpose of this document (Deliverable 5.3) is to outline how each of the nine OSHubs will contribute to the baseline study through actioning the evaluation tools instruments detailed in deliverable 5.2.

Due to the diversity of Covid-19 restrictions across Europe each member of the OSHub Network network is currently facing regional specific difficulties that are affecting the launch of their local hub. Despite the restrictions all local OSHub are actively working with their communities (as seen in the project website (<https://oshub.network/>)). Through the "Local OSHubs" subpages its clear to see the Hubs have established their local teams, partner schools and Local Management Boards;

and have identified, together with their local stakeholders, the challenges they will be tackling throughout this year, as well as the corresponding Open Schooling projects. . These restrictions also impact the type of engagement that can be ensured, the type of audience and the capacity, the experience of participating, and the stakeholders who can be involved. In turn this also has a profound effect on the evaluation methods across the network. It has always been the case that each location will face specific challenges, therefore the evaluation tools and the data they collect will be specified to their circumstances.

The aim of this document is to outline the following:

- To state the role of evaluation for each regional OSHub
- To point out how each local OSHub will implement the evaluation instruments from D5.2
- To provide a timeline of the evaluation process for the overall OSHub.Network project
- To describe how the data sets for each tool will be visualised

2. ENGAGEMENT WITHIN OPEN SCIENCE HUB NETWORK

Due to limitations experienced by each OSHub it was important to understand the current specific needs of each partner. We interviewed and collected data that specifies the goals of each OSHub program, the audience they plan to work with , and their preferred evaluation methodology.

LOCATION	DESCRIPTION OF OSHUB	AUDIENCE TYPE	EVALUATION INSTRUMENTS
The Netherlands ²	Formal education outreach program. This program consists of a tutoring project in which university students tutor primary school students for at least ten weeks assisting them with their work at the request of their partnered school.	OSHub The Netherlands currently works with 5 primary schools, and aims to work with 25 primary schools in 2021. The local municipality and council of The Hague acting as a stakeholder partner.	<ul style="list-style-type: none"> — Teachers Survey (Perspective of students) — Teachers Reflection — Students Reflection Journals (University Students) — Stakeholder surveys
Ireland ³	Informal learning program where students receive a short course on active global citizenship. The first part of this course is grounded in competency development. Students will then move on to tackling a local community action project in the second half of the year.	OSHub Ireland works with 5 teachers across 3 schools, a total of 70 students aged 14-16.	<ul style="list-style-type: none"> — Student Survey — Student Reflection Journals — Teacher Reflection — Teacher Survey — Stakeholder Survey
Portugal ⁴	OSHub Portugal is currently working with 3 types of programs; The first is a teacher training and development program to teach teachers open schooling methodologies. The second is a long standing open science project called Drinkable Rivers, this is a community project that aims to introduce concepts of citizen science. The third programme is based on developing digital literacy skills to students who did not previously have access.	<ul style="list-style-type: none"> — OSHub Portugal is working with 22 teachers to develop open schooling approaches over the course of 7 sessions. — 15 students aged 10-15 every week working on the Drinkable Rivers project. — Aims to work with 30 students bi-weekly on the digital literacy project. 	<ul style="list-style-type: none"> — Teaching survey (pre/post) — Student survey (pre/post) — Student Reflection — Community Survey — Digital Literacy Questionnaire

