

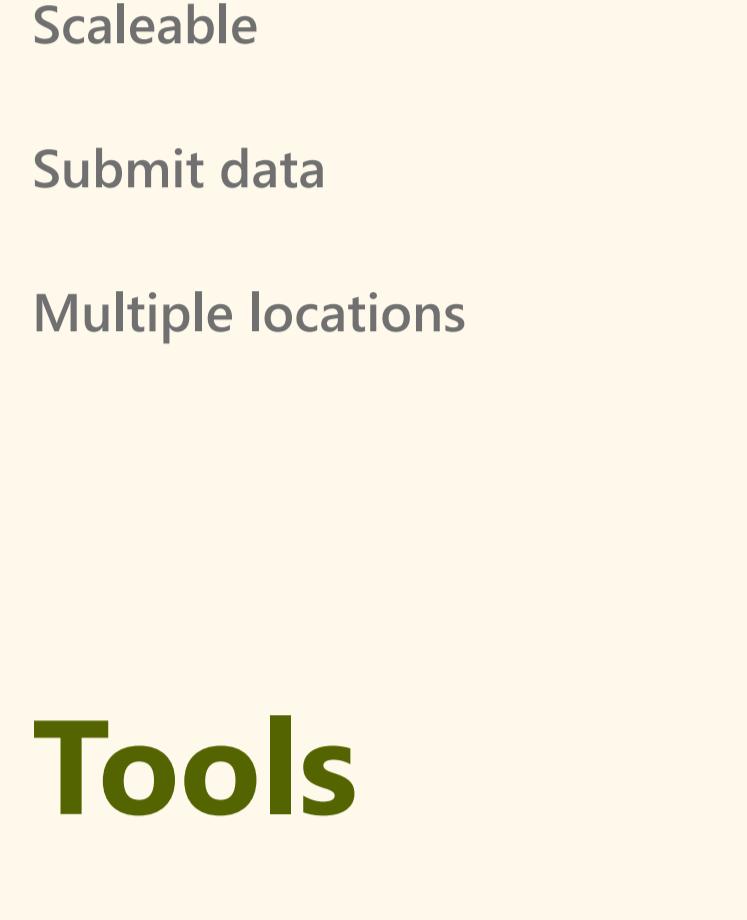
Goals

Educational
Spur interest
Digitalize learning
Fun

Challenges

Unstructured content
Low budget
Scalability

Style Guide



End User

Students
12-15 years

Requirements

Assignment based
3D environments
Interactable animals
Explorative navigation
Scalable
Submit data
Multiple locations

Tools

Adobe XD
MIRO
Optimal Workshop
Adobe Illustrator

Duration

1 year

Background

The Greenlandic institute of Natural Resources conducts research into Arctic ecosystems, monitors the living resources and the environment in Greenland and advises the Government of Greenland and other authorities on sustainable exploitation of living resources and safeguarding the environment and biodiversity.

They agreed to fund a digital learning platform in cooperation with the educational body of Greenland, the purpose being to increase knowledge of the local flora and fauna.

We were approached by them as they had seen our previous work on AR applications.

The project was to be developed over the course of one year, in cooperation with local teachers and students.

My role in this project was UX/UI Designer and Product Owner.

Overview

The main purpose of the application would be to develop an interest in this particular field among the students, with an internal review showing it to be severely lacking. The school also had a supply of ipads that were not being utilized and wanted to incorporate them into the curriculum.

The application would support two languages and be developed using the Unity engine.

The customer would provide the unformatted educational material for us to structure. In addition, we were asked to make the application inclusive for students with learning disabilities. It was also very important for the customer that the material was presented in a clear and comprehensible manner whilst being suitable for the target age group. The students should have fun and be encouraged to explore.

A user management system would potentially be implemented at a later stage depending on additional funds being made available.

Problem

The application would need to present a large amount of unformatted text heavy data, yet retain a sense of lightness and ease of use. Each assignment followed a different structure and this could be difficult to encompass into a universal layout.

The topic itself had a low appeal amongst the students and the assignments would need to be fun and diverse.

