

The background features three vertical stripes on the left: a wide pink one, a narrower blue one, and a narrow beige one. The rest of the background is a light beige color with a pattern of small, faint pink dots arranged in a grid-like fashion, with some dots missing to create a sparse effect.


Developing an interactive visual tutorial for Citizen Science

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24/10/2023



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

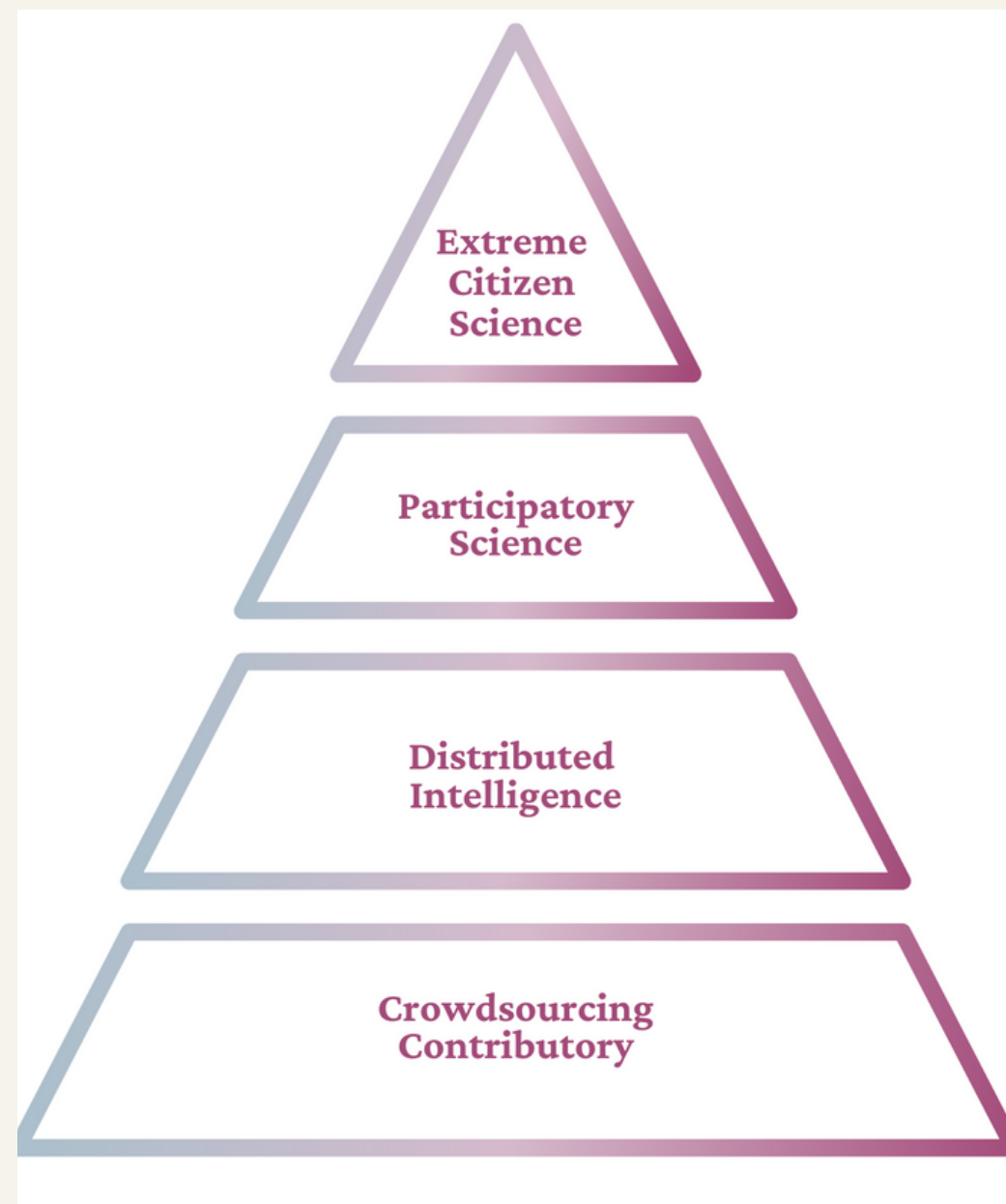
To evaluate and analyze how the users perceived the tutorials and what can be improved.

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

Career path	Career path
<h3>Front-End Engineer</h3> <p>Front-end engineers work closely with designers to make websites beautiful, functional, and fast.</p> <hr/> <p>Includes 34 Courses</p> <hr/> <p> With Professional Certification</p> <hr/> <p> Beginner Friendly 124 Lessons</p>	<h3>Full-Stack Engineer</h3> <p>A full-stack engineer can get a project done from start to finish, back-end to front-end.</p> <hr/> <p>Includes 51 Courses</p> <hr/> <p> With Professional Certification</p> <hr/> <p> Beginner Friendly 162 Lessons</p>

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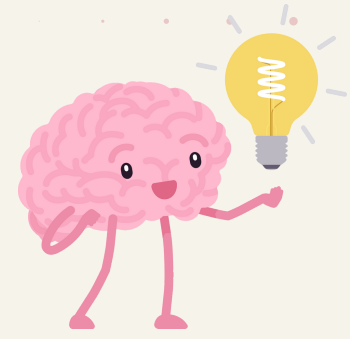
Not feeling ready for this? Check out [Get ready for Geometry](#).

High school geometry

9,000 possible mastery points ⓘ

Mastered
 Proficient
 Familiar
 Attempted
 Not started
 Quiz
 Unit test

Unit 1	<div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/></div> <div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div> <div> <input type="checkbox"/> </div>	Unit 6	<div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div> <div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div>
Unit 2	<div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div> <div> <input type="checkbox"/> </div>	Unit 7	<div> <input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/><input type="checkbox"/> </div> <div> </div>
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METHODOLOGY

