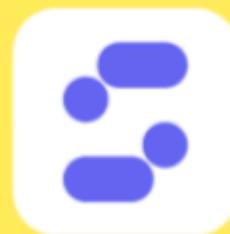


Spuren im Netz

WS 2023/2024



Project team:

Julian Straif | Liljana Stefanelli | Caroline Kopp |
Vi Anh Nguyen | Saga Lannerhjelm

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1. Introduction

1.1. Identified Problem

Nowadays, children come into contact with digital media earlier and more frequently. It is therefore crucial to teach children safety concepts for the internet and social media as early as elementary school. According to a study by the MPFS (Medienpädagogischer Forschungsverbund Südwest), 58% of children in the fourth grade already have their own smartphone. The problem here is that children can usually surf the internet unsupervised without their parents noticing. Prior to this project, we had the opportunity to talk to a student from Weingarten University of Education about the results of last semester's research. She confirmed our impression that this is an important topic.

Another problem is that teachers at elementary school are usually unable to teach digital skills because they simply lack the knowledge and possible applications that they can use in the classroom. It was therefore important for us to build an application that can also be used in the classroom.

We therefore decided to develop an application that shows the children potential risks and dangers on the Internet and teaches them digital literacy.

Link to study: <https://www.mpfs.de/studien/kim-studie/2022/>

1.2. Purpose of the Project

In cooperation with School 4.0 and a primary school teacher, we set out to build an exciting and interactive application by the end of the semester that can be used in a classroom setting. The project aims to contribute to promoting media literacy in primary schools across Germany. This freely available application is intended to motivate teachers from other schools to integrate it into their teaching and impart digital skills to children.

The main goal of the project was to develop an application that not only entertains children but also provides a learning experience. Through the playful and interactive design of the application, we aim to stimulate students' interest in media literacy and digital topics. At the same time, the application is intended to provide teachers with a tool to make their lessons more dynamic and contemporary while supporting the impartation of digital competencies.

Furthermore, the project also aims to assist teachers in becoming familiar with the opportunities and challenges of the digital world and integrating them into their teaching. By developing an easily accessible and customizable application, we seek to encourage teachers to use digital tools as part of their pedagogical approach and actively promote media literacy among students.

Overall, the goal of the project is to make a contribution to promoting media literacy in primary schools by developing an innovative and practice-oriented application. We aim to

support teachers and students in utilizing the opportunities of the digital world and navigating it safely and competently.

1.3. Team

The project team consisted of five students, with four specializing in Mobile Media and one focusing on App Design & Development. This diverse composition allowed us to leverage a range of skills and perspectives throughout the project. Given the international nature of our team, communication was conducted primarily in English to accommodate the involvement of international students.

Each team member brought unique expertise and strengths that were utilized to address various aspects of the project. Collaboration occurred within both larger teams and smaller, specialized groups, enabling us to make targeted contributions. In larger team settings, we clarified general questions about the project, while in smaller groups, we delved into detailed discussions about design and prototyping. Our workflow was characterized by regular weekly meetings to drive the progress of the project. Additionally, we arranged to meet weekly for co-working sessions. Communication channels included platforms such as Figma, Trello, and WhatsApp, enabling an efficient exchange of ideas and updates between team members. In addition to these meetings, we maintained contact with the teacher we were collaborating with, seeking feedback on various pedagogical issues.

Project Team:

Liljana Stefanelli

Caroline Kopp

Vi Anh Nguyen

Saga Lannerhjelm

Julian Straif

Stakeholders:

Benedikt Gack - Schule 4.0

Lennart Gastler - Schule 4.0

Johannes Lux - Hermann-Butzer-Schule

Supervisors HdM:

Prof. Dr. Sabiha Ghellal - Hochschule der Medien

1.4. Project Milestones & Development process

At the project's beginning, we analyzed the idea and deliberated on how to proceed with the development of the application. The application development process appears to be well-suited for division into four phases.

Phase 1 - Project Idea: (Deadline: Early December)

First and foremost, our focus was on crafting an idea suitable for our target demographic and feasible for implementation. Initially, we considered developing a decision tree that would

guide children through a narrative to impart digital literacy skills. Each decision would lead to different outcomes. However, we soon realized that we didn't want to expose children to the real consequences of "incorrect" choices. Therefore, we opted to create a mobile phone simulator where children would respond to questions instead. At the outset of the application and during the introduction to our modules, we devised a storyline about Pixel the fox to provide children with context for their activities.

Through constant feedback from stakeholder meetings and our own research findings, we were able to successfully complete this milestone on time.

Phase 2 - Interim conclusion:

After developing our idea, we had to consider whether to build not only a design prototype, which would be impractical for user testing, but also to create a functional prototype in the form of a website. The decision was not easy, as we were aware that both options would significantly increase the workload for our team.

However, we ultimately decided to develop both.

Phase 3 - Project Prototype: (Deadline: user test 18th January)

In mid-December, we began integrating our design into the functional prototype. Initially, we encountered difficulties with our chosen framework, next.js, which led us to uninstall it. Subsequently, we opted to solely use React. In order for our entire frontend to be published and especially for elementary school students to be able to use the application during user testing, we needed to find a way to publish our project without programming the backend ourselves. After several hours of research, we managed to publish the website using Firebase. In order to meet the deadline of January 18th, we had to put in a lot of work and engage in constructive discussions during our regular meetings to integrate as much of the design into the prototype as possible. Ultimately, we managed to program both units in time for the user test. However, we were aware that after this test, we would need to continue working on it, as we anticipated receiving a lot of feedback.

Phase 4 - Final product: (Deadline: 16th February 2024)

After the Media Night, we split up again to process the feedback from the last feedback round. While we were writing the documentation, we tidied up the design and functional prototype and made the necessary changes. We also made the images more clickable and enlarged the text. In the end, we were not able to implement 100% of the design, we simply didn't have the time. Furthermore, the project will now be made "open source" and available to other teachers.

