OSHub Ireland

OPEN SCIENCE HUB
MAKEDOCK
IRELAND

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Trinity College Dublin

OSHub-IE is led by Trinity College Dublin (TCD), a research-intensive university, with expertise in several disciplines including nanotechnology, information technology, immunology, mathematics, engineering, education, psychology, politics and English. OSHub-IE started out as part of the education programme in TCD's former art-science public engagement space Science Gallery Dublin, and is now led by researchers in TCD's School of Education.

TCD is based in the heart of the capital city, with direct access to networks of researchers, innovators, educators and students, both locally and internationally.

OSHub Team

Brendan Owens	**Joseph Roche**	**Shaun Ussher**	**Róisín McGannon**
Open Science Coordinator	*Assistant Professor in Science Education*	*Learning and Engagement Researcher*	*Informal Learning Researcher*

Value Proposition

OSHub-IE works as a community broker between schools, rese-archers and industry that promotes transdisciplinarity and active global citizenship, by providing or pooling networks of stakehol-ders that support teachers building student action out into local communities and vice-versa.

Target public

Transition Year Students, particularly from communities at high risk of educational disadvantage.

Transition Year (TY) is a one-year programme that forms the first year of a three-year senior cycle in many schools in Ireland. TY provides an opportunity for learners to reflect on, and develop an appreciation of, the value of learning in preparing them for the ever-changing demands of the adult world of work, further and higher education and relationships. Hence, each school designs its own TY programme by taking into account the possibilities offered by local community interests, in a way that suits the needs and interests of its students, thus providing an ideal opportunity to activate students as active global citizens.

Although not exclusive to these schools, OSHub-IE places focus on schools with a DEIS (Delivering Equality of Opportunity in Schools) designation, meaning the students there are at the greatest risk of educational disadvantage, or Educate Together Secondary Schools, with a high proportion of students with Special Educational Needs.

Management Board

02   Non-formal education-related entity

- **Science Gallery Dublin**
  Aisling Murray, *Head of Programming*
  Type of relationship/interaction: Science Gallery connections and interplay
  Contact frequency: Monthly

- **National Youth Council of Ireland**
  Barbara Nea, *STEAM Engagement Programme Manager*
  Type of relationship/interaction: Best practice in engaging young people in informal learning settings with STEAM practices
  Contact frequency: Quarterly

04 School

- **Ringsend College**
  Ciara Moran, *Vice Principal*
  Type of relationship/interaction: Teacher forum member and participating school
  Contact frequency: Monthly

- **Balbriggan Community College**
  Marie Jan Buckley, *Programme Coordinator*
  Type of relationship/interaction: Teacher forum member and participating school
  Contact frequency: Weekly/fortnightly during term time

- **St. Joseph's Secondary School**
  Chris O'Connell, *Science Teacher*
  Type of relationship/interaction: Teacher forum member and participating school
  Contact frequency: Weekly/fortnightly during term time

- **Assumption Secondary School**
  Michelle Salter, *Science Teacher*
  Type of relationship/interaction: Teacher forum member and participating school
  Contact frequency: Weekly/fortnightly during term time

Approach

OSHub-IE developed a STEAM-focused year-long programme to empower students to become active citizens within their own communities. This programme aimed to spark inspiration through STEAM workshops, to identify challenges of local concern, to construct projects to tackle these challenges and to showcase their work beyond the classroom.

The role of OSHub-IE throughout this process is the following:

- to connect schools to experts and local stakeholders who assisted with workshops and provided guidance to students throughout their OSHub project development phase, placing these projects within a real-world context. Through these interactions, students gain relevant and real-world insight into the topics they are exploring and are encouraged to share their thoughts and opinions. In addition, it acts as inspiration for future career paths for the students;

- to prepare the sessions and inform the invited stakeholders of their role, ensuring clear communication between all actors involved;

- to evaluate the programme from the perspective of students, teachers and the hub itself, to make suitable improvements for the following year;

- to coordinate the project showcase, including organising a location, ensuring the physical design of informative panels and student projects, inviting the guests, and developing the programme;

- to ensure sustainability of the programme.

To support teachers in secondary schools facilitating this year-long programme, TCD organised teacher training workshops, and co-created the OSHub-Ireland: Teacher Handbook using teacher consulation, which outlines all elements of the programme and links to required resources, providing a means for teachers to adapt the material to suit their local context. Specifically, it includes relevant definitions, diversity equity and inclusion guidelines, a selection of transdisciplinary inspiration workshops and a series of guidance materials. These guidance materials include co-creation session outlines, how to build a research question, how to activate the research question as a project and finally tips and tricks for showcasing student work.