Qualitative Method

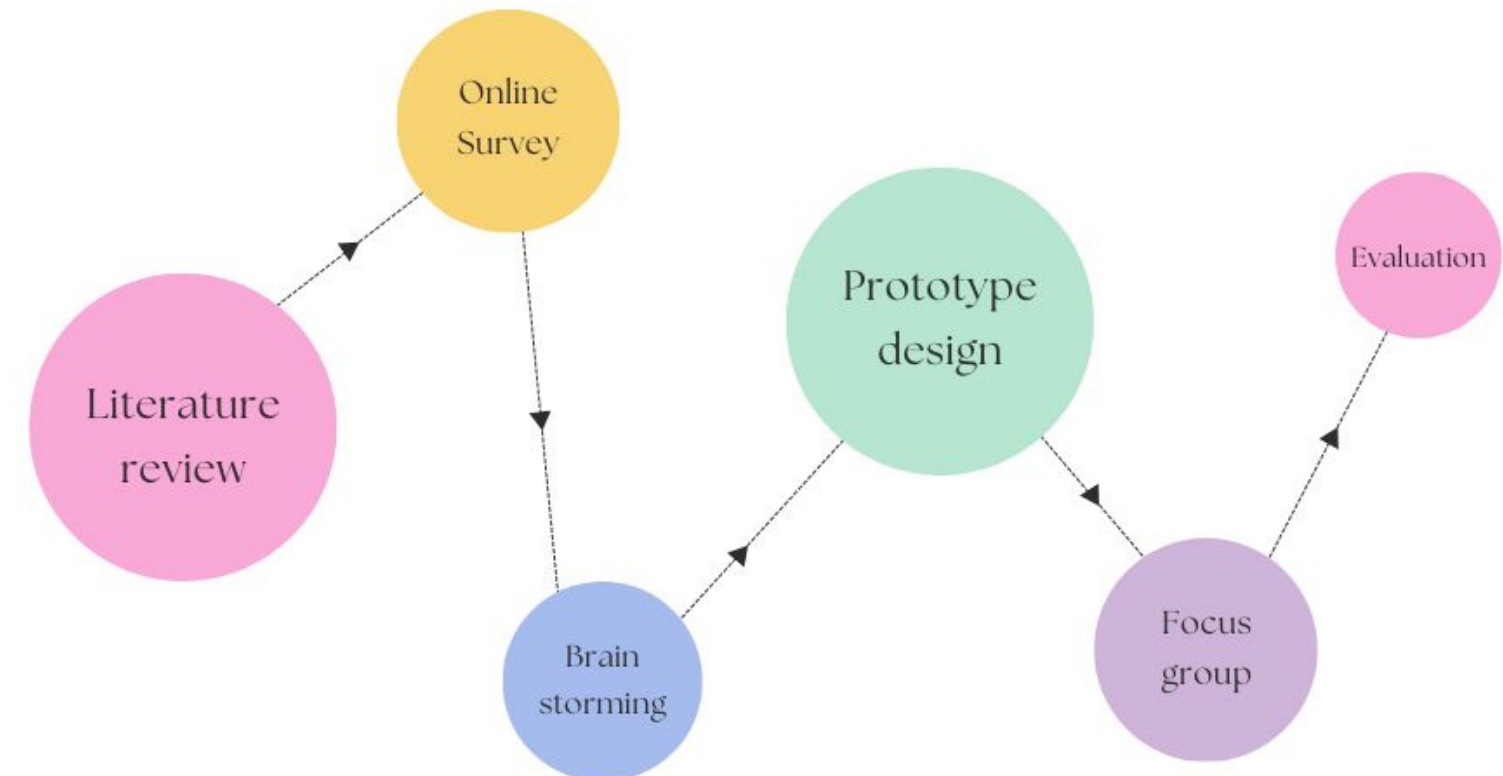
Literature review

Focus group user study

Quantitative Method

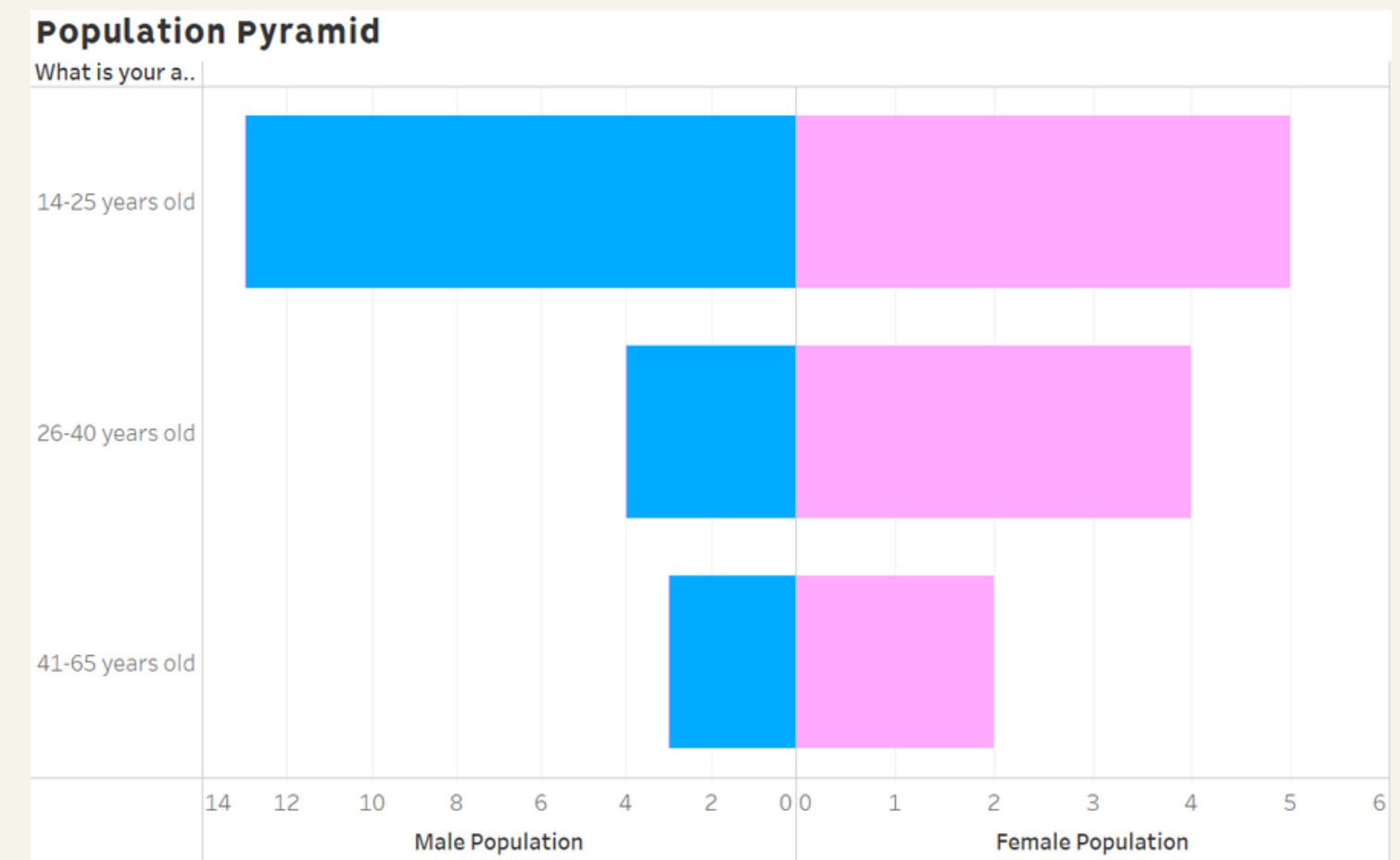
Online survey

Prototype design



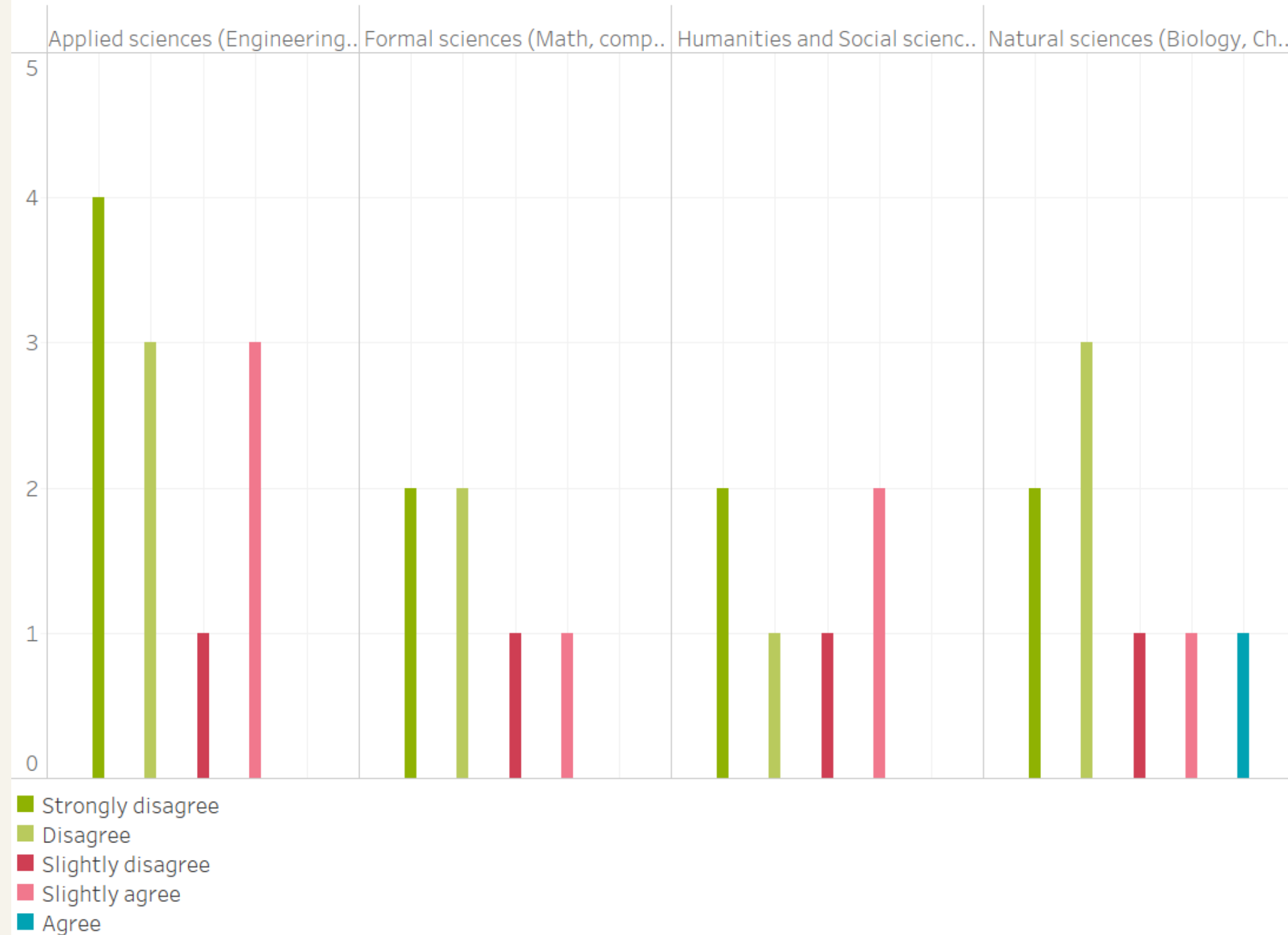
ONLINE SURVEY

- 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)



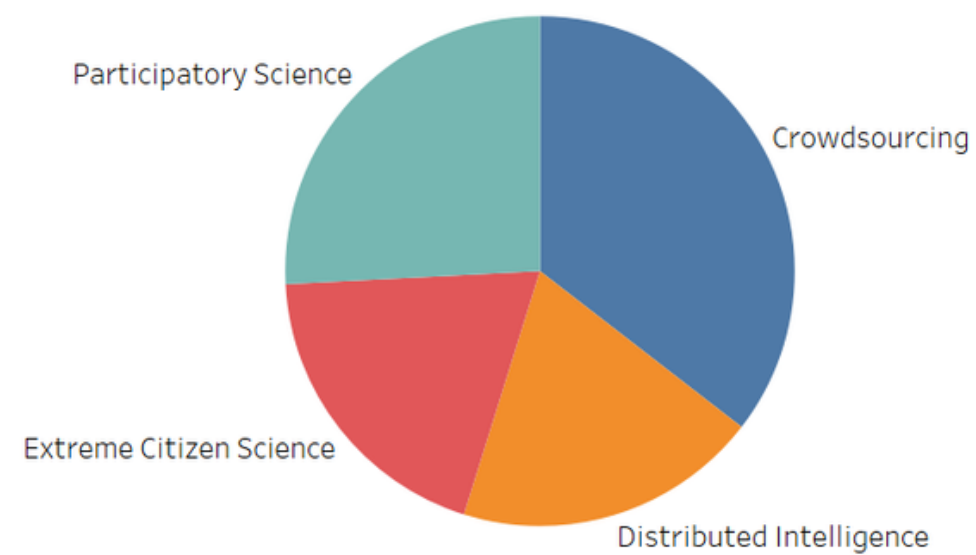
ONLINE SURVEY

I am familiar with citizen science projects.

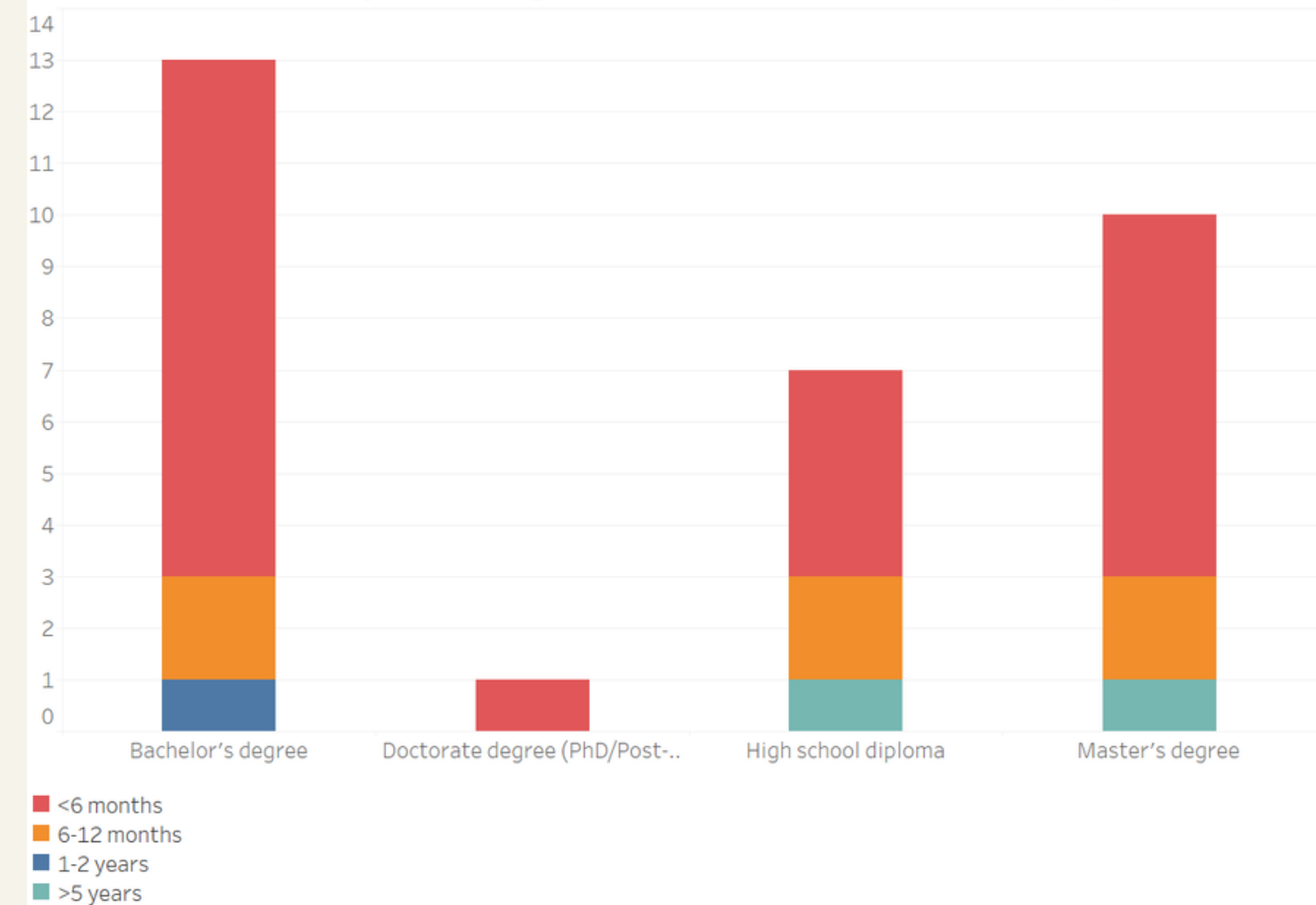


ONLINE SURVEY

What is your preferred level of participation in Citizen Science projects?

