

LogoHub

A website to provide better exercises for speech
and language therapy patients

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Zusammenfassung

Logopädie Patientinnen und Patienten müssen regelmässig Übungen durchführen, um in ihrer Therapie Fortschritte zu erzielen. Um eine ausreichend hohe Anzahl an Übungseinheiten zu erreichen, müssen sie viele davon zu Hause durchführen. Dabei gibt es potenzielle Probleme: Sie müssen sich Details der Übungen merken können und erhalten kein Feedback, falls sie Fehler machen sollten. Zusätzlich kann es manchmal schwer sein für sie, genug Motivation zum Trainieren zu finden. Deshalb wurde LogoHub entwickelt. Dabei handelt es sich um eine Webseite, welche es den Therapeutinnen und Therapeuten ermöglicht, Übungen mit detaillierten multimedialen Anweisungen zu erstellen und diese ihren Patientinnen und Patienten zuzuweisen. Diese können dann auf LogoHub von zuhause aus zuzugreifen und ihr Training mit den vorbereiteten Anweisungen unterstützen. Drei Logopädie Patienten wurden im Rahmen einer qualitativen Studie befragt, wie sie zuhause üben. Zwei dieser Patienten haben LogoHub für zwei Wochen getestet. Ihre Erfahrungen zeigen, dass LogoHub Potential hat, sie zu motivieren und beim Üben zu unterstützen.

Abstract

Speech and language therapy patients need to exercise regularly to improve their condition. To reach enough repetitions, they are required to do many of these at home. There are potential problems with that: the patients need to remember details about the exercises and they do not get feedback if they make mistakes. For exercises to be helpful they have to be done correctly. Furthermore, it can sometimes be hard for patients to find enough motivation at home to even start exercising. To address these problems, LogoHub has been created. It is a website which allows therapists to create exercises, containing instructions in different media formats, and assign them to their patients. Patients can access LogoHub from home and support their exercise with the prepared instructions. During a qualitative study, three speech and language therapy patients were questioned about their exercise practices and two of them used LogoHub for two weeks. Their experiences showed its potential in motivating them to exercise and helping them to do it correctly.

Acknowledgements

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Chapter 1

Introduction

The causes of an indication for speech and language therapy are various. The work of speech and language therapists (SLT) is described by Royal College of Speech and Language Therapists (n.d.) as treating and supporting people who have difficulties with acquiring language, voice, communication or swallowing. People may need speech therapy in different stages of their lives, from infancy up to old age. SLTs work closely with their patients, as well as teachers, parents, relatives and health professionals to provide a treatment tailored to a patient's needs, which allows participation in daily life (World Health Organization, 2002).

To reach these goals, many therapy plans revolve around small exercises, which require lots of repetitions to be effective (Bhogal et al., 2003). For an effective treatment, patients are required to exercise at home in addition to the therapy sessions with their SLT.

There lies a potential problem: Exercises need to be done correctly to have a positive effect (Frieg et al., 2017), which means patients need to be able to memorize and recall them correctly. Even if they can do that, they still might exercise wrongly because they get no feedback. This leaves the question; how can these exercises be made more accessible and effective for patients?

Andree, Fässler and Winkelmann, three students from the *Interkantonale Hochschule für Heilpädagogik* in Zurich, Switzerland, looked into the value of such exercises under usage of modern media as the topic of their bachelor's thesis. They focused on patients with dysarthria. They concluded, that patients exercising at home is an important factor of a successful therapy, mainly because it increases the exercise frequency. They also concluded that modern media in form of a website or an app would bring many benefits to the patients: such a system can be accessed from everywhere, allows the usage of text-, audio- and video-based material and is cheaper than books or CD's.

The idea of such a website was picked up during the *Human Computer Interaction (HCI)* course at the *University of Zurich* by a group of students, including the author of this thesis. The goal was to create a prototype of an app, which would solve a problem from daily life. The problem was defined as the low number of therapy sessions in speech and language therapy, in contrary to the high need of repetitions. As a result, a usage scenario, where the role of both therapists and patients were reflected, was defined and interactive mockups were designed and created.

This thesis continues the work from both Andree et al. and the HCI group, with the goal to see how the patients would respond to such a website. It is worth mentioning

that this thesis only aims at the exercising behaviour of patients at home, not during face-to-face therapy sessions, since the use of technology in these two areas needs to be differentiated (Bilda et al., 2017).

This thesis consists of two parts: The creation of a website called LogoHub and speech and language therapy patients testing it. To capture the experiences and practices of the patients, two semi-structured interviews were conducted with three participants. Between the interviews, two of them tested LogoHub for two weeks, incorporating it into their therapy plan. During the first interview they were questioned about their current exercise practices and motivation. In the second interview, they reported their experiences with LogoHub and how it affected their exercise behaviour. The following research question are addressed in this thesis:

- RQ1: How do speech and language therapy patients repeat exercises at home?
- RQ2: How do speech and language therapy patients respond to LogoHub?

This thesis makes the following contributions:

- Insight into experiences and practices of speech and language therapy patients.
- A basis for a website-based solution to support speech and language therapy patients.
- Design implications for LogoHub and other speech and language therapy applications.

To address the goal and research questions of this thesis, it is structured like this: Chapter 2 gives an insight into current research on the design and use of apps in speech and language therapy, and introduces both the thesis by Andree et al. and the prototype from the HCI course. In chapter 3, both structure and functions of LogoHub are explained. Chapter 4 contains details about the participants and the interviews. In chapter 5, the results of the two interviews are summarized and conclusions from them are drawn in chapter 6. Finally, chapter 7 discusses the results critically and looks forward to future research.

Chapter 2

Background & Related Work

This thesis aims to capture the experiences of speech and language therapy patients with LogoHub. LogoHub is a website where patients can find exercises with detailed instructions in video and text format, created by their therapist. The goal is to help them exercise correctly and increase their motivation. In a first step, the area of speech and language therapy and two impairments are defined. In a second step, guidelines for the design of speech and language therapy applications are reviewed. In a third step, studies that evaluated speech and language therapy applications and systems are presented. Since this thesis is based on another bachelor's thesis by Andree et al. (2020), as well as a semester project done at the University of Zurich, these works are summarized in two final steps.

2.1 Background on Speech and Language Therapy

Speech and language therapy supports people who have difficulties with acquiring language, voice, communication or swallowing. In section 2.2, two impairments that require speech and language therapy are mentioned, so for better understanding, they are explained here:

- **Dysarthria** is "an attained neurological speech impairment, caused by damage to the central or peripheral nervous system, with an impact on control and execution of speech movements" (Siegmüller and Bartels, 2017, p. 282). Symptoms are changes to breathing while speaking, voice, articulation resonance and prosody.
- **Aphasia** is caused by impairments of the central nervous system where different areas have a too low blood flow (Siegmüller and Bartels, 2017). People suffering from aphasia may have trouble with finding words, word flow or comprehending and using language.

2.2 Guidelines For Speech and Language Therapy Apps

Starke and Leinweber (2018) propose evidence-based and ethical strategies on how to select training apps for speech and language therapy. Their advice for an ethical use of apps needs to be considered when designing one. Namely, the patients must not be restricted in their privacy, self-determination, consent and their part in society. Therefore, the applications must be functional, transparent, easy to use, provide help if needed and they have to respect the user's privacy.

This is also supported by Frieg et al. (2017), who state that for a dysarthria therapy to be effective, a high therapy frequency is needed. This stays in conflict with a limited number of therapy sessions however, which requires patients to practice outside therapy sessions. This again raises another problem, since feedback is important for a correct execution of the exercises. They show that assistive technologies have much potential in speech and language therapy, and present the core elements of *Isi-Speech*. It is a system that is currently under development and has the following core principles:

- **Platform independence:** Isi-Speech will be available on PC, phones and tablets. This makes it accessible for people who have less technical knowledge but use these devices on a daily basis. Furthermore, it reduces additional costs since most people own at least one of these devices.
- **Activity and participation:** Exercises will be taken from standard therapy exercises, with the aim to allow patients to take part in social activities.
- **Feedback and voice recognition:** Feedback is vital to for an effective dysarthria therapy, since patients often are unaware of their impairment. Voice recognition allows evaluation and feedback at home, without the presence of a therapist.
- **Motivational elements:** Patients should exercise by themselves and self-regulated. Since the exercises can be both exhausting and boring, many lack enough motivation to exercise enough, however. Through gamification elements like social connections, competition, cooperation or rewards, their motivation may be supported.
- **User-centered development:** Through continuous participation of both patients and therapists in the development process, a widely accepted system can be created and its effects on the users end-users can be tested.

Sidock (2011) critically reviewed literature on the effectiveness of integrating mobile applications into speech and language therapy. They concluded that mobile apps do have much potential in engaging and motivating patients, due to their only design constraint being the designer's own imagination. Still, the use of apps cannot replace the traditional therapy and their use fullness needs to be estimated for each patient.

2.3 Studies With Existing Systems

Several studies have shown that speech and language therapy patients can profit from the use of training applications.

Beijer et al. (2010) conducted a 4-week study on a patient suffering from dysarthria due to Parkinson's disease with a web application called *E-learning-based speech therapy (EST)*. The core of this system is a central server, to which both patients and therapists have access to. Therapists can select audio files from the server and create custom training programs. Patients can then access these from where-ever they want to exercise and get immediate feedback. They found out that the participant had a significantly higher speech intelligibility after the 4-week training time and that it lowered without training. They concluded that there is potential for EST in Parkinson's disease treatment, and they saw the value of practice confirmed.

Similarly, Halpern et al. (2012) assessed both the feasibility and effectiveness of an assistive technology system, the *Lee Silverman Voice Treatment Companion*, designed for individuals with Parkinson's disease. 16 participants did a 16-session therapy, where 7 sessions were done at home by using the Companion. All were able to independently use the companion and showed therapeutic gains, like the patients that underwent therapy without the companion.

Stark and Warburton (2016) let patients with chronic aphasia exercise at home according to the self-delivery method. They provided iPads with a training app installed. After instructing the patients and recommending them a daily training time, they let it up to the patients to decide when and how often they exercise. They concluded that there were measurable improvements and suggested further research on the topic.

Gerber et al. (2018) propose a multimodal telerehabilitation system, designed for aphasia patients. Therapists can create an account for a patient and assigns a group of tasks in so called decks to them. These decks are then automatically downloaded on the patient's device. Patients are recorded while exercising and receive feedback after completion. The exercise data is also sent to the therapist for analysis. Alternatively, therapists can observe the patients live. The system was used by 166 patients and accepted by both them and the therapists. They concluded that the system offers patients the possibility of exercising independently at home and that the system has potential as an addition to face-to-face aphasia therapy.

Katz et al. (2014) tested a new way to give feedback to patients. They created *Opti-Speech*, a system that captures the users tongue movement and gives a 3D visual feedback. Data is collected from sensors on head and tongue and is then displayed in a human head model. They conducted a test with four participants and estimated that the system can produce reliable feedback for American English consonant place of articulation targets. They suggest further research for more conclusive results.