Model

This programme consists of weekly sessions that bring the students through the process of formulating an idea to actualising it as a solution in a real world context.

These sessions include:

- **Inspiration workshops**

  Students are introduced to a number of science topics from the perspective of their relationship with a societal concept or challenge through workshops designed by OSHub-IE. The topics were Bias and Technology; Astronomy and Diversity; Sustainability and Future Cities; Mental Health and Wellbeing; Activism and Climate Change; Innovation and Ethics, Trust and Science. Experts in these topics would often be introduced during these workshops.

- **Ideation sessions**

  Over 2 sessions, students collaboratively select a challenge topic and initial project ideas for an Open Schooling project. The rapid ideation approach is used to assist students with concept generation.

- **Accelerator session**

  Students are introduced to a variety of experts related to their chosen topics, one or more of which are then paired with the school for the research and project phases. One aim of this session is to inspire possible pursuits of interest and make aware the career paths available to students.

- **Research sessions**

  Students carry out research into their concept, guided by experts and local stakeholders to ensure real-world relevance.

- **Project development sessions**

  Students develop project outputs that address their chosen issue, which are then later presented in the form of a physical or digital showcase.

The entire programme can be separated into milestones that teachers should aim for when planning their activities: Kick-off, Inspiration, Ideation, Accelerator, Research, Project, Showcase. However the programme is designed to be flexible around time commitments of TY, as well as adaptable to suit the resources of the school.

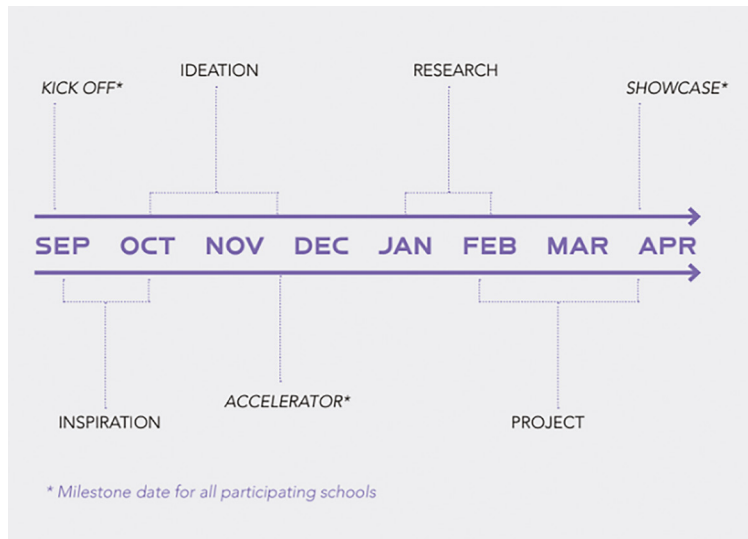A proposed timeline for milestones can be found in Figure 1 below.

Figure 1: Milestone timeline for OSHub-IE Transition Year programme, taken from the Teacher Handbook 22/23.

Physical Space

The community space OSHub-IE was to use on a part time basis (Unit18 in TCD's Technology and Enterprise Campus) was not available due to COVID-19 restrictions. Instead OSHub-IE has concentrated on establishing a programme which can be run in any school with local community collaboration. OSHub-IE makes use of Unit 18 occasionally for interactions with schools when they come for campus visits to the university.

Workshops developed during the OSHub project can be carried out online, led in a hybrid way, or carried out in person.

Figure 2: Students taking part in a workshop in Unit 18.

Partner Schools

NAME	LOCATION	SCHOOL YEARS	# STUDENTS	# TEACHERS	# SCHOOL HEADS	# PARENTS / GUARDIANS
Ringsend College	Dublin	Transition Year (15-16)	36 (2 classes)	1	1	36
Balbriggan Community College	Balbriggan	Transition Year (15-16)	36 (2 classes)	2	1	36
Firhouse Educate Together Secondary School	Firhouse	Transition Year (15-16)	18 (1 class)	2	1	36
St. Joseph's Rush	Rush	Transition Year (15-16)	18 (1 class)	2	1	30
Clonturk Community College	Clonturk	Transition Year (15-16)	50 (2 classes)	2	1	50

Implementation

Through teacher consultation a handbook was created by TCD to help teachers in Irish high schools facilitate a year-long programme to develop student citizenship and STEAM skills culminating in a project build and showcase. The handbook includes relevant definitions, diversity equity and inclusion guidelines, a selection of transdisciplinary inspiration workshops and a series of guidance materials. These guidance materials include co-creation session outlines, how to build a research question, how to activate the research question as a project and finally tips and tricks for showcasing student work.