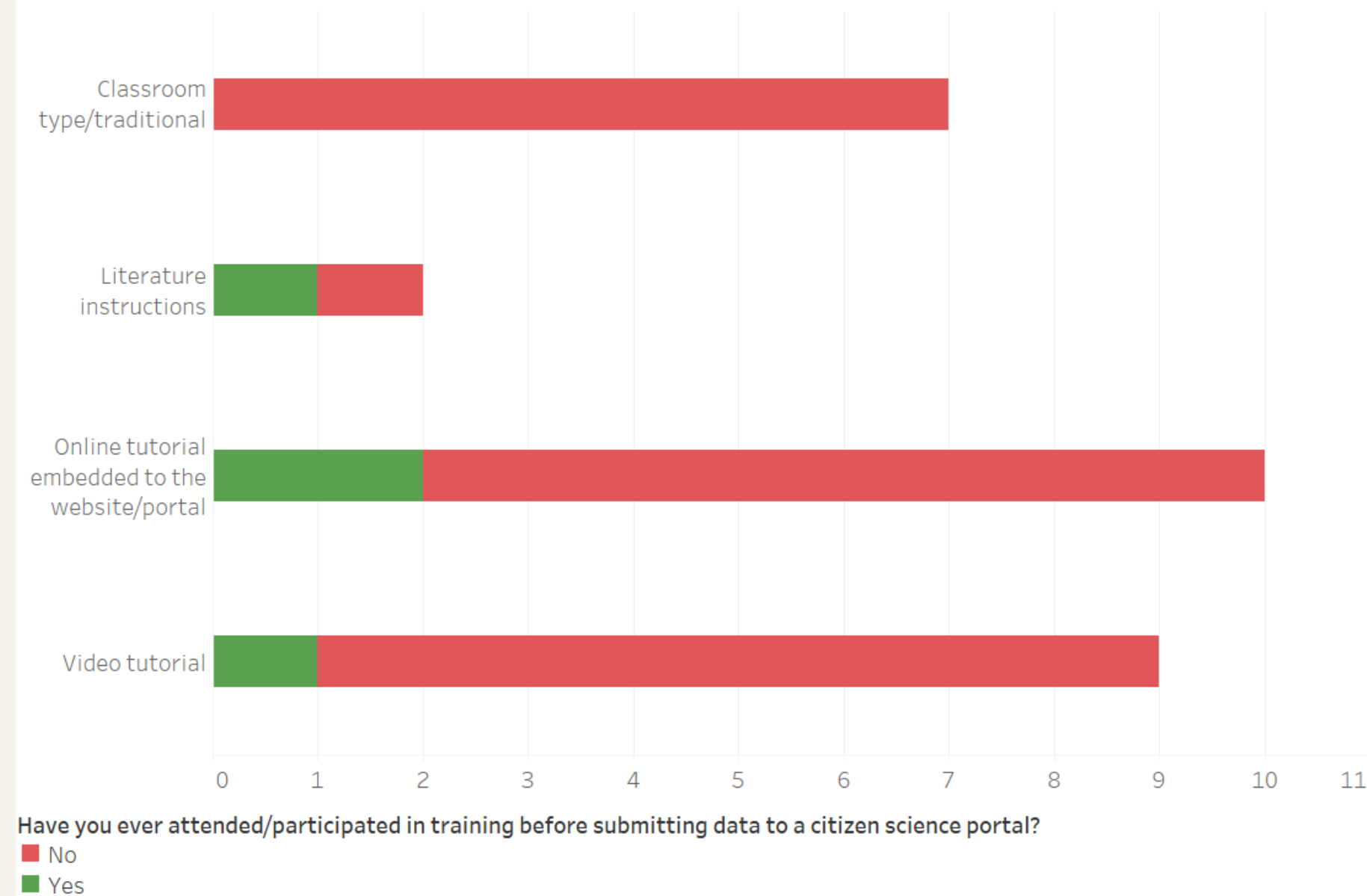


How much time are you willing to devote to a citizen science project?



ONLINE SURVEY

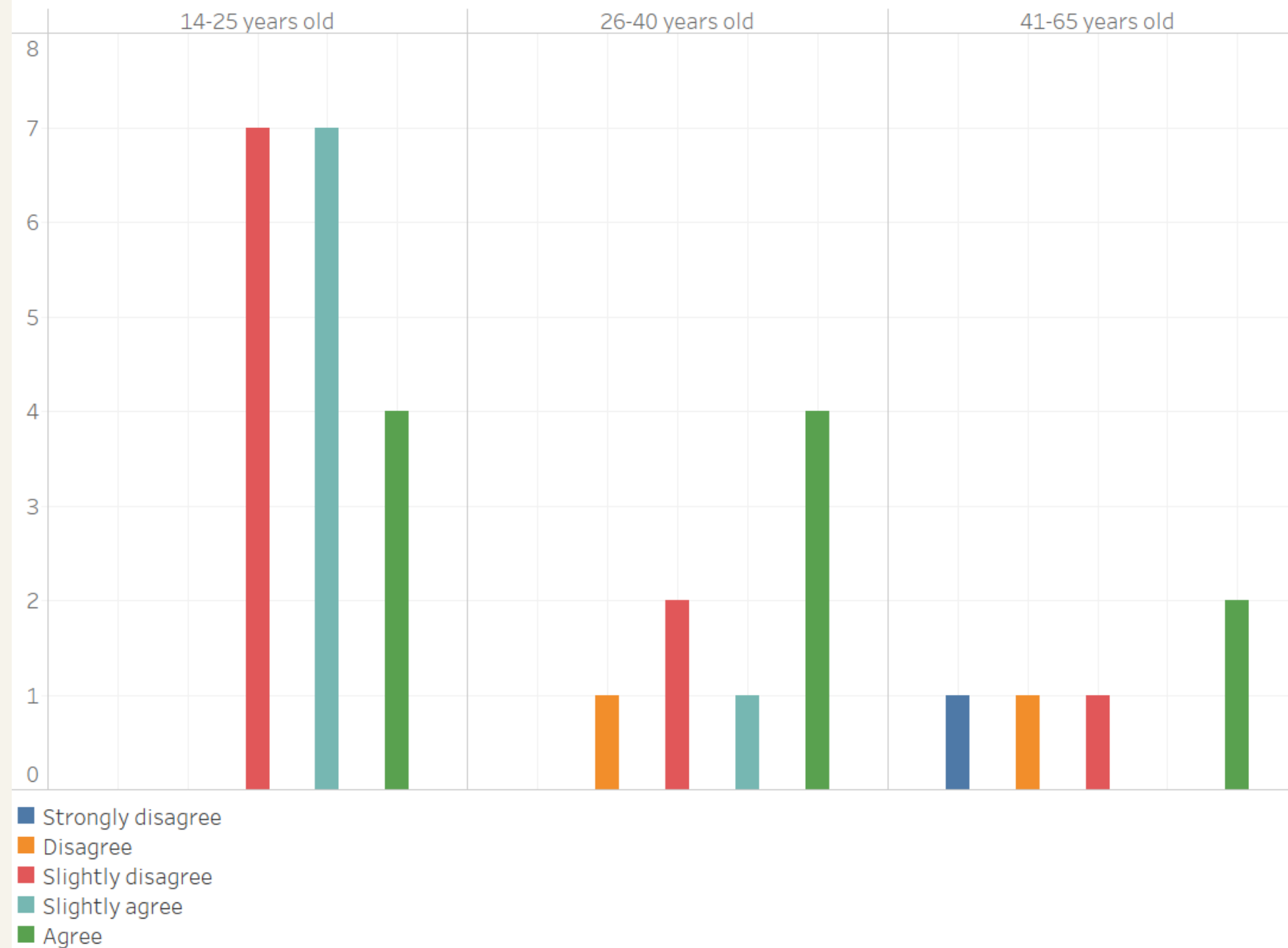
What are your preferred methods for learning new skills or concepts online?



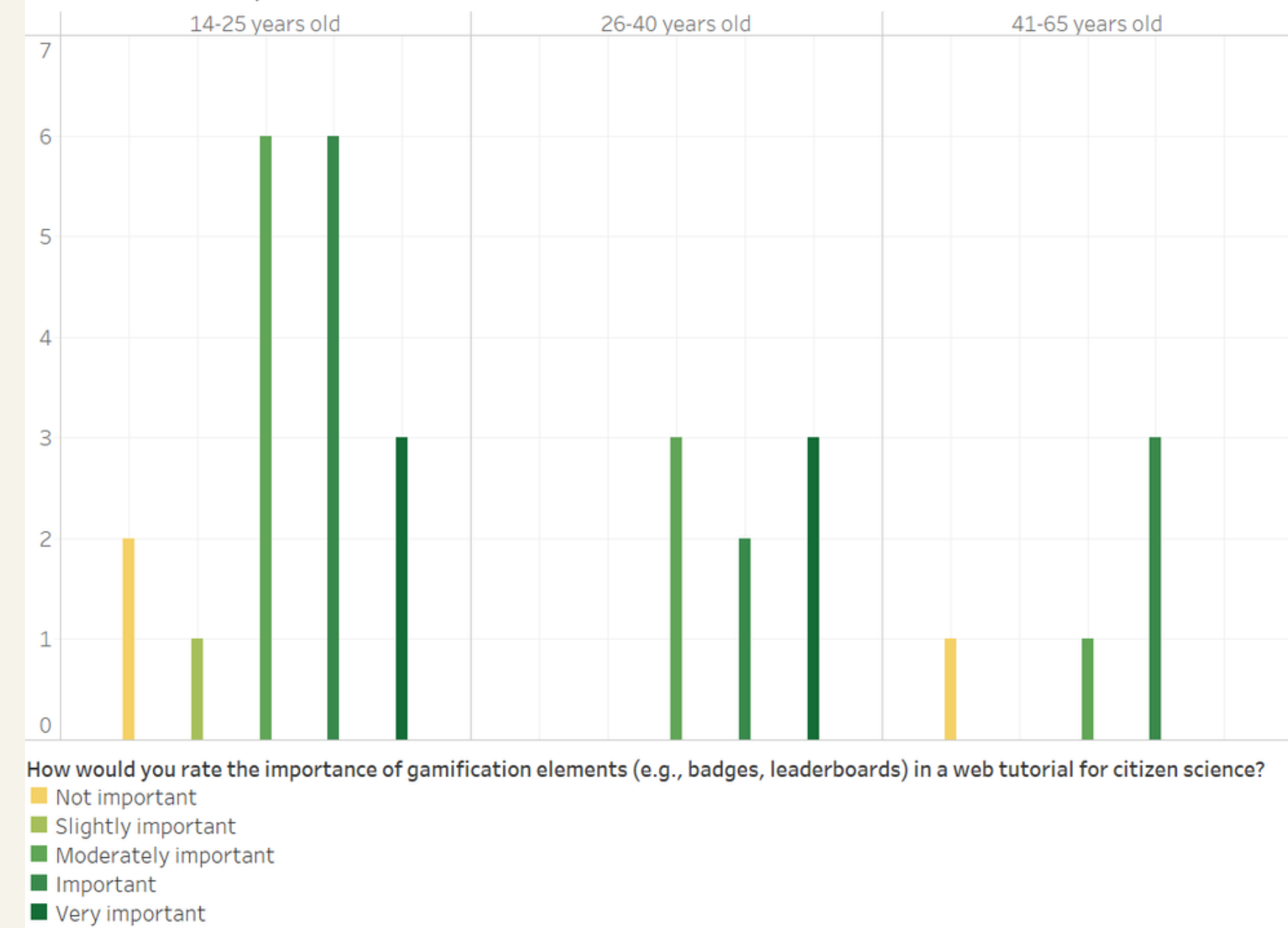
Participants with no previous experience with CS portals prefer the traditional way of learning instead of digital methods.