2.4 ÜBDY

The basis for thesis is another bachelors thesis called *Angeleitete Eigenareit in der Dysarthrie-Therapie - "ÜBDY" Eine didaktisch aufbereitete Übungssammlung unter Berücksichtigung des Einsatzes neuer Medien* published by Andree et al. (2020), three students of the *Interkantonale Hochschule für Heilpädagogik* in Zurich, Switzerland. They focused on patients that are suffering from dysarthria. Their goal was to determine how important it is for patients to exercise at home. Furthermore, they studied how exercising could be supported with new media, for example websites or apps. Their vision was a website, where patients have access to an exercise collection with detailed instructions. The patients could access it from their own computer or tablet, something most people own nowadays and be more independent that way.

They recorded a collection of standard speech and language exercises. The videos are about one to two minutes, and each explains a single exercise in detail, including a demonstration. They showed their collection to professional therapists, who had at least three years of experience. They evaluated the therapists' feedback through a survey. They aimed to answer three questions:

Q1: How does exercising support dysarthria therapy?

They concluded that exercising is important in supporting the therapy, because it increases the frequency of repetitions. The therapists supported that conclusion, saying that exercising is highly important but also mentioning that it is often overlooked by both their patients and themselves.

Q2: Why and how does new media support patients when they exercise?

They found that modern media would allow many patients to access a collection of exercises, if they own a computer. Also, a website would be cheaper than books or DVD's and allow the usage of different media formats, such as videos, text, audio and images. These different formats would also increase the website's accessibility, which is important since it should be usable by people who have trouble with reading, hearing or other comprehension disabilities.

Q3: Which exercises from dysarthria therapy are especially applicable to exercising and how can they be didactically prepared?

They concluded that exercises must fulfil the following requirements:

- The exercises need to be simple and easy to explain.
- The patients need to be able to perform the exercises without any additional tools or support.
- The exercises have to be accessible by a wide range of patients.
- The exercises need to support different media formats, to allow an individual learning experience for each patient.

They concluded that an exercise collection on a website would support the therapy process. They did not manage to create said website however but raised some important points for future research. First, they state that patients that fulfil the inclusion criteria should be included in the design process. From the feedback they received from practicing speech therapists, they concluded that the videos could be livelier and add various difficulty levels. Actors may be hired to present the exercises and it could be interesting for the patients to be able to choose a male or female model to create a tighter bond between themselves and the therapy. This might make exercising more engaging for patients when they exercise by themselves.

2.5 HCI Prototype

The thesis of Andree et al. (2020) served as an inspiration for a group project during the HCI course, which took part during the autumn semester of 2020 at the University of Zurich. The group consisted of five students, including the author of this thesis. They were tasked with the creation of a prototype for an app, which would solve a real-world design problem. The goal was to apply the knowledge from the HCI class to an iterative design process. This included topics like design principles, definition of design problems, understanding the users, idea generation or human perception and cognition.

The problem to solve was chosen to be the need for more exercising in speech therapy, as Andree et al. (2020) had described. While they had shown the need and use of an exercising website, they did not really touch its functions or design implications. Therefore, the challenge of the project was to take the rough idea of a website and transform it into a product that could satisfy the needs of real patients and therapists.

Literature on the topic was studied in addition to the thesis of Andree et al. (2020) to gain basic insight into speech and language therapy. In a next step, ideas for the functions of the website were generated and discussed. With these ideas, three practicing speech and language therapists were interviewed to hear what they deemed important for a successful therapy. They gave feedback to the generated ideas and gave input where they thought that something was missing. After evaluating the interviews, the following main features were defined and improved in an iterative design process.

The images that are used in this section were all taken from this prototype.

2.5.1 Exercises

Therapists can create exercises and assign them to different patients. This allows therapists to create a collection over time. Exercises can be grouped together to sessions, making it easier for patients to navigate to the desired exercise. The idea is that they match the therapy sessions, but they could also be grouped by topic, for example a session about general exercises. Figure 2.1 shows all exercises assigned to a patient. On the left side of the screen an overview over all available exercises can be found. If a session is selected, detailed information about its exercises is

displayed on the right. To start an exercise, patients can just click on it, and they will be sent to the exercise page.

2.5.2 Feedback And Help

When exercising, patients have the option to record themselves. They can listen to themselves and check if they did the exercise correctly. To extend this idea, the website could analyse the recording and give feedback whether the exercise was done correctly and give hints in case there was a mistake. The patients can also request feedback from their therapist on their performance, which would send a message with a link to the recording. These functions should be optional, since some patients may not be comfortable with the idea of recording themselves.

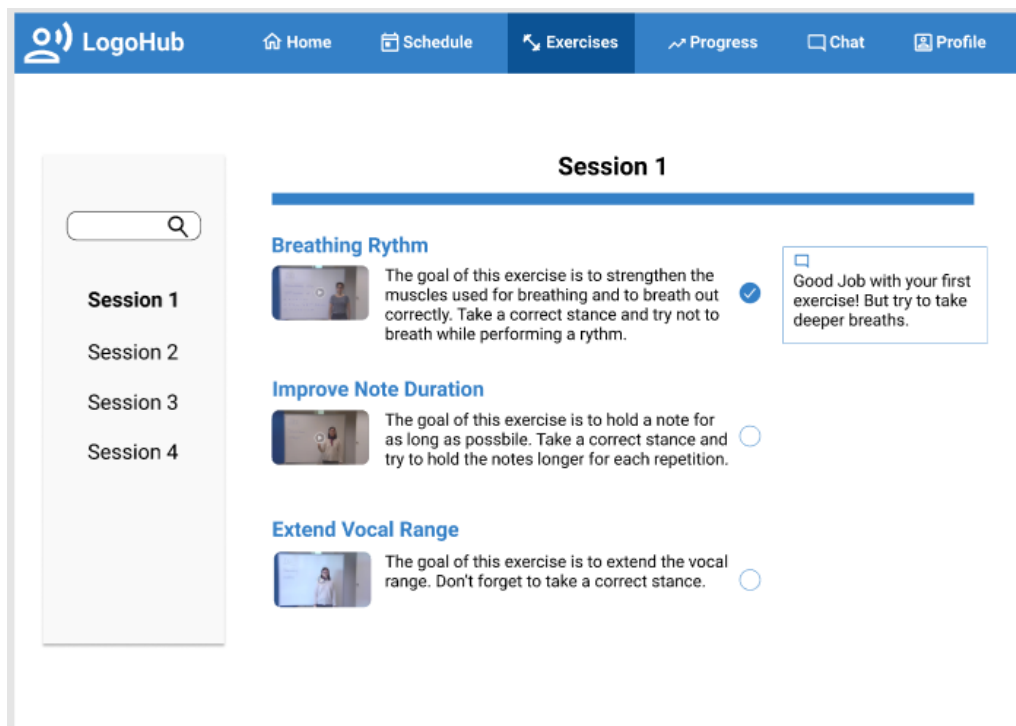


Figure 2.1: Exercise overview page

Figure 2.2 shows an example of an exercise page. Patients can find instructions in both video and text form, to support the requirement of multiple media formats by Andree et al. (2020). The page also informs them how many times they need to repeat an exercise until it's done and when they can continue to the next exercise in that session.

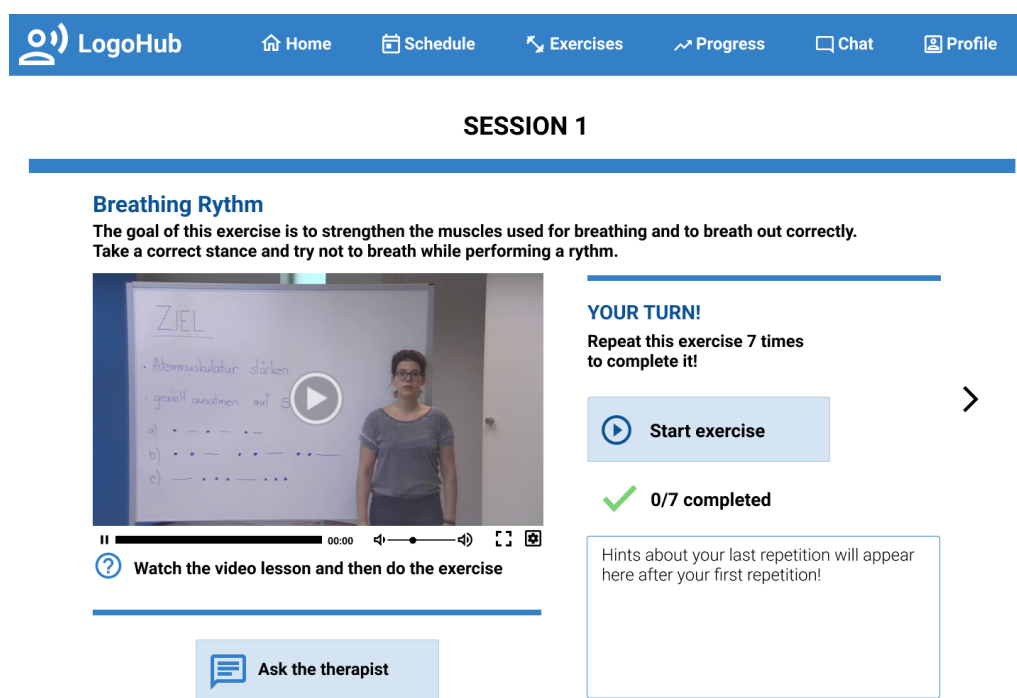
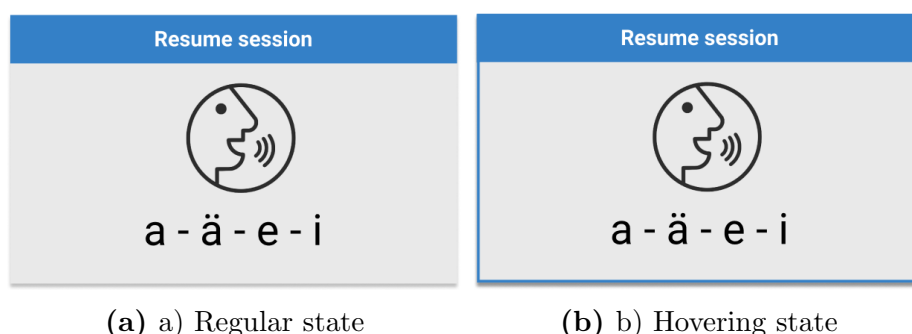


Figure 2.2: Exercise page

2.5.3 User Interface

Norman (2002) describes feedback as a fundamental basis of discoverability. Furthermore, Ferguson et al. (2012), state that feedback, especially visual, is important in speech therapy. The website should therefore offer it to the user as often as possible. Figure 2.3 shows how clickable elements get highlighted when hovering over them.



(a) a) Regular state

(b) b) Hovering state

Figure 2.3: Hovering the *resume session* button

Another example is shown in figure 2.4: A patient is recording their voice during an exercise. As they press the *Start exercise* button, it's colour and text changes and below it there's a visual cue to indicate that the page is currently recording.