The handbook is intended to support teachers, but requires the additional assistance of a broker such as an Open Science Hub or other institution to provide feedback, connect schools with relevant expertise and to host a school project showcase to reach audiences within the schools' local community and beyond.

A key point about this programme and framework is that the lead up to deciding on final projects and show-

case formats is equally important – the journey is part of the enrichment experience as well as the destination and final visible outputs. The programme has content that should serve a period of 8 months of the school year (e.g. September to April).

Overall, OSHub-IE impacted:

- Directly:
    - 158 students corresponding to 5 691 interactions (engagement rate: 4)
    - 9 teachers corresponding to 290 interactions (engagement rate: 9)
    - 46 community members corresponding to 56 interactions (engagement rate: 1)
- Indirectly:
    - 260 students
    - 238 community members

Figure 3 – 6: Photos from OSHub-IE sessions.

Partnerships

02   Civil Society

- **Office of the Chief Innovation Officer, Trinity College Dublin**
    Type of relationship/interaction: Providing a space outside the school and Science Gallery/Trinity

College Dublin that is in the community and is regularly used by community actors. Opportunity to prototype challenge projects in a flexible space and interact with those community actors where relevant (e.g. testing, data collection, etc). Opportunities delayed during Covid restrictions in 20/21, but ongoing communication throughout for future plans.

Contact frequency: Regular contact over the period of three months [in order to organise showcase]

- ### Jigsaw – National Centre for Youth Mental Health

    Type of relationship/interaction: One off event with one school interviewing a regional manager to learn how an organisation practically creates a positive impact in the community.

    Contact frequency: Two workshops

04 Academia

- ### University College Cork

    Type of relationship/interaction: Consultation with immunologist Dr. Anne Moore to work with Ringsend College students on their vaccine hesitancy project. Included a school presentation, q&a by email, survey consultation and final shareback.

    Contact frequency: One workshop with schools / One day of consultancy with coordinators

- ### University College Cork

    Type of relationship/interaction: Consultation with Dr. Gillian Murphy, School Psychology on best practice in survey design with particular attention to mitigating bias in participant responses. Included presentations to pilot schools, and direct school consultation while creating drafts of surveys to inform three challenge projects (two on bias and the third on vaccine hesitancy).

    Contact frequency: One workshop with schools / One day of consultancy with coordinators

- ### Trinity Access 21

    Type of relationship/interaction: Organisation within Trinity College Dublin which works to widen access and participation at third-level for under represented groups. They have connections to a large network of schools, and acted as a bridge between OSHub-IE and the schools which participated.

    Contact Frequency: Monthly

- ### Trinity College Dublin

    Type of relationship/interaction: Researchers at TCD School of Education (Autumn Browne, Ross Dowde and Eimear McDwyer) spoke to students during the accelerator sessions.

    Contact frequency: 6 sessions (3 per year)

02 Industry

- ### Ruza Leko – LekoDesign

    Type of relationship/interaction: Designed elements of the SEA CHANGE exhibition.

    Contact frequency: Regularly over a 3 month period

- **Dublin Maker**
  Type of relationship/interaction: Created one piece of the SEA CHANGE exhibition.
  Contact frequency: Regularly over a 3 month period

Activities

03   Teacher Training Sessions

SHORT DESCRIPTION

- The first teacher training held was in 2020, in response to covid. Teachers were asked what support they needed and how OSHub-IE could help them and their students. This assisted with the development of the TY programme. OSHub-IE facilitated the programme.

- The second training occurred in 2021. It went into detail about the TY course that had been done the previous year, and how the teachers could facilitate the course and take ownership over it themselves.

- There was a training also held in 2022 for the current set of teachers completing the programme for the year 22/23. Content was more or less the same, slightly refined to take on board feedback and adjustments to the programme for 2022/23. Note – the weekly sessions mentioned above do not include the year 22/23 as they are currently ongoing.

Below outlines the topics covered in the second and third trainings. Teachers were invited for a training day to learn about stages, topics and goals of the project to ensure successful implementation. The following topics were covered

- Overview of Science Gallery Dublin and its project

- Introduction to the OSHub project

- Facilitation tips and tricks

- Overview of OSHub-IE Inspiration Sessions

- Explanation of Ideation Sessions

- Breakdown of evaluation and reflection techniques used for the programme.