2 OSHub-NL: https://oshub.network/local_OSHub_NL.html

3 OSHub-IE: https://oshub.network/local_OSHub_IE.html

4 OSHub-PT: https://oshub.network/local_OSHub_PT.html

Greece ⁵	<p>OSHub Greece are working with students on the island of Lemnos to monitor their notable environmental wealth and rich biodiversity. Students will monitor the mushroom species and create a citizen science app to monitor as well as creating automatic pet feeders from upcycling resources. To do this they will work with teachers as a training approach.</p>	<p>OSHub Greece will be engaging with secondary school students and educators on the island of Lemnos and Agios Efstratios. OSHub Greece will be working closely with a set of teachers and educators in their "Train the trainer" approach.</p>	<ul style="list-style-type: none"> — Teacher Survey — Teacher Reflections — Student Survey
Switzerland ⁶	<p>OSHub Switzerland will work with schools to develop floating stations to monitor the quality of water in rivers and in the lake Lèman. They will also recruit the help of regional offices for water management and other stakeholders to identify the scientific objectives of the mission, build and install the stations, analyse and communicate the results.</p>	<p>OSHub Switzerland will work with primary or secondary schools to focus on specific territorial challenges. Particularly, the Geneva canton is characterized by freshwater abundance – whose quality is greatly valued by citizens. They will also work closely with association Maison de la Rivière, the engineering school HEPIA, the regional office for water management.</p>	<ul style="list-style-type: none"> — Student Reflection Journals — Stakeholder Interviews/ reflections — Teacher Survey
Austria ⁷	<p>OSHub Austria will be engaging with high school students aged 12-17 through informal science and art education projects based on the theme of Media communication. The workshops will be focused on hands-on learning and skill development.</p>	<p>OSHub Austria will be working groups of 15 students aged 12-17 for 2 day workshops on media communication with the aim to have 30 different cohorts of students throughout the year.</p>	<ul style="list-style-type: none"> — Student Reflection — Student questionnaire (pre/post) — Digital literacy questionnaire — Teacher experience questionnaire / reflection

5 OSHub-GR: https://oshub.network/local_OSHub_GR.html

6 OSHub-CH: https://oshub.network/local_OSHub_CH.html

7 OSHub-AT: https://oshub.network/local_OSHub_AT.html

France ⁸	<p>OSHub France will focus on 2 projects. The first is a community development project that will take place in the school community where students will work to build installations in their schools. The second project will focus on climate change activism projects.</p>	<ul style="list-style-type: none"> — OSHub France will be working with middle school children in their school community development program. These students are 12-14 year olds of two classes of 24. — They will also be working with 10 year old primary school students on climate change projects. — OSHub France will also be working with 14 teachers through a teacher development programme. 	<ul style="list-style-type: none"> — Student Survey — Student Reflection Journals — Community Interviews/Survey — Teacher Reflection — Teacher Survey
Czech Republic ⁹	<p>OSHub Czech Republic will work with five neighboring villages (their schools and municipalities) to “experience” landscape history and to activate public interest in it. Children will be taught how to process videos and how to work with GIS software, they will also present their results to the public.</p>	<p>OSHub Czech Republic will work with five neighboring schools in Konigsmuhle (their schools and municipalities), two secondary schools in the area Trebon, and a local secondary school village of Zdikov in collaboration with Charles University.</p>	<ul style="list-style-type: none"> — Student Reflection — Student questionnaire (pre/post) — Stakeholder Questionnaire — Community assessment
Italy ¹⁰	<p>OSHub Italy will not host its own Hub. However it will support the other entities in developing their open science hub and will monitor the self evaluation tool for each partner.</p>	NA	NA

8 OSHub-FR: https://oshub.network/local_OSHub_FR.html

9 OSHub-CZ: https://oshub.network/local_OSHub_CZ.html

10 Impact Hub: https://oshub.network/local_OSHub_IT.html

3. RESEARCH INSTRUMENT REFINEMENT

3.1 Feedback Forums

The feedback forums will remain very similar to those described in D5.1 (Feedback Forums). These will be a consistent part of the evaluation of the OSHub.Network. The questions proposed in the feedback forums will be subject to change and based on the milestones, deliverables and progress of the overall OSHub.Network consortium. Feedback Forums will be completed in December and June of each year.

Feedback will be obtained via a Google Form and interviews. These will then be coded to a set of indicators which are subject to the questions at that time in the project. All indicators and coding will be described in full detail in D5.4: Impact Evaluation Toolkit in month 36.

Indicators of feedback forums will consist of the following:

- Consortium collaboration
- Stakeholder engagement
- Local network development
- School engagement (relationships / collaboration / progression)
- Workshop development and engagement.
- Local OSHub development (Physical space / program resources)
- Teacher Engagement (assistance / training / reflections / insights)
- Consortium Training
- Goal Achievement

3.2 Self Evaluation Tool

The evaluation tool will also be a consistent process in evaluating the OSHub.Network project. As described in D5.2: Research Instruments, the self evaluation tool is a means for partners to self evaluate / score themselves on a list of indicators. This provides both a means of reflection and quantitative measurement for partners to assess themselves over a period of time.

The indicators of the self evaluation are described in D5.2 Research Instruments.

