

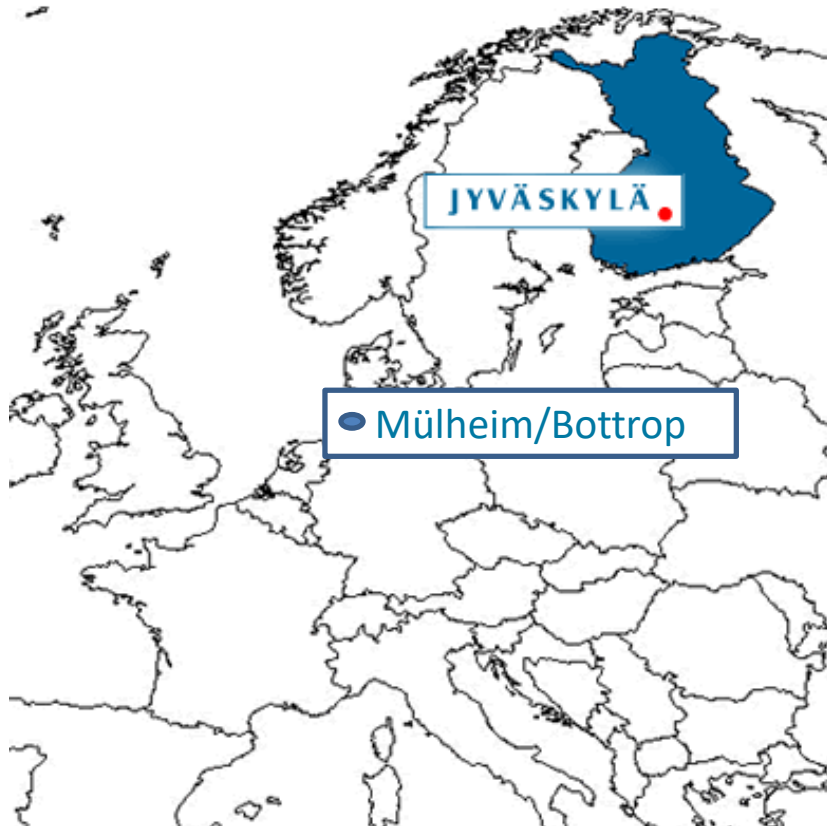


FabCITIZEN

The FabCITIZEN Methodology
Marathon, 03.07.2023



Welcome to the Ruhr Metropolitan Area ☺





Hochschule Ruhr West

Ruhr West University of Applied Sciences



History

- Founded in 2009
- Public institution, regional development
- 6000 students, 100 professors and growing 😊
- Western Ruhr area (Bottrop, Mülheim)

Focus Areas

- Civil Engineering
- Business Administration - International Trade Management & Logistics
- Mechatronics
- Human-Machine-Interaction
- Business Information Systems
- Master Programme Business Administration





Glo-Link

Global Learning, Innovation and Knowledge Management

Researching Processes and Systems in a Global Context



Focus Areas

- Global Process Management
- Collaborative Innovation Management
- Competency Management, Knowledge Management and E-Learning
- Open Innovation, Open Educational Resources



Glo-Link

Global Learning, Innovation and Knowledge Management

Researching Processes and Systems in a Global Context



Projects

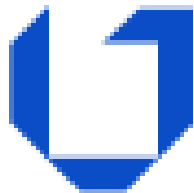
- Alware: Artificial Intelligence in Schools
- FabCitizen: Citizen Science in Schools
- CoTA: Computational Thinking in Schools
- Emscher Lippe⁴: Inclusive and Social Innovation / Competence Development
- ÖWR: Public Knowledge Resources
- EAGLE: Enhanced Government E-Learning
- Play4Guidance: Simulation Game for Innovation and Entrepreneurship
- iGOAL: startup innovation competencies in intergenerational and global contexts



Our Partners



Politecnico
di Bari



VILNIUS
TECH





The FabCitizen project: Outcomes



- Create **Pedagogical and Competency frameworks** for Citizen Science for grade 5-9 including links to existing curricula
- Establishing **FabLabs & Maker Spaces** as the main environment for Citizen Science projects
- Build **open learning scenarios and materials** for Citizen Science from fifth to ninth grade as Open Educational Resources
- Build **Learning Scenarios** for Citizen Science and in related disciplines (such as biology, geography, ...).