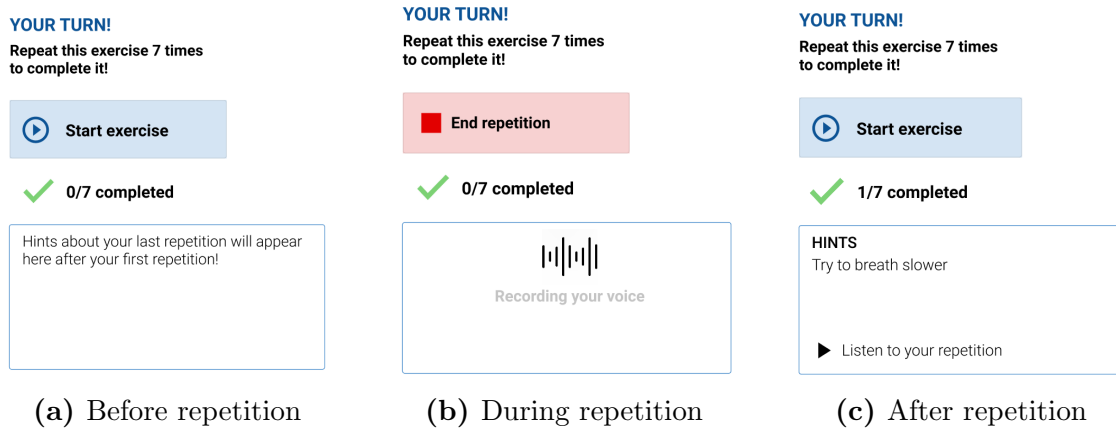


Figure 2.4: Sequence when performing a repetition

2.5.4 Gamification

Gamification can be found in many different learning applications and it can help motivate users to practice on a regular basis. Ferguson et al. (2012) says that a lot of systems in speech and language therapy try to engage children through gamification. This could be used on the speech therapy website as well. Patients can be motivated by showing them what they have achieved so far and which milestones they reach next if they are keeping up their exercise schedule. Gamification can also make the exercising feel less like a chore and more like a fun experience. Figure 2.5 shows the welcome page after a user has logged in. There they can find gamification elements such as the *Your progress* box or the congratulations at the bottom. Their total progress and goals are accessible under the *Progress* in the header.

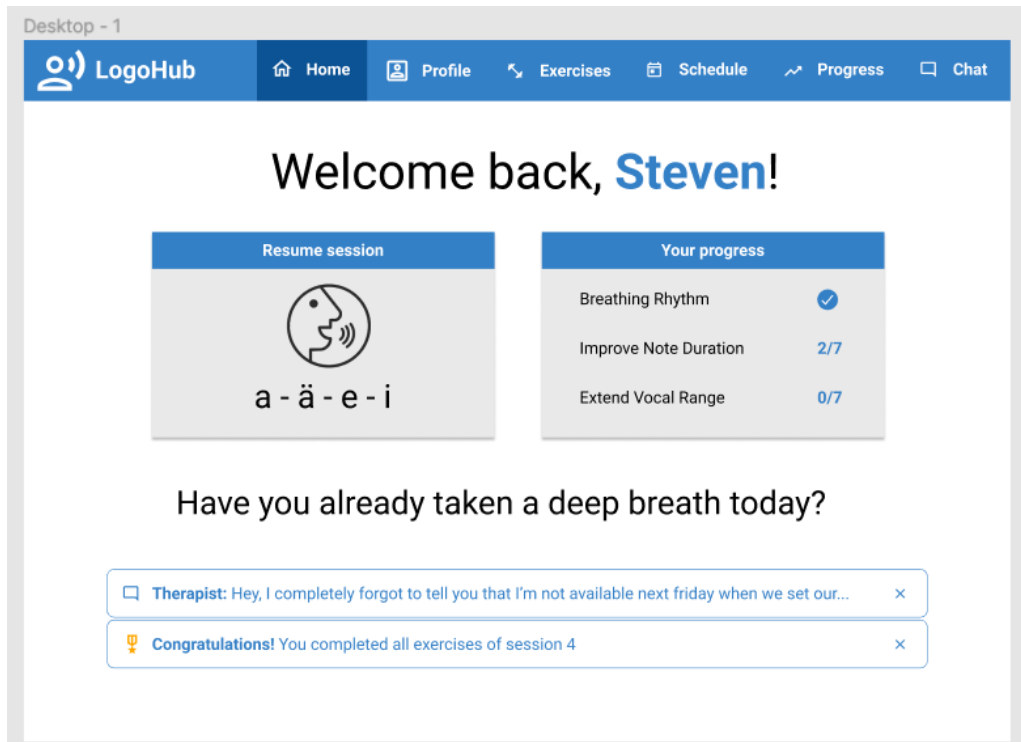


Figure 2.5: Welcome page after login

2.5.5 Communication and Scheduling

Another idea was that the website would have functionalities for communication and scheduling as well, like e-mail applications as Microsoft Outlook. This could make it easier to integrate the website into the therapy process. One part of the communication tools is the opportunity for patients to request and receive feedback to their exercises, as mentioned in 2.4.2. Scheduling allows therapists and patients to set exercise slots in a calendar and link them to the corresponding exercises. Reminders can be set for these exercises if a patient would desire it. This could motivate and help them to exercise regularly. Apart from that, normal calendar functions are also supported.

Chapter 3

Project Description

In this chapter, the design and functions of LogoHub are described.

3.1 Usage

This project aims to serve as tool to support speech and language therapy patients in exercising at home. Traditionally, therapists introduce exercises to their patients during therapy sessions and repeat them together. The patients are then advised to exercise by themselves at home, where they might have difficulties with recalling an exercise or make mistakes while doing it. LogoHub is a website that aims to solve these problems. It allows therapists to create exercises with detailed instructions in video and text format. Patients can access these when and where they want (figure 3.1). Therapists and patients have their own accounts. This means that therapists can only assign exercises to their patients and patients can only access videos that have been assigned to them. People without an account can't access the website at all.

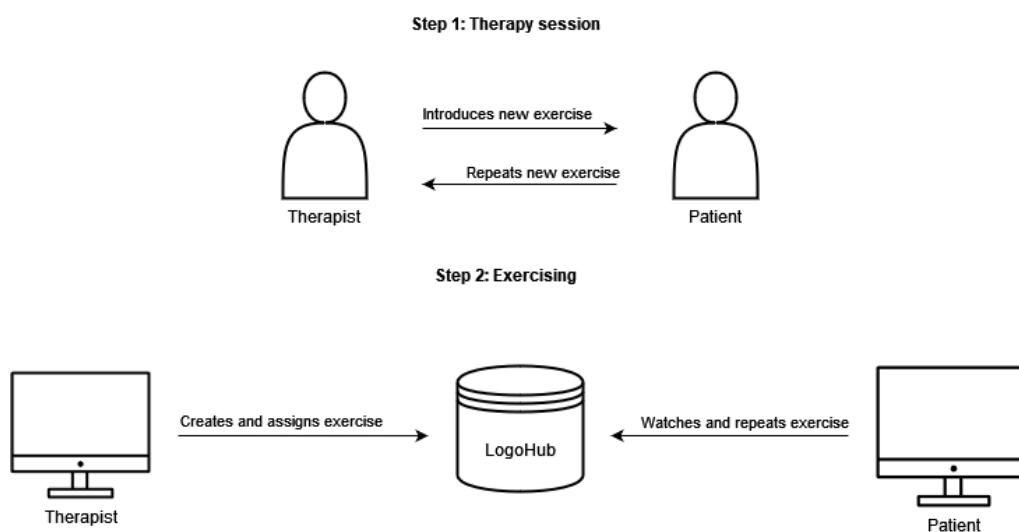


Figure 3.1: Therapist creates an exercise after a therapy session which their patient can then access from home.

3.2 Development and Design

During the development, intermediate versions were discussed iteratively with the participating therapist to find major flaws. The patients could not give feedback before the testing phase since there was not enough time left after they had been recruited.

The design of LogoHub is based on the prototype described in chapter 2.4. The name *LogoHub* came up during that time. It is derived from *Logopädie*, which is the area of speech and language therapy in German, and the hub-like nature of the website. Many of the functions of the prototype could not be included in LogoHub however, since such a website is beyond the scope of this bachelor's thesis. It is planned to continuously improve and extend LogoHub. For this thesis, it was optimized for desktop computers, though it can also be used on tablets or smartphones.

3.2.1 Therapist Interface

Therapists have access to pages which let them create, edit and assign exercises. Exercises can only be assigned to patients that are assigned to that therapist.

- The home screen (figure 3.2) appears after a successful login. It offers a shortcut to the dialog for creating exercises. Apart from that, it has no other functions at the moment.
- The patients page shows a table that contains all patients that are assigned to the currently logged in therapist (figure 3.3). Each patient-row can be extended to show all exercises that have been assigned to that patient. These exercises can be selected and removed from that patient, without deleting the exercise from the database.
- The exercise page in figure 3.4 shows all exercises that a therapist has created. Like the patients page, it's a table with one exercise per row. These rows can be extended as well, which shows to which patients the exercise is currently assigned and gives the option to assign or remove exercises. Additionally, exercises can be deleted and previewed

Exercises can be created via a dialog, which can be opened from almost all pages. It's a one-step dialog, where therapists must set a title, category, instructions and select a video for upload. These attributes are meant to support the different media formats, that were required by Andree et al. (2020). Images can be added as well, but this is optional. An empty dialog is shown in figure 3.5. After it has been created, an exercise can be assigned to one or many patients. When exercises are getting assigned, they need to be grouped together as a session. These sessions are meant to relate the face-to-face sessions and should make it easier for patients to find their current exercises. Figure 3.6 shows how therapists, patients and exercises are connected.

- The profile page is for personal settings. For this study, the only setting that could be changed was the password.

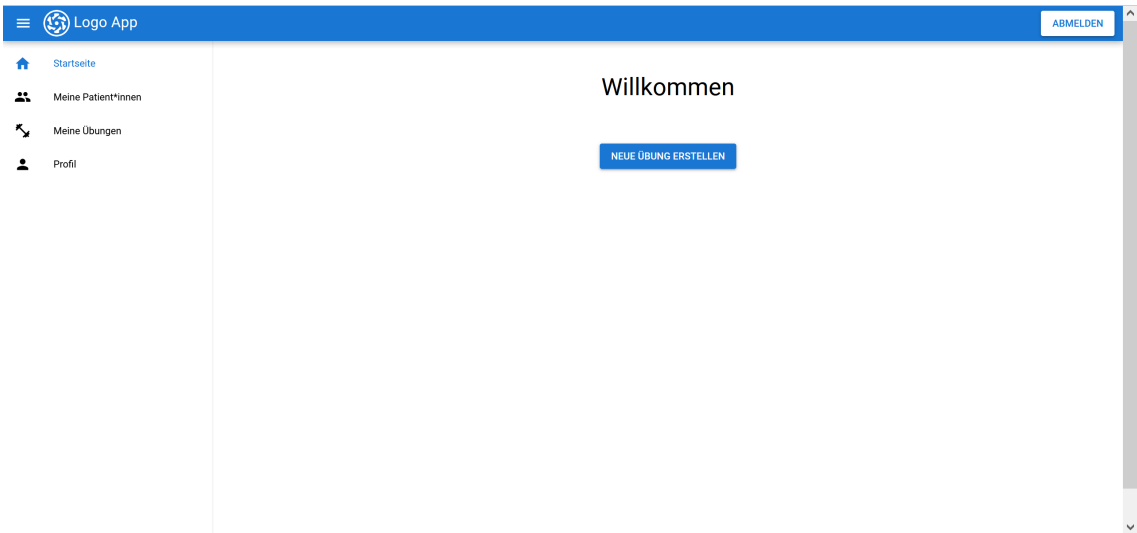


Figure 3.2: A therapist’s home screen after login.

