Developing an interactive visual tutorial for Citizen Science

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OVERVIEW

- Introduction
- Problem
- Objectives
- Hypothesis
- Literature Review
- Methodology
- Results
- Conclusion
- Future Work

INTRODUCTION

- Research by amateur scientists -> challenges due to the *needs* of participants (Roche et al., 2020)
- *Quality* of data related to training of participants
- *Literature gap* on how to design a tutorial for Citizen Science

PROBLEM

Training of volunteers/amateur users

↘

integral part of the citizen science process

↘

affects the *accuracy* of the selected data

An interactive visual tutorial that encourages users to participate in it and provide the CS project with accurate data!

RESEARCH OBJECTIVES

R.Objective 1

To identify the users' needs for an interactive visual tutorial

R.Objective 2

To develop a web-based tutorial based on RO1 for citizen science projects.

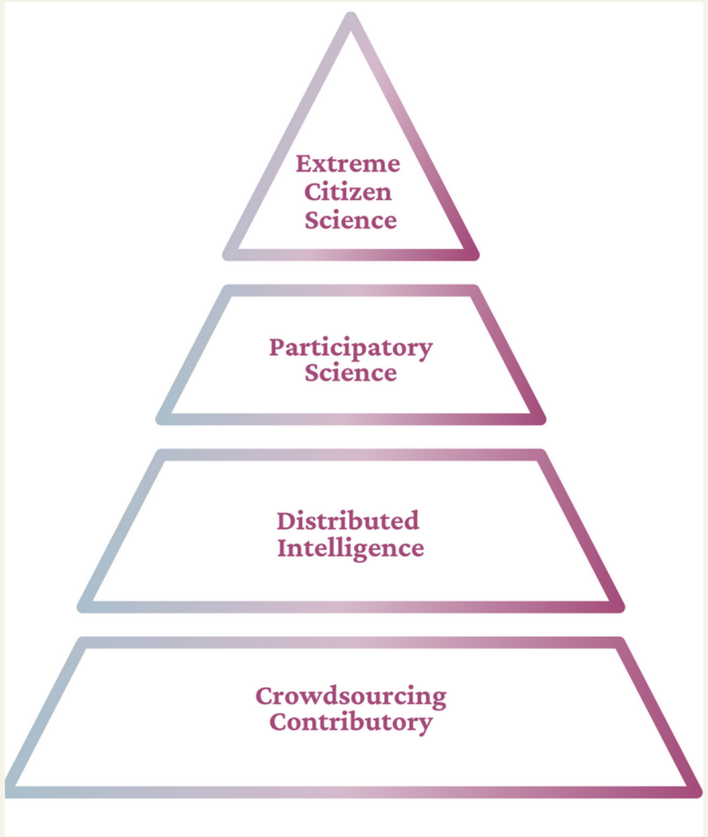
R.Objective 3

To evaluate and analyze how the users perceived the tutorials and what can be improved.

HYPOTHESIS

- How users' design *preferences* shape their learning experiences
- *Effectiveness* of visual tutorials in the context of citizen science
- Importance of *user feedback*

CITIZEN SCIENCE



Bridges the gap between scientists and the public while generating valuable scientific data and offering several benefits.

CITIZEN SCIENCE PLATFORMS

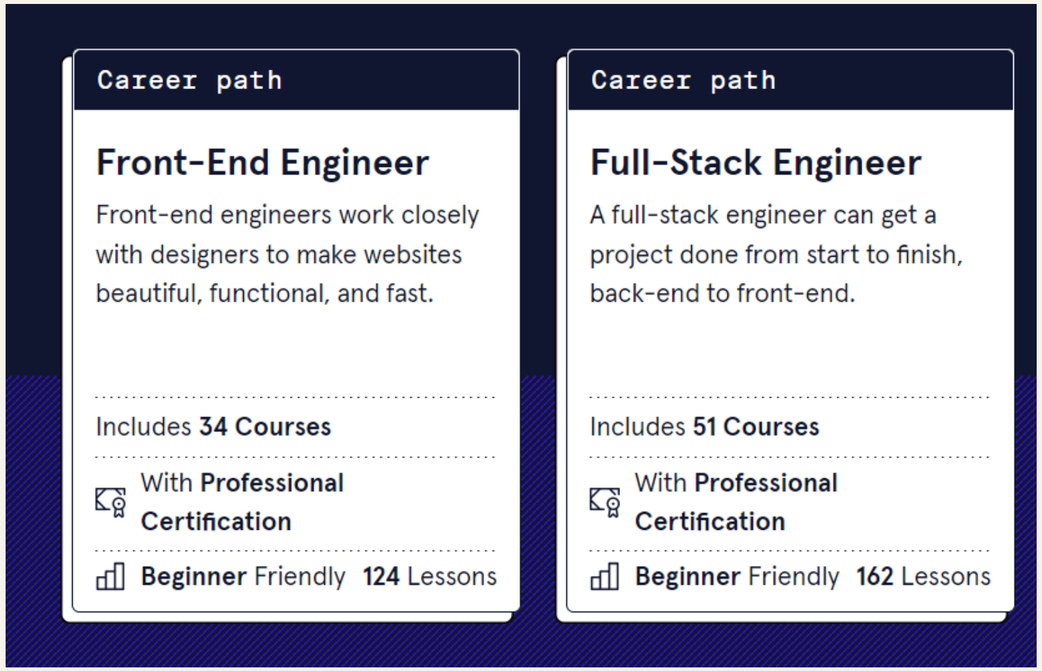
- Lack a proper training phase for their participants.
- Tutorials with a lot of text and static images
- QnA or Wiki structure for the tutorial, few interactive elements.

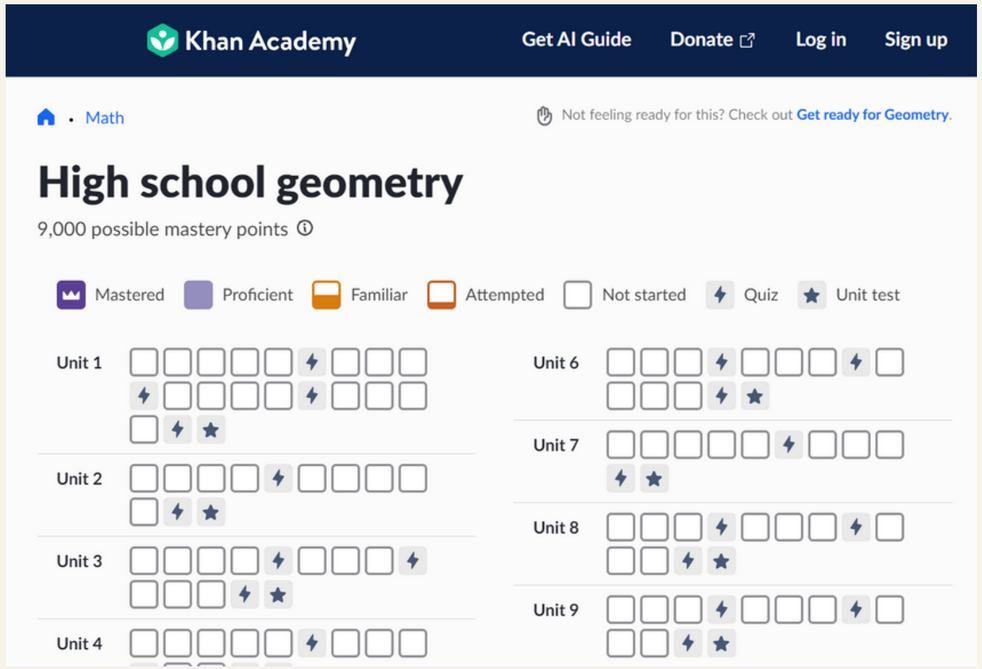
INTERACTIVITY ON DESIGN

Interactivity is vital in user experience design because it can have a significant impact on users' judgement, impact and overall satisfaction with a website or application (Hart et al., 2013).

Interactive styles on web design: animated elements, interactive maps, slides, carousels, gamification elements.