Teachers had the opportunity to ask questions or voice concerns regarding the implementation of the programme in their school.

DURATION

- Training 1: Online, 3 hours, 7 teachers from pilot schools

- Training 2: In person, 6 hours, 5 teachers

- Training 3: Online, 3 hours, 4 teachers

TIMELINE

- Training 1: 2020

- Training 2: 2021
- Training 3: 2022

PEOPLE ENGAGED

- Directly engaged:
    — 188 students corresponding to 5640 interactions (interaction rate: 30)
    — 9 teachers corresponding to 270 interactions (interaction rate: 30)
    — 5 school heads corresponding to 20 interactions (interaction rate: 4)
    — 15 researchers corresponding to 15 interactions (interaction rate: 1)
    — 2 professionals from NGOs corresponding to 2 interactions (interaction rate: 1)
- Indirectly engaged:
    — 188 parents/guardians
    — 50 researchers

180   Facilitated Sessions

SHORT DESCRIPTION

There were 6 TY programmes carried out in total. The pilot year corresponded to approximately 89 one hour weekly sessions, thus two years in five schools corresponding to roughly 180 hours of sessions in total. Per week, there were approximately 2 x 1 hour sessions per week per class group. This varied depending on the resources available to the school throughout the year, and how the programme was integrated into the previously existing curriculum. Approximately, each student would sit through 30 one-hour sessions throughout the programme.

Note: The TY programme is currently being implemented for a third year, however this is not included in the activity sessions listed above as it is currently seen as a form of legacy.

Figure 7 – 9: Students participating in research and prototyping as part of their project.

DURATION

1h sessions

TIMELINE

These sessions were carried out for two consecutive school years (Sept 20 – Apr 21, Sept 21 – Apr 22) at five schools in total.
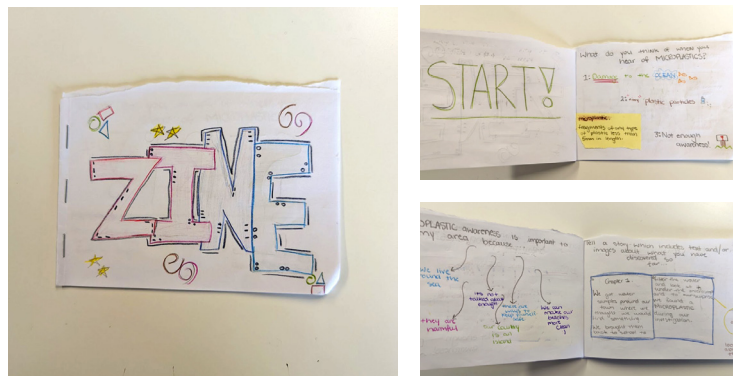

Figure 10-12: Example of a zine created during the project development phase. Zines were an integral part of.

PEOPLE ENGAGED

- Directly engaged:
    — 16 teachers corresponding to 16 interactions (interaction rate: 1)
- Indirectly engaged:
    — 260 students

01   Showcase of Open Schooling Projects

SHORT DESCRIPTION

At the end of the OSHub-IE TY programme '21-'22, participating students from the three schools involved showcased their projects at an exhibition at the ground floor of the Naughton Institute on Pearse Street, Dublin, the previous location of Science Gallery Dublin. This showcase was called SEA CHANGE. Across the three schools, the students focused on the microplastic crisis, sustainable materials and practices, and River Liffey pollution and recreational usage. TThe participating students, teachers, local stakeholder, researchers and the TCD community were invited to view and discuss the projects with one another. Collaborations with local designers brought aspects of the exhibition and the students' projects to life.

DURATION

SEA CHANGE was on display for one day, 27th April 2022.

TIMELINE

The exhibition was open to invitees between 11.00 and 15.00.
Lunch and coffee was provided between the hours of 12.30 – 13.30, alongside speeches.

- 11.00 – Doors open to invited guests to view the exhibition
- 12.30 – Tea, coffee, sandwiches served in old café space
- 12.45 – Welcome and context (Brendan Owens, Project Manager OSHub)
- 12.50 – 3x short speeches (5 minutes each)
- 13.05 – Exhibition viewing/ photography/ speaking informally with students
- 13.30 – End of event portion, exhibition remains open to staff
- 15.00 – Exhibition closes

Figure 13 – 16: Photos from the SEA CHANGE 2022 Showcase, where projects of the three schools involved in the '21/'22 TY programme were displayed.