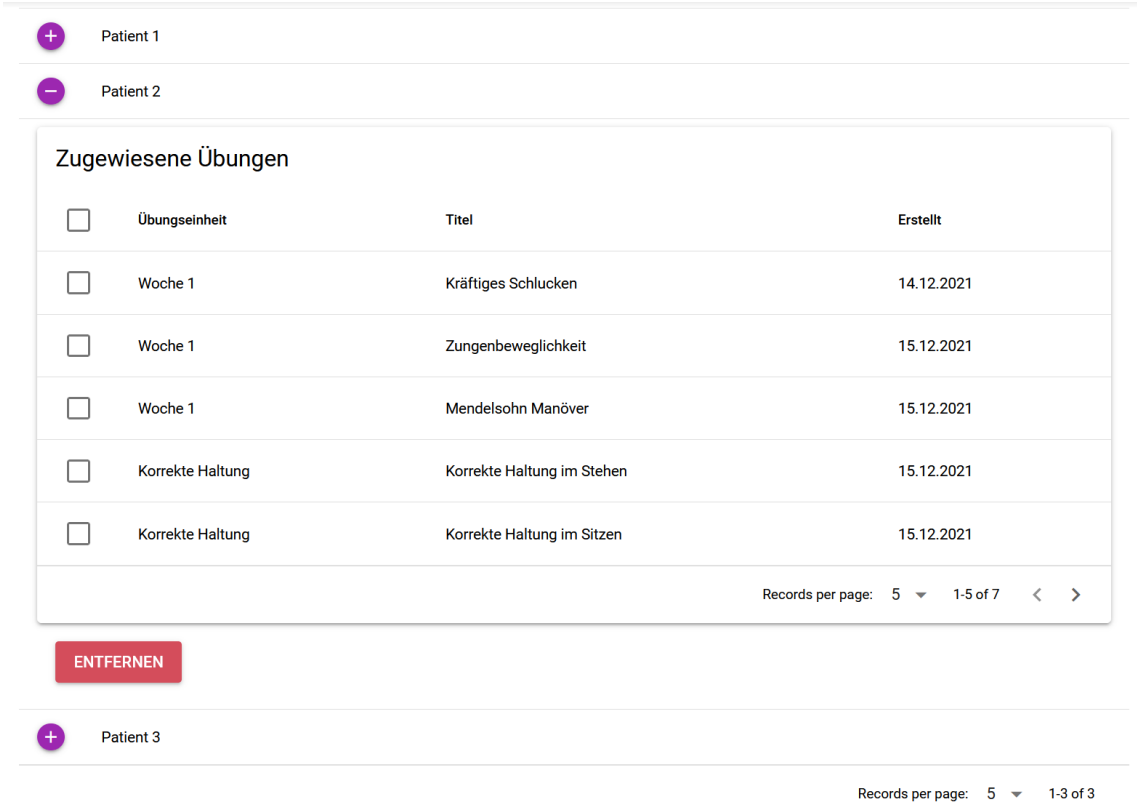


Figure 3.3: All exercises that are assigned to Patient 2.

Meine Übungen

	Titel	Kategorie	Erstellt		
-	Kräftiges Schlucken	Dysphagie	14.12.2021	DETAILS	LÖSCHEN

Zugewiesen zu

	Name ↑	Übungseinheit
<input type="checkbox"/>	Patient 1	Woche 1
<input type="checkbox"/>	Patient 2	Woche 1

Records per page: 5 ▾ 1-2 of 2

ZUWEISEN
ENTFERNEN

+	Modifiziertes Valsalva Manöver	Dysphagie	14.12.2021	DETAILS	LÖSCHEN
+	Entspannung durch Ausstreichen	Dysphonie	15.12.2021	DETAILS	LÖSCHEN
+	Kiefer Entspannung		15.12.2021	DETAILS	LÖSCHEN
+	Mobilisieren Kehlkopf	Dysphonie	15.12.2021	DETAILS	LÖSCHEN

Figure 3.4: All exercises created by a therapist.

Video auswählen

Kategorie
Wählen Sie eine Kategorie + ▾

Titel

☰ ☰ ☰

☰

B *I* U

☞

↶

↷

Bilder

HOCHLADEN
ABBRECHEN

Figure 3.5: An empty exercise creation dialog.

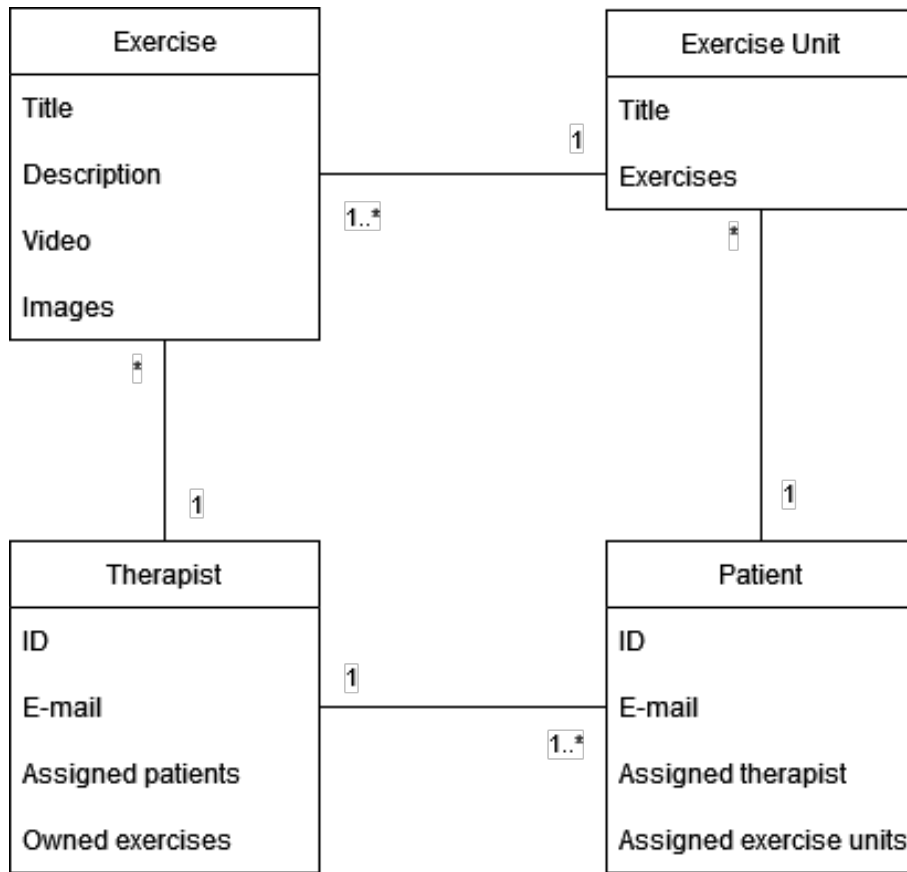


Figure 3.6: Relations between therapists, patients and exercises.

3.2.2 Patient Interface

Patients have access to an overview which contains all exercises that have been assigned to them. This gives them access to an exercise page, where the instructions are displayed.

- The home screen is very similar to what a therapist can see. The only difference is that it contains a shortcut to the exercise overview, instead of exercise creation. With this, the patients can directly navigate to the exercises, which is their reason for using the website.
- The exercise overview page is shown in figure 3.7. It consists of two columns: The one on the left holds all sessions. They can be filtered by a search bar. When a session is selected, all exercises that belong to it are listed in the column to the right. The title and written instructions of each exercise give a preview what it is about. Patients can click on the *START* button to start with the first exercise or they can select any exercise from the list and start from that one. This will bring them to the exercise page.
- The exercise page (figure 3.8) is where patients can receive exercise instructions. The page displays one exercise at the time, with the video at the centre since this is the most important part. Below it, instruction in text form and additional images can be found. A header above the video allows users to quickly switch between other exercises of the same session. Alternatively, they

can go back and forth with the buttons in the side of the exercise video or return to the overview page.

- Patients have access to the same profile page as therapists.

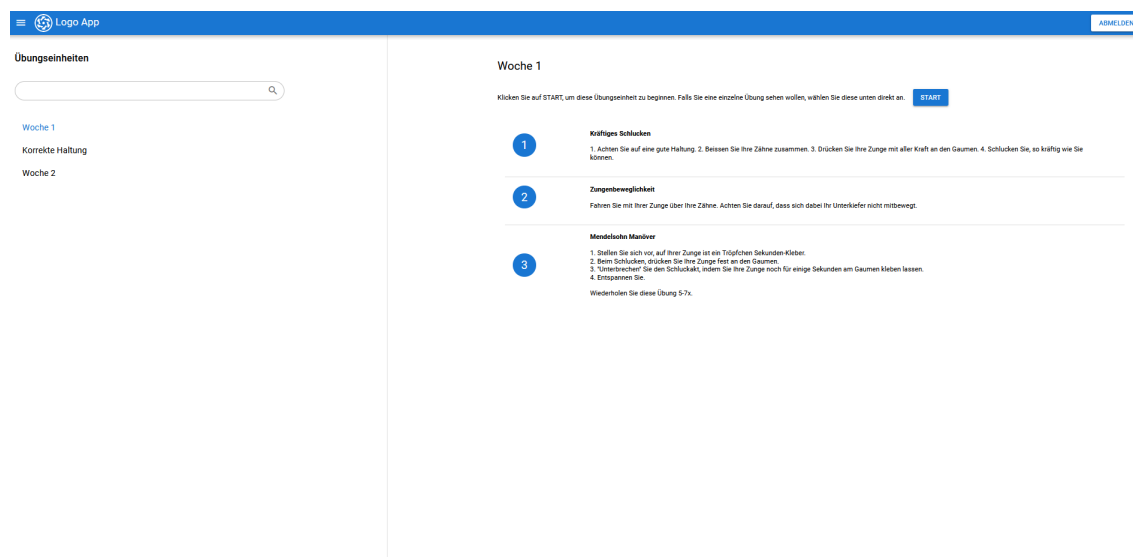


Figure 3.7: Exercise overview page of a patient. The first column holds all sessions, the second shows all exercise contained in the selected session.