INTERACTIVE VISUAL TUTORIALS





METHODOLOGY

Qualitative Method

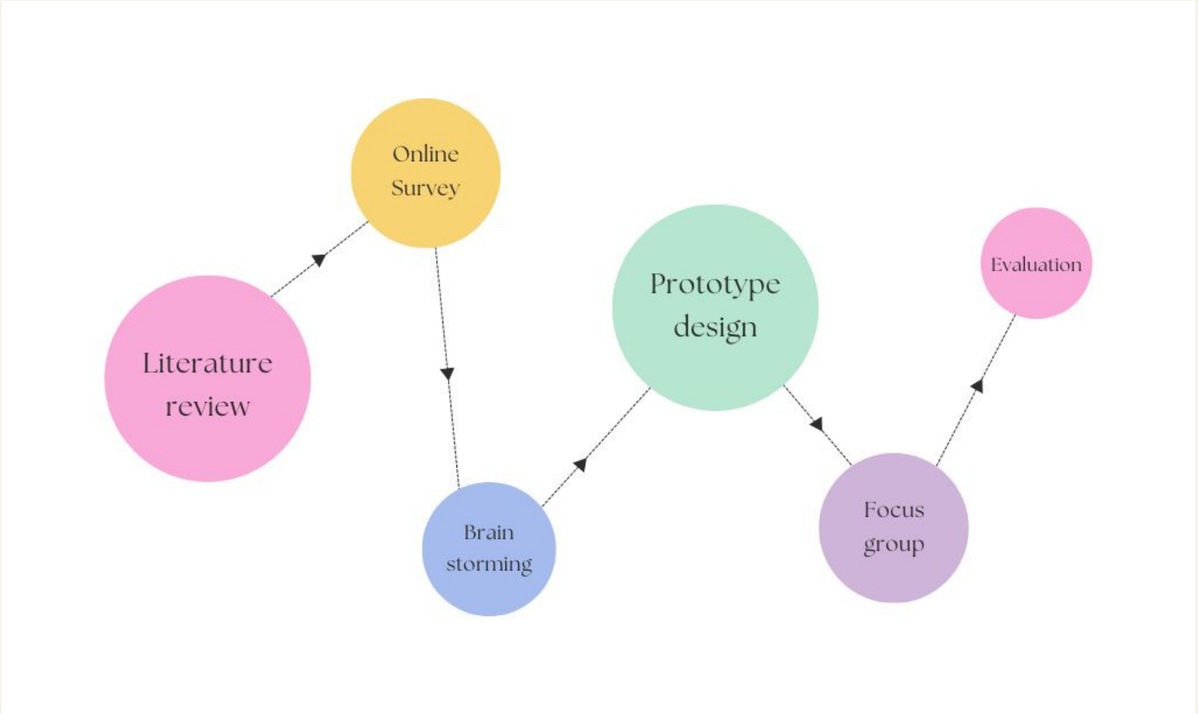
Literature review

Focus group user study

Quantitative Method

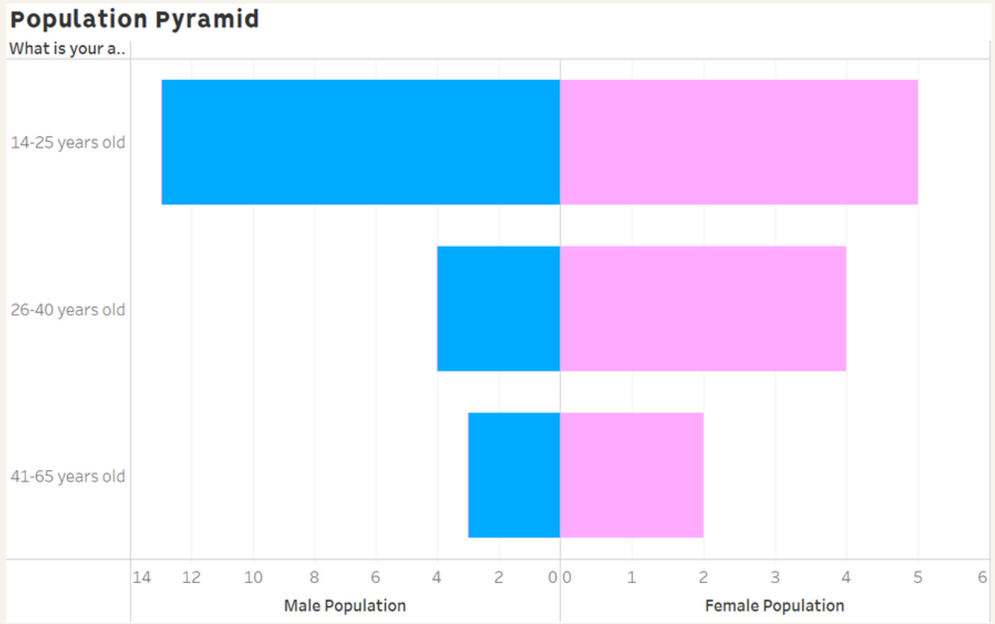
Online survey

Prototype design

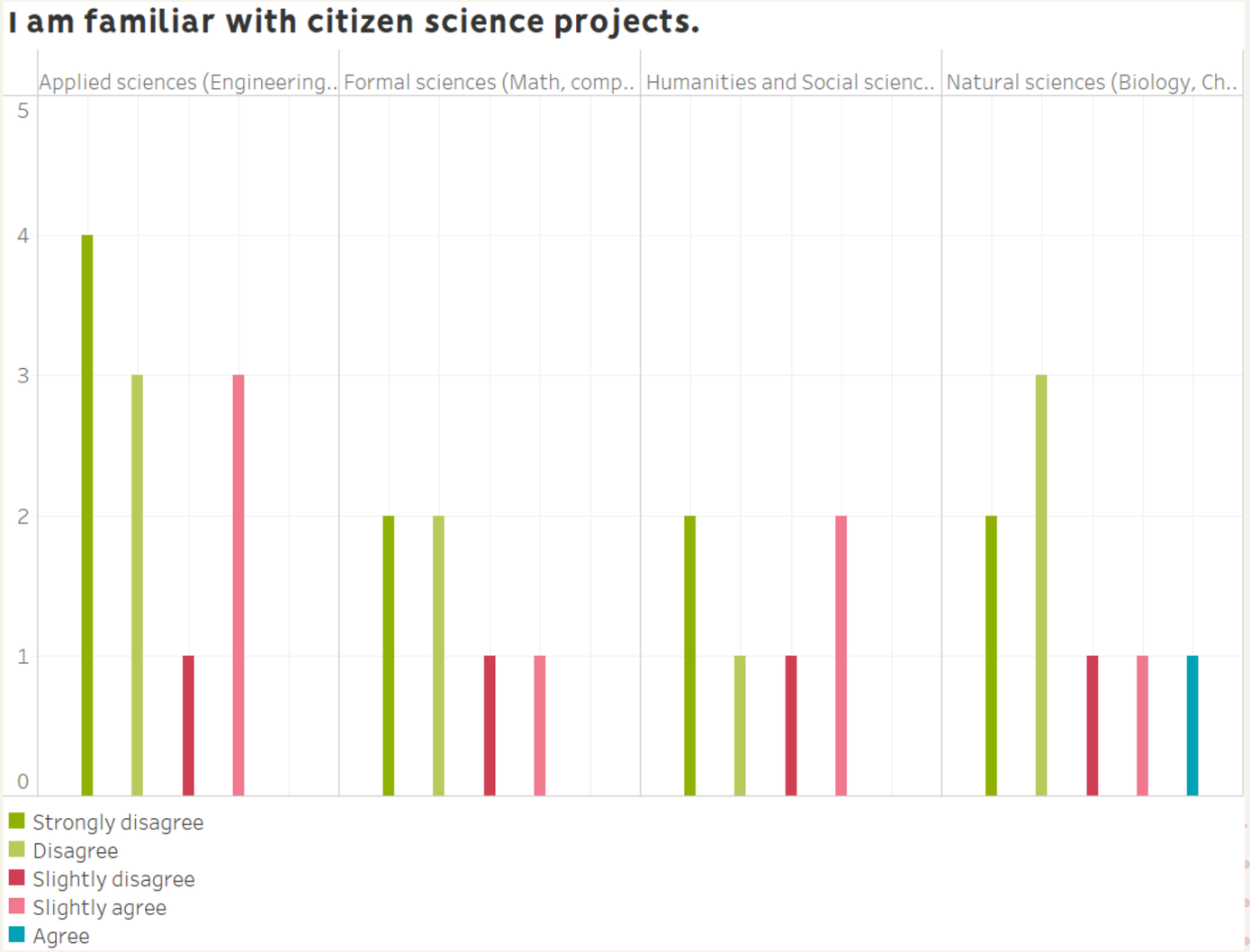


ONLINE SURVEY

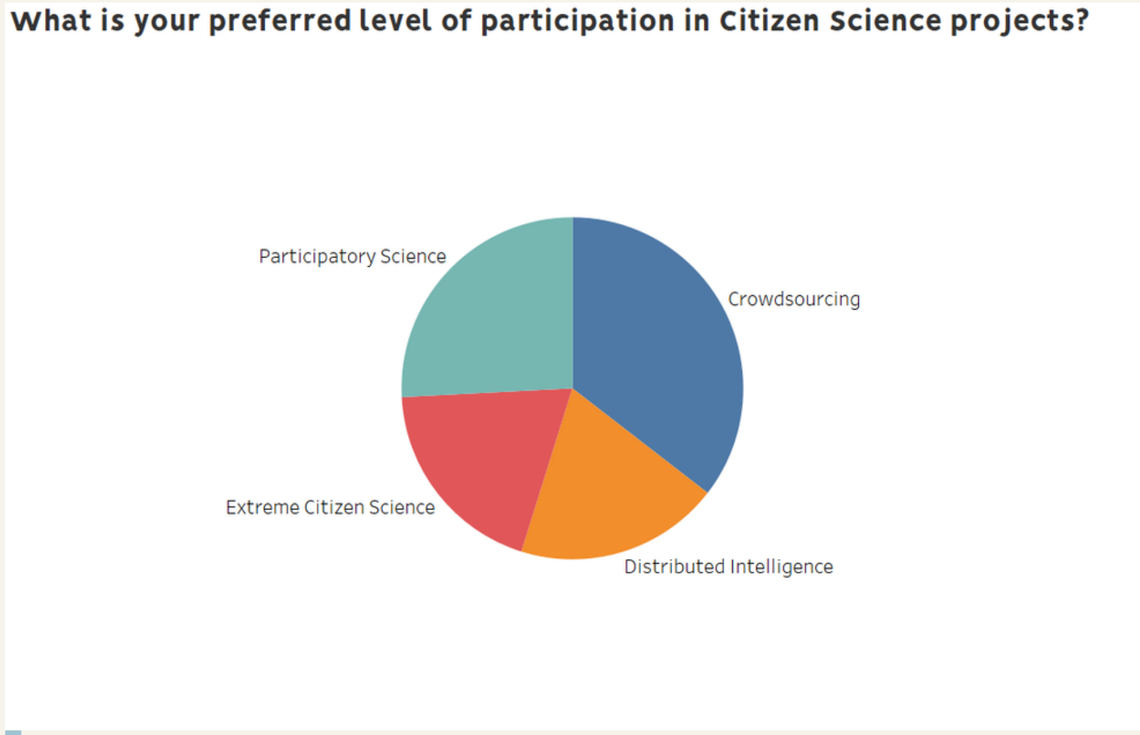
- Gain valuable insights that will inform the refinement and development of interactive visual tutorials.
- 32 responses
- 5 parts of 32 questions in total (rating scale, open questions, multiple choice questions)