2. The Project

2.1. Analysis

In order to come up with an idea, a crucial initial step involves gaining a deep understanding of our users. It was evident to us from the beginning that our product will be used by, or at least tested by, third graders from an elementary school in Ludwigsburg. With this information provided, we started defining our user personas. Our objective in this phase was to develop three distinct user profiles for third graders, each reflecting diverse personalities, challenges, family dynamics, and financial backgrounds. We believe that these elements significantly influence decision-making processes and shape their interactions with social media.

Steffen



AGE 8
GRADE 3rd Grade
LOCATION Reutlingen
MEDIA TIME High

Personality
Introvert, Gamer, Distracted

Bio
Steffen loves to show others his skills, and he is especially good at video games and always wants to get the high score. He has a hard time at school and doesn't like to do his homework, he prefers to spend his time online. His mother has to work long hours and doesn't have much time to spend with him.

Expectations

- Wants to show what he built in Minecraft
- See what his favorite youtubers post
- Need a lot of help with his homework

Challenges

- Might fall for an impersonator of his favorite youtubers
- Spends too much time online
- Reveals too much personal information
- Learning difficulties

Interests

- Watch Minecraft Streams on YouTube
- Play Video Games

Parental Background
Upper Class, Parents are divorced

Media Consumption
PC/Console, Instagram, YouTube

Scenarios Steffen (posting too much information)

Steffen:
Today, Steffen and his mother are going to a shopping mall after school. Steffen always uses this time to look at new Minecraft Lego toys, which he then wants for Christmas. When he walks past the stores, he always takes a photo of the new items straight away. Even if they are sometimes blurred and a little crooked, he posts the pictures on the Internet. He can often be seen in the mirror, but that doesn't bother him. His mother has to work long hours and doesn't know about his social media usage. His father does not live with him and Steffen comes to visit him only on the weekends, so he is also not aware. In the afternoon, he sends lots of pictures of his castle and his PC to his friends. He has also met some of them online. One of them is even a big Minecraft Youtuber that he likes, however he hasn't considered at all that it might be an impersonator. He hasn't told his parents about it either. One last Minecraft video before going to bed and then the weekend begins! He is going on holiday this weekend and has told this "big Youtuber" all about their plans.

Sophia



AGE 8
GRADE 3rd grade
LOCATION Esslingen
MEDIA TIME Low

Personality
Extrovert Outgoing Friendly

Bio
Sophia is a 3rd grade student living in Esslingen, Germany with her parents. She likes going to school because she loves meeting her friends and teachers. In her free time, Sophia likes to spend time outside, like going cycling, walking and playing with the family dog or visiting her friends. She has little experiences with technology or social media as her parents strictly restrict it at home.

Expectations

- To play outside in her free time
- To hang out with friends and other family members
- To show everyone her dog

Challenges

- Finds social media a bit scary and unknown
- Many of her friends spend a lot of time online
- Is very gullible

Interests

- Cycling and to be outside
- Playing with her dog

Parental Background
Middle Class Very Involved

Media Consumption
YouTube

Scenarios Sophia (peer pressured, messaging with strangers)

Sophia:
Her parents have always emphasized that playing in the real world is much better than staring on a screen and Sophia happily agrees. But as she has gotten older more and more of her friends she used to play with on the weekend thinks it's boring to play outside. Instead they have started to hang out in online environments from their computers, and some of them even have their own smartphone. Sophia has talked to her parents about it and they strictly forbid her to use technology at home. They say that it's for her own safety since there can exist very strange people online. However, what her parents don't know is that she sometimes goes online at her best friend's house. Her best friend told her that they couldn't be friends anymore if she didn't make an Instagram account. So she also created an account and now feels better and that her friendship has strengthened. Sophia is now afraid of being contacted by strangers. That has already happened to her friend a lot of times. Neither of them know how to deal with it and their parents must not find out about it. That would be even worse.

Lukas



AGE 9
GRADE 3rd grade
LOCATION Stuttgart
MEDIA TIME Medium

Personality
Extrovert Creative Social

Bio
Lukas is a bright boy who spends a lot of time with his friends on the soccer field. He likes school because he has many friends there and he loves to make fun of others. With his parents, Lukas likes to build things with Lego. They have already built many things, such as Harry Potter's castle. In the evening, Lukas likes to watch videos on YouTube and TikTok and sends them via WhatsApp to the group from his soccer clique.

Expectations

- Become a pro Lego-builder
- To share his Lego projects with as many people as possible
- Sending Reels to his friends

Challenges

- Don't know how to post content on social media in a good way
- Is easily influenced by advertisement and opinions by others online

Interests

- Playing football with his friends
- Building with LEGO
- Watching funny Reels on YouTube and TikTok

Parental Background
Middle Class Average Involvement

Media Consumption
YouTube Mobile App WhatsApp

Scenarios Lukas (He is the bully)

Lukas:
One week ago, Lukas was with his friends on the soccer field playing football. They were having fun and Lukas was filming videos like he always does. His friends and him like to keep videos to look back on their memories. Lukas noticed someone from the opponent team falling down and crying from the pain. He thought this was funny and took a video of him. After the soccer game, he showed his friends and they all thought it was very funny, and convinced him to post it to social media. After Lukas posted it, all of his friends liked the video and left a lot of comments. They also shared it, so many people at school saw the video and was making fun of the other boy. This was not what Lukas wanted, he did not want so many people to make fun of the other boy, but the video already had so many likes and comments that Lukas did not want to delete it. He also did not want to get into conflict with his friends, so he tried to reply to some of their comments, trying to be funny and going along with the joke. The boy has skipped school since the incident and nobody have heard anything from him.