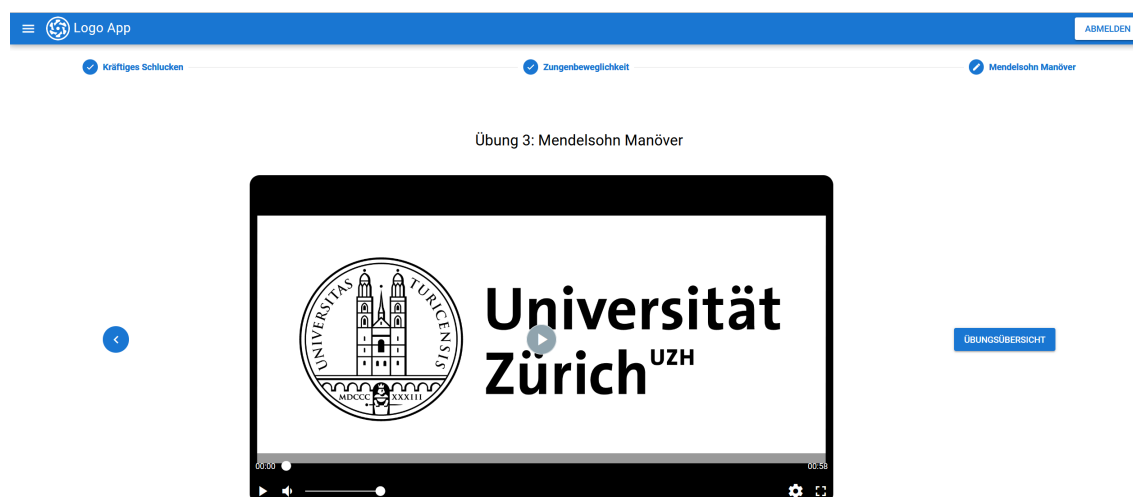


Figure 3.8: Exercise page with the video in the centre. The written instructions and images could be found below it.

3.3 Technical Notes

The front-end of LogoHub was developed with Quasar, a Vue.js framework. Google's Firebase service was used as back-end and hosting platform.

Chapter 4

Design & Methodology

This chapter presents the design and methodologies of the study. First, the overall procedure is explained and then the methodologies used in the study are presented.

4.1 Overall Procedure

The procedure consisted of two main parts: an insight into current experiences and practices that the participants had with speech and language therapy, and an evaluation of the participants experiences with LogoHub during a two-week testing phase.

To address the first research question *"How do speech and language therapy patients repeat exercises at home?"* semi-structured interviews were conducted. The interviews aimed to gain insight into practices, experiences and challenges of speech and language therapy patients.

The second research question *"How do speech and language therapy patients respond to LogoHub?"* was addressed by giving the participants access to LogoHub for two weeks, where their therapist had created exercises and assigned these to them. Their feedback was collected in semi-structured interviews.

4.2 Interview Guide

The goal of the two semi-structured interviews was to get insight into the exercising behaviour of the participants in the existing therapy setting, as well as their experiences with LogoHub.

An interview guide was created according to *Interviewing Users: How to Uncover Compelling Insights* by Portigal (2013). Since the participants had to talk about a personal impairment, it was important that they felt comfortable and were able to speak freely. The goal was to start with open questions and capture as much of the patient-experience as possible. The interview guide was there to make sure key aspects were talked about.

The interview guide was written in German, but the interviews were conducted in Swiss-German since it was the mother-tongue of all participants.

4.2.1 First Interview

The goal of the first interview was to understand details about therapy sessions and their exercise behaviour at home. The interview guide contained the following key points:

- How old are you?
- What is your profession?
- Why are you going to speech therapy?
- Where do you go to speech therapy?
- Tell me how a typical therapy week looks like.
- Tell me about the exercises.
- Does your therapist give exercises to do at home?
- How many different exercises?
- How much exercising is recommended?
- How often do you exercise?
- Where do you exercise?
- How do you exercise?
- What does motivate you to exercise?
- Do you like to exercise?
- Do you use tools for exercising?
- How do you remember exercises?
- Are there difficulties with exercises?
- Have you ever forgotten how to do an exercise?
- Do you think the exercises are helpful?
- Is there anything else you would like to tell me about exercises?

4.2.2 Testing phase

The participants were introduced to the website after the first interview. They learned how to log in and how to navigate the page. They had access to LogoHub for two weeks. Their therapist created and assigned exercises to them. They could use LogoHub as often as they wanted to. There was no obligation to use it, should they dislike it or perceiving it as unhelpful.

4.2.3 Second Interview

After the testing phase, the participants were interviewed again. This time the goal was to collect their experiences and feelings from using LogoHub. They were encouraged to give honest feedback and they suggest features that should be added. The guide contained the following questions:

- Tell me your experiences with the website during the last two weeks.
- How often did you use the website?
- Did you encounter difficulties while using the website?
- Did the website affect your exercising behaviour?
- Did the website affect your motivation?
- What would you add to the website?
- Would you use such a website in the future?

4.3 Participants

Participants were recruited through personal contacts, by asking practicing therapists in different hospitals. First, a therapist needed to have both interest and time to participate. Then they asked their patients if they wanted to take part in the study. Once the patients had given their consent, they were contacted to clarify additional questions.

Andree et al. (2020) had focused on patients with dysarthria, which was also the initial target group for this thesis. That requirement was changed to any speech impairment however, since it proved quite difficult to find participants. The main reason for that was that many therapists had reported that they would be interested to take part but simply lack the time necessary to record and upload exercises. Another reason was that dysarthria patients are often not aware of their impairment, which is also mentioned by Frieg et al. (2017). This wider requirement is still considered to be relevant since chapter two showed that exercising and repetition is important in different areas of speech therapy.

Apart from going to speech therapy, patients needed to own a device that can access the internet and be able to navigate web pages. In the end, three participants were recruited. All three are male, aged 48, 64 and 81. They all go to the same therapist at the same hospital, but for different reasons as shown in table 4.1.

All participants, including the therapist, were compensated with a 50.- CHF gift card for the Migros grocery store chain. They were informed about the gift card after the testing phase, to ensure that no one would feel forced to use LogoHub and thus falsify their experience with it.

ID	Age	Sex	Reason for Therapy
P1	64	M	His spine presses against the throat, which causes it to be sore and leads to swallowing problems.
P2	81	M	Suffers from coughing attacks due to untrained throat muscles.
P3	48	M	Had to remove a cyst on vocal cords, needs exercises to normalize his voice.

Table 4.1: Participant data

Chapter 5

Results

In this chapter, the results of the interviews are presented. Common themes were defined for each interview, based on the participants' statements.

5.1 Current Practices and Experiences

The findings from this interview correspond to

RQ1: *"How do speech and language therapy patients repeat exercises at home?"*

5.1.1 Introduction of Exercises

The therapist introduces one to three new exercises to a patient in each therapy session. She explains and demonstrates an exercise, then the patient has to repeat it. After the session, the patients are advised to repeat the exercise at home at least daily and receive instructions on paper. P1 and P2 like to use the papers, since they help them understand the exercises better. *"Since I have many exercises, it's nice sometimes to have something to help remembering the instructions."* P3 on the other hand said *"No, they are simple exercises. [...] I have never needed the papers."* but when asked what to do if they were more difficult he answered *"I'd probably write them down somewhere, since if they are more complex there are certain points that should not be forgotten."* It can be important for patients to receive exercises step by step, to not overwhelm them. P1: *"I prefer she gives me a task for the next time instead if she tells me 'Look, we have to work through this' (all exercises together)."*

5.1.2 Motivation

Even though they exercise daily, all participants said that it can be difficult for them to find the motivation to do so sometimes. P2: *"I do want to practice and improve, but I have other therapies as well [...] sometimes it's very stressful."* When asked if they had a way to motivate themselves, P1 said he likes to do simple exercises while playing a game on his phone, *"It distracts me and (might be an illusion) while I play it, I subconsciously do more exercises."* The other participants do not have a trick, they just push themselves. P3: *"Well, I'm never really motivated for these kinds of exercises. [...] I need to remind myself to do it."*

5.1.3 Tools

The participants were asked if they use any tools while exercising, for example recording themselves. None of them use any, apart from the exercise sheets they got from the therapist. Two participants thought that recording themselves wouldn't be helpful. P3: *"It can be weird to hear one's own voice."*

5.1.4 Feedback

Two participants mentioned that they would be interested to be able track their exercise progress. P2: *"In theory one could document the progress. [...] A feedback system that would not have to be applied every time but maybe weekly or so"*. One participant thought about the possibility to analyze the state of the voice in the future, while another thinks that the therapist's feedback is enough. P1: *"I must show it to her (therapist) every time and she notices if I have exercised or not."*

5.2 Testing Phase

The insight from the second interview provide answers to

RQ2: *"How do speech and language therapy patients respond to LogoHub?"*.

5.2.1 Usage

LogoHub was mostly used as a source of detailed instructions. P3: *"To check it's good, to have a quick peek, but I didn't use it during exercising [...] used it as an encyclopaedia. That was nice."* P1 used it every day first, then every second, while P3 used it about three times in total. P3: *"Since I had relatively easy exercises, I opened it two or three times and had a peek in between."* Both would want to use it in future therapy. When asked if he wanted to continue using LogoHub after the interview was done, P1 said: *"Yes, with pleasure. I am not done yet."*

5.2.2 UI and UX

Both participants had no difficulties in navigating the website and liked the general user flow. P1: *"Apart from that, all in all it's clear, one can find their way."* and P3: *"The navigation worked nicely. I noticed that there are multiple places where I can navigate forward or backward. [...] I like that there are multiple ways of doing it."* P3 mentioned that the navigation back to the main menu could have been better: *"think for the navigation as a whole, you have to come up with a better way for getting back to the main menu. I think that was not always available, one or two times I had to click back one time"*. P1 thought that on the exercise overview page, exercise and sessions could be displayed in the same column. *"I personally think that the second column is unnecessary. I'd have the exercises and weeks (sessions) in the second, now third) column and select them directly."* He also suggested that the search function, which now filters session names, should also look for exercise names.

5.2.3 Exercises

Exercises were visible as soon as they were assigned to a participant. This could potentially be confusing for some patients. P3: *"I noticed that all sessions were unlocked from the start. That was fine for me, I don't know if it could be bad for somebody else, if they can see what the future holds for them."* The exercise page was generally liked by both participants. P3: *"Considering that, it's good, also the design with video and text below, that makes sense."* They did encounter some issues though. The standby mode of the video player did confuse P1, because it hid many of its buttons (figure 5.1). P1: *"If you are on the website and she calls you, then you are distracted and then you only see the logo of the University Hospital (actually the logo of UZH)."* The therapist was free to record the videos however she wanted. This led to some videos having different sizes or lower volume. P1: *"When she speaks, it's extremely quiet. I don't know if it has to do with the microphone or if it was possible to increase the volume settings even more"* or P3: *"I noticed that the videos had different sizes. [...] When I watched it my smartphone, I couldn't always zoom in."* Multiple variants of an exercise all had their own page, this might lead to redundancy. P3: *"There are a lot of 'Ah I've seen this already and then it's explained again. It needs to be estimated how well that works, because I clicked through it five times to see that 'ok, I know this already'. One could say there are variants, one exercise with five variants."* P1 missed the possibility to mark exercises as done. P1: *"I told her that when an exercise is done, it could be marked or coloured in some way, to show that it has been completed. With these few exercises it's no problem."*

5.2.4 Motivation

LogoHub managed to support the motivation of both participants by engaging the participants, P1: *"Motivation in a way, since you watch the video more often."* and by giving them the feeling that they are doing repeating the exercises correctly P3: *"I think the exercising behaviour gets affected, if you can, as an encyclopaedia, see how an exercise is done correctly."*

5.2.5 Reminder

P3 thought that a reminder function would be helpful: *"I thought as input, a type of reminder [...] like you haven't logged in for 2 weeks, if you want to check how to do the exercises correctly, receive an e-mail. I don't know how this would work with privacy concerns."* and *"If you see that someone has not been logged in for some time, send an SMS once: 'You've got an appointment soon or you haven't logged in a while.' That could be a reason to login and see if you do the exercises correctly."*

5.2.6 Further Improvements

P1 mentioned that he would have liked to have a contact page: *"What I still don't like is that there are no contacts on the left side. Like e-mail, or a text field that allows to send a message to her or you."*



(a) Active



(b) Inactive

Figure 5.1: P1 was confused when the buttons of the player disappeared.