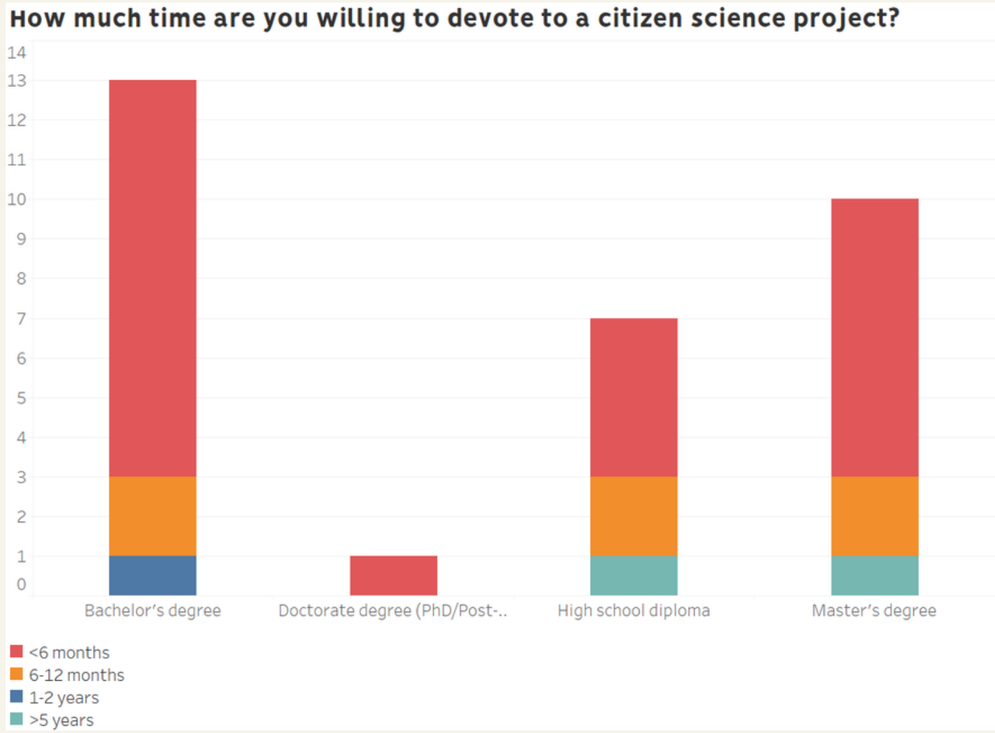


ONLINE SURVEY

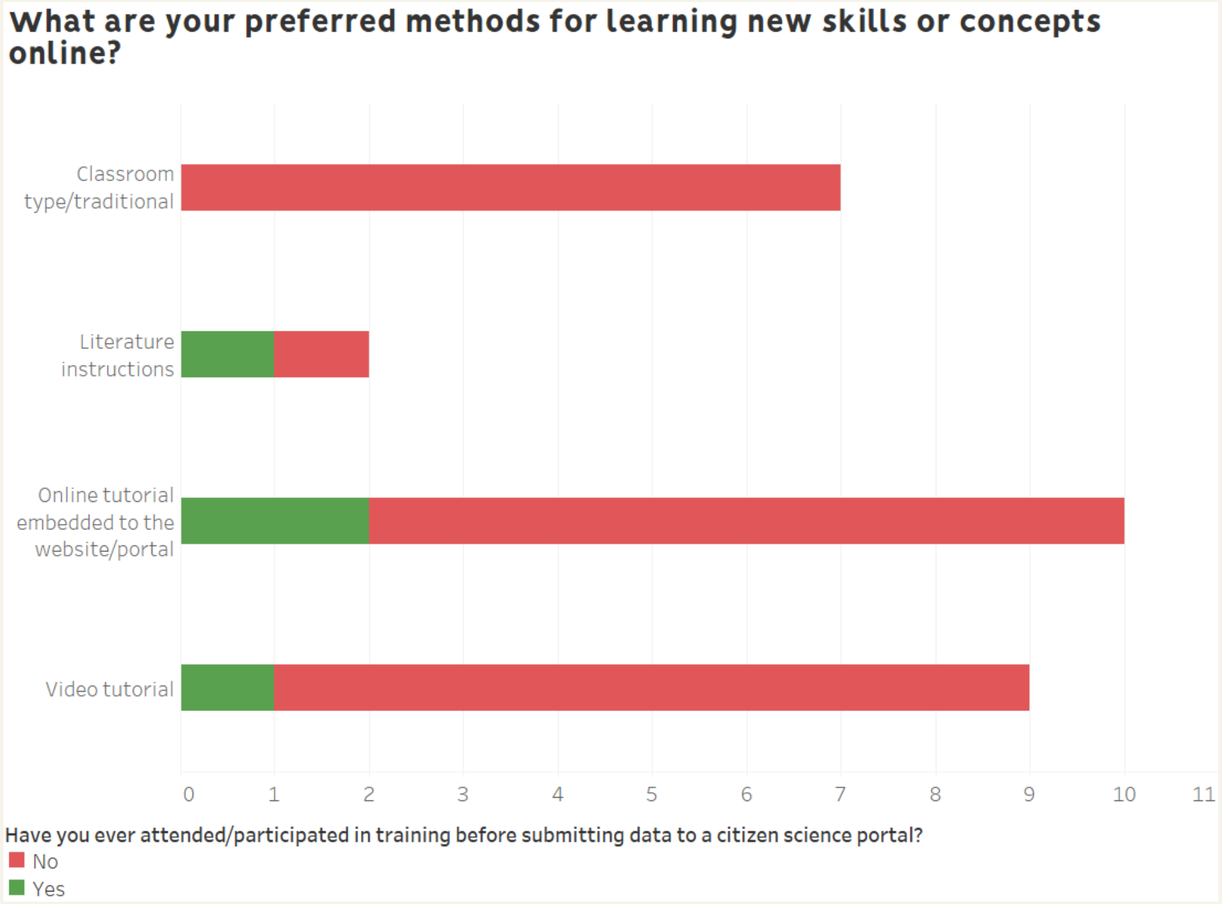


ONLINE SURVEY



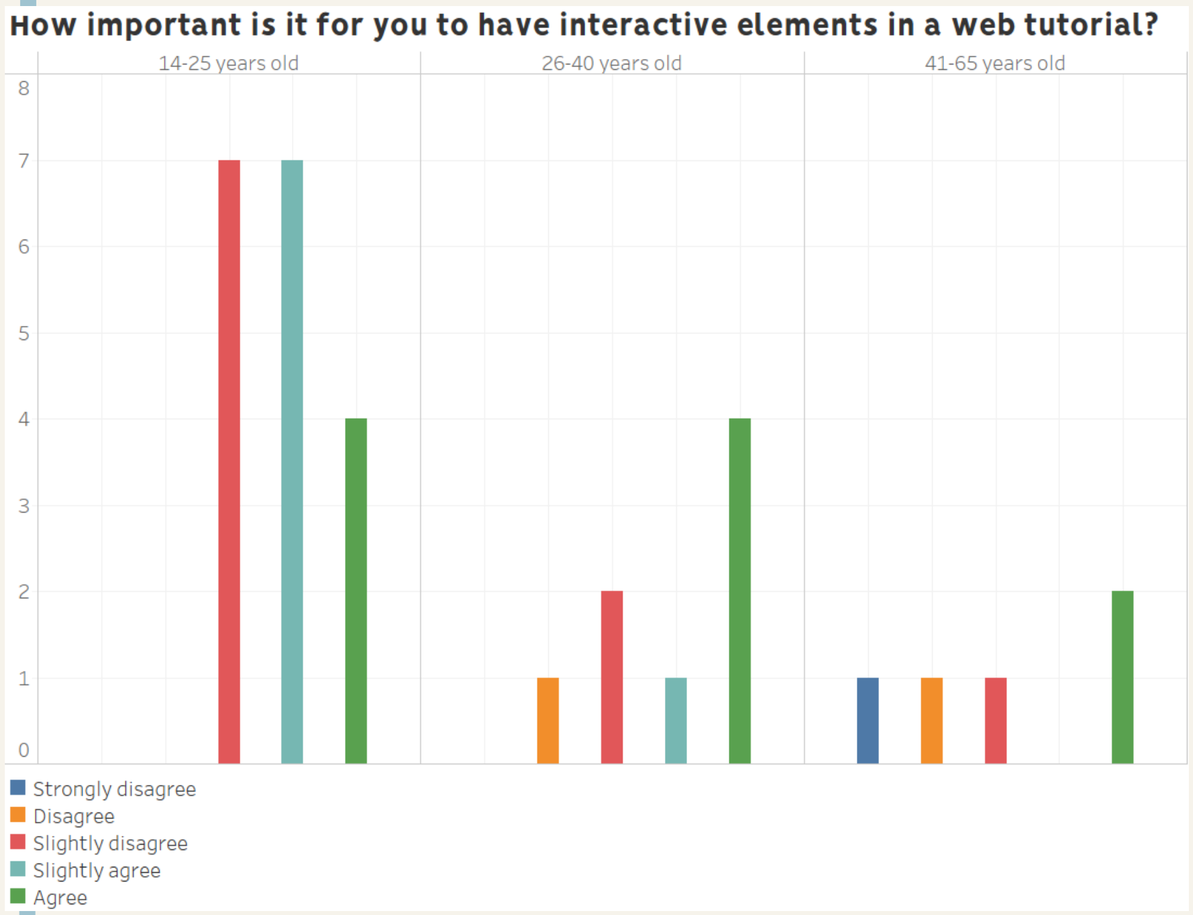


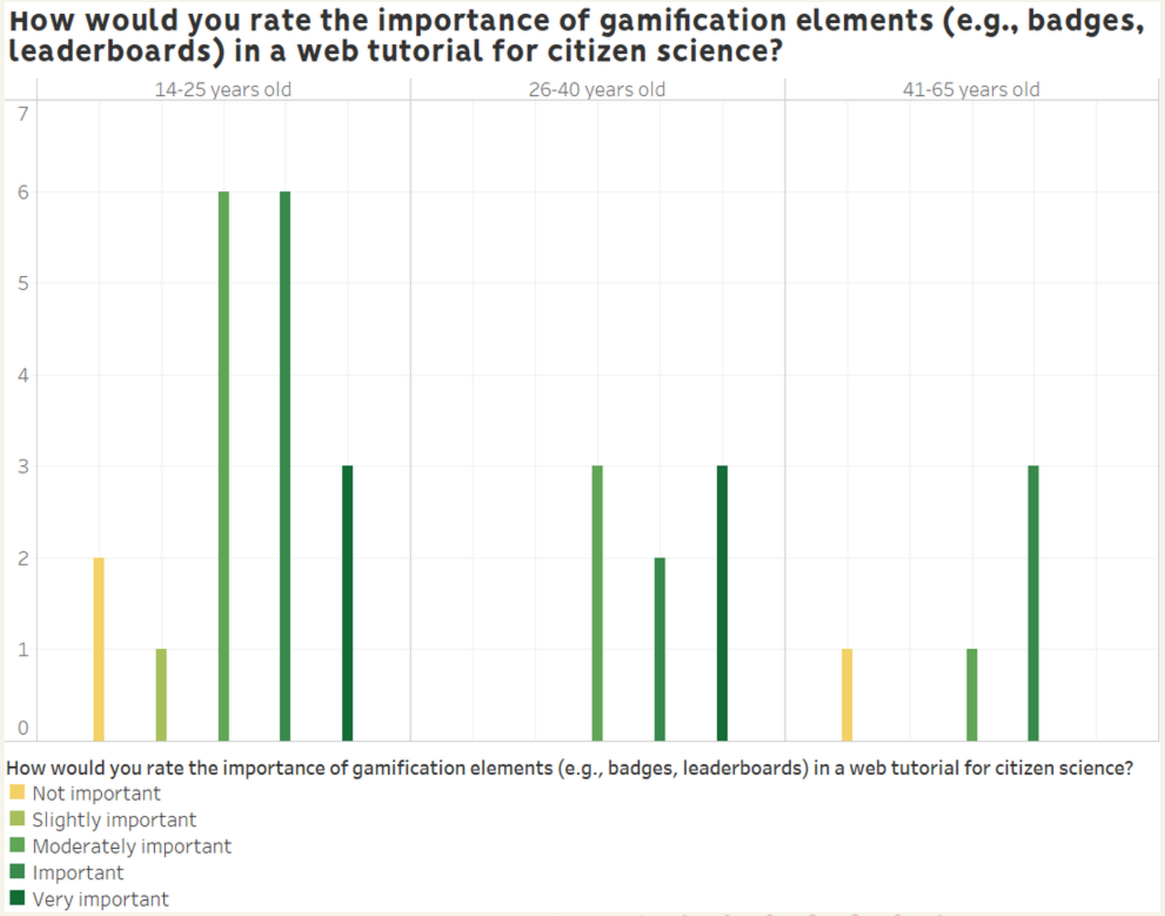
ONLINE SURVEY



Participants with no previous experience with CS portals prefer the traditional way of learning instead of digital methods.

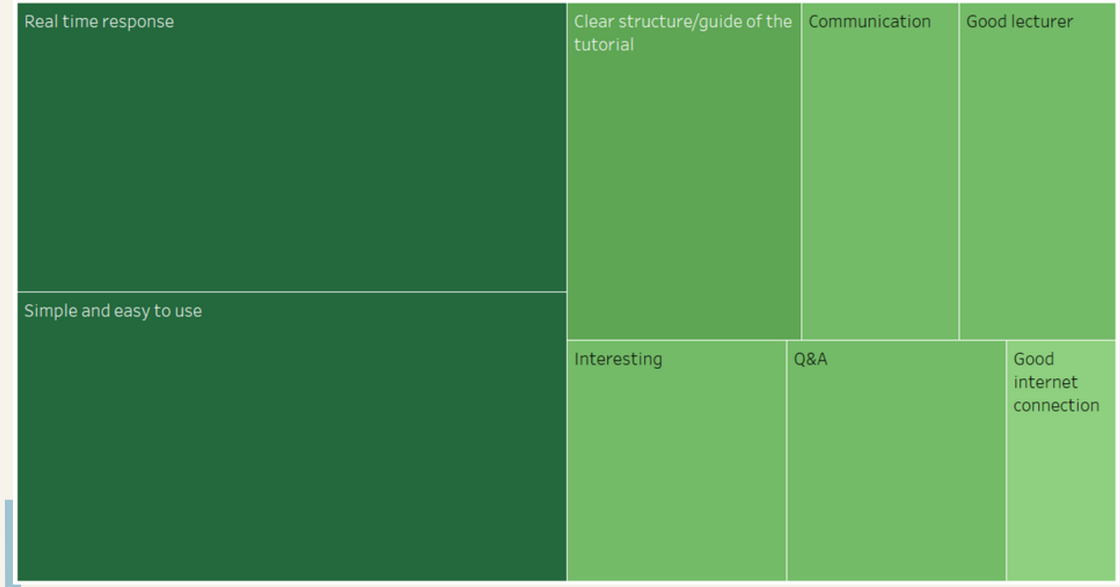
ONLINE SURVEY



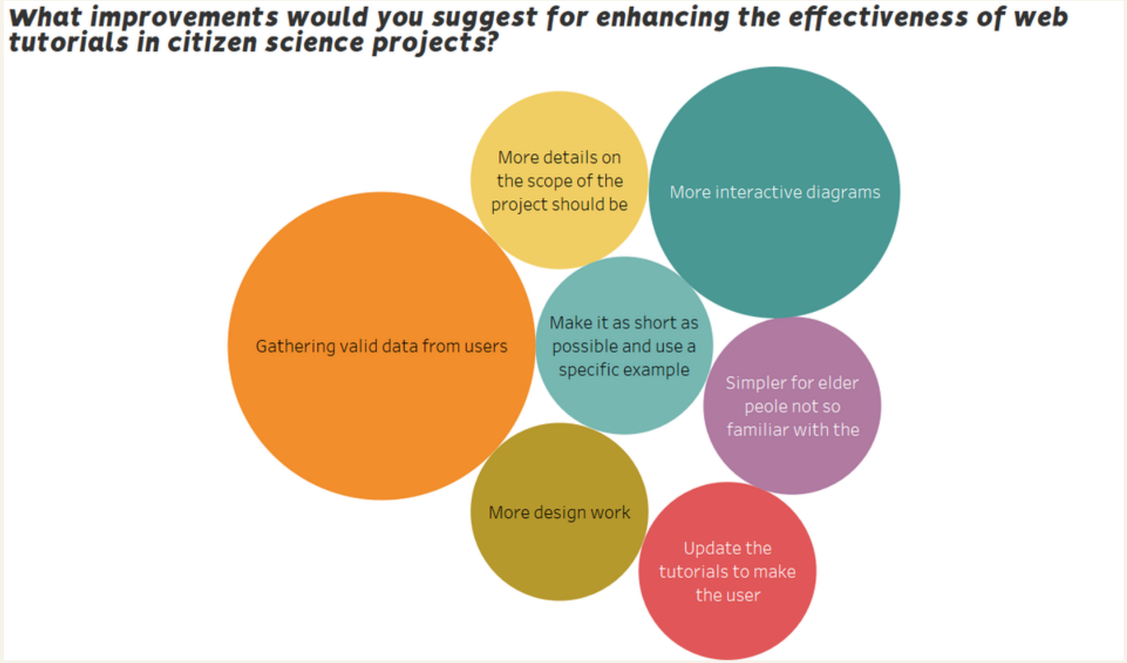


ONLINE SURVEY

