## Citizen Science (2) Education & Awareness-raising

AU, 27 October 2023 Gitte Kragh & Kristian H. Nielsen, Centre for Science Studies, AU

# TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

The TIME4CS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006201



## AIM

# TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

### **Embedding citizen science at AU**

- Establishing AU citizen science network
- Running citizen science activities and events
- Offering workshops on citizen science

H2020 EU-funded: 3 years: 1 January 2021 -31 December 2023

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## AIM of this workshop

- Develop citizen science awarenessraising activities
- Develop meaningful citizen science learning experiences
- Develop meaningful interactions with volunteers and volunteer groups





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## Citizen science – the term emerges

#### Amateur contributions to science

Audubon Society (1989) & Rick Bonney (1996)

- Citizens collecting and analysing rain samples
- > Birdwatchers submitting sightings
- Participants are instruments

Biodiversity monitoring

#### **Democratisation of science**

Alan Irwin (1995)

- > Democratic, participatory science
- Science to address needs and concerns of citizens
- Citizens could develop process of producing reliable knowledge themselves
- Participants can influence and transform science

#### Activist science

Participatory action research

Community-based natural resource management

Public and Patient Involvement (PPI)

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Training and <u>Q</u> Awareness-raising for Citizen Science in Research Performing **Organisations** (RPOs)

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## TIME4CS Ladder of Participation for both AND researchers!







## **TIME4CS Training and Awareness-raising**

#### Inreach vs. outreach

#### Awareness-raising and training - *capacity building* – inside RPOs

- Target groups are usually research staff, administration & support staff, students
- Formats are often courses, seminars, lectures and workshops either online or in-person and usually conducted in a semi-formal way

#### Awareness-raising and training - *capacity building* – outside RPOs

- **Target groups** are usually members of the public: individuals or groups of people who are often not scientists
- Formats can take many forms like open days, stands at events and festivals, debates, talks, hands-on learning experiences and activity workshops. The format is usually informal and in-person





#### **TIME4CS Academic courses: for Master students**



- → See the results of the 2022 projects here: Eleven tolent student projects (PDF)
- → See the results of the 2020 projects here: Exploring Citizen Science - Nine talent student projects (PDF)

**Citizen Science** 

Talent Programme 💵

#### More info:

- → Citizen Science Taient
- → Projects 2020
- → 20 ECT5 Spring 2022
- → Coses 2022
- → 10 ECTS Fall 2022

→ Readings

>

→ Foculty & Science Advisors



#### TIME4CS Academic courses: also open to the public



#### Citizen Science and Scientific Crowdsourcing: an Introduction

30 hours No start date. Work at your own pace

#### Overview

This online course will introduce you to the theory and practice of citizen science and scientific crowdsourcing.

Citizen science is the participation of members of the public in scientific projects, including the engaging a large group of people in the creation of new scientific knowledge (crowdsourcing).

#### You'll explore the history, theoretical foundations, and practical aspects of designing and running citizen science projects.

By the end of the course, you'll have a good understanding of citizen science and be familiar with the academic literature in this area.



#### Book a place

Available online

Book now

## Length and time commitment

O Time commitment: 30 hours

#### **TIME4CS EU-citizen.science**

eu-citizen.science Search Blog Events Moocs Forum FAQ About ECS Project Open Call for Ambassadors

Welcome to the platform for sharing citizen science projects, resources, tools, training and much more





#### TIME4CS EU-citizen.science MOOC example



- 유 Badges ☆ Competencies 邼 Grades
- 🕐 Dashboard
- G Site home
- 🗰 Calendar
- A My courses
- Private files
- Course sections



#### COURSE DESCRIPTION

This is a free two and a half hour course that provides an introduction to storytelling and gives practical tools to shape narratives to communicate about and engage with citizen science. Citizen science is a form of active public engagement in science.

#### 1. WELCOME AND INTRODUCTION ( 5 MINUTES)

Welcome to Storyteiling for citizen science	3
Course overview: What will you learn?	3
There are several paths	2

#### 2. STORYTELLING FOR CITIZEN SCIENCE (30 MINUTES)

🕞 Or	nce upon a time_us and stories	Ø
() M	eet writer Fernanda Krahn Uribe: Gathering around the ? like in the ancient times	
() w	thy storytelling?	2
Th	ne use of stories in science communication and participatory research	
I Me	eet Dr. Erinma Ochu: Relate to your audience	
🗐 St	ories came before science	Ø

#### 3. CREATIVE WRITING TO GET YOU STARTED (30 MINUTES)

0	Training our creative muscles	
0	Meet writer and illustrator Johanna Lohrengel, Hannuka: The power of stories to empowe	1
0	You, the storyteller	
0	Watch a short video with little elevens!	2
	Now, let's write this "little elevens" poem	$\square$
0	Think about the needs of your audiences:	$\square$
0	The 5 whys?	

## **TIME4CS Training and Awareness-raising: Outreach**

## Why should people engage with you or your project?

#### Citizen scientists' top motivations:

- Contributing to science & Interest in / concern about project topic (Values)
- Learning something new (Understanding) 
   this is why your focus on volunteer training is important!