3.3 Questionnaire for stakeholders

The stakeholder questionnaire was originally developed as a Google Form. Upon reflection with the consortium these questionnaires would be more accessible for stakeholders if partners could also capture this information through a short interview.

Questionnaires will also be available to distribute via an OSHub event. Therefore we will establish a questionnaire combining questions from the events questionnaire and stakeholder questionnaires.

Stakeholders are an essential part of the local OSHub network. These are key actors in the community and will support our local open schooling projects. Similarly with all actors involved it is important to capture the experience of the stakeholders working with open schooling projects. Understanding the stakeholder experience will allow us to better identify suitable stakeholders and create better partnerships between all community actors.

Answers from questionnaires or interviews will be transferred or transcribed to a spreadsheet and coded based on a set of indicators, these will then be counted and a comparison analysis will be carried out at the end of the project. This will be detailed in D5.4 Impact Evaluation Toolkit.

The indicators will include the following:

- Interest in OSHub
- Resources provided to / gained from participating in OSHub
- Role in OSHub
- Type of community stakeholder
- Time spent working with OSHub

3.4 Event Questionnaire

The event questionnaire will be available to all local OSHubs to be used in any public events they host with the community, stakeholders and schools. The questions as set in D5.2 will be altered to accommodate the needs of the partners and to accommodate interests of the community stakeholders.

The questionnaire will be distributed via a Google Form, data will be coded based on a set of indicators, these will then be counted and a comparison analysis will be run at the end of the project.

The indicators will include the following:

- Type of community stakeholder
- Role in OSHub
- Experience of the event (Measured as 5 point Likert scale)
- Experience of the event (Long answered reflection)

3.5 Pre / Post Students Survey

3.5.1 Student Surveys

As per the description in D5.2 Research Instruments, a pre and post survey will be available for all students taking part in OSHub programs. The aim of the survey is to track any changes in students identity and perceptions of science, art, or their community. A section of digital literacy will also be included in the new version of the student survey.

The indicators will include the following:

- Student perception and connection to STEAM skills
- Student perception of digital literacy skills
- Social and environmental perception of STEAM
- STEAM self identity
- Community identity
- Future Aspiration
- Extracurricular STEAM activities

3.5.2 Alternatives

As a proportion of OSHubs are working with audiences in a different capacity or audience of a much younger age, for instance, OSHub The Netherlands, the survey will not be accessible for those students, and so alternative methods will be proposed. OSHub The Netherlands will distribute a survey to a group of university student tutors and/or the teachers of the young students involved in the project. This will act as assessment of their tutoring program on the students involved from the teacher's perspective. This survey will also be available to those partners interested in tracking the teachers' perspective of the students involved in OSHub projects such as OSHub Austria, France and Ireland.

3.5.3 Teachers Surveys

Originally teachers were surveyed as part of the wider stakeholder group. Upon reflection we have decided to pivot this to make teachers a specific category. Teachers have a unique experience and play a key role in OSHub that separates them from the larger stakeholder group. Teachers are being provided with resources that both assist them with their teaching practices, personal development, assist with their individual workloads, and provide them with community resources. They are both stakeholders providing assistance with the design of OSHub as well as using the resources that are being developed. The aim of the survey is to capture the teacher experience throughout their involvement with OSHub.

Indicators will be as follows:

- Interest in the OSHub program / How relevant it is to their teaching

- Openness to work with external partners
- Resources provided to / gained from participating in OSHhub
- Role in OSHub
- OSHub effect on workload / Teacher pressure
- Perception of students engagement
- Effect of OSHub on school community

3.6 Reflection Tools

3.6.1 Students Reflection Tools

Reflection Tools and the theory behind them are described in D5.2: Research Instruments. The aim of the reflection tools are to capture students' experience over the course of their OSHub projects. Originally the student reflection tools were described as zines in D5.2. Similarly due to limitations described in pre / post student assessment; zines may also be no longer be accessible for all partner OSHub. This is due to time constraints, audience accessibility and style of curriculum. The reflection tool can be described and implemented in various ways such as zines, journals, diaries or a lab book.

When students are carrying out reflections, to be effective its important their reflections are guided. This involves providing students with the correct resources, equipment and instructions. Reflections should also be structured so that students have prompts to guide their reflection based on the programs they re completeing.