The students were of different ages and levels and the assignments would need to be crafted with this in mind.

The application would need to be scalable with the teachers hoping to add additional assignments in the future. This could potentially oversaturate the 3D environment.

Process

Beginning with EMPATHIZE, I began to research various educational tools and games for inspiration. I remembered a game I used to play while growing up called Backpacker, which I found particularly inspirational. I also looked at the Greenlandic landscape for visual inspiration for the fjords and surrounding areas. I turned to a few games for visual and technical inspiration. Lastly I sought inspiration for icon design.

I proceeded to create a mood board which can be viewed [here](#).

Next I arranged to interview the teachers and a representative from the Institute to get a better understanding of what aspects of the application they found most important and what they were hoping to see. I also wanted to learn about their intended teaching methods once the application was delivered. I also wanted to get their insights on the students and learn if any special considerations needed to be made.

The first takeaway was that the teachers intended for the student to be able to solve the assignments using only the information available in the application. This meant that the assignment layout must be short and precise and contain all the necessary instructions. It also suggested that an elaborate help section would need to be added.

The second takeaway was that the customer prefers a minimalistic interface with cool colors to resonate with the climate of Greenland. They also felt that it would make the nature elements stand out more. For this reason I decided to go with a white color scheme with two or three sparsely used secondary colors. The water would provide the necessary tone.

The third takeaway was that some students had reading impairments such as dyslexia. The decision was therefore made to go with a sans serif font with increased line spacing and limited text width, and also add an audio option for all the text segments.

The fourth takeaway came from the institute spokesperson who felt that their priority was the different areas were made to look as close to reality as possible. I set up a Google Drive where the teachers were asked to take photographs of the surrounding areas of Nuuk and nearby fjords, and several spreadsheets were created where the customer could provide a detailed account of animals, locations, behaviours and other relevant information needed to create an authentic 3D landscape.

These documents can be viewed on the following links:

[Environment](#)

[Species](#)

Additionally, we set up goals that were aligned with their expectations for the application.

Next I wanted to focus on the students themselves, and felt it was crucial to create a few personas to get a richer understanding of the end user. I interviewed a group of children to get their perspective on what made the topic less interesting and how it could be turned into a fun experience. I also wanted to get an insight into their preferred method of studying, if there was something in particular that they struggled with, what applications they regularly used and learn about their hobbies and what they found interesting about nature. This would help me when designing the assignments to create an experience that felt familiar and interesting.

The first takeaway was that a combination of outdoor activities and a light gamification of assignments would cater to most students. The students would not get to choose the assignments as this was reserved for the teacher, but there would at least be something that appeals to everyone.

The second takeaway was that very few users were accustomed to using the iPad, instead relying on their smartphones for daily interactions. They also had limited experience with AR. My recommendation was that we choose a style of navigation that was similar to the applications frequently used by the students, such as TikTok and YouTube. As a result, swiping is primarily used throughout the application.

The third takeaway was that some students enjoy being challenged and would not find the more simplistic assignments enjoyable. My recommendation was that we introduce a difficulty level for the assignments but the customer did not approve of this at this time due to budget and time constraints.

The fourth takeaway was that the students have a very short attention span and are accustomed to a rapid flow of information. The decision was therefore made that the assignments should have short information sequences and not be text intensive, instead having a good mix of imagery and video material. They should also not take longer than 20 minutes to complete.

The personas based on the student interviews can be viewed on the [MIRO board](#).

With scope and requirements defined, I began to review the provided material and created 9 unique assignment types to tailor to the different personas.

The customer was heavily involved in the ongoing process and wanted weekly updates. They co-wrote the assignments with us, where they provided the material and we provided a suitable layout. On a weekly basis, we sent them a new build that they were able to test and provide feedback on.

Once the information structure was in place, I began to IDEATE by sketching a few suggestions for a layout for the overall navigation and the intended layout for the assignments. I also sketched a few concept images to showcase the intended look and feel.

The sketches can be viewed [here](#).