Chapter 6

Conclusion

This thesis aimed to explore how speech and language therapy patients would react to LogoHub. They had access to exercises created and assigned from their therapist, which they had to repeat at home. To achieve that, three speech therapy patients were in a first step interviewed about their current therapy practices and experiences. They were asked about how and when they exercise, what tools and techniques they use to support their exercise and how they manage their motivation. In a next step, the participants were able to test LogoHub for two weeks. During this phase, they could use it as often as they wanted and there was no minimum number of times. In a final step, the second interviews gave insight into how the participants experienced and used LogoHub during the two weeks. This thesis continues the work of Andree et al. (2020), who reflected whether modern media could be used in dysarthria therapy, to allow patients to exercise independently and thus increase their exercise frequency, which could improve the patients' conditions.

The first interviews showed that all three participants have a similar relation to do-at-home exercises. While they do like exercising and improving their condition, they can find it difficult sometimes to get motivated to start exercising. They all use instructions on paper or take notes to remember important details about exercises. It was also discovered that the participants are interested in additional functions apart from exercising. The first is a reminder function, which would send an e-mail or SMS if a patient had not logged in a while. The other is a documentation of a patient's progress through the therapy, to see what they have achieved so far. This was also a function of the prototype in section 2.4.4.

The second interviews showed that LogoHub can have a positive effect on the motivation and cause the patients to keep up their exercise schedule. The most important part was that LogoHub allowed them to access detailed information when and where they needed it. Another point is that instruction videos were perceived as more engaging than on paper, even though P3 also said that it would not make a difference what exactly is shown in the video if it is clear and understandable. Both participants could use LogoHub on their own, which suggests that the simple design is working well. One glaring issue is the quality of the recordings, as mentioned by P1. Therapists may not have easy access to good recording equipment, so it could be difficult for them to create high quality videos, which are needed to deliver detailed instructions.

From both interviews, the following design implications were derived, some which support design decisions of the HCI prototype: *reminder* functions which can be customized to the patient's wishes. These could make the patients open LogoHub and guide them to the exercises or help them not forgetting their therapy sessions. A system or page which documents the *progress* of a patient is of interest to patient. *Gamification* should be used with caution. Even though it can make exercises more engaging, it can also over-complicate things for certain users.

This thesis made the following contributions: The basis for a website-based solution to support speech and language therapy patients. Insight into experiences and practices of speech and language therapy patients. Design implications for the website and other speech and language therapy applications were derived.

Chapter 7

Discussion & Future Work

This chapter covers the limitations of this thesis and implications for future research in the use of technology in speech therapy.

A big limitation of this thesis was the set of participants. With three participants it was already small and this was further impacted by one of them forgetting to use LogoHub. All three participants are going to the same speech therapist. Different therapist might take different approaches to exercises.

With two weeks, the testing phase was rather short, and the participants might have used the website more often because of the novelty effect. Due to a delay in finding participants for the study, the testing phase took place over Christmas and New Year. This meant that the participants had a different schedule than usual and may have had more or less time for exercising.

Another limitation is that this thesis only considered the experiences of patients, not therapist. There are possible problems for including LogoHub in their therapy plan: Creating the exercises takes time. Therapists must record videos and write descriptions. While this workload might be very high in the beginning, it might be lower in the long run, since the same exercise can be used for many patients. Still, if therapists have very little time for each patient, it may make the use of LogoHub just not feasible for them. Another potential problem is the quality of the recordings. Andree et al. (2020) have stated that the recordings should be in high quality, which requires a proper recording setup. This might simply not be available or affordable for some therapists. Therefore, it is important to explore the view of the therapists on LogoHub in future research, to avoid building a system which they could not effectively use.

This was a qualitative study which aimed to capture the patients' reactions to LogoHub. While the potential for such a website was supported, this thesis cannot tell if it is truly having a positive effect on the therapy. Therefore, it should be followed up with a quantitative study trying to measure the effect of LogoHub on the therapy progress.

The prototype that was designed during the HCI course was much more sophisticated than LogoHub. While LogoHub only covered basic creation and accessing of

exercises, there is still gamification, scheduling and reminders, as well as feedback and progress report, which haven't been evaluated yet. Since this thesis showed that patients are potentially open to these ideas, LogoHub should be further developed and tested.

It would be interesting to see if the concept of this website could be applied to other therapeutic areas, which also require their patients to repeat exercises at home, for example physiotherapy. Patients there may have the same problems with remembering exercises and motivating themselves to exercise.

Bibliography

- Andree, D., Fässler, V., & Winkelmann, V. (2020). *Angeleitete eigenarbeit in der dysarthrie-therapie - übdy : Eine didaktisch aufbereitete übungssammlung unter berücksichtigung des einsatzes neuer medien*. Interkantonale Hochschule für Heilpädagogik (HfH) Zürich.
- Beijer, L. J., Rietveld, T. C., Hoskam, V., Geurts, A. C., & de Swart, B. J. (2010). Evaluating the feasibility and the potential efficacy of e-learning-based speech therapy (est) as a web application for speech training in dysarthric patients with parkinson's disease: A case study. *Telemedicine and e-Health*, 16, 732–738. <https://doi.org/0.1089/tmj.2009.0183>
- Bhagal, S., Teasell, R., & Speechley, M. (2003). Intensity of aphasia therapy, impact on recovery * aphasia therapy works! *Stroke; a journal of cerebral circulation*, 34, 987–93. <https://doi.org/10.1161/01.STR.0000062343.64383.D0>
- Bilda, K., Mühlhaus, U., & Ritterfeld, U. (2017). *Neue Technologien in der Sprachtherapie*. Georg Thieme Verlag KG.
- Ferguson, S., Johnston, A., Ballard, K., Tan, C. T., & Perera-Schulz, D. (2012). Visual feedback of acoustic data for speech therapy: Model and design parameters, 135–140. <https://doi.org/10.1145/2371456.2371478>
- Frieg, H., Leinweber, J., Ritterfeld, U., & Bilda, K. (2017). Assistive Technologien in der Dysarthrietherapie. Entwicklung des Trainingssystems ISi-Speech als Anwendungsbeispiel. *Forum Logopädie*, 31, 10–15. <https://doi.org/10.2443/skv-s-2017-53020170302>
- Gerber, S., Schütz, N., Uslu, A., Schmidt, N., Röthlisberger, C., Wyss, P., Perny, S., Wyss, C., Koenig-Bruhin, M., Urwyler, P., Nyffeler, T., Marchal-Crespo, L., Mosimann, U., Muri, R., & Nef, T. (2018). Therapist-guided tablet-based tele-rehabilitation for patients with aphasia: Proof of concept and usability study (preprint). *JMIR Rehabilitation and Assistive Technologies*, 6. <https://doi.org/10.2196/13163>
- Halpern, A., Ramig, L., Matos, C., Petska-Cable, J., Spielman, J., Pogoda, J., Gilley, P., Sapir, S., Bennett, J., & McFarland, D. (2012). Innovative technology for the assisted delivery of intensive voice treatment (lsvt ® loud) for parkinson disease. *American journal of speech-language pathology / American Speech-Language-Hearing Association*, 21. [https://doi.org/10.1044/1058-0360\(2012/11-0125\)](https://doi.org/10.1044/1058-0360(2012/11-0125))
- Katz, W., Campbell, T., Wang, J., Farrar, E., Eubanks, J., Balasubramanian, A., Prabhakaran, B., & Rennaker, R. (2014). Opti-speech: A real-time, 3d visual

- feedback system for speech training. *Proceedings of the Annual Conference of the International Speech Communication Association, INTERSPEECH*, 1174–1178.
- Norman, D. A. (2002). *The design of everyday things*. Basic Books.
- Portigal, S. (2013). *Interviewing users: How to uncover compelling insights*. Rosenfeld Media.
- Royal College of Speech and Language Therapists. (n.d.). *What is speech and language therapy?* <https://www.rcslt.org/wp-content/uploads/media/Project/RCSLT/rcslt-what-is-slt-factsheet.pdf> (accessed: 03.02.2022)
- Sidock, J. (2011). Critical review: Is the integration of mobile device apps' into speech and language therapy effective clinical practice?
- Siegmüller, J., & Bartels, H. (2017). *Leitfaden Sprache Sprechen Stimme Schlucken*. Elsevier.
- Stark, B., & Warburton, E. (2016). Improved language in chronic aphasia after self-delivered ipad speech therapy. *Neuropsychological Rehabilitation*, 28, 1–14. <https://doi.org/10.1080/09602011.2016.1146150>
- Starke, A., & Leinweber, J. (2018). App-Einsatz in der Sprachtherapie. Die Nutzung evidenzbasierter und ethisch orientierter Strategien für die Auswahl von Applikationen. *Forum Logopädie*, 32, 22–26. <https://doi.org/10.2443/skv-s-2018-53020180204>
- World Health Organization. (2002). *Towards a Common Language for Functioning, Disability and Health: ICF The International Classification of Functioning, Disability and Health*. World Health Organization. Geneva. <https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health>

Appendix A

Recruitment Flyer (German)

The following pages contain the flyer that was handed to speech and language therapists, which they then discussed with their patients.



Bachelorarbeit: Eine Onlineplattform zur Unterstützung von Logopädie-Patientinnen und -patienten

Ziel der Arbeit

Eine Onlineplattform soll Logopädie-Patientinnen und -patienten bei der angeleiteten Eigenarbeit unterstützen. Dazu erstellen Therapierende zuerst Videoaufnahmen von Übungen, welche sie zuvor mit ihren Patientinnen und Patienten in der Therapiestunde besprochen haben, und laden diese dann auf die Plattform hoch. Dadurch haben die Patientinnen und Patienten auch ausserhalb der Therapie Zugriff auf professionelle und massgeschneiderte Instruktionen in hoher Qualität und multimodaler Form. Es wird erhofft, dass sich dadurch die Übungsfrequenz und -effizienz erhöhen lässt.

Mit dieser Arbeit soll zuerst das jetzige Übungsverhalten von Patientinnen und Patienten untersucht werden. In einem zweiten Schritt wird untersucht, ob eine solche Plattform die Eigenarbeit der Patientinnen und Patienten unterstützen könnte.

Ablauf

- Erstes Interview Ende November. Thema ist das aktuelle Übungsverhalten.
- 2-wöchige Testphase der Plattform im Dezember. Es gibt keine Mindest- oder Maximalnutzungszeit.
- Zweites Interview Anfang Januar. Dabei soll das Übungsverhalten während der Testphase besprochen werden.
- Ein schriftlicher Fragebogen, um die Nutzerfreundlichkeit der Plattform zu ermitteln.

