

A co-designed portal for intuitive navigation

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Abstract:

Citizen Science projects need public participation for their success. In this research, we evaluate a climate research portal called BAYSICS (Bavarian Synthesis Information Citizen Science Portal for Climate Research and Science Communication) which is funded by the Bavarian Ministry of Science and Art.

The purpose of the portal is to raise awareness, that climate change is not only a global but also a local phenomenon and communicate the involved processes behind climate change in a transparent matter to citizens. Furthermore, it is used as a teaching tool in cooperation with 55 Bavarian schools. The portal was opened to the public in May 2020 and has over 600 signed up users.

In an attempt to raise public involvement in our Citizen Science project, we decided to apply a co-designing approach and include the users in the process of designing this portal, having them suggest tools and desired features, which we then built.

The data collected in this portal falls into four categories (1) the phenological¹ development of plants that are sensitive to climate change, (2) trees and their comparative historical elevation in the Bavarian Alps, (3) pollen drift and allergenic species which are sensitive to atmospheric conditions, and (4) animal observations. These data are displayed in our portal via a customizable map and tables.

In this work, we tried to evaluate if a user-co-designed portal is intuitively useable by users that have previously not interacted with our portal and see if they can fulfil common tasks without being actively guided by experts.

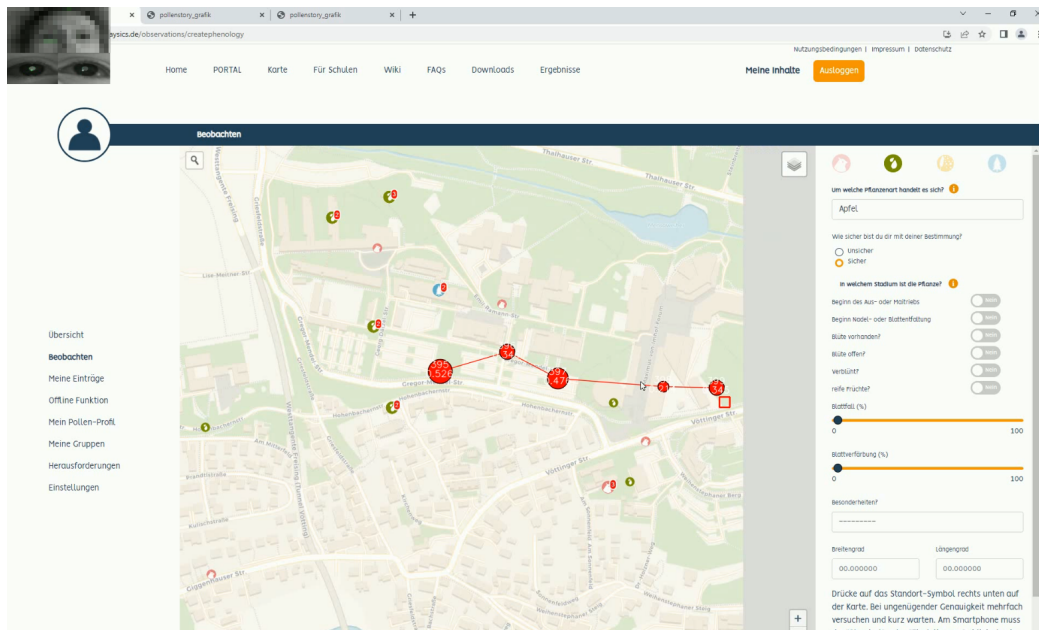


Figure 1. Screen recording during user test

We devised a user test with 15 master-level university students taking part in a phenological course who each had to fill out their previous experience with Citizen Science and Visual analytics. The user's previous experience turned out to be mostly homogeneous with only 2 people out of 15 having professed more than a 3 out of 6 on the question about familiarity with visual data analysis or Citizen Science portals: 1 being not at all, 6 being expert. We chose a 6-point scale instead of a 5-point as we wanted to record their tendencies towards either end.

The users had 11 tasks (table 1) to fulfil in which we recorded the success rate of the task and the time it took them to fulfil the tasks. Furthermore, we recorded the screen on how they navigated our portal, as well as had them fill out a 6-point Lickert scale questionnaire about their user experience, visualization, and contentedness with the system.

Tasks	Success rate [%]	Mean duration [sec]	Standard deviation [sec]
Create a new account and login	100	51	48.73
Create an entry of the category plant (forsythia) at a specific location	100	190	43.20
Check your entry on the portal map	86.7	65	40.66
Search for specific attributes of that entry	73.3	95	80.59
Report an entry as "wrong position"	53.3	153	98.05
Update the position of an entry	93.3	76	48.21
Delete an entry	100	18	5.80
Filter entries based on category and time	56.7	152	93.86
Filter for 2 tree species of a certain growth-height and elevation	83.3	181	72.60
Download background information	100	26	14.14
logout	100	8	4.44

Table 1. Evaluation of Tasks

Our results show that the design seems to be intuitive for the users as most were able to complete even complex tasks without any assistance aside from the instructions from the initial task. The exceptions were flagging an entry as incorrect as well as filtering by time. The questionnaire after completing the tasks shows a positive attitude of the users towards our portal with an average of 4.7/6 regarding navigation, 5.4 regarding visualization, and 4.7 of overall contentedness.

¹ the study of the biological life cycle e.g. date of flowering