#### **Training volunteers**



#### **TIME4CS Awareness-raising**

**Open Citizens' Day** 



The purpose of the Open Citizens' Day is for the public to actively participate in citizen science projects, trying out different types of projects, and be able to meet and talk to the researchers behind the projects. Citizen science projects from Denmark, and beyond, within any scientific discipline are invited to participate, showcase their projects, and directly engage the visiting public in their citizen science projects.

There will be some set activities at certain times throughout the day, organised by the participating citizen science projects, e.g., water sampling as part of the 'Søer i Fritiden' citizen science project; and talks by scientists leading citizen science projects.

The Open Citizen's Day will take place on Sunday 24th of April 2022 at the <u>Steno Museum</u>, part of the Science Museums, and adjacent outdoor areas at the Aarhus University campus in Aarhus. Participating citizen science projects will be placed either among existing exhibitions where themes overlap, in the foyer, or in outdoor areas as relevant. The Open Citizens' Day is part of and supported by the <u>Danish Science</u> <u>Festival</u> and leads up to the Engaging Citizen Science Conference 2022 the following two days.











## **TIME4CS Training and Awareness-raising**

## Inreach (staff & students)

- Curriculum-based, e.g. courses
- Capacity-building, e.g. seminars and workshops
- Informal mutual learning, e.g. peergroups, mailing lists, Working Groups, e.g. European Citizen Science Association working groups



### **Outreach ('the public')**

#### Awareness-raising (/recruiting)

- Open days, festivals, science cafés
- Competitions & challenges

#### Training of volunteers (/recruit & retain)

- Hands-on activities
- More practical than theoretical
- Think about the social aspects
- Make it fun!





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Setting up training sessions for researchers and others in the RPO

## TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

Identify audiences and stakeholders, design training and Train-the-Trainer concept

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## TIME4CS Setting up training for staff in RPOs

### Things to consider

#### Audiences and stakeholders

• Who and when could or should someone be interested or impacted by your training, or have an influence on your planned training?

#### Content differs based on your training target audience

• Researchers, other staff, or students

#### The Train-the-Trainer concept

• Enabling more people to conduct trainings will enable more people to be trained





#### TIME4CS Core Team, Audience, Stakeholders for training







#### TIME4CS Core Team, Audience, Stakeholders for training







## **TIME4CS Stakeholder Analysis**

## Who are your stakeholders? Some initial questions

- Who is/should be involved in making the training happen (approval, organising, execution, attendance, etc.)
- > What & how do they contribute?
- > What interests do the stakeholders have in the training?
- > What influence can or do the stakeholders have on the training?
- > How may stakeholders be **affected or impacted** by the training?
- > Which stakeholders are essential to involve?
- > At which stage do the stakeholders need to be involved?
- Several ways to identify stakeholders
- Several ways to think about their involvement interest, influence, impact, roles, timing, etc.





Audience Training participants

## TIME4CS Stakeholder Analysis example: Interest/Influence



## TIME4CS Stakeholder Analysis example: Timing/Stakeholders

Stakeholder mapping for Citizen Science Training implementation within RPO



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## TIME4CS What researchers need to know about CS

#### Some theory and some practice

#### Theory (and some cases)

- Inspiration from online courses, e.g. UCL course:
  - Technical aspects
  - Volunteer management & communication
  - Data issues & data management
  - Topic-specific approaches (inspiration from cases)
  - Ethics & legal aspects (e.g. GDPR)
  - Evaluation
  - (Policy)

#### Course content

The course starts with the basics of citizen science and scientific crowdsourcing.

tizen Science and Scientific Crowdsourcing: an Introduction

Cost: Free

Overview

You'll then learn about:

- the technical aspects of citizen science projects
- · how to make projects participant-centred
- · volunteer management
- · user-centred design and human-computer interaction
- data issues in citizen science managing data and ensuring quality
- · environmental citizen science
- · ethics and legal issues
- evaluation and policy

The course ends with a look at social theory approaches to thinking about citizen science and its place in the world.

There will be plenty of hands-on experiences to help you analyse and understand citizen science.



## TIME4CS What researchers need to know about CS Some theory and some practice NELCOME TO THE ZOOME SE People-powered research

See All Projects





#### **Practice!**

- A great way to learn and get inspiration is to participate in citizen science projects!
- An easy way is to try out projects on Zooniverse.org (usually around 100 projects)
- Try to find local projects you can participate in as well (not necessarily only within your own discipline!)

## TIME4CS What other RPO staff need to know about CS

#### Depends who your audience is! (communication staff, funding staff, administrators)

#### For all:

- Theory (but not too much)
- What citizen science is (and is not)
  - Enable their participation in an ongoing citizen science project (practice)
- What the proposed citizen science project is about

#### Specific to their role:

- Why their role is important for a successful citizen science project
- How they can support researchers with citizen science projects, identifying specific tasks:
  - identifying and applying for funding
  - running communications and outreach
  - volunteer management
  - IT platform development & maintenance
  - support on legal and ethical aspects



## TIME4CS What students need to know about CS

## Some theory and some practice

#### Theory (and some cases)

- Inspiration from courses, e.g. UCL course (past slide) or SDU course:
  - Reasons to include citizens
  - Co-creation
  - Managing citizen science projects
  - Learning to work cross-disciplinarily
  - How to contribute to (citizen science) research

#### Practice

 Include field trips, citizen science project visits and/or conference attendance

#### The students would learn to:

- · Co-create and manage citizen science projects
- Employ digital media to engage citizens
- Critically argue for inclusion of citizens in your field
- Support the sustainability agenda through citizen engagement
- Unfold your own profession in a cross-disciplinary team
- · Contribute to citizen science research.