In your experience, what are the essential components of an interactive web tutorial for a citizen science project?

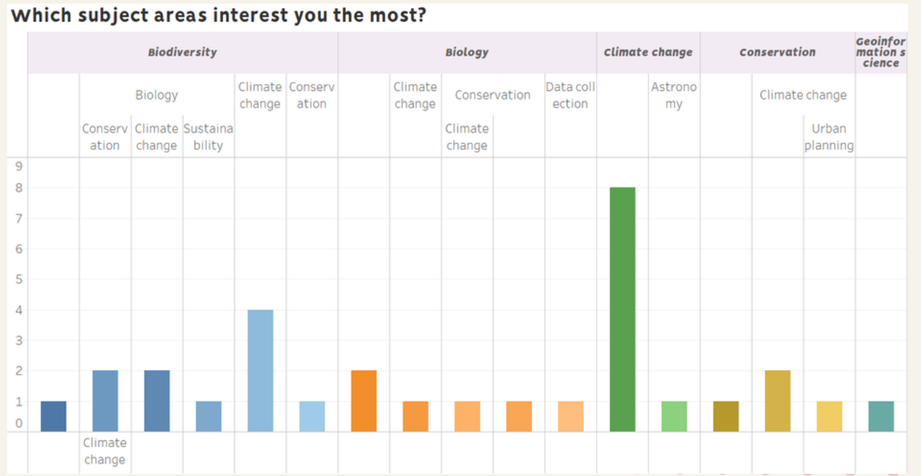


What improvements would you suggest for enhancing the effectiveness of web tutorials in citizen science projects?



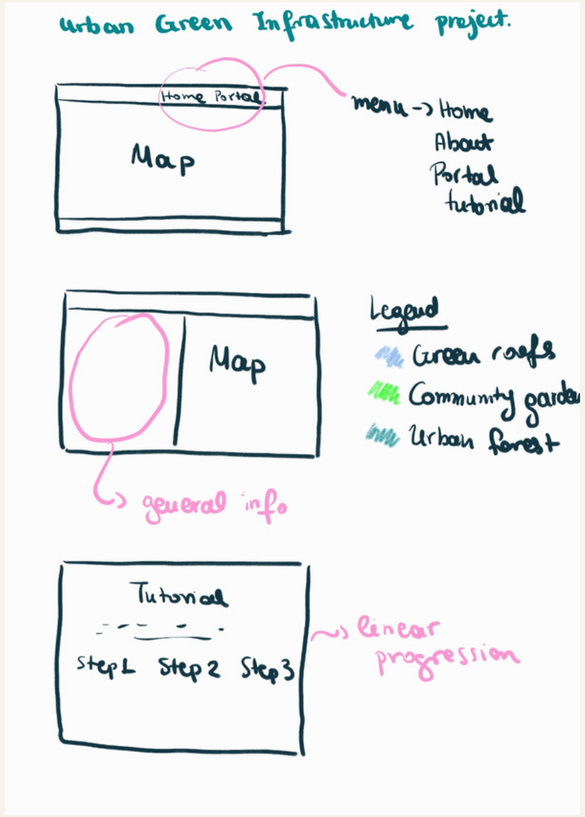
CASE STUDY

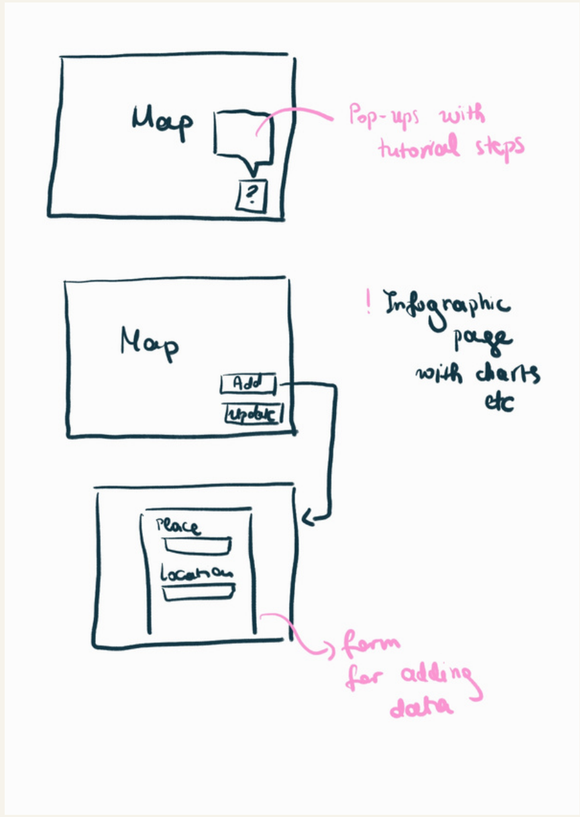
- Fictional portal about urban green spaces in Munich.
- Impact on climate change.
- Three data categories: urban forests, green roofs, and community gardens.