Citizen Science: The FabCitizen view



- Involving citizens in science / research projects
- Involvement of volunteers in the scientific process (Bela, 2017)
- Tool vs. movement vs. social capacity?
- Scientific and / or educational objectives?
- ...from the beginning to the end...
- ...defining research questions to evidence-based recommendations
- Social impact
- Tool for education and educators



Some sample critical competencies



- Scientific thinking
 - Formulating research questions
- Data handling
 - Interpreting data
- Attitudes
 - Positive attitude towards science
- IT competencies
 - Programming and data handling
- Communication
 - Community involvement
- Sustainability
 - Socially responsible issues (eg food waste)



How to implement this into schools?



- Open Educational Resources
 - Learning materials with an open (creative commons) license
- Open Educational Practices
 - Learning Scenarios = Lesson Plans
 - Experiences
- FabCitizen
 - More than 100 scenarios in different subjects
 - Combining science, IT and citizen science
 - <https://fabcitizen.eu/learning-scenarios/>



The Key Question



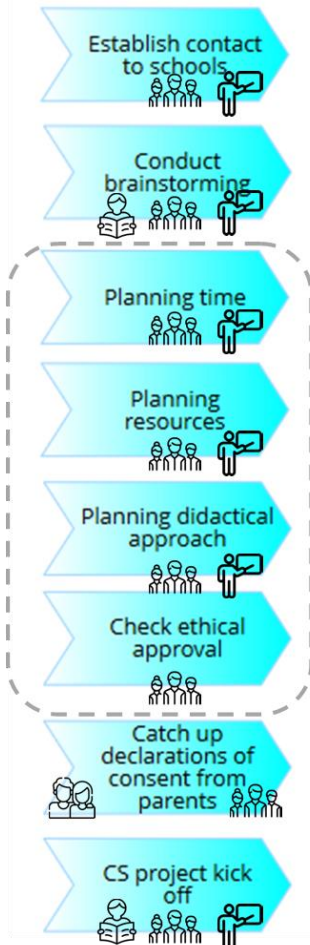
How to develop a Citizen
Science project?