PEOPLE ENGAGED

- Directly engaged:
  - 51 students corresponding to 51 interactions (interaction rate: 1)

— 4 teachers corresponding to 4 interactions (interaction rate: 1)

— 1 school head corresponding to 1 interaction (interaction rate: 1)

— 15 researchers corresponding to 15 interactions (interaction rate: 1)

— 2 professionals from NGOs corresponding to 2 interactions (interaction rate: 1)

— 10 local stakeholders corresponding to 10 interactions (interaction rate: 1)

— 2 professionals from industry corresponding to 12 interactions (interaction rate: 6)

• Indirectly engaged:

— 188 parents/guardians

— 50 researchers

Resources

• **Open Science Hub Ireland Teacher Handbook and associated presentations**

Developed in Summer 2021 and informed by the pilot programme feedback, the Teacher Handbook outlines all elements of the programme and links to required resources, providing a means for teachers to adapt the material to suit their local context. It is designed for a collaboration with Trinity College Dublin, but much of the pack can be reworked for another local context in a different country. The handbook is laid out in a way that the workshops can be given as stand-alone activities.

— Links for resources:

— *Suitable for devices*

— *Suitable for print*

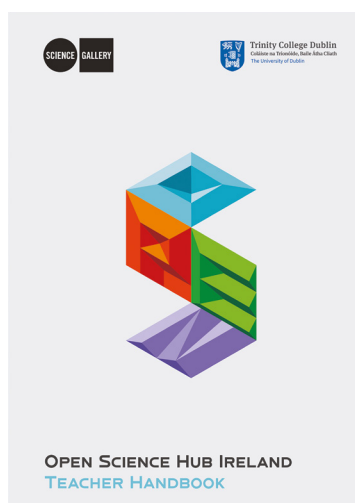— *Slides for Inspiration Sessions, that complement the OSHub Ireland Teacher Handbook*

Figure 17: Front cover of OSHub-IE Teacher handbook.

Videos

- **SEA CHANGE Showcase**

  This video includes interviews with teachers and students[1].

Activities and workshops

- **Diversity and Astronomy**

  An exploration of how diversity affects decision making and the selective sharing of knowledge based on dominant cultural identities, all through the lens of astronomy.

  — The guidelines for this activity can be found in the *OSHub website*.

- **Sustainability and Future Cities**

  An exploration into sustainable living and current and potential future challenges our world faces, how we can come together to tackle these challenges as local communities and a global society.

  — The guidelines for this activity can be found in the *OSHub website*.

- **Innovation and Ethics**

  This workshop expands learners' perception of what is considered ethically appropriate when engaging the public through art practices and scientific research, and how to innovate responsibly.

  — The guidelines for this activity can be found in the *OSHub website*.

- **Ideation Session**

  This is a series of co-creation sessions designed to collaboratively select a challenge topic and initial project ideas for an Open Schooling project through the approach of rapid ideation.

  — The guidelines for this activity can be found in the *OSHub website*.

- **Ethics Walking Debate Workshop**

  The goal of this workshop is to provide an open and supportive space in which learners can voice their opinions and insights on societal topics that often pose challenging ethical questions.

  — The guidelines for this activity can be found in the *OSHub website*.

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1   Video SEA CHANGE Showcase: *https://drive.google.com/file/d/1VcH3tp1iMJETZaDdOJ8BRtMvsMxVdcf1/view*

- **An introduction to Zines**

  Overview of how to make and implement zines as a creative and personal way for learners to reflect on their learning experience of any activity/workshop undertaken.

  — The guidelines for this activity can be found in the *OSHub website*.

Dissemination and Communication Activities

ACTIVITY TYPE	# ACTIVITIES	INFORMATION ABOUT ACTIVITIES
Organisation of a Conference	1	• Trinity in the Community Presentations – acted as organiser and participant Detailed information in the document in the footnote[2]
Exhibition	1	• SEA CHANGE at Science Gallery Dublin End of programme showcase for all students involved in OSHub-IE for the school year Sept 21 – Apr 22 . The students displayed the outputs of their Open Schooling projects, which all worked towards the goal of reducing plastic pollution, with a focus on its impact on the oceans (video in the footnote[1]). Detailed information above
Flyer / Posters / Brochures	3	• SEA CHANGE invitation copy[3] • Panels within SEA CHANGE exhibition[4] • OSHub Ireland Teacher Handbook Detailed information above
Training	3	Teacher training and on Open Schooling practices and implementation of the Transition Year Programme Detailed information above