Teilnahmebedingungen

- Sie sind mindestens 18 Jahre alt.
- Sie verfügen über solide Deutschkenntnisse.
- Sie nehmen momentan Logopädietherapie in Anspruch.
- Sie verfügen über einen Computer mit Internetzugang.
- Sie können selbständig Seiten im Internet besuchen.
- Sie sind bereit, mehrere Stunden zu investieren, um an dieser Studie teilzunehmen.

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Appendix B

Consent Form Therapist (German)

This appendix contains the consent form for therapists, which was signed once they agreed to participate in the study.

Einverständniserklärung für Therapierende

Eine Bachelorarbeit über eine Übungsplattform für Dysarthriepatientinnen und -patienten

Sehr geehrte Damen und Herren,

Mit dieser Arbeit soll ein Einblick in das Übungsverhalten von Dysarthriepatientinnen und -patienten ermöglicht werden. Des Weiteren soll herausgefunden werden, ob eine Übungsplattform in Form einer Webseite eine Ergänzung zu der Therapie darstellen könnte. Auf dieser Plattform können Therapierende Übungen in multimodaler Form zur Verfügung stellen, um damit die Eigenarbeit ihrer Patientinnen und Patienten zu unterstützen.

Was wird von mir verlangt?

Wenn Sie an dieser Arbeit teilnehmen, wird folgendes von Ihnen verlangt...:

- (1) ...selbst erstellte Video- und Audioaufnahmen, in welchen Sie Übungen für Ihre Patientinnen und Patienten vorzeigen und erklären.
- (2) ...zusätzliche Zeit pro Patientin oder Patient, da Sie die Übungen aufnehmen, hochladen und beschreiben müssen.
- (3) ...eine schriftliche Umfrage, in welcher Sie zu der Bedienbarkeit und Nutzerfreundlichkeit der Webseite befragt werden.

Welche Daten werden gesammelt?

Die Video- und Audioaufnahmen werden von den Therapierenden selbst erstellt und hochgeladen. Dazu kommen die Daten der schriftlichen Umfrage.

Was passiert mit den Daten?

Alle Ihre Daten werden anonymisiert. Digitale Daten werden auf passwortgeschützten Geräten gespeichert, während physische in verschlossenen Schränken der Universität Zürich aufbewahrt werden. Die Daten werden spätestens nach 5 Jahren gelöscht.

Die Webseite wird durch Passwörter vor unberechtigt Zugriff geschützt. Patientinnen und Patienten haben nur Zugriff auf die Aufnahmen von ihrer spezifischen therapierenden Person. Die Webseite wird nur während der Testphase verfügbar sein.

Gibt es Risiken?

Die Teilnahme an der Arbeit ist freiwillig und vertraulich. Ihre Daten werden anonymisiert. Falls die Daten jemals mit jemanden ausserhalb des Forschungsteams geteilt werden, inklusive schriftlicher Artikel oder mündlicher Präsentationen basierend auf dieser Arbeit, dann werden Sie nur anhand von einer Nummer (z.B. P3) oder einem Pseudonym identifiziert.

Sie können ihre Teilnahme an der Arbeit jederzeit zurückziehen, ohne sich dafür rechtfertigen zu



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müssen. Mit Ihrem Einverständnis würden aber alle Daten, die bis dahin gesammelt wurden, weiterhin für die Arbeit verwendet werden.

Gibt es Vorteile, um an der Studie teilzunehmen?

Mit Ihrer Teilnahme unterstützen Sie die Forschung des Übungsverhaltens von Dysarthriepatientinnen und -patienten. Falls Sie an den Resultaten der Arbeit oder an zukünftigen Studien Teilnehmen möchten, werden wir Sie gerne informieren.



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Berechtigungen

Bitte kreuzen Sie alle Punkte an, mit welchen Sie einverstanden sind:

Video- und Audioaufnahmen: Ich erlaube, dass meine Aufnahmen auf der Webseite im Rahmen dieser Arbeit verwendet werden.

___ für Analysen von Forschenden im Rahmen dieser Arbeit.

___ für die Nutzung für interne und externe Artikel und Präsentationen.

Weitere Nutzung von anonymisierten Daten

___ Ich erlaube die Nutzung meiner anonymisierten Daten für Forschende des People and Computing Lab der Universität Zürich für weitere Untersuchungen und Analysen.

Mit Ihrer Unterschrift bestätigen Sie Folgendes:

- Dass mir die Studie von einer Forschenden Person erklärt wurde und alle Bedingungen genannt wurden.
- Ich konnte Fragen stellen.
- Die Antworten waren für mich klar und verständlich.
- Ich bin mindestens 18 Jahre alt.
- Ich hatte genug Zeit um über meine Teilnahme nachzudenken.
- Ich möchte an der Arbeit teilnehmen.

Mit Ihrer Unterschrift werden Ihre persönlichen Rechte in keiner Weise beeinträchtigt. Sie dürfen Ihre Teilnahme an dieser Arbeit zu jedem Zeitpunkt zurückziehen. Fall Sie Fragen haben sollten, dürfen Sie diese jederzeit stellen.

Name der teilnehmenden Person

Name der forschenden Person

Ort und Datum

Ort und Datum

Unterschrift der teilnehmenden Person

Unterschrift der forschenden Person

Fragen?

Bei Fragen dürfen Sie sich jederzeit bei uns melden:

Marino Schneider (primär)
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Universität Zürich

Prof. Elaine M. Huang, Ph.D.
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Universität Zürich

Appendix C

Consent Form Patient (German)

This appendix contains the consent form for patients, which was signed before the first interview.

Einverständniserklärung für Patientinnen und Patienten

Eine Bachelorarbeit über eine Übungsplattform für Logopädiepatientinnen und -patienten

Sehr geehrte Damen und Herren,

Mit dieser Arbeit soll ein Einblick in das Übungsverhalten von Logopädiepatientinnen und -patienten ermöglicht werden. Des Weiteren soll herausgefunden werden, ob eine Übungsplattform in Form einer Webseite eine Ergänzung zu der Therapie darstellen könnte. Auf dieser Plattform können Therapierende Übungen in multimodaler Form zur Verfügung stellen, um damit die Eigenarbeit ihrer Patientinnen und Patienten zu unterstützen.

Was wird von mir verlangt?

Wenn Sie an dieser Arbeit teilnehmen, wird folgendes von Ihnen verlangt...:

- (1) ...eine 2-wöchige Testphase einer Webseite, auf welcher Sie Übungen von Ihrer therapierenden Person vorfinden. Es gibt keine Mindest- oder Maximaltestzeit, Sie dürfen die Webseite so oft nutzen, wie Sie möchten.
- (2) ...zwei Interviews, wobei das Erste vor der Testphase stattfinden wird und Sie über Ihr aktuelles Übungsverhalten befragt werden. Das Zweite wird nach der Testphase durchgeführt, wo Sie über den Einfluss der Webseite auf Ihr Übungsverhalten befragt werden.
- (3) ...eine schriftliche Umfrage, in welcher Sie zu der Bedienbarkeit und Nutzerfreundlichkeit der Webseite befragt werden.

Welche Daten werden gesammelt?

Die Interviews werden aufgezeichnet und ganz oder teilweise transkribiert. Dazu kommen die Ergebnisse der schriftlichen Umfrage. Sie werden nach demographischen Daten gefragt, wie Alter oder Geschlecht.

Was passiert mit den Daten?

Alle Ihre Daten werden anonymisiert. Digitale Daten werden auf passwortgeschützten Geräten gespeichert, während physische in verschlossenen Schränken der Universität Zürich aufbewahrt werden. Die Daten werden spätestens nach 5 Jahren gelöscht.

Gibt es Risiken?

Die Teilnahme an der Arbeit ist freiwillig und vertraulich. Ihre Daten werden anonymisiert. Falls die Daten jemals mit jemanden ausserhalb des Forschungsteams geteilt werden, inklusive schriftlicher Artikel oder mündlicher Präsentationen basierend auf dieser Arbeit,



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dann werden Sie nur anhand von einer Nummer (z.B. P3) oder einem Pseudonym identifiziert.

Sie können ihre Teilnahme an der Arbeit jederzeit zurückziehen, ohne sich dafür rechtfertigen zu müssen. Mit Ihrem Einverständnis würden aber alle Daten, die bis dahin gesammelt wurden, weiterhin für die Arbeit verwendet werden.

Gibt es Vorteile, um an der Studie teilzunehmen?

Mit Ihrer Teilnahme unterstützen Sie die Forschung des Übungsverhaltens von Logopädiepatientinnen und -patienten. Falls Sie an den Resultaten der Arbeit oder an zukünftigen Studien teilnehmen möchten, werden wir Sie gerne informieren.



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Berechtigungen

Bitte kreuzen Sie alle Punkte an, mit welchen Sie einverstanden sind:

Audioaufnahmen: Ich erlaube, dass meine Stimme im Rahmen eines Interviews aufgezeichnet wird.

_____ für Analysen von Forschenden im Rahmen dieser Arbeit.

_____ für die Nutzung für interne und externe Artikel und Präsentationen.

Weitere Nutzung von anonymisierten Daten

_____ Ich erlaube die Nutzung meiner anonymisierten Daten für Forschende des People and Computing Lab der Universität Zürich für weitere Untersuchungen und Analysen.

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Name der teilnehmenden Person

Name der forschenden Person

Ort und Datum

Ort und Datum

Unterschrift der teilnehmenden Person

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Fragen?

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Appendix D

Interview Transcripts

The following pages contain the partial transcripts from the interviews.

P1 – Interview 1

Date: 09.12.21

Place: At the hospital, after therapy.

Notes: Translated from Swiss German to English

00:36: *How old are you?*

I am 64

00:45: *What is your profession?*

Bus driver

00:56: *Where do you go for speech therapy?*

Here (at the hospital where the interview took place)

01:00: *And not elsewhere?*

No

01:04: *What's the reason you come here (for therapy)?*

My spine pressed into my throat, which prevents me from swallowing correctly. I always get a sore throat, depending on how I turn my head.

01:26: *Do you exercise do strengthen or relieve (your throat)?*

To strengthen and to allow food to be swallowed correctly.

01:48: *Tell me, how does a therapy session look like, when you come here (to therapy)?*

[...] after a recap, new exercises are introduced. [...]

3:25: *You're told to do these exercises at home?*

Yes [...] since I have many exercises, it's nice sometimes to have something to help remembering the instructions (referring to the instructions on paper)

5:34: *How often do you exercise?*

Daily, [...] I do the smaller exercises subconsciously.

7:20: *(After some off topic talk)*

I'm glad that she is patient and is ready to take more time if a problem arises. Sie is understanding; she does not follow a strict schedule. [...] It's very important to me that she explains things correctly and I can always ask questions.

8:40: *What's her recommendation on how often you should exercise?*

She says as much as possible. I told her I'll try my best. [...] for somebody on the outside, these exercises may seem silly, since for them everything works fine. When somebody affected, you learn step by step what it means (to have that impairment).

10:20: *So, you get one new exercise per week?*

Yes, sometimes it's a repetition from the last session.

11:15: *You exercises mostly at home?*

Yes, it's difficult to do it while working. Small exercises are ok but the passengers are always looking.

13:16: *Do you enjoy exercising or is it more a must?*

I like exercising, [...] else I wouldn't do it. I know it's hard but I'm strict with myself.