PROTOTYPE

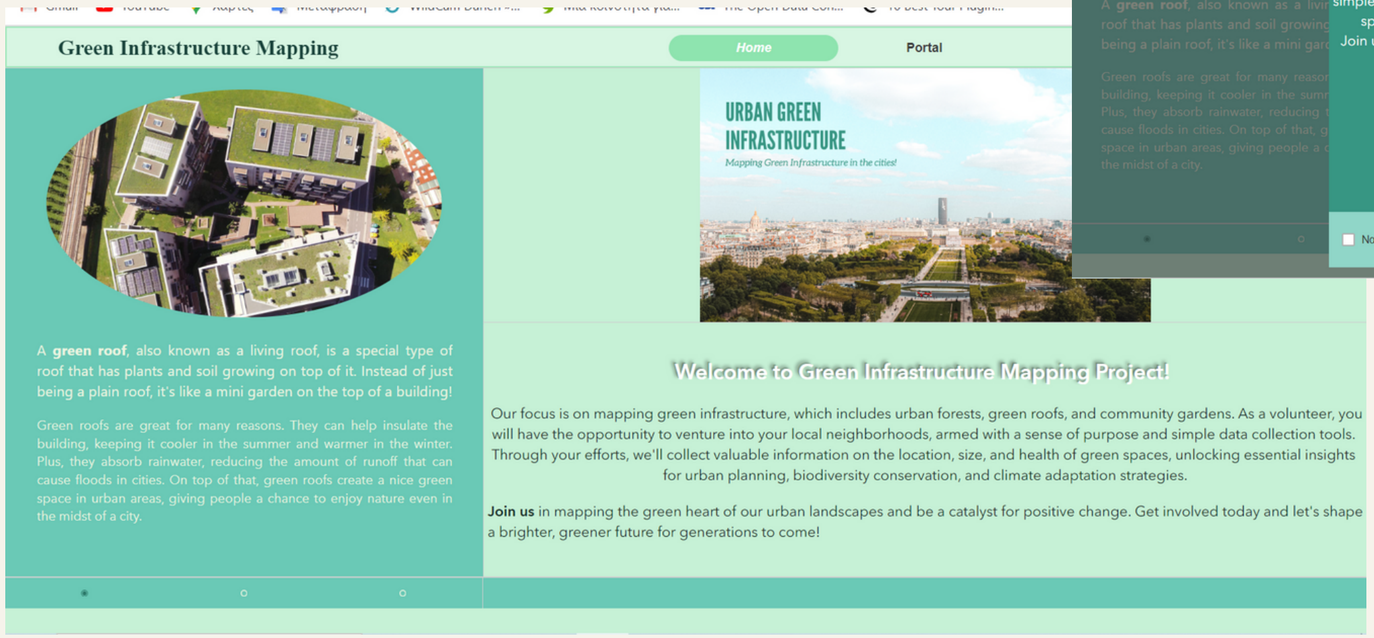
Tools:





PROTOTYPE

Portal:



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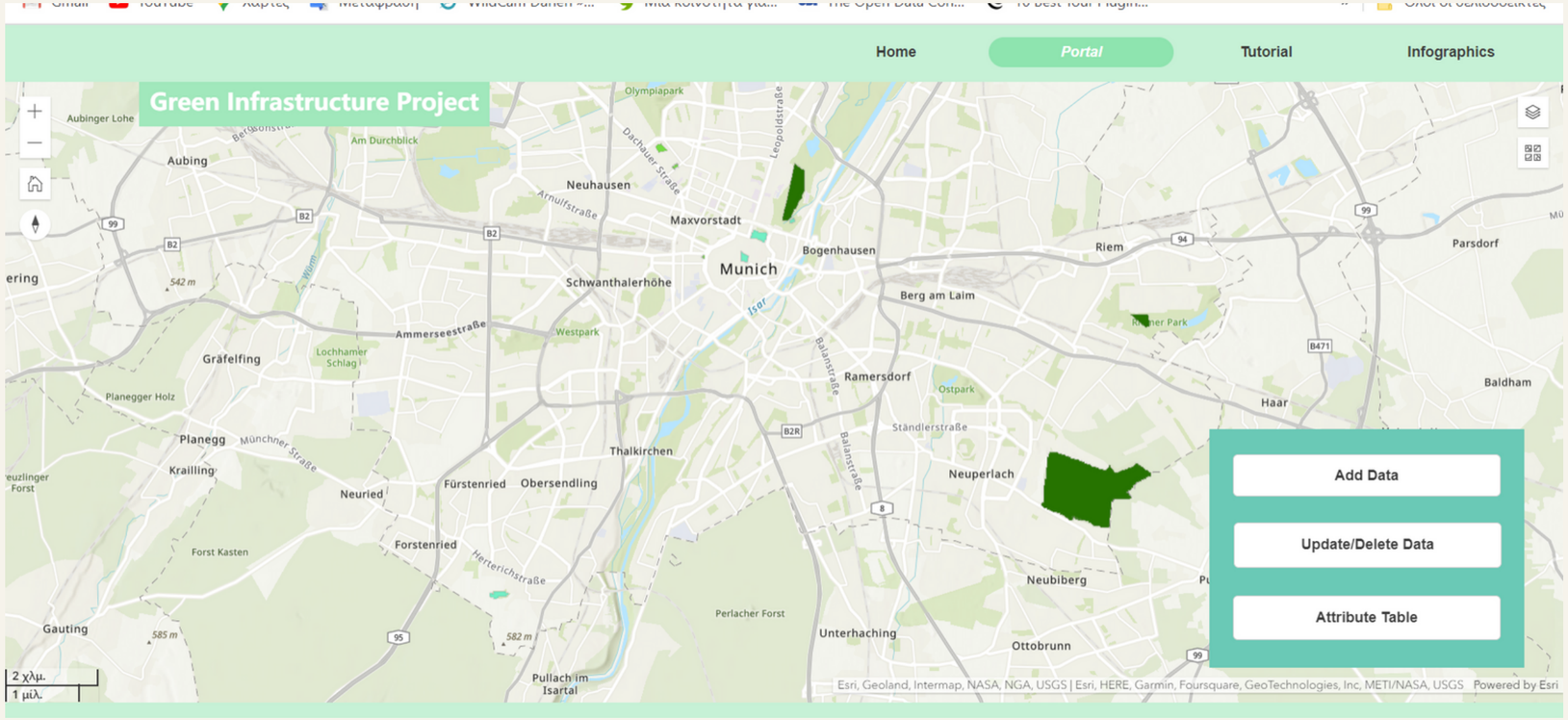