ONLINE SURVEY

How important is it for you to have interactive elements in a web tutorial?

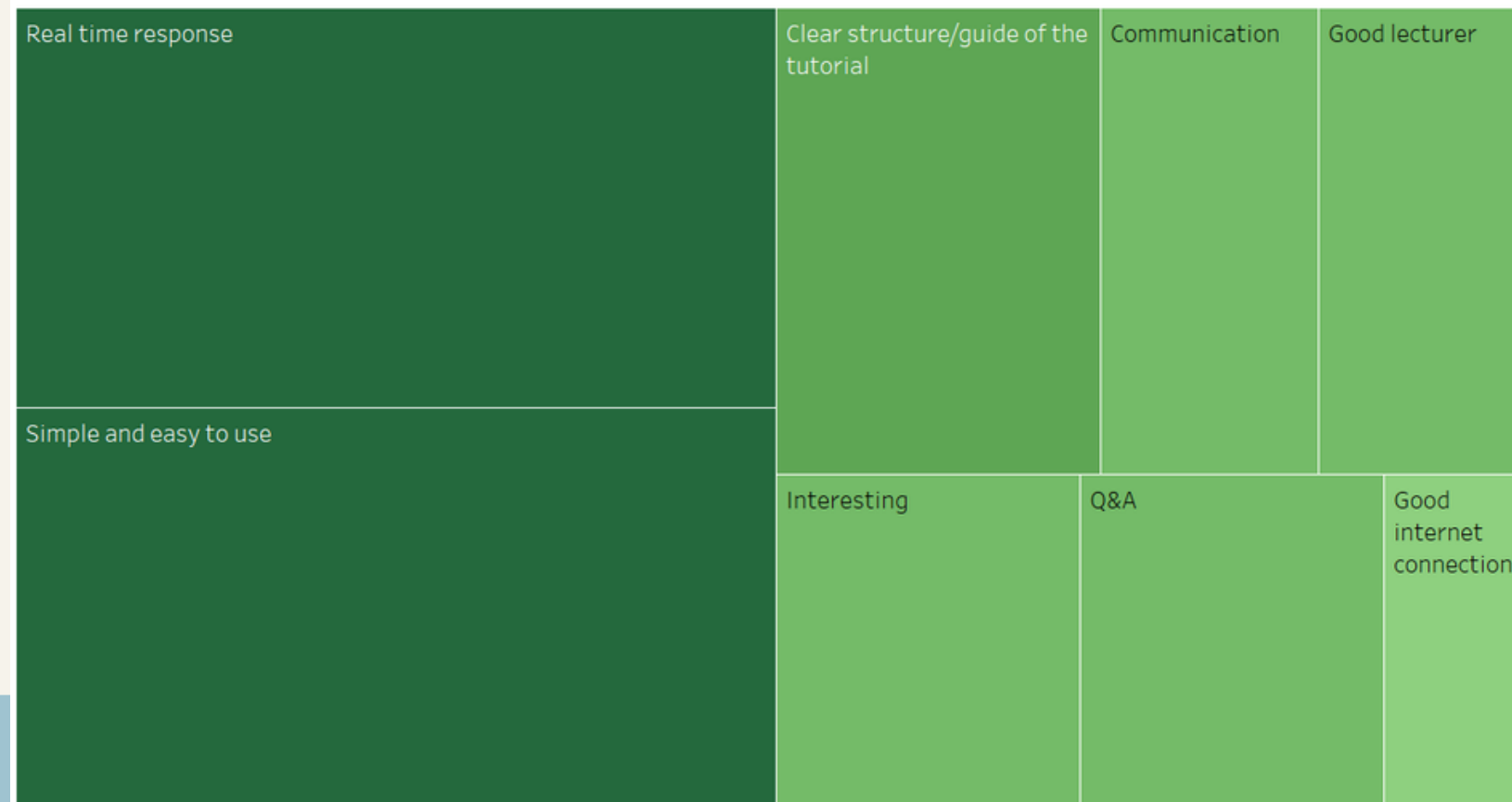


How would you rate the importance of gamification elements (e.g., badges, leaderboards) in a web tutorial for citizen science?

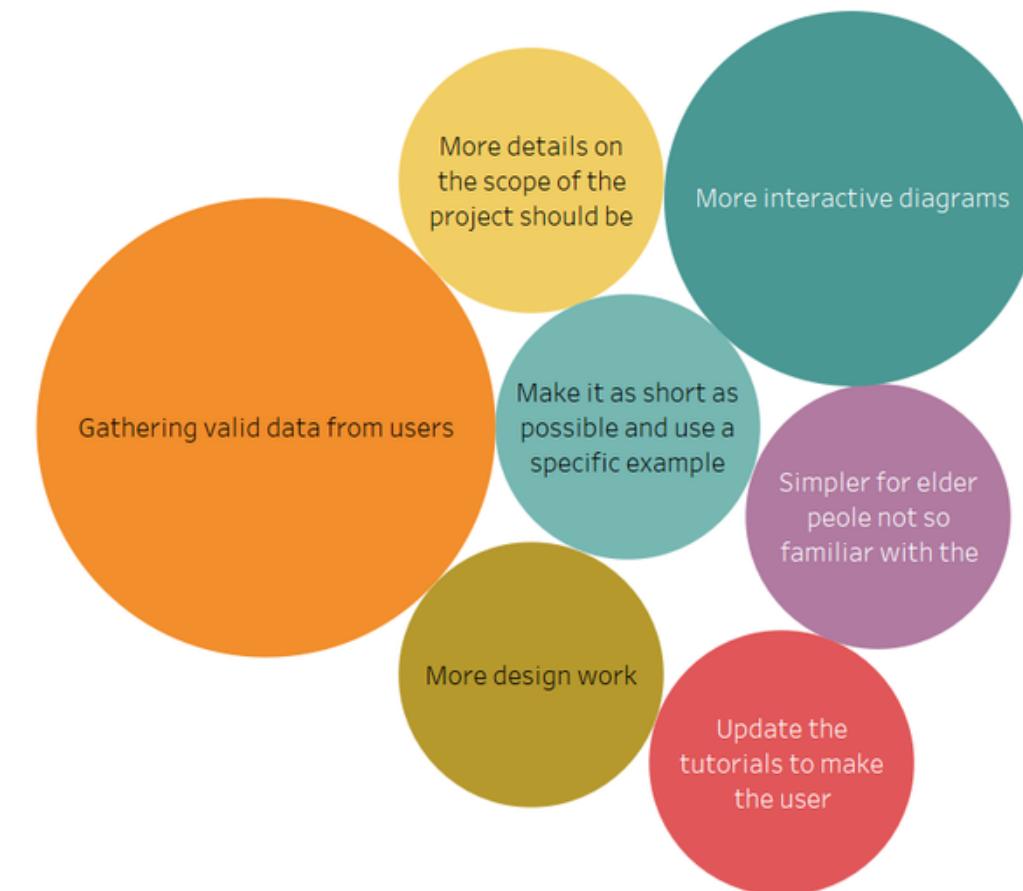


ONLINE SURVEY

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

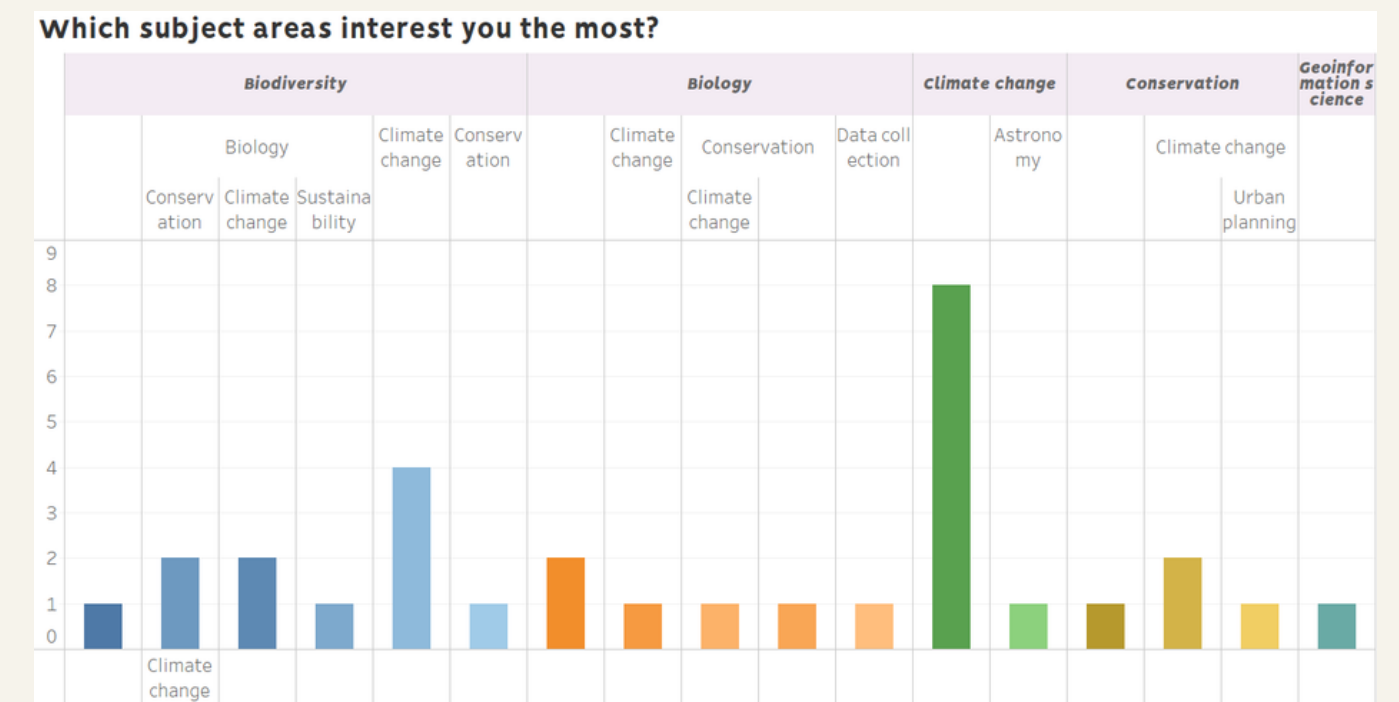


What improvements would you suggest for enhancing the effectiveness of web tutorials in citizen science projects?