Next step for us was doing thorough research on our potential user. We looked into existing apps on the market that teach children in this age range about various topics, as well as learning how to design efficiently for kids this age. By doing this, we were able to brainstorm

some design decisions based on our research:

Design Decisions based on our research

Considerations for 8-10-Year-Olds

1. Like to be the experts → dont read instructions, they just jump in and start doing → **Use post-failure messaging to teach instead of up-front directions**
2. Can take into account multiple aspects of a problem in order to solve it → They like more complicated, challenging, interfaces that require them to think → **Keep the level of complexity relatively high, but not impossible to figure out**
3. Can tell the difference between ads and actual content? → Create a visual separation between ads and content
4. Are starting to realize that adults dont have all the answers → **Invite them to be silly. Provide opportunities for nuances instead of black-and-white rules.**
5. Are confident enough with their interpersonal skills to be less frightened of strangers → They're more open to chatting online with people they know and those they dont know → **Be very carfeul about how you introduce social elements. Even if they seem harmless, kids will find a way around them(strangers/predators).**
6. Have figured out that if they fib about themselves online, chances are no one will know → **Put less emphasis on identiy and more on self-expression and accomplishment. If you need age-gating, use parental opt-in to get demographic info.**
7. Make the content engaging. Children in the ages from 7-10 have a lot on energy, are very curious and thereby enjoy engaging content.
8. Consistent feedback and rewards are important to keep them engaged with the content. (e.g. audio feedback)
9. There are numerous reasons why using dark mode display in the classroom and during homework

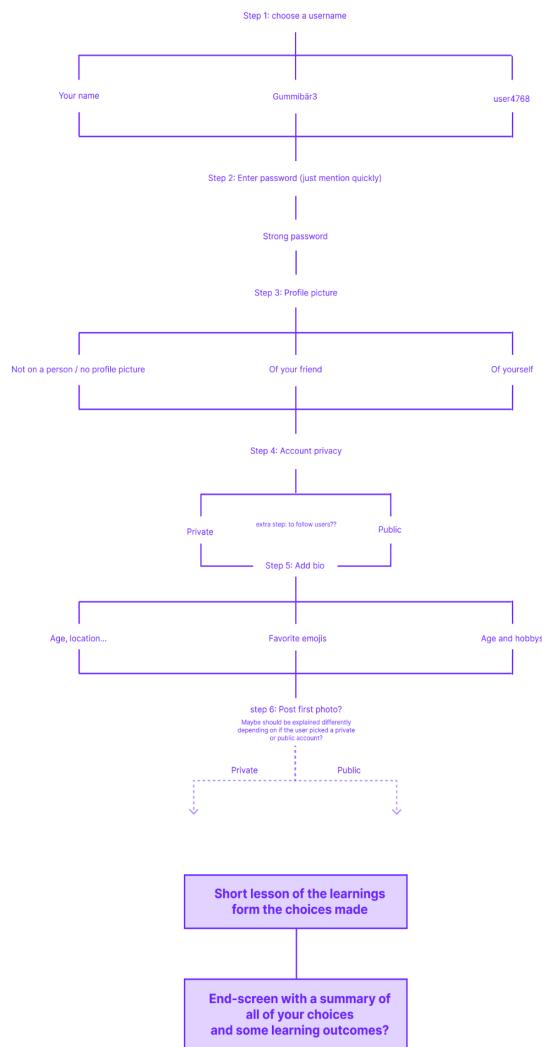
2.2. Ideation

With the research part behind us, we started to brainstorm ideas. This was probably the most time-consuming process of the project, we came up with many ideas, and also discarded many.

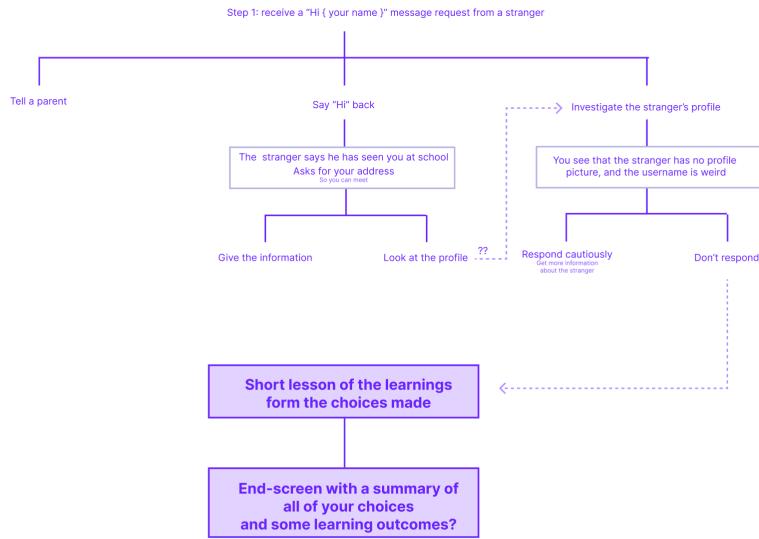
We didn't want to just create a better version of the previous project from the PH Weingarten students, but rather come up with our own ideas tailored to our strengths, with a focus on creating an engaging and enjoyable experience for the children involved.

Our original idea was to create an app inspired by the movie "Bandersnatch", an interactive film released in 2018. The film has a unique concept which allows viewers to make decisions at key points in the narrative, influencing the direction of the story and leading to multiple possible endings. We aimed to follow the same concept, where kids will have different experiences depending on their choices in important moments. However, upon delving into various decision trees and plotlines, we realized that finding suitable outcomes for scenarios involving online bullying and interactions with strangers proved challenging. So we decided to explore other ideas. Here is a glimpse into our initial idea and the associated decision trees. We observed a repetitiveness in the branches, resulting in consistently similar outcomes which deviates from our original concept.