A meeting followed where the customer approved of the initial concept. The next step would be to create a low-fidelity prototype of how the application may end up looking. I focused on the different assignments and navigation and also created suggestions for menu, tutorial, teacher mode, sign in and assignment submission. The usability considerations were woven into the design. I added interactions which are normally not done on a prototype of this fidelity, but testing in AR works slightly differently in my experience with Adobe XD and Figma lacking support for this. Instead, we use the prototype to test navigation, recognition and understanding while simultaneously creating a minimal viable build to test the interaction.

I strive to follow the **human centered design principle** when designing. This meant involving the end user early on and ensuring they remain a part throughout the project lifecycle. The user and customer were very accessible which made this process very smooth. I was able to test continuously and revise which made it possible to slowly add upon the build whilst still being in the design process.

The tech would have to be implemented anyway and with small additions in every iteration there was little chance of wasting development time on unwanted features.

My interpretation of the design principle resulted in several design choices being made, to name a few:

- Associating certain shapes with certain actions (here I wanted to go further)
- Tailoring the UI to suit the 3D landscape for maximum readability
- Adding global navigation due to the many available locations
- Ensuring navigation stays consistent throughout the application
- Hints and tutorial to ensure the user can work independently
- Splitting the information in the assignment window to prevent long rows of text
- Left-aligning all text for increased readability
- Adding visual hierarchy to draw focus and increase readability
- Increased line spacing to compensate for the same text color throughout the application

Once the design was shared, the customer was given 2 weeks time to comment.

The prototype in its entirety can be viewed [here](#).

Next I wanted to TEST the intended icons for the assignments and layout. I first created a dot-vote to decide on the various icons for the assignments that I had found during the research phase. Once a decision was made, I used Adobe Illustrator to create a uniform style of icons.

The result of the vote can be seen [here](#).

I also created the overall UI and the season icons. At this point, we had a working high-fidelity build on the iPad that could be tested. I wanted to prioritize testing of navigation, icon recognition, user preferences and misconceptions. I set up a click-test with 41 students spread across the different age group.

The results of the click test can be viewed [here](#).

Additionally, I arranged for a qualitative talk aloud test with a group of 5 students spread across both genders. I was hoping to pick up on any thoughts and insights that were not identified during the click test.

The results of the talk aloud session can be viewed [here](#).

The takeaway from both tests was that the students found the overall concept entertaining and visually appealing, but several revisions would need to be made. The full extent of these changes are listed in the above linked documents. The major changes to be made were the following:

- Replace icons used for seasons.
- Revise UI icons slightly as they were too similar.
- Adjustments to navigation to areas frequently clicked/swiped.

- Changes to text size and icon shape to increase diversity.
- Addition of global assignment window to help struggling students and act as a teacher aid.

Following extensive revisions, the application was further tested using qualitative interviews with 5 students where they were tasked with completing various assignments.

I wrote a script which can be reviewed [here](#).

I cannot share the video recordings because of GDPR, but the interview results can be seen on the [MIRO board](#).

The last round of testing led to some slight revisions, but overall the product was ready to launch.

Solution

The issue with large unstructured data was solved by a rigorous process of applying a common structure for each assignment along with a scalable layout. I had additional suggestions such as dropdowns, lists and dynamic window size but this was rejected due to the time it would take to implement.

Concerning the low appeal of the topic, the feedback we got from the interviews showed that the students actually had a fun time browsing through the application. Two interview sessions did not give enough data to support a trend so my recommendation to the customer was that we hold a third session once the application has been in use for some time, alternatively a survey to get more quantitative data.

To address the age and level gap between the students, the teachers felt it was sufficient to offer additional support in class for the students that require it. The tutorial and hint feature also tested well. My recommendation was that a difficulty system be created for the assignments so that the content would change slightly depending on the chosen setting.

Finally, to support the addition of more assignments in the future, we added chapters to reduce the amount of visible assignments in each location. We also added the ability to go to assignments via the overview page. This would not however be the first hand choice since the teachers wanted the students to primarily explore the environments.

Future

The educational body has applied for additional funds to continue to develop the application. A second design sprint is likely to begin in 2023.

The application will be updated with new assignments and features as they are developed.

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