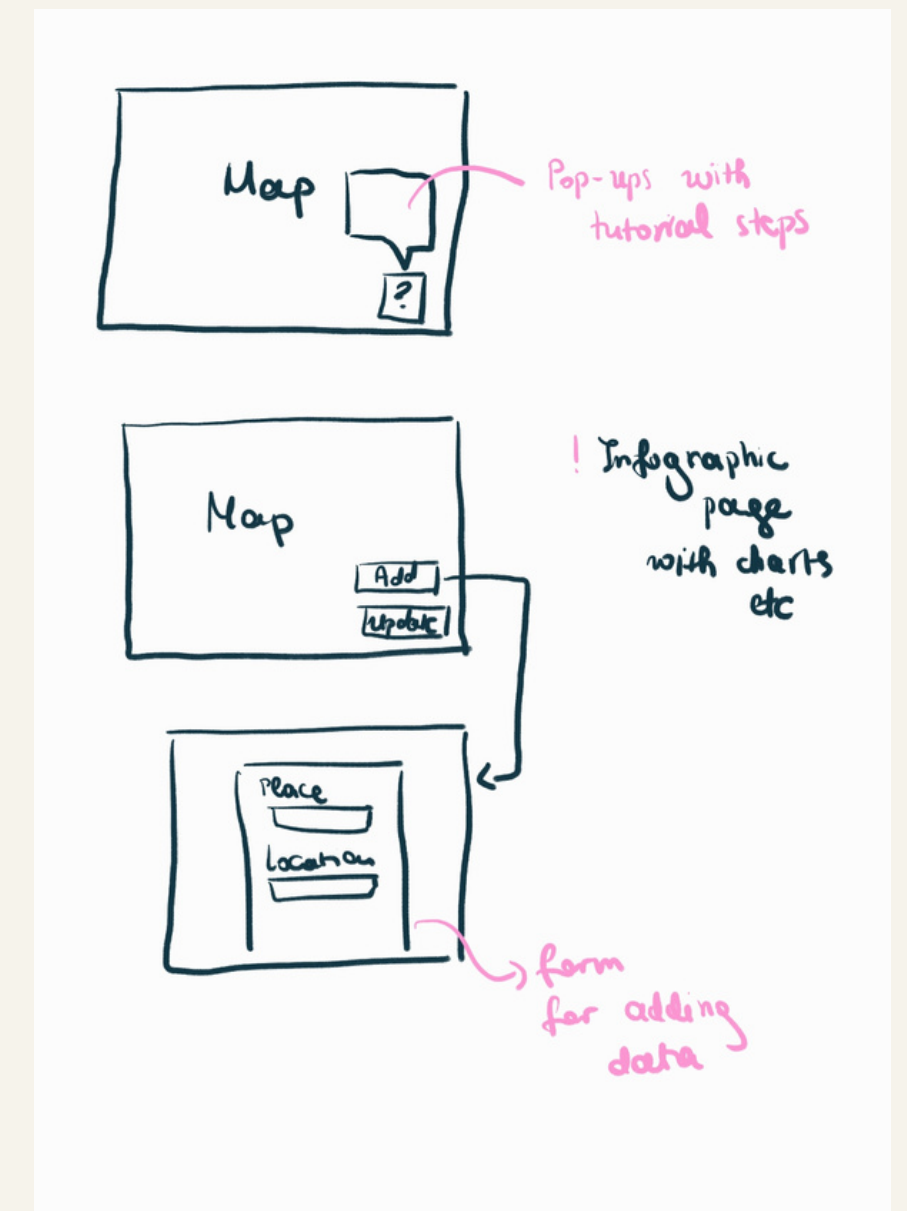
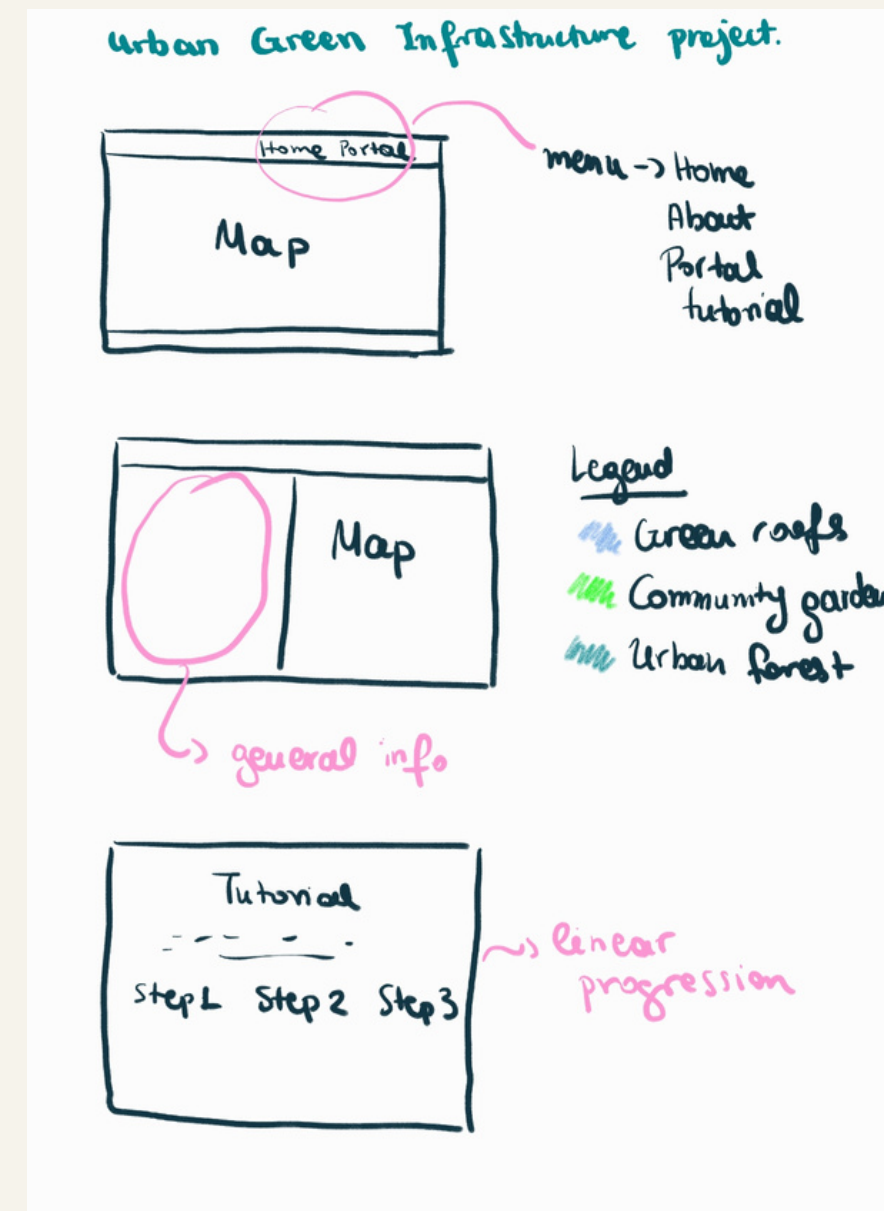
CASE STUDY

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



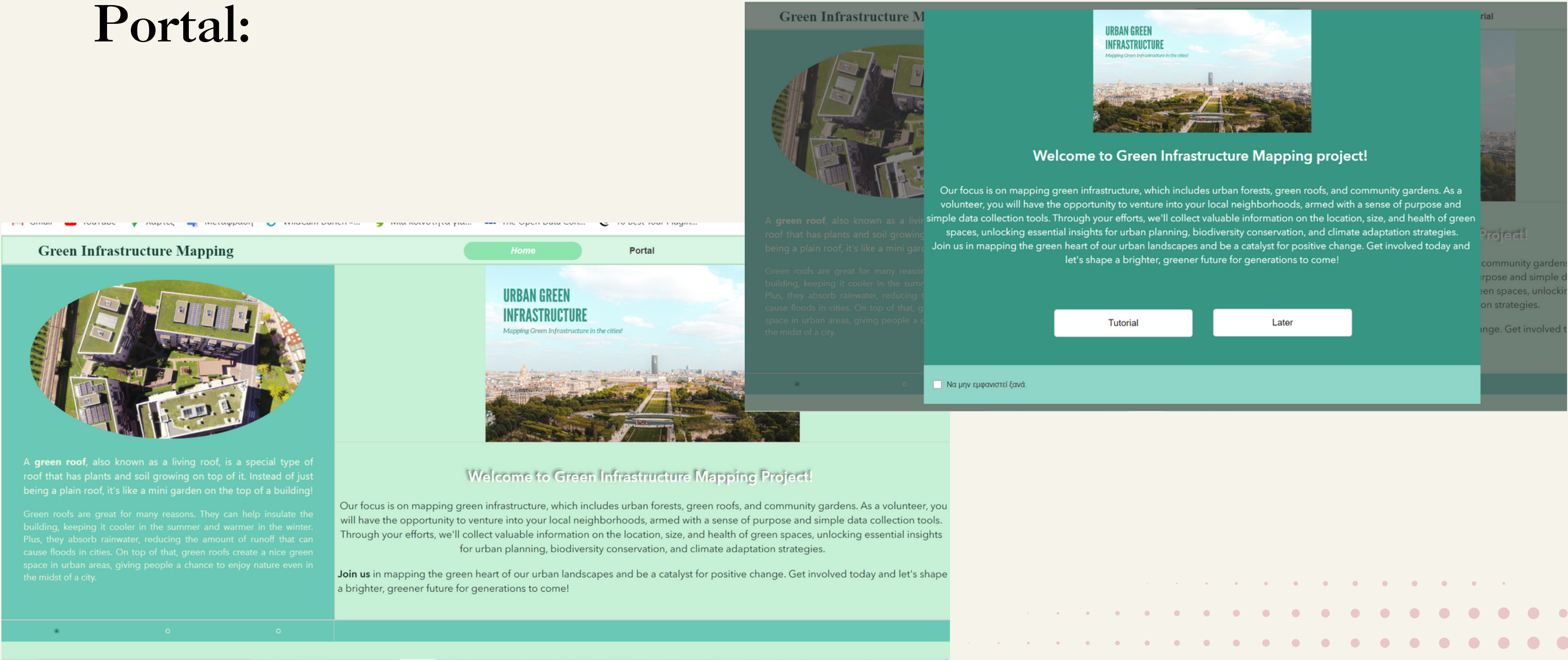
PROTOTYPE

Tools:



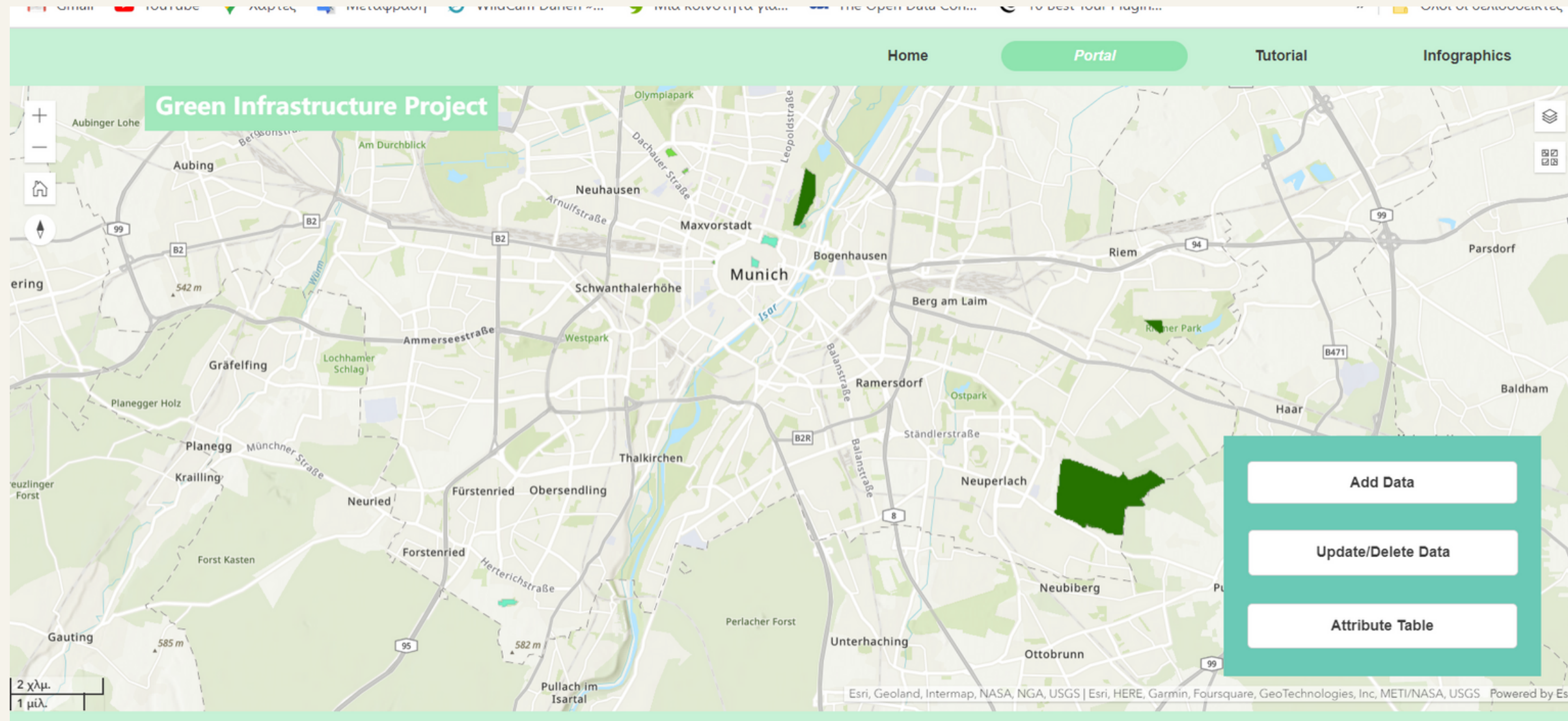
PROTOTYPE

Portal:



PROTOTYPE

Portal:



PROTOTYPE

Portal:

Data Collection

Select the green space on the map below!*

Αναζήτηση διεύθυνσης ή μέρους

Neuhausen
Maxvorstadt
Munich
Schwanthalerhöhe
Berg am Laim
Ramersdorf
Westpark
Ständlerstraße

Esri, Geoland, Intermap, NASA, NGA, USGS | Esri, HERE, Garmin, Foursquare, GeoTechn... Powered by Esri

Δεν έχει καταγραφεί γεωμετρία ακόμη.

Select the quality of the green space!*

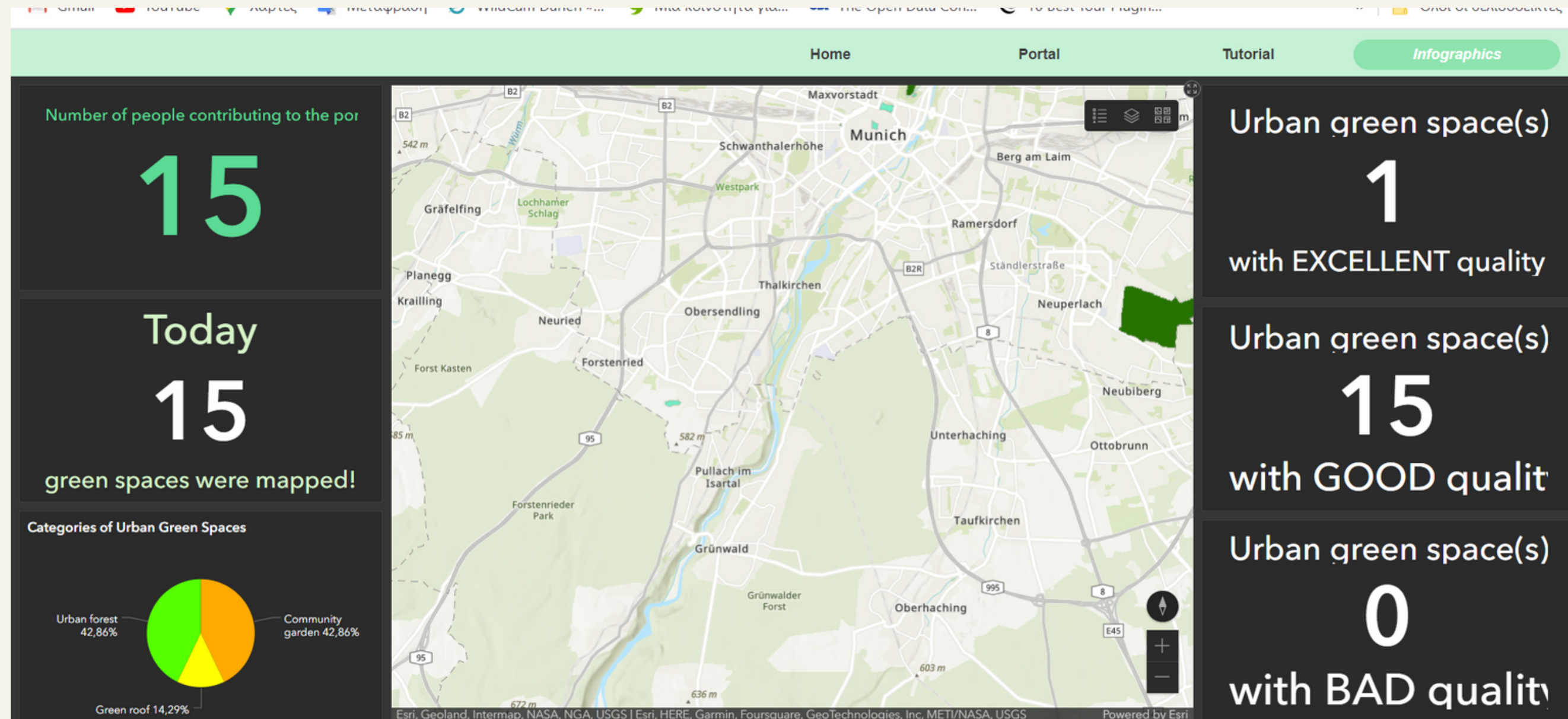
Excellent = no litter, a lot of biodiversity/species
Good = little to no litter
Bad = litter, not in a good condition
Terrible = a lot of litter, not being able to enjoy the space

☐ Terrible

← Back

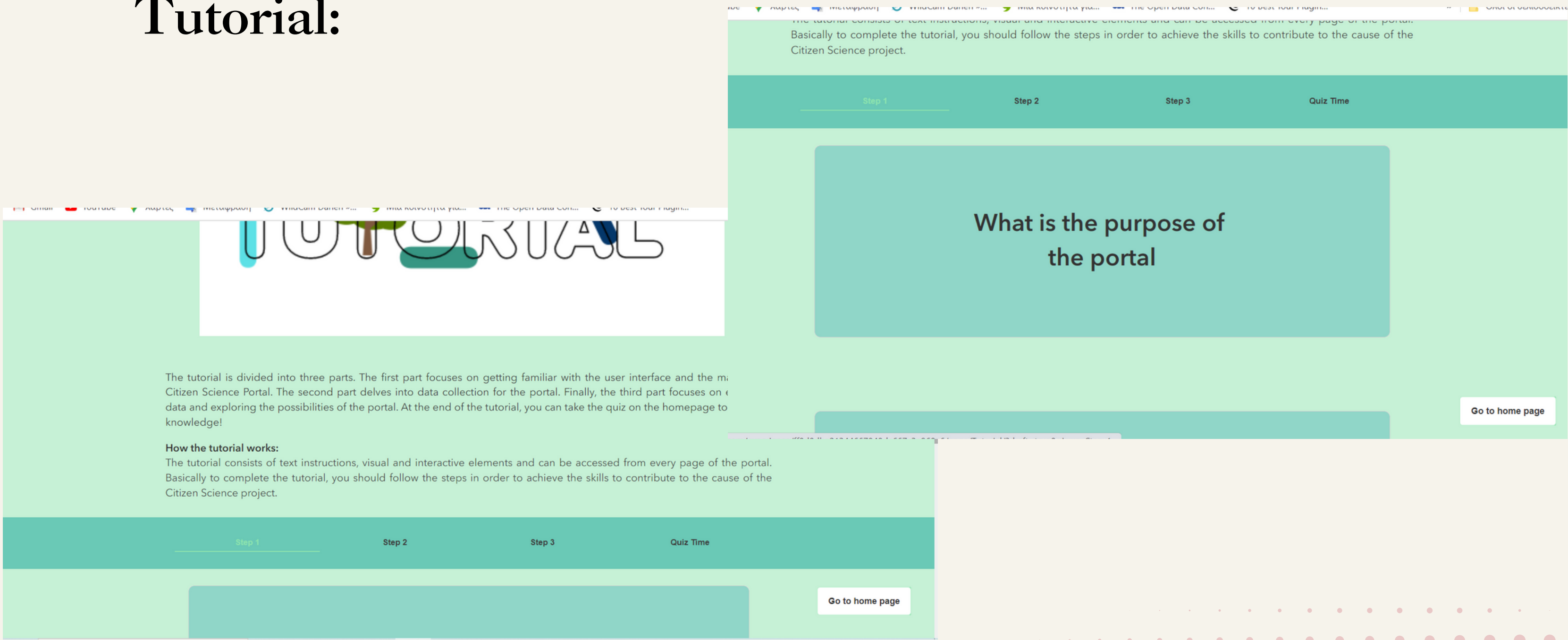
PROTOTYPE

Infographics:



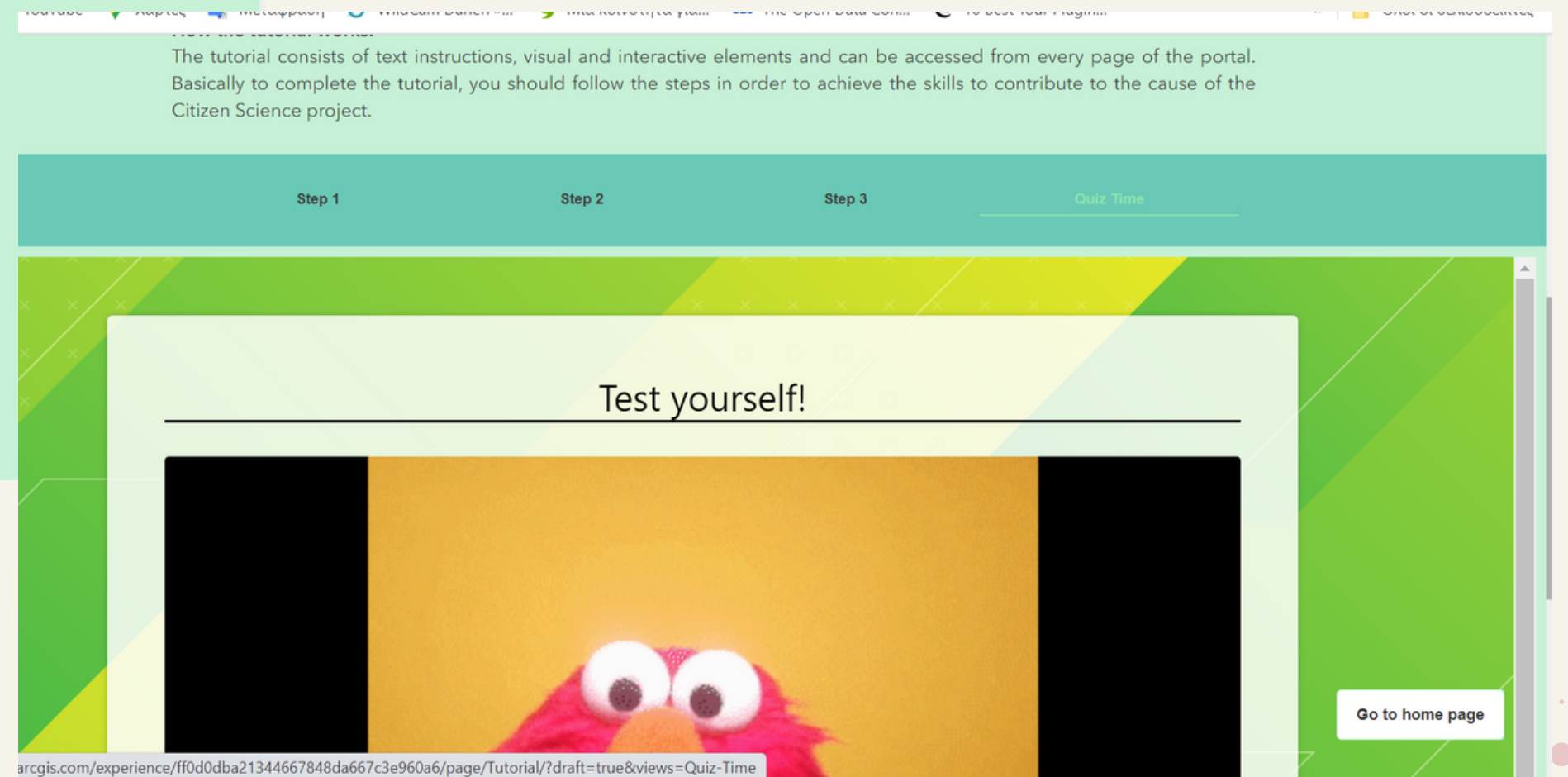
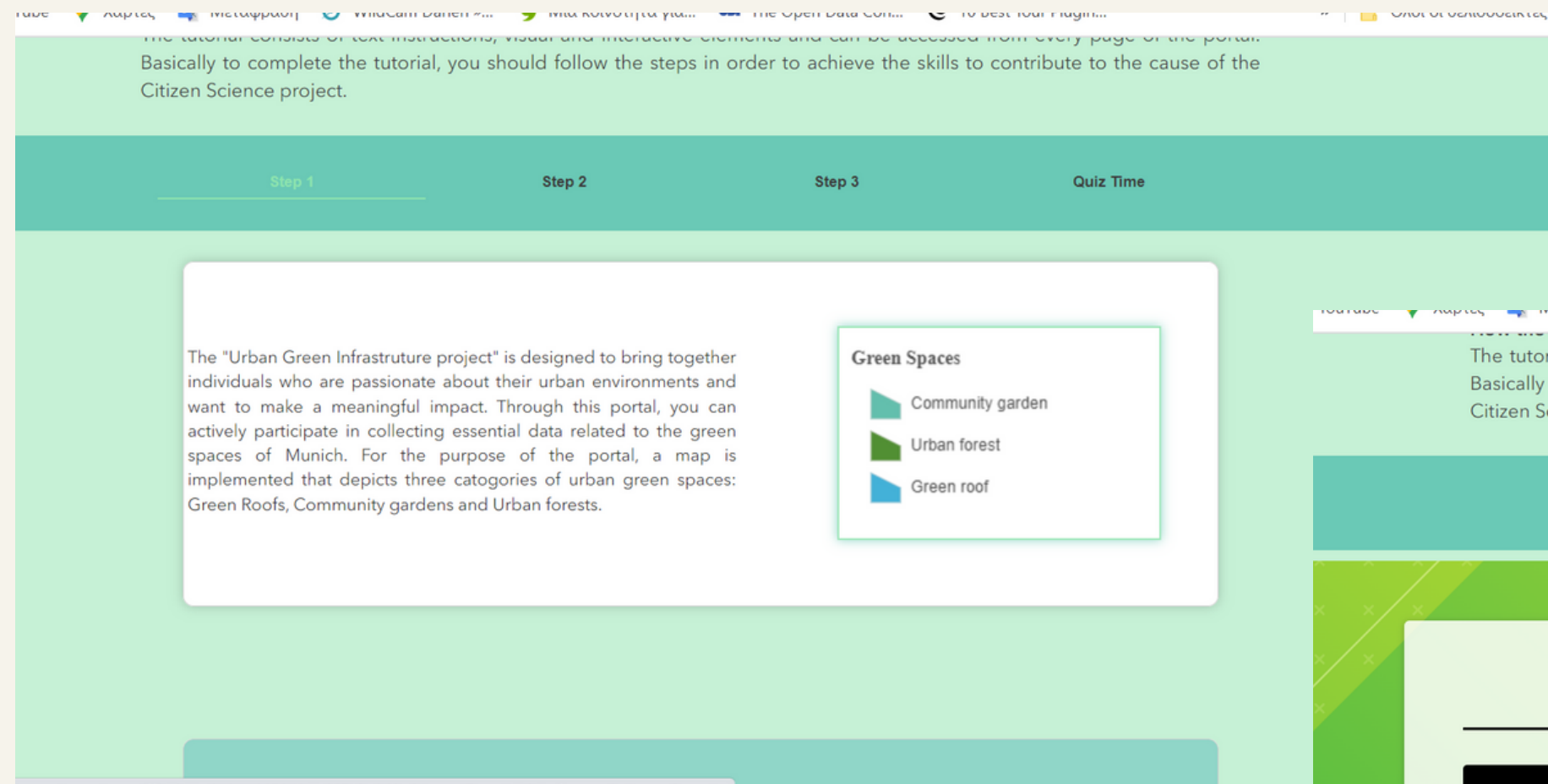
PROTOTYPE

Tutorial:

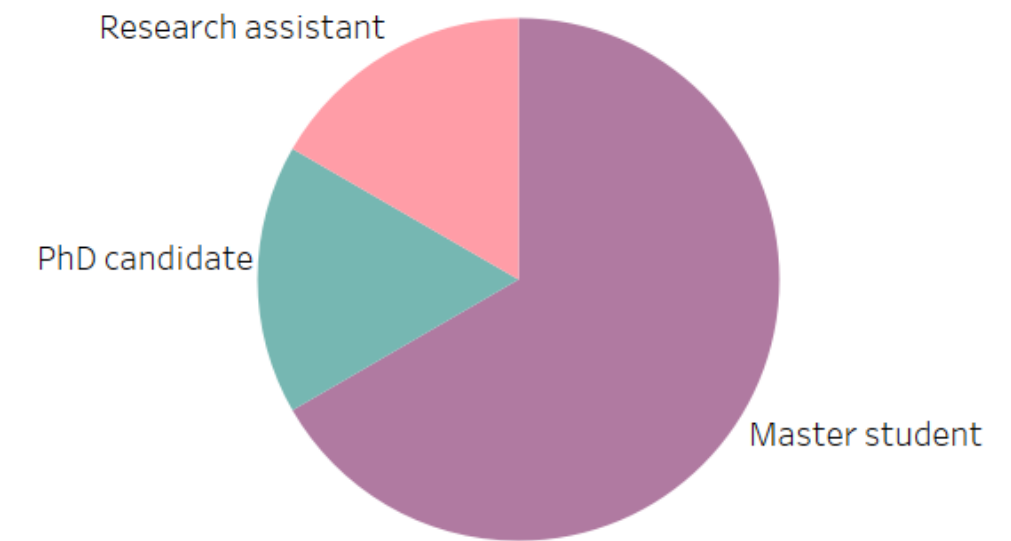
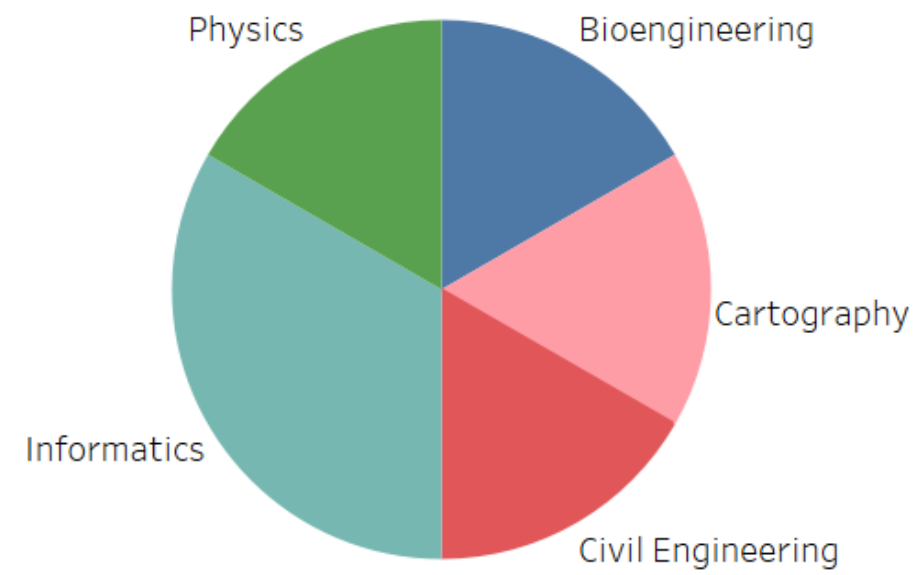
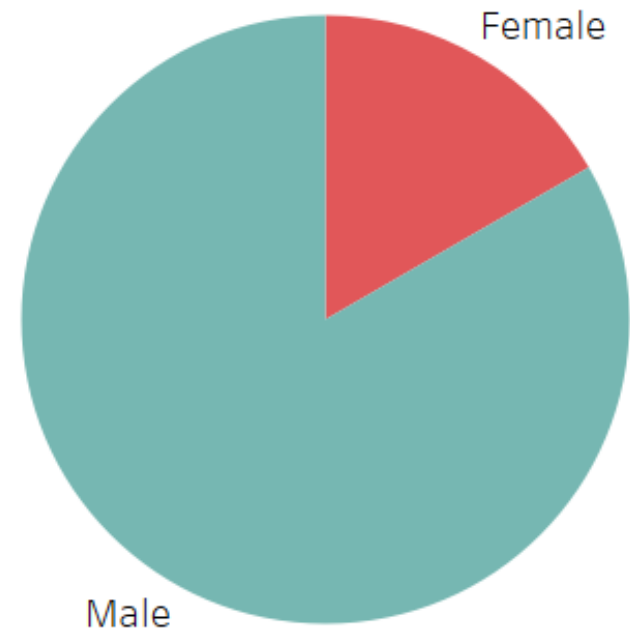


PROTOTYPE

Tutorial:

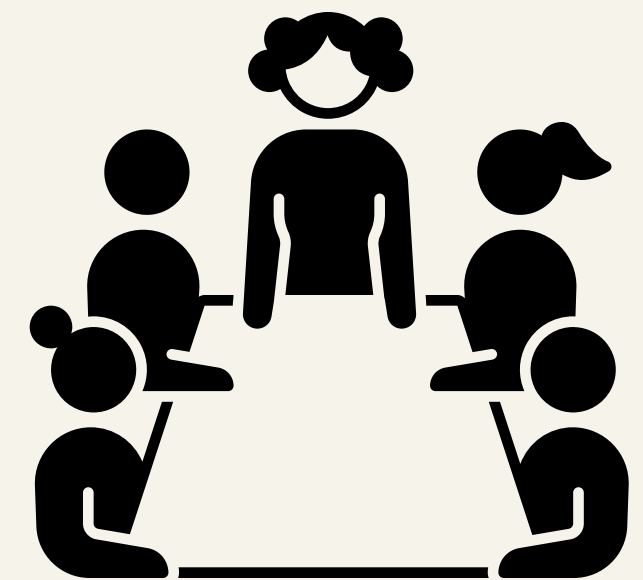


FOCUS GROUP



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.