Unit 1



Unit 2



After some more brainstorming, as well as discussion within the group to find out all members' interests and strengths, we opted to create a **web application**. To optimize efficiency, we divided the team into two groups—designers and developers. However, all members actively participated in the ideation process and decision-making to ensure a collaborative approach. As we already made some design decisions based on our research of our audience, we quickly agreed on some key aspects for our app:

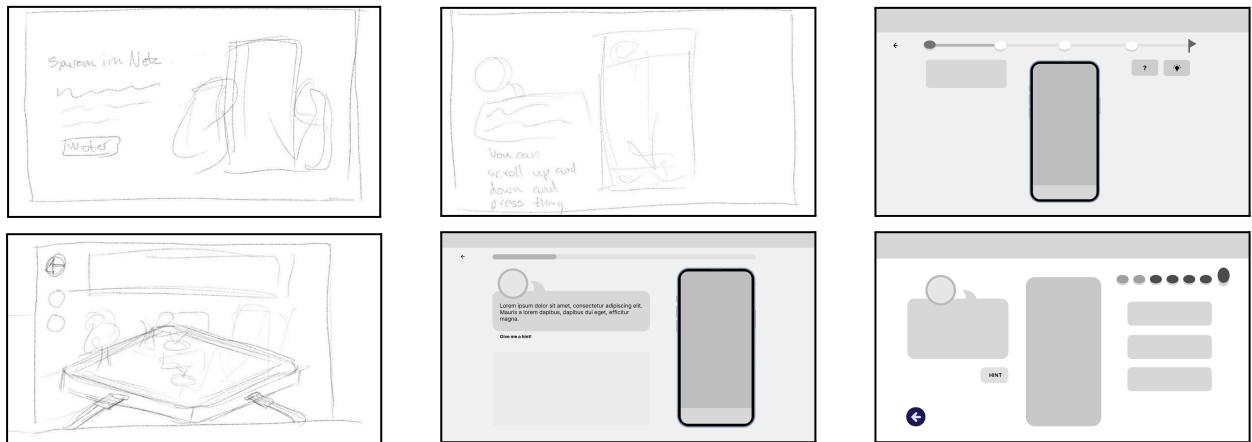
1. We need to have a mascot
2. We aim to tackle two scenarios: Online Bullying and Messaging with Strangers
3. To have a colorful and visual design
4. For the scope of this project, the app does not need to be responsive, as it will only be used on a specific tablet

2.3. Project Design

The project design was created collaboratively in Figma, with some incorporation of other programs such as procreate and Adobe Illustrator for sketching and the creation of our illustrations and other design elements. It resulted in a high-fidelity prototype as close as possible to how we imagined the end product to look like. The process of creating the design of our application was divided into three parts, sketching, basic wireframes, and finally high-fidelity interactive prototype.

2.3.1 Sketching and wireframes

The core concept of our idea was sketched out using both hand drawn sketches and rough outlines with gray boxes. This allowed us to quickly make changes and see what would work. We quickly decided on a layout consisting of a dialogue box, phone simulator and multiple choice questions, since we thought this would be an easy way for the children to receive input and learn from the feedback.



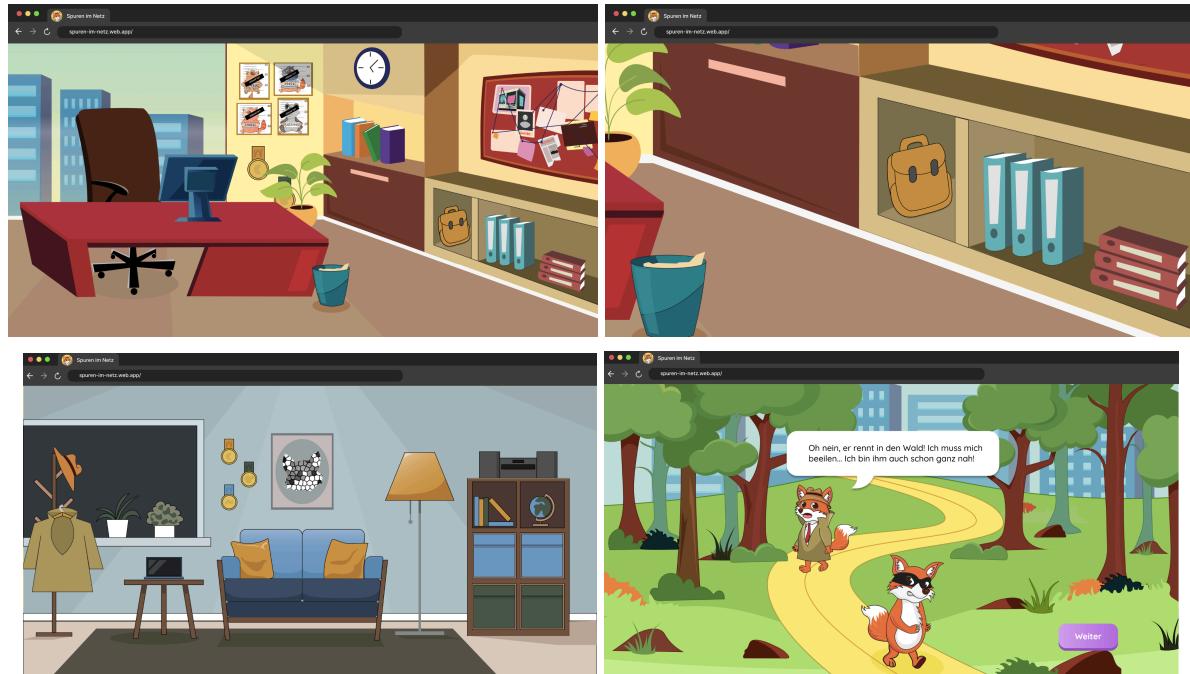
2.3.2 Design elements

As mentioned in phase 1 of our project milestones we created a storyline with a fox called Pixel. Thereby, we ultimately had to create a face for this fox as well as additional equipment and items to provide the children with a good and engaging story they could get motivated by.