As part of the programme students were invited to participate in a conference and a study trip free of charge.

See the results of the 2022 projects here: Eleve

See the results of the 2020 projects here: Explorin Citizen Science - Nine talent student projects (PD

talent student projects (PDF)

Citizen Science

> Citizen Science Tale

-> Projects - 2020





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See All Projects





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## Key Takeaways

#### Audiences and stakeholders

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Setting up training sessions (2) and learning experiences for volunteers

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## TIME4CS Stakeholder Analysis: Timing of Participant training





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You might need different types of volunteer training at different times of your project
### **TIME4CS Stages of participation**

### Awareness-raising & training focus

#### Volunteer perspective

Seeing posters / flyers Events / talks (Social) media Word-of-mouth Project perspective	Getting to know project & people Intro meeting w. information	Getting to know the tasks Receive training Building confidence	Exploring involvement & opportunities Empowerment Ongoing involvement	Provide feedback to project
Create posters / flyers Events / talks (Social) media Encourage people to talk about the project	<b>Welcome!</b> Intro meetings Volunteer handbook	Run trainings Support at tasks Provide learning and development opportunities	Offer new training & development opportunities Retain volunteers Create Ambassadors	Respond to feedback

Timing

Awareness – Recruitment – Onboarding – 'Tasks' (training) – Learning & Development – Follow-up (ongoing)



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### TIME4CS Plan your training programme

Make it a positive experience for your volunteers, not a chore they feel they have to do

- Set training goals (your goals and goals for volunteers)
- Make volunteers feel welcome
- Focus on hands-on, practical training (even if online!)
- Make your training accessible
- Ask for feedback and act on it





### TIME4CS Learning & Teaching/Training Styles

### Learning styles



### **Teaching styles**

Lots!

#### Facilitator

The facilitator's job is to support everyone to do their best thinking.

To do this, the facilitator encourages full participation, promotes mutual understanding and cultivates shared responsibility.

By supporting everyone to do their best thinking, a facilitator enables group members to search for inclusive solutions and build sustainable agreements.

Kaner & Berger, 1996





### **TIME4CS Onboarding (recruitment)**

### Make volunteers feel welcome!

### Introductory Information Session / Meeting

 Information about the organization and the project: aims, methods of involvement, project expectations and data needs

### Volunteer handbook

- Ideally there is a volunteer handbook where all the important information can be found
- Expand it as the project develops ask for volunteers to contribute (they know about their own role and what it is important to know. Acknowledge them!)

### Get to know your volunteers!

 Engage volunteers in discussions and get to know them. What are their motivations and expectations – what needs to happen for them to stay involved?



Getting to know project & people Intro meeting w. information

Welcome! Intro meetings Volunteer handbook



### TIME4CS Task Training (building confidence)

### **Active participation**

### Task training

Getting to know the tasks Receive training Building confidence

Run trainings Support at tasks Provide learning and development opportunities

- Provide task training. Think about staging it, if possible. Volunteers may not need all the information / training from the start. Recognise that some volunteers may come in with a lot of experience and may not need the 'basic' training maybe they can even help train?
- Provide a variety or types of training, make it interesting: use storytelling, games, competitions, volunteer collaboration groups, etc.

### **Provide support**

Ensure support is provided to volunteers. Questions will come up. An option is to provide a
forum where also other volunteers can respond and provide answers, also further
involving them in the project

### Provide learning and development opportunities

 Provide more advanced training opportunities, if training is staged. Offer opportunities for other types of involvement, e.g. attending conferences and meetings and having volunteers give their perspective from the project

### TIME4CS Learning & Development Opportunities

### **Empowerment and retention**

### Offer expanded learning and development activities

 Identify new opportunities and explore with volunteers what new learning and development activities they would like within the project. Accept that some will not want any and are happy with their current engagement in your project

### **Empowering volunteers**

 Enable and train volunteers to take on Ambassador roles. Training here includes how to engage with and possibly manage other volunteers, or take on more responsibility and other tasks than 'standard' volunteers. Continue providing support to your Ambassadors! They are important in further recruitment of new volunteers as well. Do not focus on your Ambassadors at the expense of your 'standard' volunteers – keep both feeling welcomed, important and empowered





Exploring involvement & opportunities Empowerment Ongoing involvement

Offer new training & development opportunities Retain volunteers Create Ambassadors

### TIME4CS Planning for Volunteers: The Logic Model

<b>Resources:</b> What do we need?	<b>Activities:</b> What do we do?	Outputs: What happens immediately?	Outcomes: What are my goals: short- and long- term?	<b>Impacts:</b> What may happen ultimately?
Types of resources needed	Types of activities and actors	Direct products of activities and trainings	Behavioral and social change (new motivations, practices and communities)	Changes in assumptions, values, policies, attitudes, aims, contextual factors
Specific resources available	Specific activities planned	What the participants specifically produce or learn	Benefits to participants	Organizational change
Staff/volunteer capacity, money, facilities, materials, partnerships	Events, trainings, tasks, group work, tool use, actions, processes	Cognitive, attitudinal, and social capacities or connections	Better data collection, better engagement & empowerment of volunteers	Addition to / change in scientific knowledge