Workshop Method



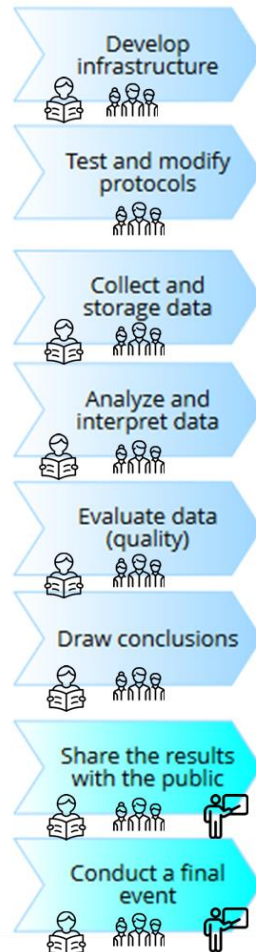
Preparation phase



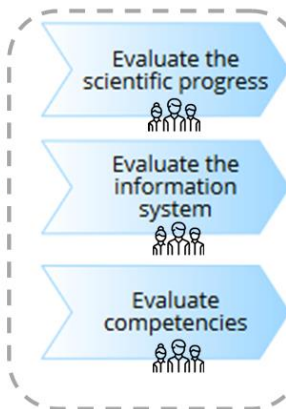
Starting phase



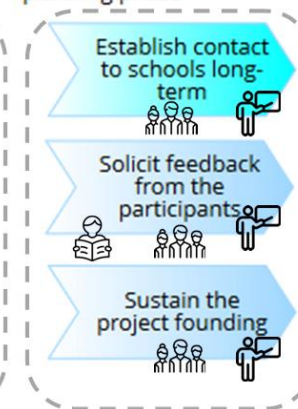
Activities



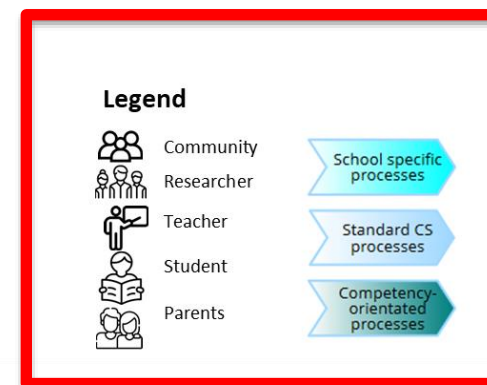
Evaluation phase



Improvement and future planning phase



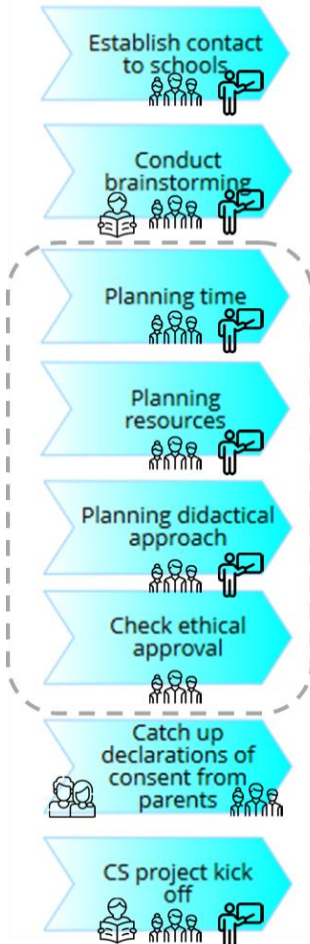
- <https://fabcitizen.eu/intellectual-outputs/> (O2)





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Preparation phase



- Topic should fit the subject-related curriculum
- Consider cross-subject teaching
- Resources
 - IT infrastructure
 - Consider
- Didactical approach
 - Inquiry-based learning, service learning, project-based learning
- Check data usage, privacy
- Ethical statement for data on participants
- Parents consent



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Starting phase



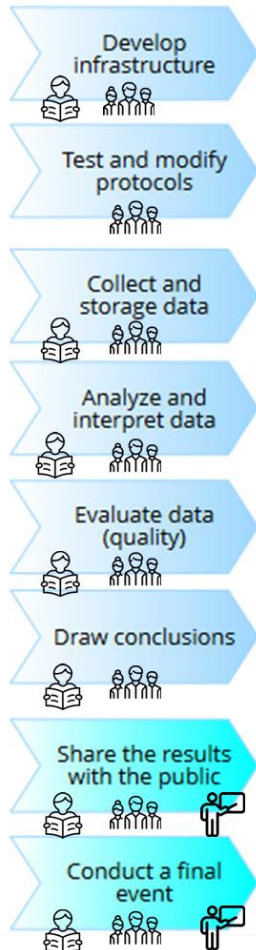
- Educational research question
- Competencies
 - Scientific competencies
 - Data handling
 - CS competencies
 - IT competencies
 - Attitudes!
- Training – find / modify / provide Open Educational Resources
- Try out if it works....