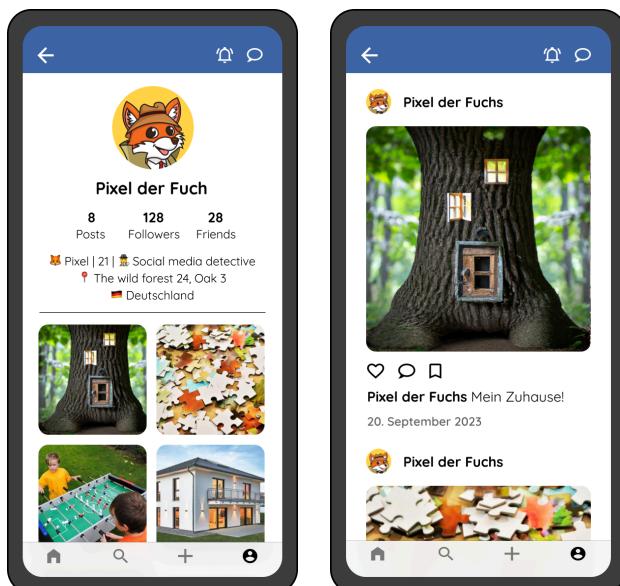
Below, you can see the design of Pixel. He acts as a guide and mentor for the children throughout the application. Next to him is the antagonist, the bad fox, which gets introduced in unit 2. Further below, is the design of our rewards system consisting of detective equipment the children can receive at the end of the units by opening a treasure box, and a backpack where they can store them.



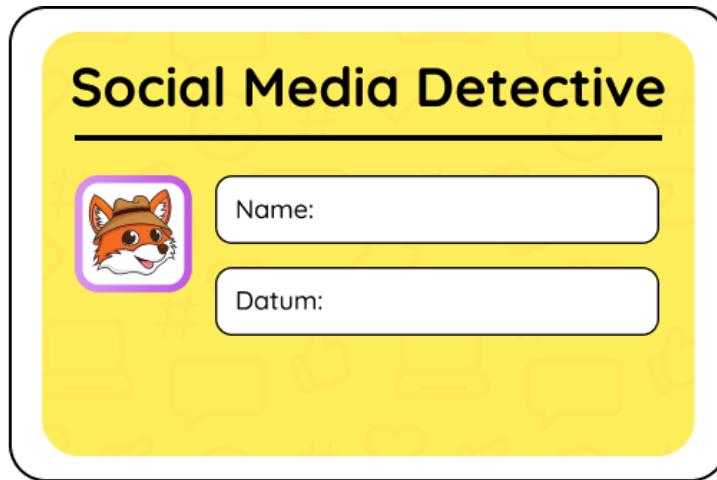
Since the main target group for our product are children in the third grade, we decided to make the story as visual as possible. We used colorful cartoon-like illustrations as a way to get the children's attention and to speak a visual language they would understand and that would engage them.



A main element of our application is the screen simulation of a mobile device. This is used often throughout our entire design, but with different content depending on the context. Below is an example of how the simulator was used to show the social media profile of our fox, Pixel. These screens often change depending on the input of the children from the multiple-choice questions in order to imply that their choices make a difference. It can in some instances also be interacted with directly by the children, such as by clicking on a specific post in one of the example profiles to see more detail.



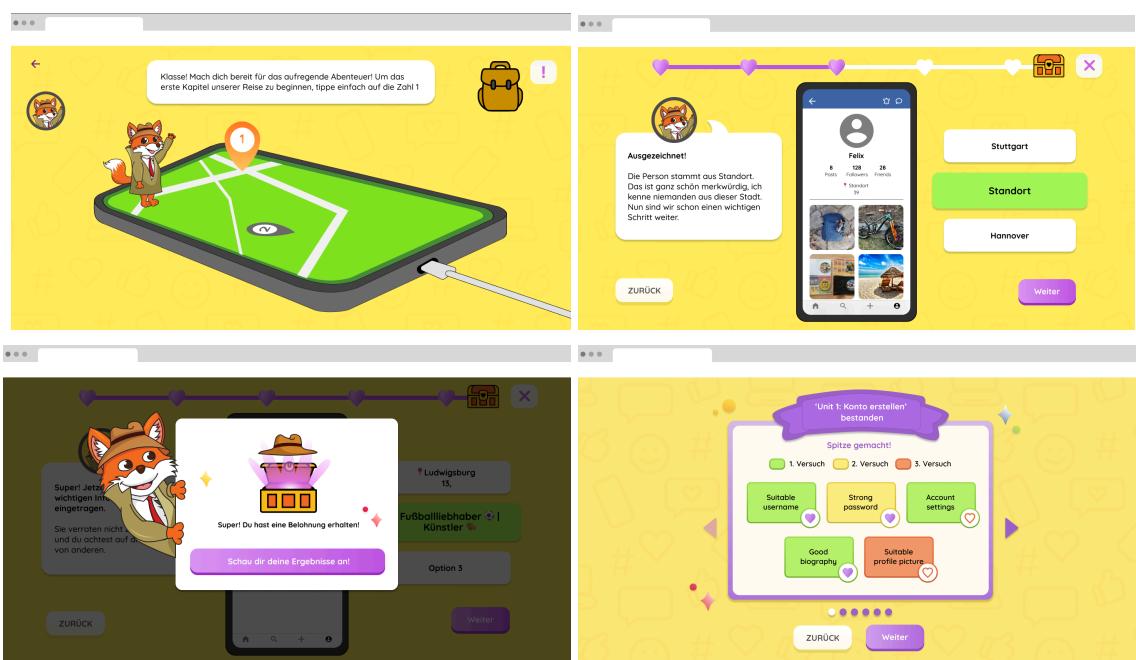
An additional visual element we created as a part of the story was a small physical card the children can obtain when they have completed all of the material in the application. The idea behind this card is that it is something they can keep as a proof and reminder of what they have learned.



2.3.3 High-fidelity prototype

Our final High-fidelity prototype consists of an onboarding introducing the viewer to the story, the application and how to use it, and two units focusing on two important topics of social media: profile creation and dealing with a stranger. The prototype is interactive and the entire process from entering the app to finishing the two units can be clicked through with suitable animations. Below are some images showing the visual look of the hub, a typical in-game screen, the rewards screen, and finally the result screen.