## Interactive session: Design your own training inside or outside your RPO

15 min group discussion + 5 min presentations from groups

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### TIME4CS Design your own training inside or outside RPO Interactive session – 20 min

In your group, use the Logic Model and/or Stages of Participation to design your own citizen science training module for either RPO staff or students, or project volunteers, working 'backwards' from impacts:

- What should be the ultimate impact(s)? What basic assumptions and values may change and how? Who (other than participants) will be impacted by the training?
- > What are the intended benefits to participants? In what way (if any) will they have received an incentive to change their behavior, attitude, thinking, or practice?
- What outputs will the participants produce during the training? What will they have gained (learned) immediately upon completing the training? Will they have expanded their social network? How?
- Who are the participants? What will they do during the training? What kind of activities, tools or exercises will be useful? Which processes will you facilitate?
- What do you need for this training? What is already available? What could be made available? How? Types of resources needed, specific resources available – and wanted





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## Collaborating with schools for effective citizen science engagement

Empowering the next generation through hands-on scientific exploration

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TIME4CS Why is it important to learn about collaboration with schools in citizen science?

### Key take-aways

Engaging in citizen science within school settings can yield scientific results, and schools, educators, and students can experience valuable advantages by participating

- Educational enrichment: enhance students' learning experiences by providing real-world applications of scientific concepts
- Community engagement: strengthen ties between schools, communities, and the broader scientific community
- Sustainable impact: forster scientific literacy and environmental stewardship, and the next generation of scientists







Mikroliv - 2023 💙

Tidligere eksperimenter 🏼 2024: Supermarked til skraldespand

Om Masseeksperiment

### Resultatet af 30.000 elevers jagt efter mos, lav og bjørnedyr kommer den 30. oktober

Læs artiklen om elevernes jagt

# Arter

Arter er et fællesskab, hvor alle kan hjælpe med at finde, registrere og bestemme arter. Du kan samtidig få inspiration til naturoplevelser og viden om Danmarks artsrigdom.

V

Q Find en art

Søg

+ Indsend et artsfund

#### Søg viden i Artsbogen

Arter indeholder viden om alle danske planter, svampe og dyr. Gå på opdagelse i Artsbogen, hvor du kan læse beskrivelser af mange af arterne.

Gå til Artsbogen

#### Se brugernes fund

Arters brugere registrerer nye fund hver dag. Gå på opdagelse i Arter, og se, hvad der lever nær dig.

Se fund

#### Bliv bruger af Arter

Arter er et fællesskab for naturinteresserede. Få hjælp til artsbestemmelse af dine fund, og hjælp selv andre.

Bliv bruger

V

### Masseeksperiment

Aktivitet 17/04-2023 - 04/06-2023 1039 følgere

I 2023 handler Masseeksperiment om jagten på mikroliv. Skolelever fra hele landet skal ud og kortlægge forekomsten af mos, lav og bjørnedyr. De skal indsamle prøver, som bliver sendt ind til forskerne, måle abiotiske faktorer og måske lede efter bjørnedyr i det indsamlede mos eller lav?

#### + Følg denne aktivitet

 Kontaktperson
 Tilmelding

 marie.lillemark@snm.ku.dk
 forskning.snm.ku.dk/citizen-science/masseeksperiment/

#### Seneste fund Se alle fund





Denne aktivitet efterspørger oplysninger om fundet, der kun kan udfyldes via denne knap:



Du eller andre kan også bruge linket: Kopier linkadresse til udklipsholder



2.068

2.052

25

\*masse eksperiment

Scientific impact: New knowledge and insights

### The advancement of (useful) scientific knowledge

- The project is the largest survey of mosses, lichens, and tardigrades in Denmark
- New tardigrade species may be discovered
- Furthermore, as microfauna are sensitive to air emissions resulting from agriculture, industry, and transportation, the data will aid the researchers in understanding the effects of human-environment interactions on biodiversity





\*masse eksperiment

Educational impact: Motivation and empowerment

### The advancement of learning and engagement

- The pupils' motivation will increase when they engage in authentic, scientific investigations, and when the data they provide is actually used to produce scientific results
- The Mass Experiment will enhance the pupils' scientific literacy and their science capital (their knowledge, attitudes, participation, experiences), empowering them to engage with science and scientific issues in the future





TIME4CS Collaborating with schools for effective citizen science engagement

The value of citizen science for schools

### Enhanced learning and understanding of science

 Citizen science engages students in real-world scientific research with hands-on learning, critical thinking, and problem-solving

### Community engagement and civic responsibility

 Schools' participation in citizen science projects connects students with their local communities and the broader scientific community





TIME4CS Collaborating with schools for effective citizen science engagement

The value of citizen science for schools

Scientific literacy, informed decisions, and STEM careers

 Citizen science empowers students to become scientifically literate citizens by developing skills to analyze data, make informed decisions, and contribute to scientific knowledge

Environmental awareness and sustainable practices

 Through citizen science, students may gain a heightened awareness of environmental issues, conservation efforts, and eco-friendly behavior







Aktuelle Seite: Vorhaben > Projektarchiv > LETS Study Leysin

Q Suche

FR DE

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#### Projektarchiv LETS Study Leysin

LETS stands for "Local Environmental Transect Survey". The Leysin American School is carrying out an elevation-based transect and study of the forest ecology of Leysin, Switzerland.