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2   Conferences & Events: *Conferences & Events*
3   *https://docs.google.com/document/d/180p8oEvYRp7kYPDOhP_QKc8n8XN3mD9kW8YDGTyHkqc/edit?usp=sharing*
4   *https://drive.google.com/file/d/1C2NZmMQoPyQqkjQaEH3wHGbkT28QbdXw/view?usp=sharing*

Social Media	12	Twitter: • Estimated reach: 30 000
Website	4	• Webpage about OSHub in TCD's website[5] • Open Science Hub: Ringsend College Transition Year 2020/21[6] • Open Science Hub: Firhouse ETS[7] • Open Science Hub Ireland: Reflecting on Year One[8]
Communication Campaign (e.g. Radio, TV)	1	• Open Science Hub BLAST Challenge[9,10] OSHub BLAST Challenge: Online campaign shared with teachers in Ireland, used as both research for the programme and launch build up. Weekly co-creation activities posted by Science Gallery Dublin over the course of three weeks.
Participation to a Conference	3	• Trinity in the Community Presentations • ECSITE 2022 Pre-conference, organised jointly with the Open Schooling Together group[11] • ECSITE 2022 Main conference (2 presentations) Detailed information in the document in the footnote[12]
Participation to a Workshop	2	• Ars Electronica Festival 2021 • StickyDot Webinar
Participation to an Event other than a Conference or a Workshop	2	• Trinity Access Virtual Teachmeet • OSHub Inspiration Session #7 • OStogether Inspiration Session #9 Detailed information in the document in the footnote[12]

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5   OSHub in TCD's website: *https://dublin.sciencegallery.com/research*

6   Website article*: https://dublin.sciencegallery.com/latest/open-science-hub-ringsend-college-transition-year-202021*

7   Website article*: https://dublin.sciencegallery.com/latest/open-science-hub-firhouse-ets*

8   Website article*: https://dublin.sciencegallery.com/latest/open-science-hub-ireland-reflecting-on-year-one*

9   OSHub BLAST Week 2: *https://dublin.sciencegallery.com/latest/open-science-hub-blast-2*

10   OSHub BLAST Week 3: *https://dublin.sciencegallery.com/latest/open-science-hub-blast-3*

11   ECSITE 2022 Pre-Conference Session: *https://www.ecsite.eu/activities-and-services/ecsite-events/conferences/sessions/we-love-and-believe-open-schooling*

12   *Conferences & Events*

Video/Film	4	• Video of the SEA CHANGE exhibition[13] Video created about the SEA CHANGE exhibition, which displayed the projects of the OSHub-IE 21/22 Transition Year Programme. The video includes elements of the exhibition and interviews with students, teachers and OSHub-IE facilitators. • "What is Open Schooling?" (made by the consortium)[14] • "Why would you encourage a peer to take part?", featuring a local partner[15] • "What do I need to know to get started?", conversation between an "experienced partner" and a newcomer[15]
Participation in activities organised jointly with other EU project(s)	2	• ECSITE 2022 Pre-conference, organised jointly with the Open Schooling Together group • OStogether Inspiration Session #9 • Detailed information in the document in the footnote[16]

Legacy

During 2020/21 and 2021/22, the programme was implemented in five schools around Dublin, and in 2022/23 is currently being carried out in three more schools.

The *OSHub Ireland: Teacher Handbook* has been a key tool for the scalability and sustainability of the project. It includes relevant definitions, diversity equity and inclusion guidelines, a selection of transdisciplinary inspiration workshops and a series of guidance materials. These guidance materials include co-creation session outlines, how to build a research question, how to activate the research question as a project and finally tips and tricks for showcasing student work.

The long term goal is to expand the adoption of an OSHub programme with a wider set of DEIS schools and schools linked to Trinity Access 21. Trinity Access 21 provides pathways to higher education to those met by a variety of geographical and socio-economic barriers. TCD sees this organisation and teacher relationships as key to establishing a legacy of open schooling programmes.

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13   Video SEA CHANGE Showcase: *https://drive.google.com/file/d/1VcH3tp1iMJETZaDdOJ8BRtMvsMxVdcf1/view*
14   *https://opensciencehub.net/index.html*
15   *https://opensciencehub.net/local_OSHub_IE.html*
16   *Conferences & Events*