Follow this link to see the entire prototype in Figma: [Link to Figma prototype](#).



2.4. Project Prototype

The code base of our project prototype is based on ReactJS, a popular JavaScript library for creating user interfaces. We used Material UI for some of our components to ensure a consistent and aesthetically pleasing design throughout the application.

2.4.1 Initial Discussions and Decisions

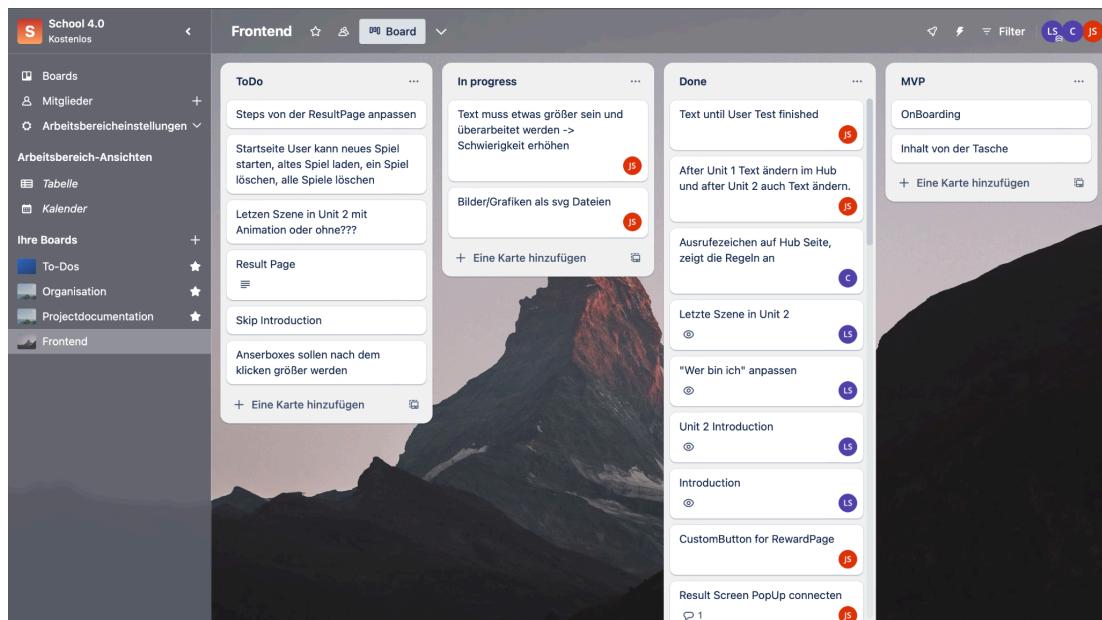
Before starting the coding phase, we discussed the requirements and technical specifications of the project in detail. Key considerations included deciding whether to develop a web application or an app, the need for a backend infrastructure and the choice of frontend framework. Initially, the considerations leaned towards using Next.js alongside ReactJS. However, after some experimentation, the decision was made in favor of ReactJS, as it was best suited to the scope and goals of our project.

2.4.2 Collaboration with Project Design

Our collaboration with the design team was an important part of our working process. Every week we sat down together to discuss the new designs. Not only were we able to review progress, but also brainstorm new ideas for the units together. These regular meetings helped to ensure that design and development went hand in hand and that our project ended up looking harmonious and well thought out.

2.4.3 Start of the coding phase

At the beginning of the coding phase, we used the design as a guide to plan and divide up our first and next steps using Trello. This allowed each team member to select and take on their tasks. In parallel, we created a solid skeleton of the code, which was initially filled without specific functions. This framework was then uploaded to Github so that all developers were on the same page locally from the start and could start developing straight away.



2.4.4 Responsive Design

During the user test at school, it was crucial that our application had a responsive design. We presented the application on the whiteboard so that the whole class could read the introduction together. This test was an important milestone for us as it allowed us to get direct feedback from the users and evaluate the usability and effectiveness of the application.

Before this test, we had to make sure that our design looked good and worked optimally on different screen sizes and resolutions. Responsive design played a crucial role in this, as it ensured that the application's user interface and content was consistent and user-friendly across different devices.

By implementing responsive design, we were able to ensure a consistent experience for users, regardless of whether they were using the application on a desktop computer, tablet or smartphone.

2.4.5 Transfer of unit data and local storage of user information

To dynamically load and display the contents of each unit, we have created an object that contains relevant information such as the type of unit and the associated data. For example, an entry in the object could have the type "unit1", which is then taken from an array of data to ensure that the user is shown the relevant content on step 1 of unit 1. This data is used to dynamically generate the bubble texts, the pages in the phone simulator and the answer options in the answer boxes.

```
task: [
  {
    step: [
      {
        question: "Profilname",
        speachbubble: [
          {
            type: "paragraph",
            content:
              "Bevor du mir helfen kannst, müssen wir einen guten Namen für dein neues Konto aussuchen.",
          },
          {
            type: "bold",
            content: "Welchen Namen würdest du auswählen?",
          },
        ],
        phoneSimulatorStep: 1,
        title: "Konto erstellen",
        answerboxes: [
          { answer: userName, right: true },
          { answer: "Puzzlestär oder MegaMalerin", right: true },
          { answer: "Name meiner Oma ", right: false },
        ],
        rightAnswer: "Super! Das ist ein sehr guter Name.",
        wrongAnswer:
          "Schade, versuche es nochmal! Dieser Name ist nicht gut. " +
          "Denk daran, dass es wichtig ist, einen Namen zu wählen, der persönlich ist, aber gleichzeitig deine Ide
      ],
    ],
  ],
]
```

Furthermore, we also record the number of incorrect answers chosen by the user locally to ensure an effective learning effect in class. This data is stored to display on the results page

so that the user and teacher can see which questions have been answered incorrectly and which areas may require additional attention. Through this local storage of user information and learning progress, we can ensure a personalized and effective learning experience within the application.