#### About the project

We have established 13+ 30m X 30 plots from 600m to 2300m in elevation. Inside these plots we are identifying, counting, and measuring the trees, as well as conducting complete species inventories. We do this twice a year with students in the school. Approximately 100+ students visit the plots in October and another 100+ in May.

#### How can citizens participate?

We welcome the public to help monitor our plots including inventorying species so that we can know when new species arrive. We also welcome other schools sharing our plots in order to contribute to this long-term research. But mostly we want to share our methodology so that other schools will launch their own Local Environmental Transect Surveys. We would like to see schools worldwide doing their own LETS Study \_\_\_\_\_\_ (fill in your town).

#### What happens with the results?

The results so far are in our Excel spreadsheets and in iNaturalist and will be shared on lets-study.ch. However, we are looking for ways to open up our data for others to use as they wish.

Institution: Leysin American School Alpine Institute

Projektleitung: John Harlin

Leysin American School Chemin de la Source #3 Leysin 1854 Suísse

E-mail: jharlin@las.ch

Zur Projekt-Homepage





### ReGAME Research-Enabling Game-Based Education

#### What is ReGAME?

ReGAME uses games to relate research challenges to core curriculum - to cultivate a love of learning and curiosity for how the world works. Utilizing gamification and 'extreme' citizen science we aim to revolutionize 21st-century education by nurturing students creativity and intuition.



ReGAME consists of learning trajectories that can be integrated into a structured school curriculum, but also be followed by citizens on the basis of personal interest. Co-created Citizen science allows the general public to contribute to many steps of the research cycle, and even co-create gameplay, instead of simply producing data for researchers to analyze. The full democratic potential of citizen science will only be unleashed by incorporating these principles.



TIME4CS Collaborating with schools for effective citizen science engagement

Guiding design principles for citizen science in schools

### Curriculum alignment

 Integrating citizen science projects into the school curriculum, reinforcing key science concepts and skills

### Problem-based learning (PBL) design

 Engaging students in active learning by presenting them with real-world scientific challenges

### **Collaboration with teachers**

 Leveraging the expertise of educators to design and implement effective citizen science programs





### TIME4CS Teachers are important gatekeepers, but also serve as team leaders and data quality filters



### **TIME4CS Citizen Science Education & Awareness-raising**

Time	Activities
14:00-14:05	Welcome and introduction
14:05-14:20	<ul> <li>Training and awareness-raising for citizen science</li> </ul>
14:20-14:30	<ul> <li>Setting up training sessions for researchers and others in the RPO</li> </ul>
14:30-14:40	<ul> <li>Setting up training sessions and learning and development opportunities for volunteers</li> </ul>
14:40-15:00	<ul> <li>Interactive session: Design your own training inside or outside your RPO</li> </ul>
15:00-15:15	<ul> <li>Collaborating with schools for effective citizen science engagement</li> </ul>
15:15-15:20	<ul> <li>Providing clear directions to or creating easily accessible resources</li> </ul>
15:20-15:30	<ul> <li>Communication and engagement in citizen science</li> </ul>
15:30-15:50	<ul> <li>Interactive session: Developing elements of a good story about a citizen science project OR Designing communication tactics and tools for a citizen science project</li> </ul>
15:50-16:00	Wrap up and evaluation
TIME4CS Citize	en Science Education & Awareness-raising, AU, 27 Oct 2023 The TIME4CS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006201

## Providing clear directions to or creating easily accessible resources

Existing resources in open access and customized materials for institutions

# TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

The TIME4CS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006201



TIME4CS Why is it important to provide clear directions to or to create easily accessible resources?

### Key take-aways

Accessibility encourages greater participation, enhances the overall impact of citizen science initiatives, and foster a culture of openness and transparency

- Enhanced participation: making it easier for both teachers and pupils to get involved in citizen science projects
- Consistent learning: helping ensure that information and guidelines are consistent, accurate, and aligned with curriculum
- Increased impact: enhancing the overall impact of citizen science initatives, fostering a broader culture of openness and transparency





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#### Eksperimentvejledning **Masseeksperiment 2023**









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### **Cornell Institute** for

### **Biology** Teachers

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Lab issue date: 08/01/2014

Title:	Lichens and Mosses and Water BearsOh my!
Authors:	Amanda Schraeder, Greater Nanticoke Area High School, Nanticoke, PA Megan Wieboldt, Port Jervis Middle School, Port Jervis, NY
Appropriate Level:	Middle School Science: Grades 6-8
NYS Standards:	See pages 6-7.
Abstract:	Students will explore the microscopic world found living on lichens and mosses. Using a simple collection and extraction process, students will observe extremophiles called tardigrades. This lab includes a reading activity with questions as well as an anticipation guide handout for use with a YouTube video.
Time Required:	This activity will take approximately 2 standard periods to complete depending on student level and class size.
Materials Needed:	Ziplock bags, water, plastic liquid transfer pipettes, compound light microscopes, moss and/or lichens, student handouts.

#### **Teacher Section Contents**

Background information	
ime required	
quipment and supplies	
lotes/Recommendations	
Answers to student lab questions	
Other resources	
VYS Learning Standards	



15

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Published July 15, 2022 | Version v1

TIME4CS H2020 project

TIME4CS WP4 Mapping of citizen science training resources

Kragh, Gitte 0, Nielsen, Kristian H. 0

This dataset was compiled as part of the TIME4CS project, WP4, and lists identified citizen science training resources, as of July 2022.