PROTOTYPE

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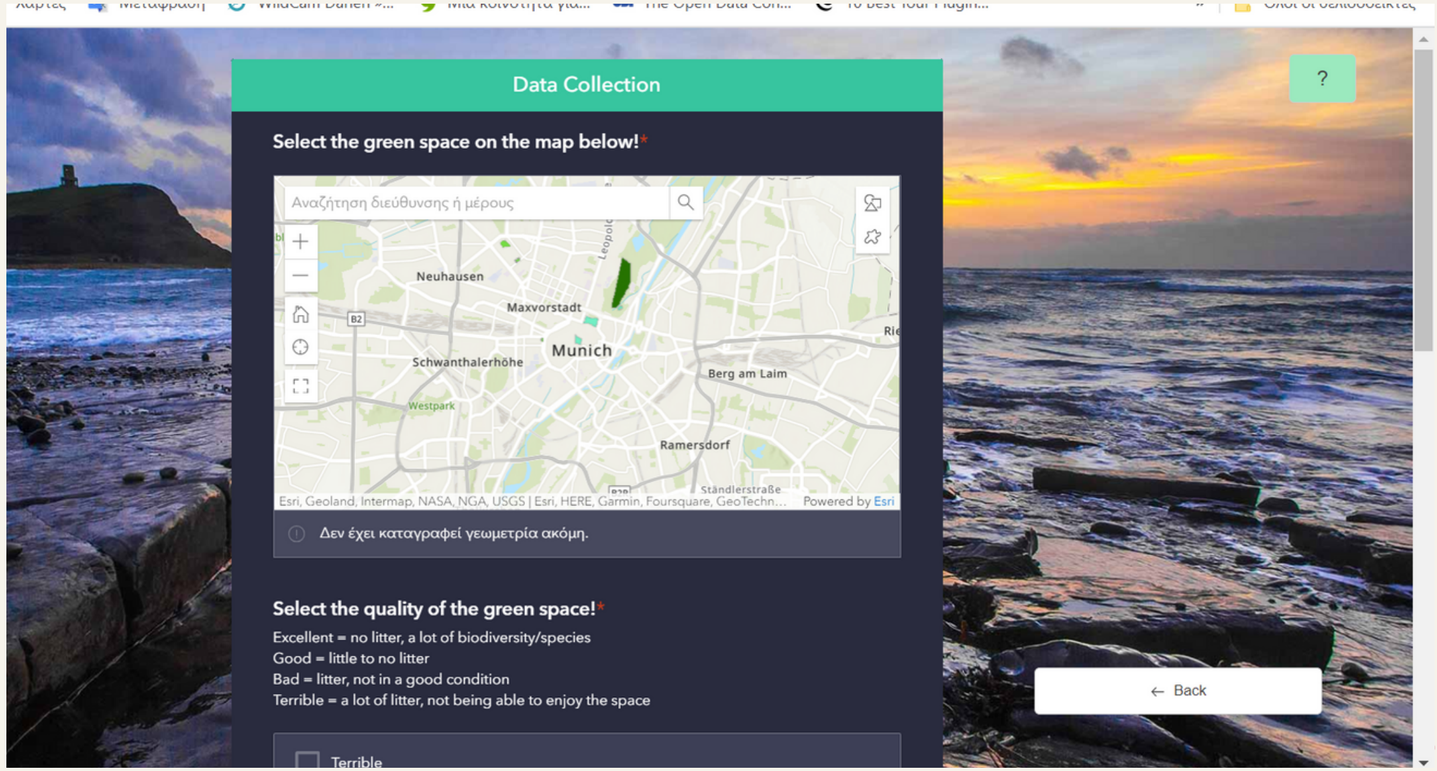
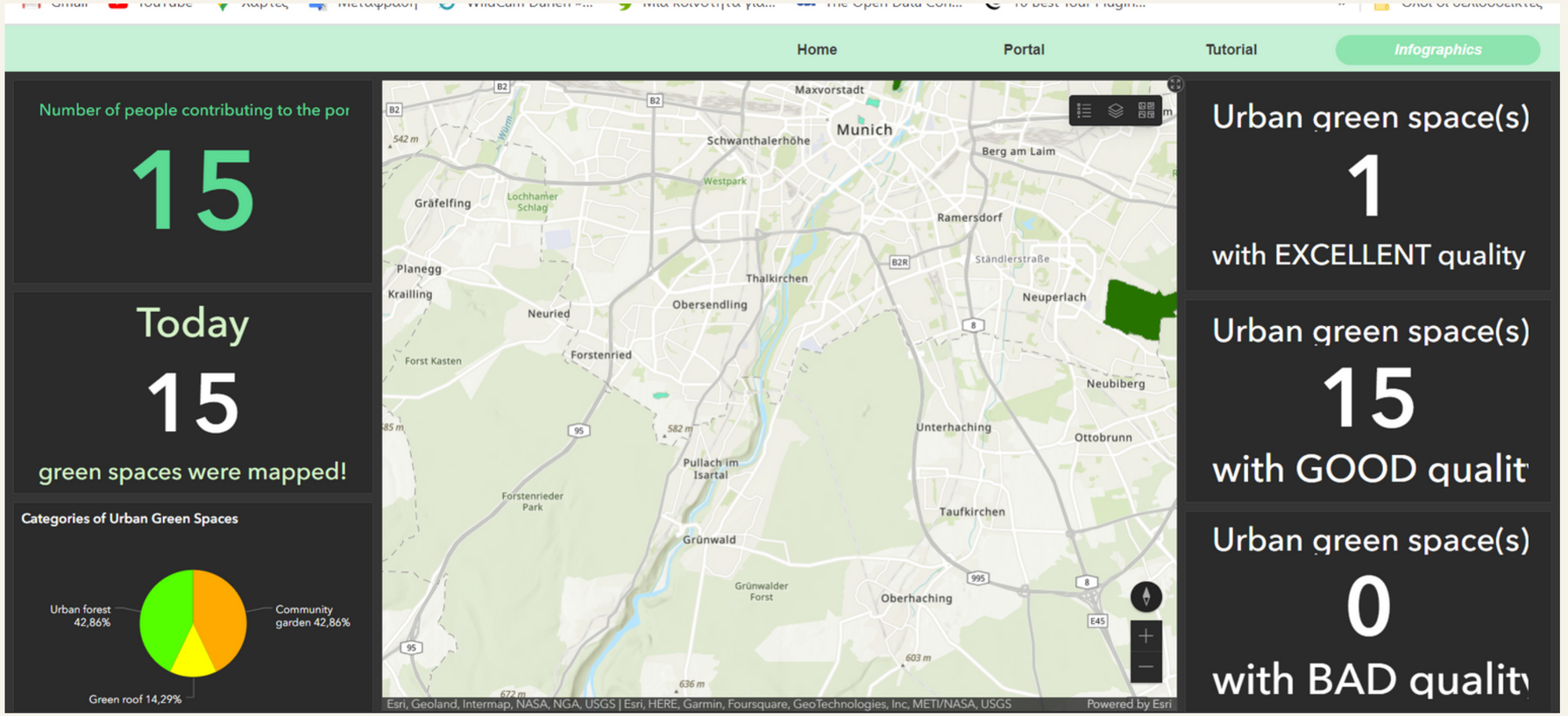


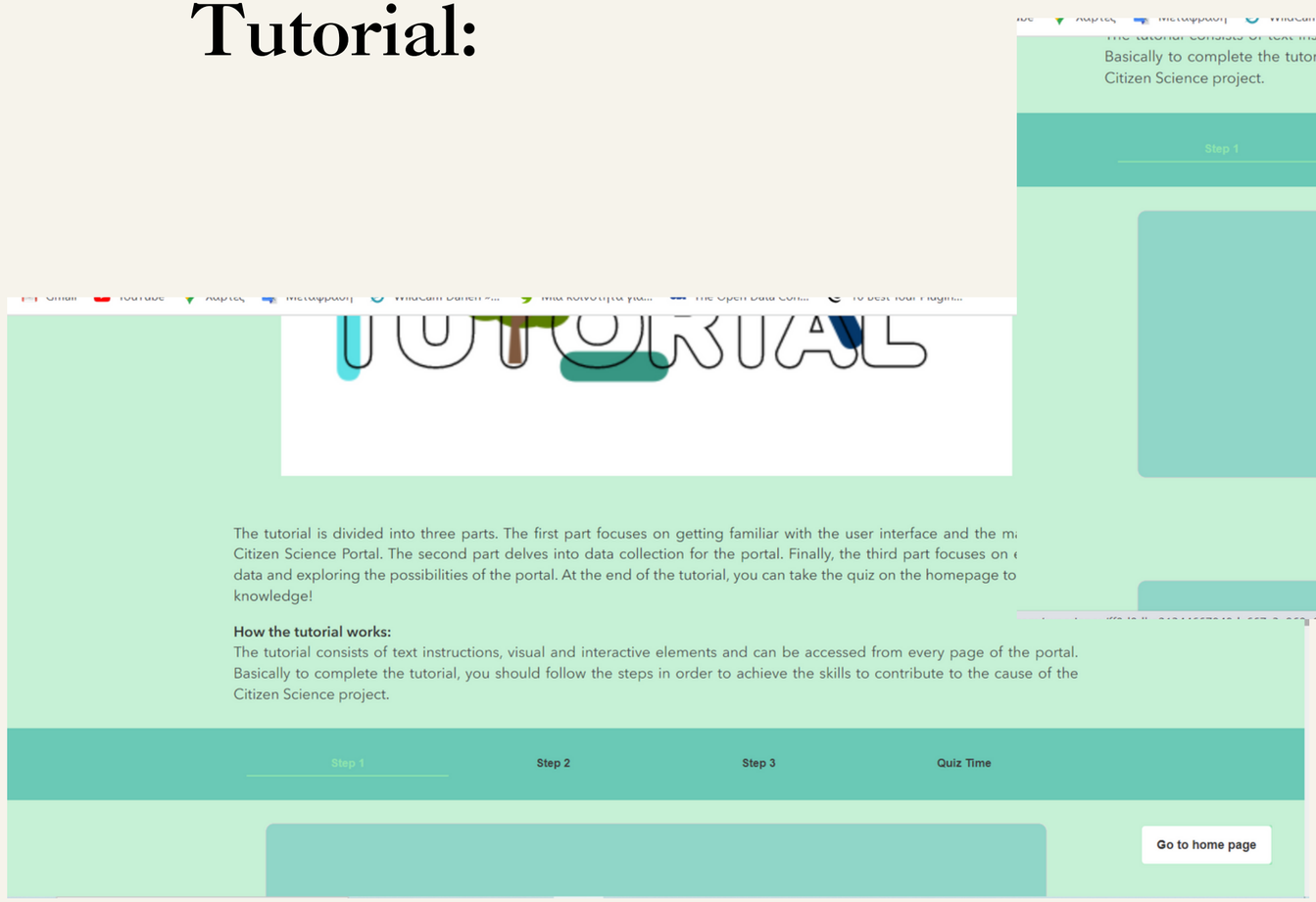
PROTOTYPE

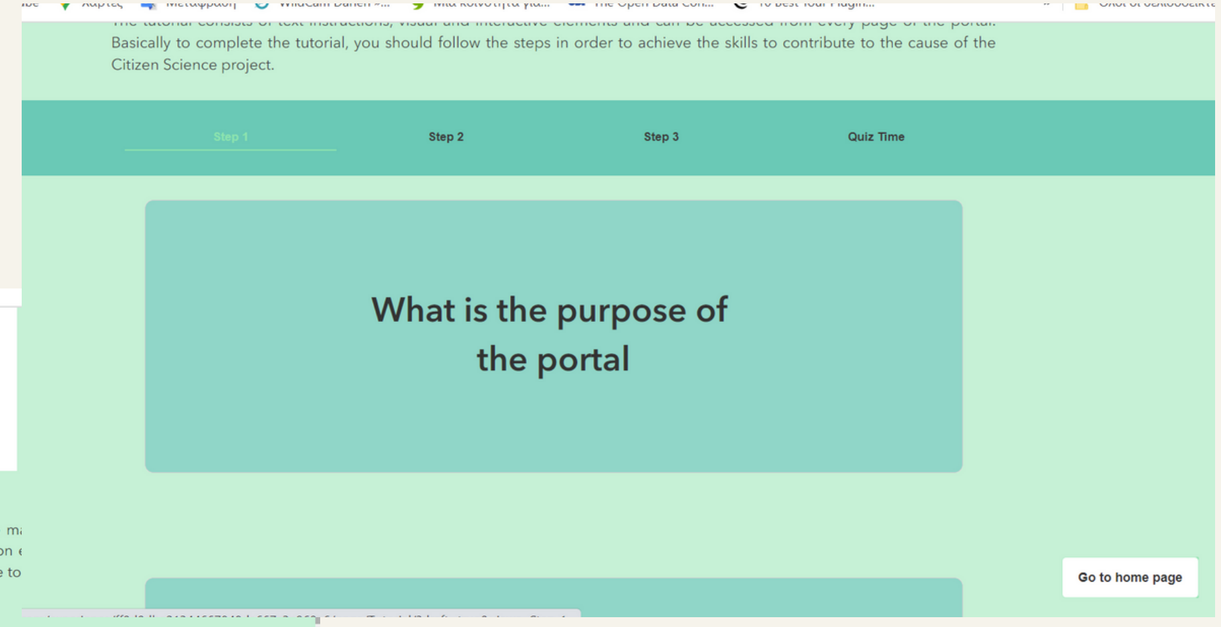
Infographics:



PROTOTYPE

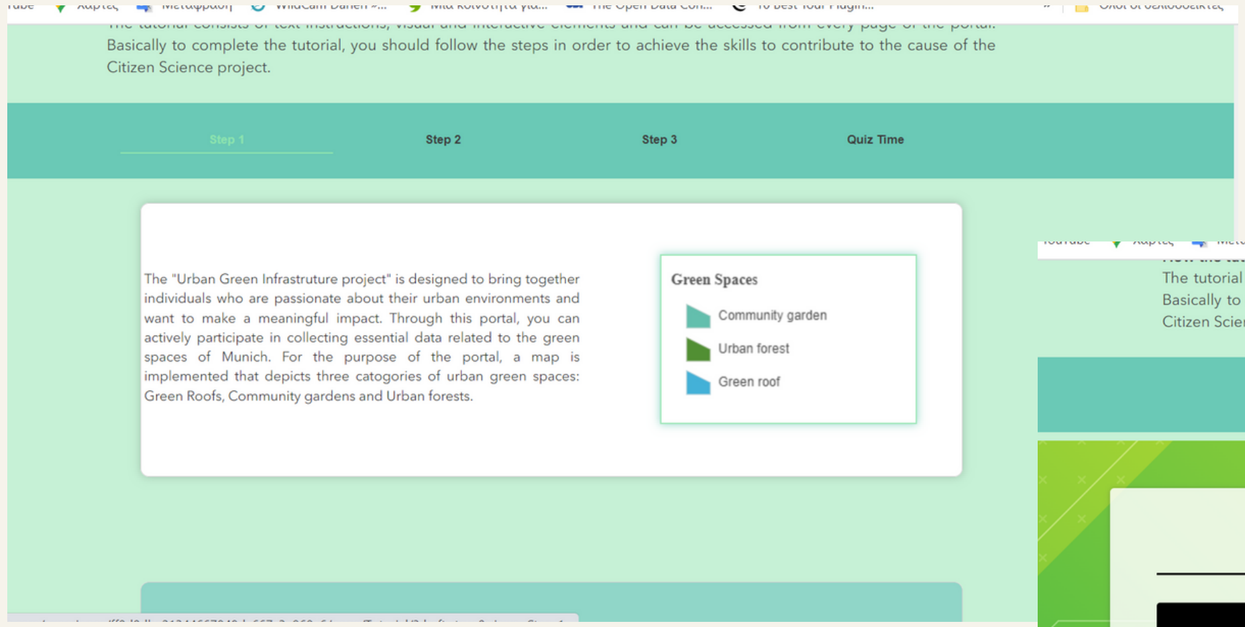
Tutorial:

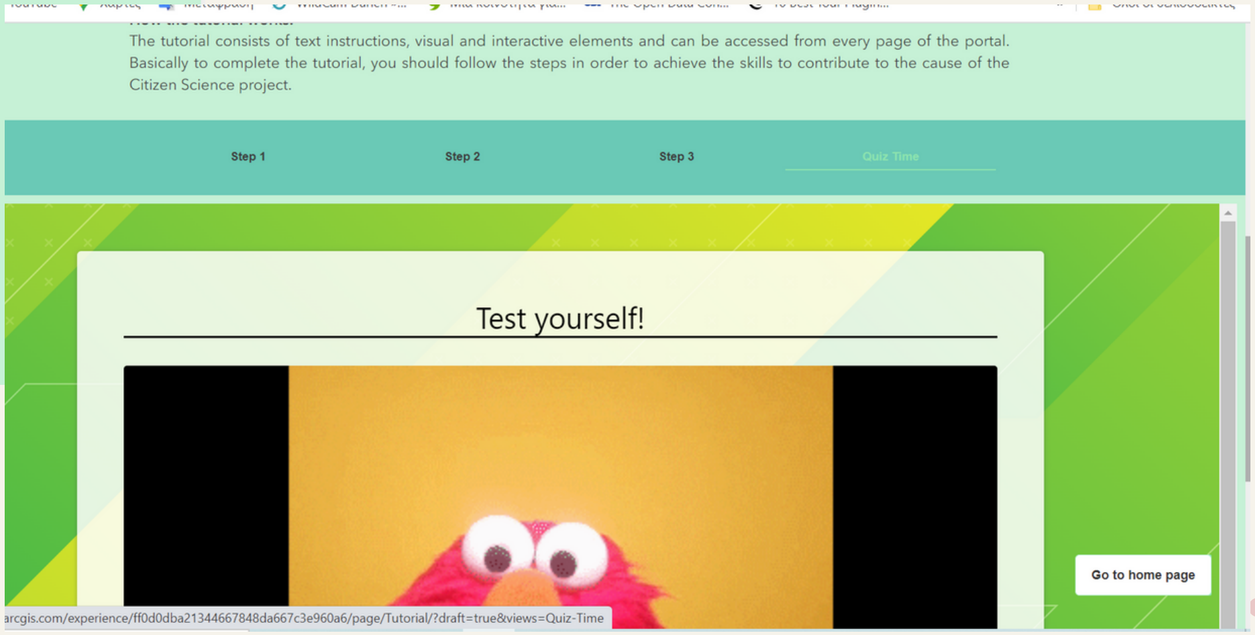




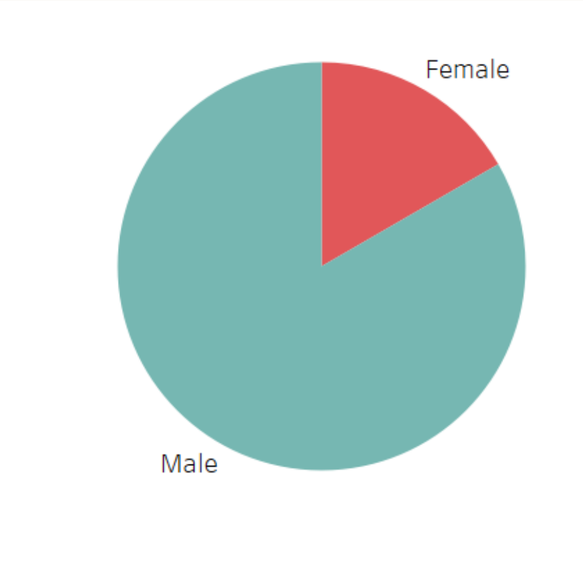
PROTOTYPE

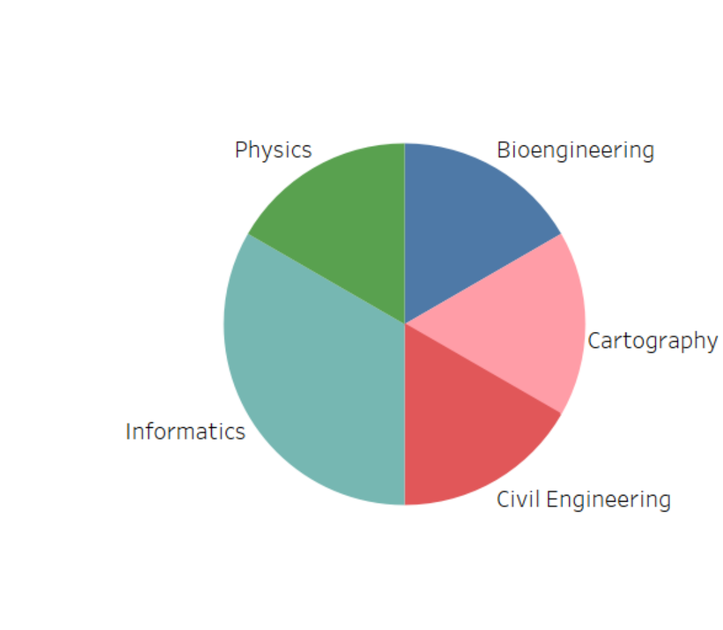
Tutorial:

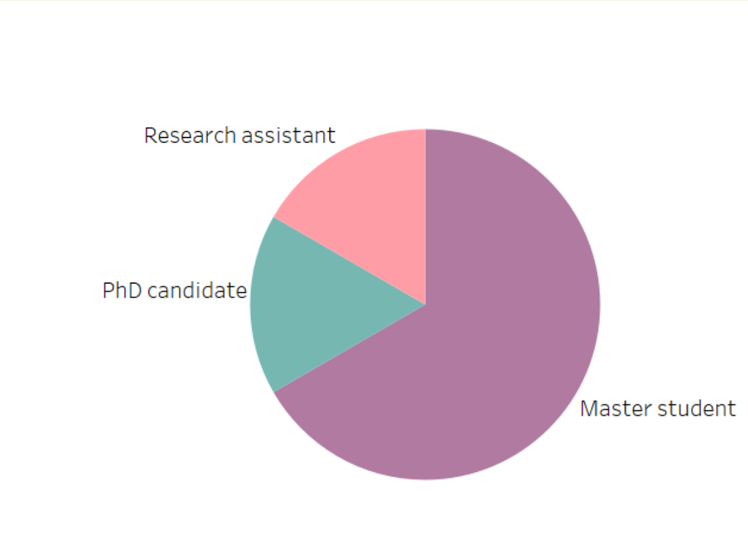




FOCUS GROUP

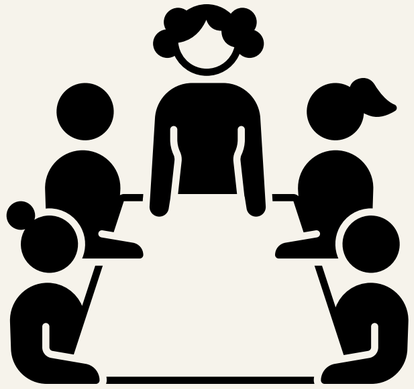

Female
Male


Physics
Bioengineering
Cartography
Informatics
Civil Engineering


Research assistant
PhD candidate
Master student

FOCUS GROUP

- Two groups of 3 participants each completed 3 tasks with 8-10 minutes of tutorial practice.
- Tasks included adding data to the portal, updating or deleting data, and downloading information.
- Tasks were followed by open-ended questions and group discussion.