2.4.6 Github

To ensure efficient collaboration and version control during development, we used Github as the central repository for our project. This is where we initially created the project and uploaded the first basic framework with all the necessary installations so that every developer had the necessary local requirements right from the start. By using branches, we were able to work on different features in parallel without interfering with each other. Pull requests were used to review and approve changes before they were integrated into the main code.

2.4.7 Docker

Integrating Docker into our development process allowed us to have a consistent and portable environment for running our application. By using containers, we were able to ensure that our application ran consistently and reliably regardless of each developer's local development environments. Docker also simplified the deployment process by allowing us to package our application in an isolated environment and easily transfer it to different platforms.

2.4.8 Firebase

We chose Firebase for the deployment of our application. With Firebase hosting, we were able to deploy and manage our application quickly and easily in a secure way. Right from the start of the development phase, we used this hosting to test the web application on the students' Chromebooks. This early deployment allowed us to ensure that the application ran smoothly on the target devices from the start and that potential issues such as responsiveness could be identified and fixed early on.

[Link to Github Prototype](#)

2.5. User Testing

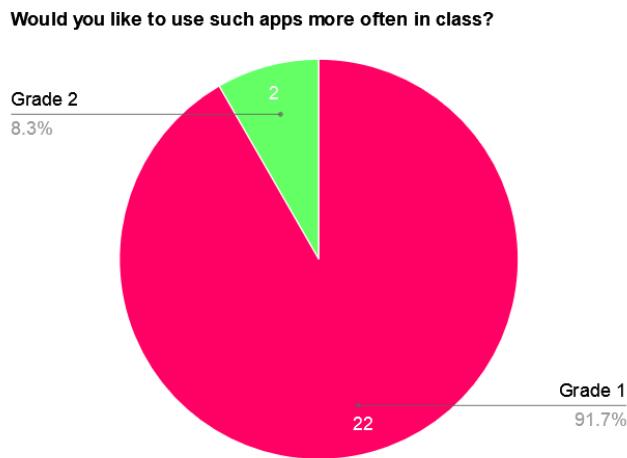
Once we had built the functional prototype, the next step was the user test in the elementary school. Thanks to our cooperation with a teacher, we were able to visit an elementary school near Ludwigsburg and test our application together with him and 24 children. We made the following considerations before the user test:

- The children should first try out the app in pairs. This simplifies the handling of the app and the operation of the pupils' devices.
- While the children are using the app, we talk to them and get even more feedback for our project.
- After the user test, a poster is hung on the room's blackboard and the children can give us feedback on a maximum of three questions using colorful dot stickers.

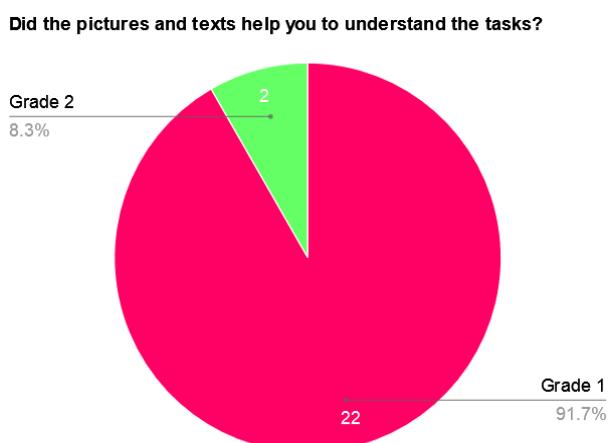
- As this is still a very young target group, we have decided to use the grading system that the children already know as a scale.

With the user test, we wanted to find out whether the children not only have fun with the application, but whether there is also a learning effect. We also wanted to find out whether the pictures and texts help them to solve the tasks and therefore whether our story about pixels is helpful. The first question relates to its use in the classroom and whether this is at all desired by children in an elementary school. We therefore decided on these three questions.

First question:

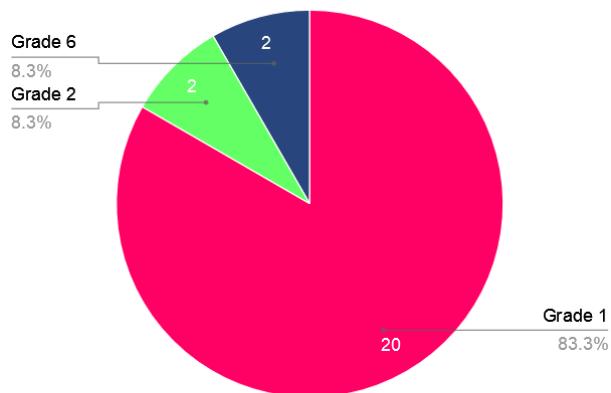


Second question:



Third question:

Are you more familiar with social media/internet now than you were before?



As a result, we received very good feedback and our application was fun for the children and they were able to learn something. In addition to these results, during the user test we identified two things that would improve our application. Firstly, we need to increase the size of the text within the app due to the children's devices. To make the pictures in the fox's profile look clickable, we need to make some changes to the phone simulator.

In summary, we can say that the user test was a complete success and that we were able to learn something not only from the experience in the classroom, but also from the conversations and feedback from the children.

3. Results

We took the feedback from the user test to heart and were able to improve a few things by the end of the semester.

3.1. Final Design Prototype

1. More detailed social media feed

It was difficult for some students to find information about the stranger in the social media feed. If they have never interacted with social media, it might not be clear that the pictures were taken in the past but also which pictures were uploaded more recently. To prevent misunderstandings, each post was tagged with a date to create a readable timeline.

3.2. Final Prototype

1. Increase Text Size

Since the Chromebooks the students used were quite small, the text was too small for some students to read it without moving closer to the screen.

2. Increase difficulty

A lot of the students were able to finish the exercises more quickly than we thought. To achieve that, we changed the wording in some of the questions.