Q

Communities

My dashboard

Datase

Ореп

Show affiliations

The EU-citizen science platform provided the basis for mapping CS training in Europe, as the team behind the platform has put considerable effort into compiling, and encouraging the CS community to contribute, CS training resources. Additionally, training courses were identified based on the case studies in WP1, as most universities do not list their courses on the EU-citizen.science platform.

#### Files

Files (48 0 KB)		e.
Name	Size	Download all
TIME4CS_D4-1-suppl_July2022_CS_Training_Resources.xlsx md5:bdc0b5d7se7e5b4ct0039ac10e60ef4f @	48.0 kB	🛓 Download

### eu-citizen.science

Welcome to the platform for sharing citizen science projects, resources, tools, training and much more



Signup

Login

en

#### Guidelines for creating a training module - Version 1

The training modules on the EU-Citizen.Science platform will be developed using the Moodle learning management system<sup>1</sup>. In this section, we provide the guidelines needed to create and design a new module on the Moodle system.

#### 1. Introduction

The conditions under which the training modules of EU-Citizen.Science need to operate are the most challenging for online learning - they are intended for a student who cannot benefit from a cohort of other students who start the unit at the same time, or from the availability of an instructor who can answer questions and help clarify different issues. Therefore, modules - and each section of them - need to be engaging and interesting, while also providing up-to-date and useful information for the student. Because of these conditions, it is critical that you carefully plan and design your module well before any material is developed.

EU-Citizen.Science modules should be designed to provide 1-2 hours of self-directed learning, as described on Page 25 of the project's DoA. The aim here is to provide modules that can fit into many people's schedules and time constraints and fill a gap in the training and education for citizen science. The process of developing content for an online module without an instructor is a task that requires significant attention and time investment. The design and development of your module's content will take about 10-20 hours for each hour of online training material.

In Section 2 of this document we will provide guidance on how to design the content for your Moodle module which is supported with the use of a design template, and in Section 3 on how to create the framework for a module on the Moodle platform (this section is not yet available under version 1 of this document). The information on how to design the content for your module is based on the University College London (UCL) Connected Learning course material, and more heavily on the UK Open University OpenLearnCreate course 'How to make an open online course'. We highly recommend that you take this course<sup>2</sup>. Additionally, you might want to refer to UCL's Connected Learning material<sup>3</sup> and Coursera<sup>4</sup>.

#### 2. Designing the module content

#### 2.1. Design Template

For the training and educational modules, the <u>Content Design Template</u> will help guide you through the design process. <u>We recommend that you always use this template when</u> <u>designing a module/ course</u> as it provides you with a methodical approach to thinking about content and ensures you have accounted for all the data fields. The template is

### eu-citizen.science

Welcome to the platform for sharing citizen science projects, resources, tools, training and much more

#### **Content Design Template - Version 2**

1. Core Information Table

CORE INFORMATION		
COURSE NAME This field will be copied into the COURSE NAME field in Moodle.	EXAMPLE e.g. Introduction to citizen science for journalists	YOUR TEXT
INTENDED AUDIENCE It is important to be very clear about who the audience is before you start designing your module content. Once you know who the audience is, engage with them early on in the design process to make sure the content, language, structure is appropriate.	EXAMPLE e.g. journalists - especially in the fields of science, technology, environment, and health that want to learn the basics of citizen science for the purpose of dealing with an assignment.	YOUR TEXT
COURSE SUMMARY This field will be copied into the COURSE	EXAMPLE e.g. This is a free course of an hour and a half, that provides an introduction to	YOUR TEXT

TIME4CS Developing material for education and learning opportunities in citizen science

Three relevant socio-cognitive contexts to consider

### The science context

• Aligning learning materials with the relevant scientific principles, methods, and terminology to give participants a solid foundation

### The context of participation

 Tailoring educational materials to accommodate various skill levels and learning styles, and to promote an inclusive environment

### The project-specific context

Adapting materials to the unique goals, objectives, and data collection methods of the citizen science project





### TIME4CS Recognizing the diversity of learning outcomes

Participants can acquire a range of skills and knowledge

### Scientific understanding and skills

 Participants may gain domain-specific knowledge, deeper understanding of scientific processes, and develop critical thinking

### Cultivating communication, collaboration, and awareness

• Participants may develop communication and collaborative skills, and they may gain awareness of environmental and social issues

### Empowerment, a sense of responsibility, and advocacy

 Participants gain insight into project management and teamwork, and may become advocates for science and community
 involvement

### **TIME4CS Citizen Science Education & Awareness-raising**

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## Communication and engagement in citizen science

Fostering meaningful relationships with participants, stakeholders, and the general public

# TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

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TIME4CS What makes communication and engagement with participants in citizen science crucial?