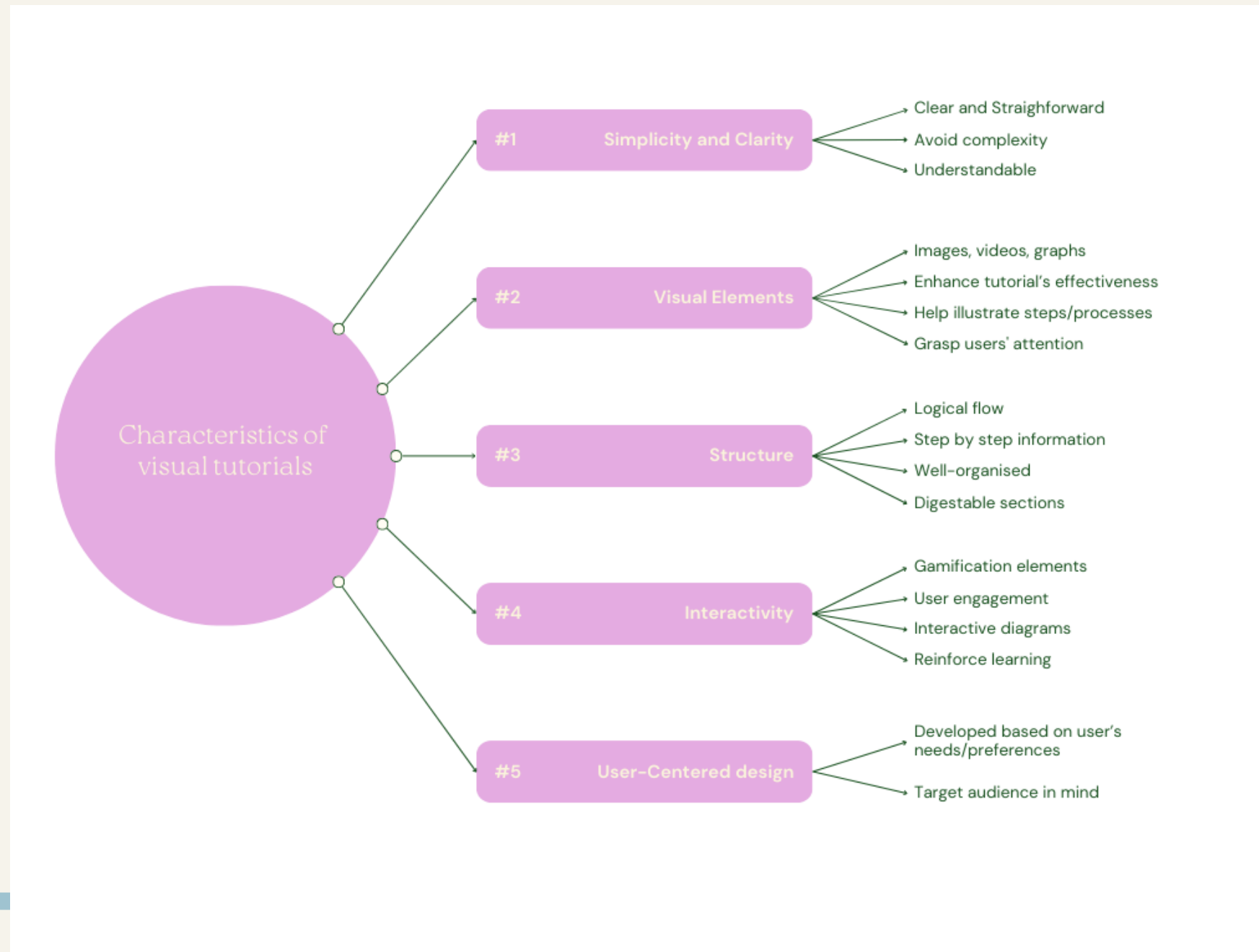
RESULTS

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	✓	✗

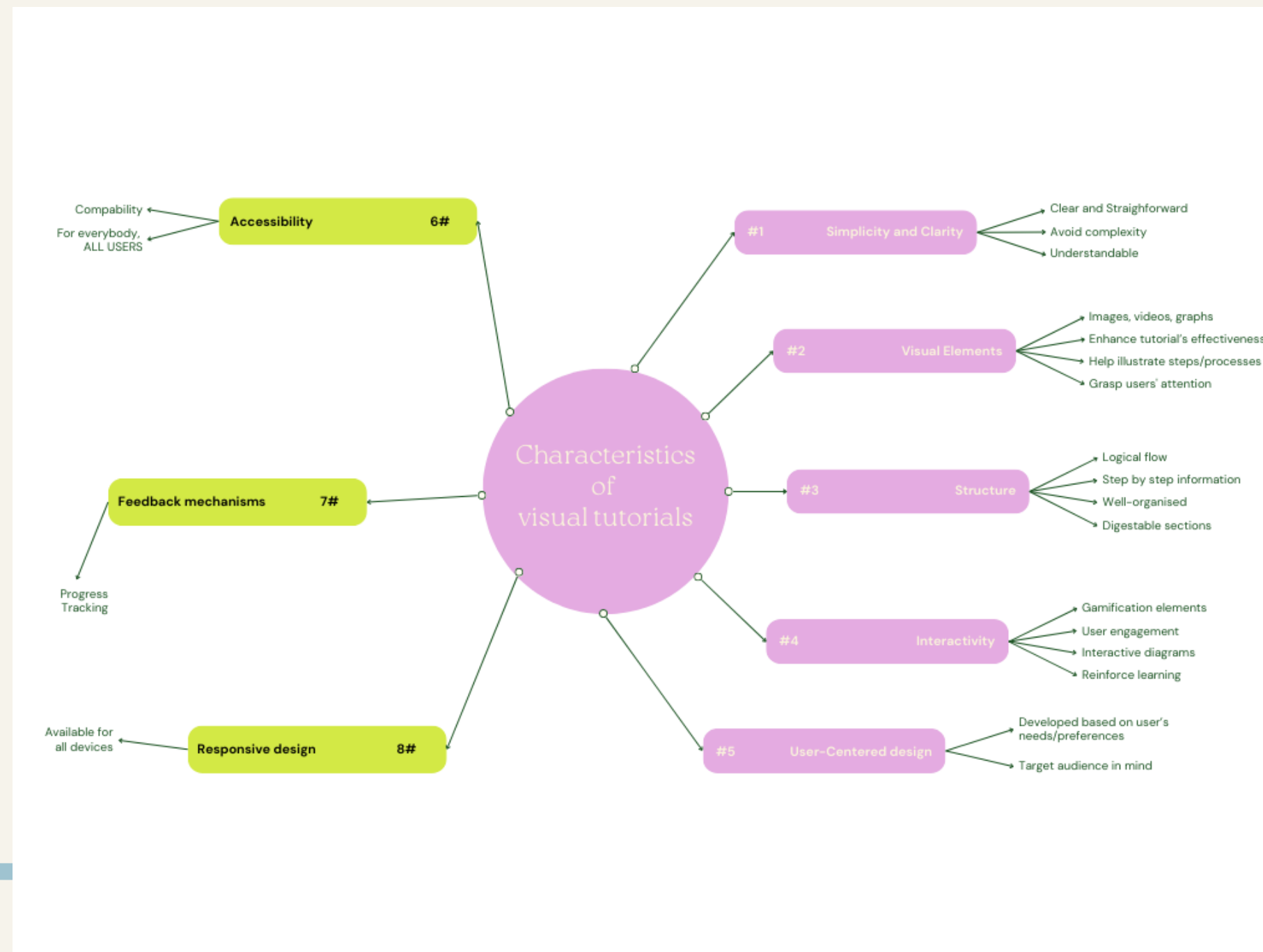
RESULTS

What are the characteristics of a visual tutorial?



RESULTS

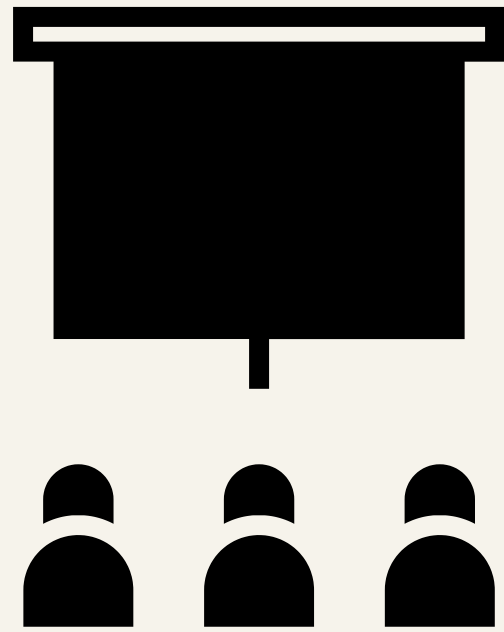
How did the user group perceive the tutorial?



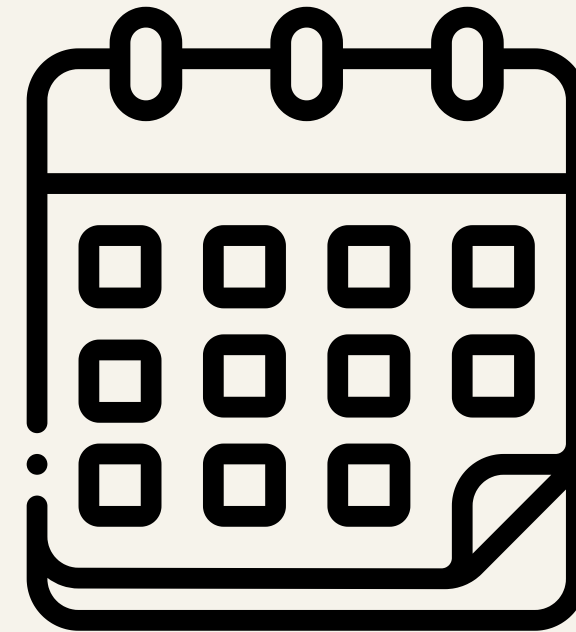
CONCLUSION

- 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**

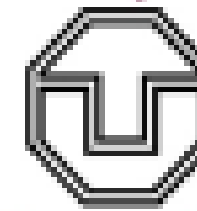
Apply the suggested improvements from the user study and focus group sessions to enhance the tutorial's effectiveness, usability, and engagement.

- **Explore UX design for tutorials**

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



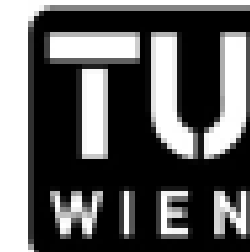
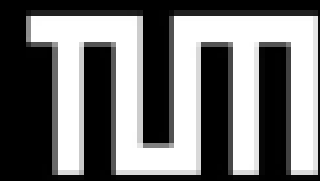
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Thank you for
your attention!

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