3. Result Screen

The result screen lacked details. After completing the unit, it was difficult for the students to remember the exact question they answered and why they might have had trouble selecting the correct answer. The result screen now includes more details about which questions they answered and how many tries it took them to find the correct answer.

4. Responsive implementation

Since the application is not designed exclusively for the Chromebooks the students in our user test have access to, it became another goal to make the application accessible for devices from the size of a tablet and upwards.

3.3. Further improvements

We had lots of other ideas about how to improve both the design prototype and web application. Unfortunately, implementing all of them would exceed our time frame for this project. These further improvements could also be an inspiration if this project continues next semester.

1. Add voice over

To create more of an immersive experience for the children, it would have been great to equip Pixel the Fox with a voice by adding sound elements. This might also prevent the children from skipping over the texts and help those students that might struggle reading.

2. Prevent the children from skipping over the text

During the user test, we observed that some of the students did not bother reading the questions and instead just clicked on the answers until they found the right one. To prevent this, we had the idea to change how we present the questions to the children. Instead of showing them the question and answers at once, they first only see the question and once they finish reading it they can continue to view the possible answers.

This could be further restricted. If for example they had to interact with the social media simulator in order to find the answer, they would have to click on the simulator first in order for the answers to become visible.

3. Images in social media feed

For a lot of the students and also visitors at MediaNight, it was not clear that the images in the stranger's social media feed were elements that they could interact with. That meant that they missed out on information they needed to answer the question without guessing. The design of how we showcase these images could be adapted to make them look more interactable.

4. Personal Learnings

4.1. Liljana

The reason why I chose this project is my enthusiasm for applications that are developed specifically for educational institutions. Even when I was at school, I was fascinated by technologies that can support learning and teaching. The opportunity to be involved in a project that works directly with a school and aims to develop learning applications for students was therefore extremely appealing to me.

It was the first time I worked on a project with a stakeholder. At the beginning, we encountered small problems due to the different requirements. We weren't sure whether we should all focus on the design as part of the interdisciplinary project or whether we should split up and actually develop a deployable application.

One challenge for me was the implementation of some design elements in the code. In particular, the design of elements such as the buttons required complex CSS adjustments to achieve the desired 3D effect and to enable interactions such as pressing down the button when clicking. It also required an additional timeout to display the desired effect to the user.

In summary, I can say that it was a successful project for me this semester and hopefully this does not mean an end yet, as I would like to continue this project with other students next semester.

4.2. Caroline

I chose to be a part of "Spuren im Netz" because I wanted to learn more about how children learn. The opportunity to not only create an application for children, but also to test it in a classroom was very exciting for me. I have never before worked so closely with stakeholders of a project before. Something I valued very much during this semester was how well the communication in this team worked. Never before have I worked in a team where members showed up at weekly meetings so consistently.

From communication with the stakeholders I learned how to write emails more quickly without rereading the text too often and wasting time. The most challenging part for me was the implementation with React. Although I have worked with React before, it has been almost a year since the last project where I first learned how to work with it. I underestimated how much time has passed since then and how much I had to relearn.

Overall, this project has been a positive experience for me and I'm grateful that I was able to contribute my part.

4.3. Saga

This interdisciplinary project was the largest project during my exchange semester here in Germany, and the only project in my higher educational studies where I have gotten to work with real stakeholders and a real company. It has given me valuable experience in working and collaborating in a team of new people. I have gained insights on how to work and communicate with different stakeholders and the challenges that may come with that.

We continuously had close contact with the stakeholders, which allowed us to discuss our ideas and get feedback from someone outside of the closed circle of our group. Thereby, our group got to practice a lot on how to deal and handle inputs from different parties. The input and ideas between the stakeholders and the supervisor sometimes differed at the start of the course. This made us a bit unsure about what we could do during this project. But after discussions within our group we figured it out.

As a part of the design team, I focused a lot of my time during the project on the interactive prototype. This allowed me to further develop my prototyping and visual communication skills. Something I got to practice a lot was how to use Figma, as I have been more accustomed to Adobe XD. These are all things I will bring with me in the future.

4.4. Vi Anh

After participating in the Mercedes project last semester, I eagerly joined the Spuren im Netz project with the initial understanding that the expectations of stakeholders and the project's objectives were clearly defined. The idea of working on a product specifically designed for children, one that goes beyond being a mere conceptual prototype and is intended for actual use, seemed exciting for me. Thanks to the support from our stakeholders, teachers and even students from last semester, we started the project with a strong foundation and a positive momentum. Ultimately, we successfully achieved our goals, delivering a product that reflected the effort and dedication of all team members.

Taking part in this project has been a valuable experience, contributing not only to the improvement of my technical skills but also the development of my soft skills. This semester, I have found the experience particularly beneficial as we had the chance to participate in weekly meetings with stakeholders and attend workshops focused on UX and Gamification. These lessons have significantly enriched my understanding, leading to a great improvement in the user experience of our app.

4.5. Julian

For me, this was the first somewhat larger project at HdM. Nevertheless, I had already worked in an interdisciplinary setting during my studies and before that. So, I didn't learn anything new in terms of team experience. However, the collaboration with a company or the elementary school was interesting to me and encouraged me to continue this in my position as a working student. Here, I would also have the opportunity to expand this project further.

Working with React and a web application was very instructive for me. I was able to learn from other team members and continue my education. I was also impressed by our design team, which made it much easier to implement the code. I often found it challenging to develop my own design that looked as good as the design of our project. This was much more enjoyable because you could see a very good result in the front-end right away.

Through other lectures, I was able to contribute well to brainstorming and conception, and definitely learned a few new things this semester. It also showed me that managing a team and assigning clear tasks is an important part of a project, and we managed this task well despite not having clear leadership. In summary, this was a great project in which everything worked well, from the concept to the user test. I will take this positive experience with me into the next semester so that I can share it with other project groups.