Key take-aways

Effective communication and engagement ensures common understanding of goals, methods, and process, while also building a sense of community

- Data quality and reliability: engaging with participants promotes data accuracy, reliability, and validity
- Motivation and retention: help partipants feel committed over time, encouraging continued involvement and sustained contribution
- **Public awareness and impact:** foster participants' ownership, so that they are more likely to share knowledge and experiences







HOME VIEWS ✓ TOPICS ✓ VIDEOS ABOUT ✓

FRONTIER RESEARCH | POLICY | SCIENCE IN SOCIETY | SOCIAL SCIENCES

#### REPUBLISH 1

# Changing the conversation about science through citizen communicators

Initiatives to help citizen science projects communicate about their results are paving the way for ordinary people to take the lead as effective and trustworthy science communicators.

19 April 2022

By CECILIE JENSEN


TIME4CS Every good citizen science project comes with a solid and sustainable communication plan

## The building blocks of the communication plan

## Determine the project aims and indicators

• Often a balance between contributing to science, raising public awareness of a scientific issue, involving members of the public in setting the research agenda and finding solutions to social issues

### Define the level of engagement

 Participants may help in any one of these tasks: 1) setting the research question; 2) searching for information; 3) formulating a hypothesis; 4) choosing the data collection methods; 5) gathering, analysing and interpreting data; 6) writing and disseminating conclusions; and/or 7) discussing the results





TIME4CS Every good citizen science project comes with a solid and sustainable communication plan

## The building blocks of the communication plan

## Specify the target audience(s)

 Consider target group demographics or segments (primary, secondary, and intermediate), and define channels, messages, and the degree of interaction and inclusivity accordingly

### Understand what motivates the audience(s)

 Participants may be driven by a mix of extrinsic motivations, such as recognition, status, identification, and other benefits, and intrinsic motivations, such as enjoyment, personal growth, sense of purpose, learning and skill development etc.





#### Reasons for monitoring air quality

hackAIR

COLLECTIVE AWARENESS FOR AIR QUALITY

As part of the development process for its engagement strategy the <u>hackAIR</u> project surveyed 370 potential citizen scientists. An online questionnaire gauged motivations for and barriers to air quality monitoring and measurement in the neighbourhood. The leading motivations were: general curiosity about the measurement results (56%), concern about the local air quality caused by the perception of living in an area with poor air quality (43%) and personal health problems (30%). These reasons were used as triggers during opportunities to communicate later in the project.



hackAIR Contest!

## Win an MLS smartphone



"I'm proud of the contribution I made to science"

So who are these citizen scientists? Jeanine Goossens took part in <u>Grote Schelpenteldag (Big Shell Count)</u>. Gitta Camfferman interviewed her about her experience.

#### Why did you take part?

"I think it's vital that we study the evolution of biodiversity on beaches. The beach, and the sea, offer me relaxation. I love being there. But today is special. You can go hunting for shells at any time, but today, as a member of the public, I got to be part of some important research. The more of us that take part, the better the results. That's why I'm here on this terribly cold Saturday in March."

"We need scientific research to safeguard our future here on Earth. By doing this I've been able to do my bit, and I'm very proud of it, even if I only played a tiny part."

#### What did you think of it?

"I thought it was really very interesting. The collection method they got us to use was pretty good and they communicated it to us well beforehand. And the experts from the Flanders Marine Institute (VLIZ), who helped us with the count, were really friendly and told us all a lot about the shells. I even managed to find a pretty rare one!"

"I think it's vital that our children and the generations to come grow up with science. It is our task to educate and train them. And I hope it works out well."



TIME4CS Every good citizen science project comes with a solid and sustainable communication plan

## The building blocks of the communication plan

## Engage with the target audience(s) in various ways

 Use different media and formats to engage with the audience, such as online platforms and apps, in-person ro virtual workshops or training sessions, and educational outreach and events

### Evaluate and improve the materials and activities

 Evaluate the effectiveness of communication materials and activities through feedback surveys, data analysis, and participant interviews to ensure that information is clear, engaging, and meeting the needs of participants and aims of the project







SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

**Tactics and tools for** communicating with participants, stakeholders, and the public

> The TIME4CS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006201



TIME4CS Tactics and tools for communicating with participants, stakeholders, and the public

Use networks and offer fun experiences

## Hitch a ride on existing networks

- Partner up with organisations or networks to get in touch with specific audiences, achieving greater reach and impact
  - Often, it makes little sense to build a community from scratch

## Offer fun and enjoyable experiences

- Participating in citizen science should be educational, but unless it is also fun, it will not be sustainable, and participants may leave
- Combine informational or educational activities with social events or special excursions or treats that will entertain the participants







#### **History excursions**

For the <u>Ja, ik wil (I Do)</u> project citizen scientists logged onto their computers to transcribe and analyse historical marriage announcements in Amsterdam. It was all to do with a historical study of marriage relations. For an enhanced sense of community and to keep citizen scientists motivated and rewarded, the University of Utrecht's researchers arranged regular meet ups, at which they talked about the study's progress and gave the participants a chance to ask questions and interact with them. They also arranged excursions, such as a visit to the Trippenhuis, a historical building in Amsterdam, which is not normally open to the public.

See also the interview with project leader Tine De Moor.



Home Projecten Deelnemers Nieuws Over ons Help







TIME4CS Tactics and tools for communicating with participants, stakeholders, and the public

Use social media and digital storytelling

## Use social media to offer opportunities for interactions

 Leverage different platforms to facilitate real-time communication, share project updates, and engage with large audiences, fostering a sense of community among participants and supporters

### Digital storytelling can create a sense of belonging

 Harness the power of digital storytelling to convey the project's narrative, share participant experiences, and highlight the impact of citizen science, making the project more relatable and engaging for a wider audience





#### Elements of a good story

#### Structure

The story follows a scenario, through which the project is introduced, followed by a specific activity to attract attention and interest, then closes on a climax.