Workshop Method



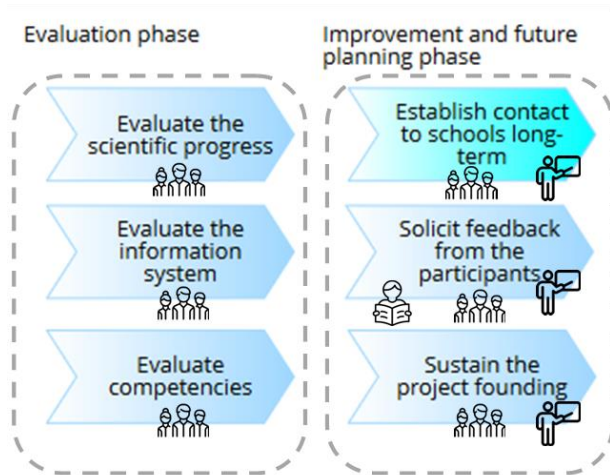
Activities



- Infrastructure
 - Data collection
 - Data storage / protection
 - Data analysis / methods / tools
- Stakeholder involvement
 - Businesses
 - Associations
 - Citizens / community
 - Parents
- In many cases
 - Pre-moduls on data handling



Workshop Method



- Evaluation on multiple levels
 - Stakeholder involvement
- Planning continuous activities
- Sharing, sharing, sharing!
- Have fun 😊



Workshop Method



Task 1: Brainstorming on Citizen Science

Discuss in groups of 4 people a possible Citizen Science projects with the following constraints

- Topic is for educational purposes (preferably in between grades 5-10)
- Topic is related to food waste / nutrition / ...
- Topic is fun :-)
- The topic should be defined in 1-3 research questions
-

List possible topics here:

- ...
- ...
- ...
-

Research Questions:

- ...
- ...
-



Workshop Method



Task 2: What are the main competencies / learning outcomes in such a project?

- The following areas should be covered:
 - Food waste / subject-related competencies
 - Scientific thinking (e.g. formulating research question, organizing experiments, ...)
 - Data handling (e.g. collection, using excel to cluster data)
 - Attitudes
 - Communication (e.g. to involve families)
- Possible competencies: <https://fabcitizen.eu/wp-content/uploads/2022/01/Competency-framework-CS-DL-SL-competencies.pdf>
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Workshop Method



Task 3 What are the target groups / communities who could be involved?

- Consider the primary target groups (participating in the full process) as well as potential supporters (helping, supporting, ...).
- Sample target groups are
 - Students between grade x and y
 - Teachers from subject A and B
 - IT expert
 - Parents
 - School administrators
 - Enterprises
 - NGOs
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Workshop Method



Task 4.1 Describe the phases / learning activities and the outcomes

- Please try to develop a rough structure of your CS project. Also, relate again or refine the learning objectives / outcomes addressed in task 2.
- Possible learning activities are
 - Contextualization - setting the context for the topic
 - Self study - exploring learning materials / texts for certain topics
 - Defining research question
 - Planning experiments
 - Learning to develop an app
 - Reflecting
 - Collecting / analyzing / interpreting data
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Workshop Method



Task 4.2 Collect possible Open Educational Resources

- There are many resources around which can be re-used, adapted and modified freely. Check out for example
 - <http://cota-project.eu> (on Basic Digital Competencies)
 - <http://fabcitizen.eu> (on CS scenarios, also App Inventor issues)
 - <https://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/1156940/> readers on food waste for children
 -



Workshop Method



Task 5: Create your CS outline and project plan

Task 6 Realize the project

Task 7: Validate and reflect



Find our scenario



- <https://fabcitizen.eu/search-learning-scenarios-in-progress-2/>
- Search for Citizen science scenarios

Search Learning Scenarios

On this page you can search for all Learning Scenarios and other website content. For example choose your preferred language from the drop down menu.

All Categories
CitizenScience Scenarios
Learning Scenarios
News
Templates
Uncategorized



Useful references



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Ideas



- Food within the political system
- Food in the school canteen
- Food waste for little kids and their parents behavior / communication
- Food literacy, co-creating information
- Food waste – how to make food appealing
- Sustainability – rooftop organic garden, local future plants in relation to climate change



<https://tinyurl.com/fcmarathon2023>

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<https://fabcitizen.eu/intellectual-outputs/>

(The full model: Output O2)