FOCUS GROUP

Feedback

Linear design, and automatic detection of green areas were desired.
Clear instructions and focus on sustainability and climate change a plus.

Suggestions

Correct answers for the quiz and improvements in visual design such as bigger frame for GIFs and a whole page for steps.

Users' needs

Helpful, understandable, and tailored to the portal tasks, responsive design was suggested, and challenges for less tech-savvy users. Interactivity was considered important, and better use of pop-up videos and flashcards.

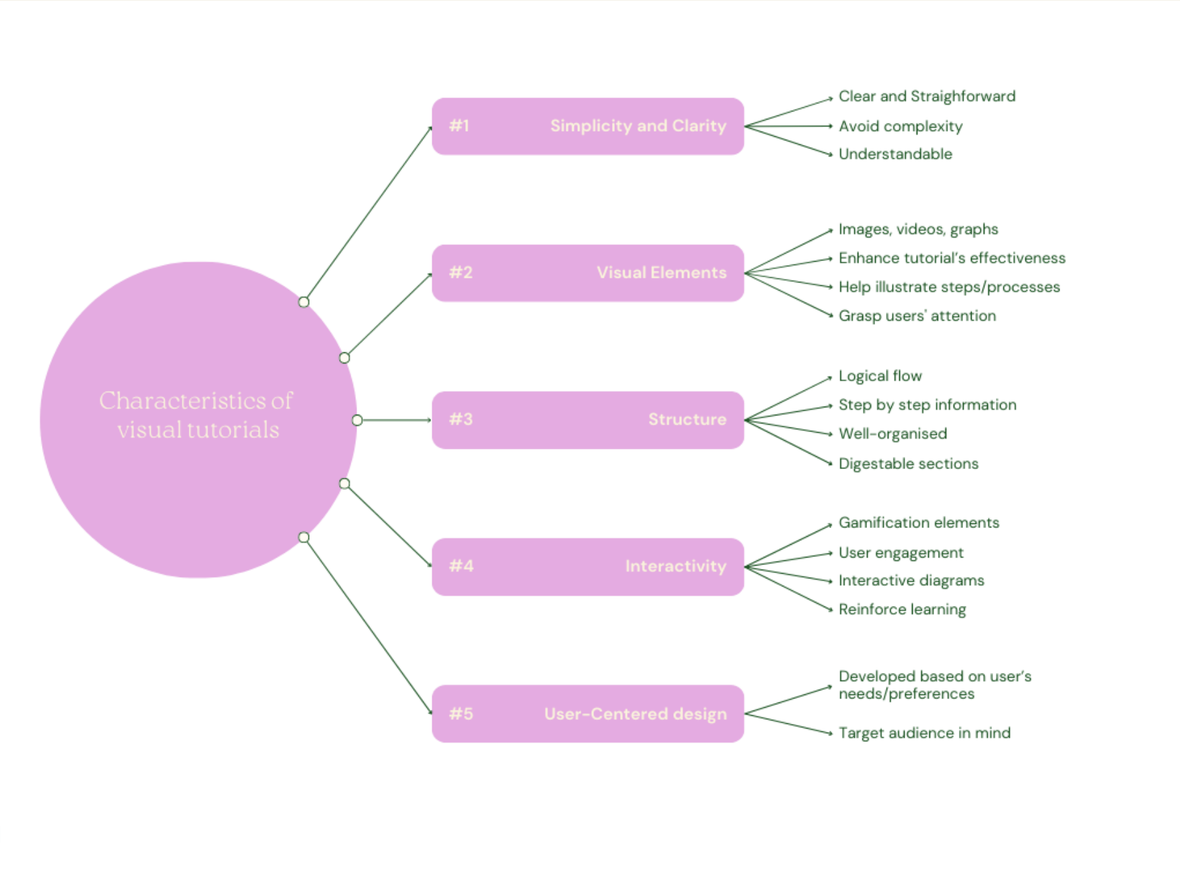
RESULTS

What differentiates a tutorial for CS than from a regular tutorial?

CHARACTERISTICS	CITIZEN SCIENCE TUTORIAL	REGULAR DASHBOARD/PORTAL
User Engagement	✓	✗
Training and Guidance	✓	✗
Active Contribution to research	✓	✗
Access to Information	✓	✓
Specific Scientific Project	✓	✗

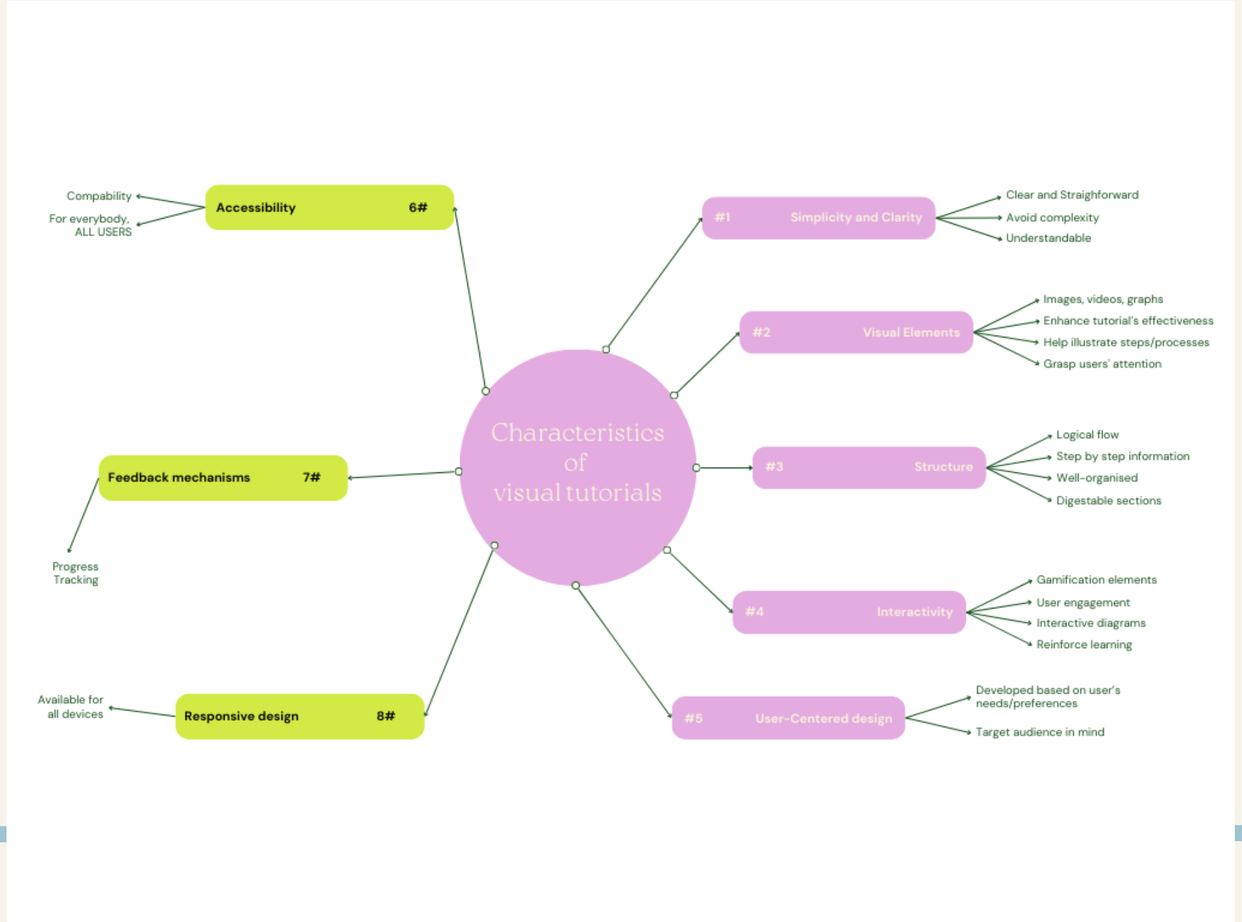
RESULTS

What are the characteristics of a visual tutorial?



RESULTS

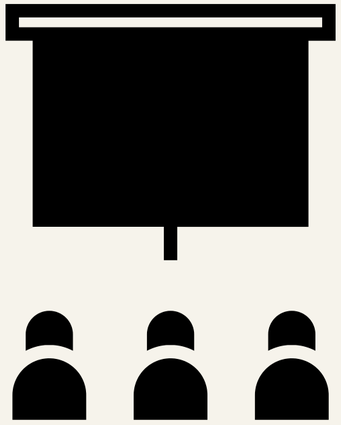
How did the user group perceive the tutorial?



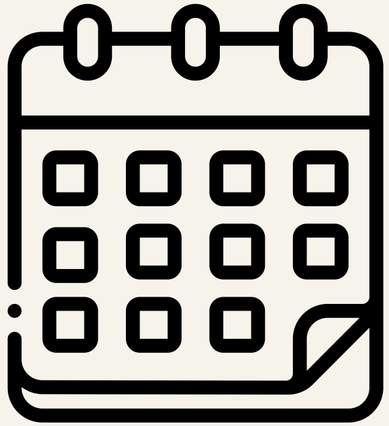
CONCLUSION

- Tutorial Design:
  - Effective citizen science tutorials should focus on interactivity, simplicity, structured step-by-step guidance, and strategic use of visual elements and graphics.
  - Real-time feedback, accessibility for diverse users, and responsive design across devices are important for an engaging learning experience.
- User Preferences Influence Design:
  - User preferences significantly influence the perceived effectiveness of citizen science tutorials.
  - A balance is needed in tutorial design, as an excess of interactive elements can become redundant.
- Gamification:
  - Gamification elements are effective in citizen science tutorials and contribute to the overall engagement.

LIMITATIONS



Limited sample size



Methodological constraints

FUTURE WORK

- **Implement user-driven improvements**

  Apply the suggested improvements from the user study and focus group sessions to enhance the tutorial's effectiveness, usability, and engagement.

- **Explore UX design for tutorials**

  Investigate UX design principles for tutorials, addressing aspects such as interface design, interactivity, accessibility, and multimedia incorporation.

Thank you for your attention!

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