Indicators will be as follows:

- Depth of reflection / student understanding of OSHub curriculum
- Scope of Reflection / Student perception of science/arts role in society
- Type of reflection / Students metacognitive understanding of learning
- Student competency development
- Students communication skills
- Attitudes towards community, science and the arts

3.6.2 Teachers Reflection Tools

Originally in D5.2 teachers were provided with a larger reflection sheet and asked to reflect on the general pillars of OSHub workshops as per the DEI policy developed in D4.1. Upon reflection with the wider OSHub consortium, the 'experience of the teachers' regarding their workload and workplace life became a much larger aspect of impact assessment than originally provided in D5.2. Therefore, as described in the "Survey for Teachers" section, teachers have been separated from other community stakeholders. Their experience will be assessed separately to gain a better understanding of the impact of OSHub on their development, workshop observation, workload, teacher-student relationship, school-community relationships.

Indicators will be as follows:

- Effect of OSHub on student engagement
- Assessment of OSHub workshops regarding diversity, equity and inclusion.
- Effect of OSHub on workload / wellbeing in school

4. IMPACT ASSESSMENT TIMELINE

DATE	ACTION	DESCRIPTION
30th November 2020	Impact Assessment Strategy refined and confirmed.	Submit deliverable 5.3 Baseline Study with confirmation of refined impact assessment strategy.
18th December 2020	Impact Assessment tools version 2.	Complete a second version of research instruments from D5.2 that accounts for changes in partners projects and audiences.
23rd December 2020	Send to Partners for Review.	Partners to review new version of tools against their needs and aims.
10th January 2021	Confirmation of tool.	Partners to confirm tools can be used or need to be refined or pivoted again.

January 2021	<p>OSHub projects aim to commence in the 2nd semester of the academic year.</p> <p>The first round of data collection begins – pre surveys are distributed.</p>	<p>Distribution of surveys to students and teachers involved in OSHub projects.</p>
February – May 2021	<p>OSHub projects continue throughout this semester. Data collection continues with student reflections, teacher surveys and reflections, stakeholder surveys or interviews and event questionnaires.</p>	<p>Each partner will distribute the assessment instruments best suited to their engagement over the course of these months.</p> <p>Data will be compiled by TCD for the overall impact assessment</p>
May – June 2021	<p>OSHub projects will begin to end for the year. The final data collection will take place with post surveys and final reflection from students and teachers.</p>	<p>As Year 1 projects come to a close the necessary evaluation instruments will be distributed and data will be collected for a period of analysis.</p>
June – July 2021	<p>Data analysis and visualisation will take place over the summer of 2021.</p> <p>A review of the OSHub project impact tools by the consortium.</p>	<p>The data collected throughout the OSHub pilot year will be analysed, visualised and presented to the OSHub consortium.</p> <p>The consortium will have a reflection period of the first year of OSHub, as well as reflecting on the evaluation methodology. Feedback will be collected and the evaluation instruments will be further refined and developed for the final year of OSHub.</p>
August 2021	<p>Final refinement of tools.</p>	<p>The evaluation tools will undergo a further stage of development before being deployed across the OSHub network for the final year of the project.</p>
September 2021 – May 2022	<p>Data collection for the second year of OSHub.</p>	<p>Data collection will take place throughout the entire academic year of 2021/22.</p> <p>This is subject to Covid-19 restrictions and a review of the OSHub timeline with partners for 2021/22.</p>

September
2022

Complete review and data analysis of OSHub released as part the Impact Assessment Toolkit D5.4.

All the data from the OSHub project will be collected and analysed. Partners will be asked to provide feedback and reflection on the use of the evaluation instruments throughout the project.

Information about the tools along with an implementation guide will be detailed in deliverable D5.4.

5. CONCLUDING REMARKS

Despite the limitations OSHubs have faced due to Covid-19 restrictions, partners have been actively working with their local communities and developing their OSHub programs at an effective rate. The majority of all OSHub partners have a clear strategy for moving forward with their program detailing clear aims and objectives. This progression has allowed us to gain insight and an understanding of the needs and interests of the partners of OSHub regarding impact assessment.

The tools originally proposed in D5.2 will be revisited, and re-developed over the coming weeks and months to best align with OSHub strategies. Alongside this there is lety of time to provide support for OSHUs in the form of Inspiration Sessions and Open Sessions.





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