Setting Where is the story set? To create empathy for the character the story also includes details on the environment, time and season.

#### Character

Who is the story about? Stories are best told from a personal perspective so the reader, listener or viewer can truly empathise with the character's situation.

#### Authenticity

The reader, viewer or listener must be able to identify with the character's story, so that a level of familiarity or connectedness is created. Hearing a voice, or choosing the right photos and captions play a role in this.

Language The language must be highly accessible. Use an airy and simple writing style.

#### Message The best stories are the simplest ones. Go for one clear story line.



TIME4CS Tactics and tools for communicating with participants, stakeholders, and the public

Gamification and project ambassadors

## Add gamification elements to the citizen science project

 Apply game-design elements such as points, badges, rankings, missions, or "race against the clock" to make the tasks more enjoyable - be aware that they may also introduce potential biases

### Find and train project ambassadors

- They may help with your project's logistics, administration or communication in order to enhance outreach and engagement
- They are usually intrinsically motivated to play a role in the project





## Hitch a ride on existing networks

Whether you set up citizen science on a small or large scale, the best way to effectively engage your target audience is often with help from existing networks and communities. Large societies and networks are usually on the lookout for a new angle or to inject new life into their annually recurring initiatives.

## Offer a fun experience

Participating in citizen science should be educational, but unless it is fun it will not be sustainable. How do you increase the fun factor of your citizen science project?

## Use social media

Facebook, Instagram and other social media can really bring your citizen science project to life. They offer opportunities for interaction between scientists and citizen scientists and between the citizens themselves.

## Digital storytelling

Telling stories can create a sense of belonging between citizen scientists. Especially if you let them testify about their experience of taking part in your project.

## Gamification

Adding gaming elements to your citizen science project can benefit your research. Those who feel they can improve, take on a challenge or win a competition are more likely to stay motivated and keep participating for longer.

## Find project ambassadors

An ambassador is a citizen scientist who has been involved since the very beginning. He or she usually knows a lot about your project's research topic and will often have taken part in other science-led projects. Ambassadors are also known as lead users. They have a strong intrinsic motivation to participate.

### **TIME4CS Citizen Science Education & Awareness-raising**

Time	Activities		
14:00-14:05	Welcome and introduction		
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Interactive session: 🧟 **Developing elements of** a robust and lasting communication plan **OR Implementing tactics** and tools for citizen science projects

> 15 min group discussion + 5 min presentations by groups

## TIME4CS

SUPPORTING SUSTAINABLE INSTITUTIONAL CHANGES TO PROMOTE CITIZEN SCIENCE IN SCIENCE AND TECHNOLOGY

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TIME4CS Developing a communication plan OR Implementing tactics and tools for communication

Interactive session, app. 20 minutes

Choose one of these tasks based on the handout:

 For a given citizen project (or for citizen science as such), elaborate on some of the elements of a good story. Use the large sheet to sketch your narrative either chronologically or by theme.

OR

 Select one or multiple communication tactics and tools for engaging with participants, stakeholders, or the broader public. Dive deeper into the selected tactics/tools, considering a specific citizen science initiative. Use the large sheet for highlighting keywords and/or visual representations.





### **TIME4CS Citizen Science Education & Awareness-raising**

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### **TIME4CS Next workshops**

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AU Citizen Science	Citizen S	cience Workshops 2023	
· People and Collaborators			
A second book and a second	Citizen Science Workshops (DAU 2023 As part of the TIME, CS project. AU has developed a range of citizen science training.		
<ul> <li>Citizen science projects</li> </ul>			
+ Upcoming events	materians and has run chized science training workshops for researchers and research performing orcanisations' admin and management teams in four European countries. I		
<ul> <li>Entran Science Werkshope 2023</li> </ul>	on this, we now offer four workshops at AU (Preben Hornung Stuen, Bidg. 422 / 132, Fredr.		
-	Nielsens Vej 2-4, Socio A	arbus C) this autumn, all 2-4pm:	
>> Past events			
Citizen-Science Training	Monday, 2 October 2023	Citizen Science Research & Methodology	
<ul> <li>Resources, networks and inks</li> </ul>	Friday, 27 October	Citizen Science Education & Awareness-raising for	
Media about AU citizen science	2023	Research Performing Organisations	
	Tuesday, 7 November 2023	Citizen Science Support Resources & Infrastructure	
	Monday, 27 November 2023	Citizen Science Policy & Assessment	
	If you are interested	in attending one or more workshops, please register	
	here.		
	Participation is free (no r conducted in English	refreskments or food will be provided) and all workshops will be	
	Workshop facilitators: K	ristian H. Nielsen and Gitte Krash	

## Tuesday, 7Citizen Science Support Resources &November 2023Infrastructure

Monday, 27Citizen Science Policy & AssessmentNovember 2023

<u>Read more and register</u> for workshops





# TIME4CS



time4cs@apre.it

#TIME4CS

## Thank you for your attention !

Kristian H. Nielsen & Gitte Kragh Aarhus University khn@css.au.dk gitte.kragh@css.au.dk

<u>citsci.au.dk</u>

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