14:07 *How do you motivate yourself to exercise?*

I play a game; it's called Hay Day. It's a forum game. It distracts me and (might be an illusion) while I play it, I subconsciously do more exercises. If I force myself then I can do it about 2 or three times.

15:13: *You mean include into your daily life?*

For me yes, but everyone has their own way.

15:31: *About exercises in detail, you said you go through them, if you are unsure then you look at the paper (instructions). Do you use other tools to exercise, like recording yourself?*

No, [...] I must show it to her every time, and she notices if I have exercised or not.

17:28: *Do you think it could be helpful to record yourself?*

No

18:48: *Do you want to tell me anything else about exercises or therapy?*

I prefer she gives me a task for the next time instead if she tells me "Look, we have to work through this" (all exercises together).

20:08: *Do we have to discuss anything else?*

I think the questions will come up later.

P1 – Interview 2

Date: 03.01.22

Place: At a restaurant

00:33: *I'd like to hear your experience from these two weeks (the testing phase).*

The login has worked without any problems. [...] The page runs, the only thing I'd change: On the left is the column with the menu guidance (menu bar). If you click on it a second column opens (exercise overview page). I personally think that the second column is unnecessary. I'd have the exercises and weeks (sessions) in the second, now third) column and select them directly. [...] I understand that the others (more exercises/units) will be added, that there will be more and which would then justify the second column. What I told you and her that the column appears but the text not. [...] That's good. What I still don't like is that there are no contacts on the left side. Like e-mail, or a text field that allows to send a message to her or you. I'd have liked that, since every homepage has contact forms or a text[field] or "Was helpful" with a checkmark, you know this little boxes. [...]

And, the third thing, I told you already. The volume (of the videos). When she speaks, it's extremely quiet. I don't know if it has to do with the microphone or if it was possible to increase the volume settings even more. [...]

I understood everything but I have to listen very closely. I think I told you that from the stance, she has a clear voice and it's much better. [...]

Apart from that, all in all it's clear, one can find their way. I told her that when an exercise is done, it could be marked or coloured in some way, to show that it has been completed. With these few exercises it's no problem. [...]

And the last (point) was the search function. I don't know how they (the exercises) are all called. "Mendelson" I could memorize. For this short thing (test phase) it's not really worth it but at least if you could see "Well, he has there in the search[bar]". [...]

All in all, I'm satisfied.

06:46: *How often did you use it?*

Well, at the beginning I used it every day. [...] If you are on the website and she (I assume his wife) calls you, then you are distracted and then you only see the logo of the University Hospital (Actually the logo of University of Zurich, which was used as the thumbnail for all videos. P1 is referring to the fact that the videos show the thumbnail once they are completed, and all buttons fade out until the user hovers over the video with the mouse). Then it is no longer there. If you move (the cursor) it does not appear as well. You can only click on “play” and just then. That’s what I didn’t find from the beginning but apart from that, well done.

08:11: *You told me about difficulties with the website but how about when doing the exercises with the videos? Did that go well?*

It went well.

08:39: *You told during the first interview that you are somebody who exercises regularly. Do you think it influenced your behaviour? Your motivation or the frequency?*

Motivation in a way, since you watch the video more often. Yet, if you have to listen carefully (the volume of the videos was very low sometimes) and listen to her at the same time, that can be quite exhausting for me, for others less maybe. [...] At the bottom you can see the instructions but if you have a video then the focus shifts automatically to the image.

10:23: *We the new recordings she made easier to understand?*

A little better, but depending how she turned her head to show, the additional volume gets reverted. [...]

I have to say, I showed to my doctor, as I asked you if it was okay to do. He said it is clear and understandable. [...] The only thing he criticised is that of something is not understandable, you can’t give immediate feedback.

12:29: *What do you think, if it would be improved could you imagine using it regularly?*

Absolutely. It’s no replacement but rather support. You don’t have to ask “Why are you doing this...”

12:59: *Was there a moment where you weren't sure how an exercise goes and could look it up.*

Exactly.

13:36: *Would you be interested to use the website as it is for a while longer?*

Yes, with pleasure. I am not done yet.

14:56: *Once again about the frequency, you said you used it every day first and after that, on average?*

Every second day.

15:34: *If everything would work perfectly, would you also use it twice every day?*

Yes, if it was more interesting, then every day.

P2 – Interview 1

Date: 09.12.21

Place: At a cafe

Notes: Translated from Swiss German to English

02:44: *How old are you?*

81

02:48: *And what was your profession?*

I was the head of an institute, which concerned itself with questions about early childhood, pre-birth until beginning of school or further. Maybe you've heard of it, the (removed, to guarantee anonymity). I was its head for 30 years. I also gave lectures at the University of Zurich and Fribourg about children with behavioural problems.

03:36: *Why are you going to speech therapy? What's the reason?*

I've got a strong cough, I had coughing attacks and thought it might be because of breadcrumbs or similar and I wanted to be sure that the attacks are not related to the brain stem stroke. People are not allowed to eat solid food for some time after a brain stem stroke or any stroke. I just wanted to know if the palate was ok. They found out it was due to a lack of exercising and badly handled.

04:22: *You only go to her (the therapist) for speech therapy? Not anywhere else?*

For this (speech therapy), no.

04:33: *Now, let's talk about a therapy session in detail. How does it go when you go to her? Please just tell me.*

Well, she has prepared documents, printed out from "Frau Hotzenköcherles" handbook, shows them to me and I have to repeat them.

05:01: *You do one or more exercises per session?*

Per session there are three to four. She shows them, how the throat moves.

05:48: *The exercises you do are for, what exactly do you train with them?*

Well, position of the tongue and soft palate, as well as, how does one say, exhaling stored air. Another important thing is that I do sound ladders, from deep to high ones.

07:03: *Does she give you exercises to do at home, or do you do the exercises from the therapy session at home?*

She gives me exercises to do at home. The documents we look at three to four times, and then I go home with them.

07:29: *How often does she recommend you to exercise? Does she do even do that?*

She probably expects me to do only this. I do it when I feel like I have the time. [...]
Once you sit down, I am occupied and can't be disturbed.

08:12: *How often do you exercise, on average?*

Daily

08:19: *Where do you do that?*

At home.

08:30: *Do you use any tools?*

[...] I've got the documents.

09:30: *Do you like exercising or do you feel you have to?*

I do want to practice and improve, but I have other therapies as well [...] sometimes it's very stressful.

10:09: *How do you motivate yourself if you don't feel like it. Is there any trick?*

No, I don't have any tricks. I have to push myself.

10:24: *Is there anything that could help. Is it helpful for the therapy if someone is present?*

In theory one could document the progress. My wife takes Spanish lessons every day. She gets an evaluation every time. [...] In a next step the state of the voice could maybe be analysed. [...] A feedback system that would not have to be applied every time but maybe weekly or so.

11:42: *Do you sometimes encounter difficulties during exercising? Are there situations where you forget how an exercise works?*

The documents are self-explaining.

11:58: *Do you think the exercises are helpful?*

Yes, yes [...] I no longer have these coughing attacks.

12:18: *Is there anything else you want to say about exercises? Any other experience?*

It not publicly discussed that this zone (mouth region) is needing special attention. [...] The advantage of the way [the therapist] presents it with these documents it's more insightful. [...] It's specific things like the tongue or palate. It's more detailed. [...] Without the documents it would be catastrophic, I couldn't remember it all.

P3 – Interview 1

Date: 15.12.21

Place: During a video call

Notes: Translated from Swiss German to English

00:14: *First some personal questions about you: How old are you?*

I always need to calculate that [...] 48 in that case.

00:32: *What is your profession?*

I'm a software developer.

01:03: *Why do you go to speech therapy?*

A had a cyst on my vocal cords, which has been removed. Then I noticed, it took very long since it's a slow condition, that I'm still strained, after balancing, loosening and then it was decided to take 3 speech therapy sessions. Exercises to loosen and normalize the voice.

01:44: *Where to you take speech therapy?*

With (the therapist) at the USZ.

01:55: *Tell me how a therapy session looks like.*

I've had one so far. She first asked me what the reasons are for me to be there. [...] Then she told me what she wants to do in that session. In my case that where two special points, three actually. She showed that and we did these three things, exercised and then the session was already over.

02:40: *These points, are those different exercises more multiple exercises per point?*

They are three different exercises.

03:06: *You looked at them in therapy and she told you to do them at home.*

Yes exactly. She wrote the important points it on paper. I hope I can find this info on the website.

03:28: *Did she recommend how often you should exercise?*

[...] Every day if possible. She said I don't have to do them every day but it's a recommendation.

03:56: *With this recommendation, how often do you exercise?*

Until now, since I've been there last week, I've done it every day. I'm active in a sports club with kids, which is more work during evenings. I'm curious to see how it will be over Christmas and New Year, since there will be neither training nor work. It makes sense at the moment, and I noticed that it helps if I do it every day.

04:38: *Keeping in mind that you are new to the therapy, are you motivated, or do you need motivate yourself?*

Well, I'm never really motivated for these kinds of exercises. [...] I need to remind myself to do it. I suspect there is the danger of me forgetting about it. Let's see if it's better with a trigger like the website. An advantage of these exercises is that I can do them while sitting and while at the computer. Since I'm a software developer there would be the possibility for triggers or notifications.

05:33: *You mentioned it already but when you exercise, where do you do it?*

Either at the computer, like now or as she proposed, I can do them in the morning while getting a coffee. They are exercises that take only 10 to 20 seconds. The relaxation exercises in the evening I can do when I watch TV. [...] This works very well on the couch or while reading e-mails.

06:14: *You said you're not always motivated but when you exercise, do you like it?*

Yes, then I like it. The problem is with starting. [...] Since the exercises are simple and short and the result can be seen quickly, it's not a big obstacle.

06:35: *You think that they really help you?*

Yes, it (exercising) does definitely.

06:42: *You said you have the exercises on paper, but can you remember them well or do you have to...?*

No, they are simple exercises. [...] I've never needed the papers.

07:02: *If they were more complex, how would you memorize them?*

I'd probably write them down somewhere, since if they are more complex there are certain points that should not be forgotten.

07:23: *This may be redundant, but did you encounter difficulties while exercising so far?*

Not really. Maybe a very small point during the relaxation exercise. [...] This wasn't really a problem, rather something I noticed. This is one of the things that wouldn't have been important in my case but something that one has to remember to start the exercise correctly. [...] It's probably helpful if one can read it again.

08:35: *Is there anything else about exercises you want to tell me about?*

[...] I wouldn't want to upload my own recordings, only if (the therapist). would like to check. [...] On the topic of voice: it can be weird to hear one's own voice.

09:55: *I've heard of others that they would be interested to get feedback about their progress.*

That could be. I personally wouldn't do that, I wouldn't like that. More of a documented progress to see what I have achieved. [...]. This likely depends on each type of person.

10:25: *I thought about a method, well the checking by the therapist was an idea but technical difficulties, like: Is the quality of the recording good enough...*

Yes, exactly. They must settle the therapies and I don't know how that would work with the whole administration behind the scenes, etc. That it won't become too much work. People expect a quick response and that could be difficult for (the therapist).

P3 – Interview 2

Date: 13.01.22

Place: During a video call

Notes: Translated from Swiss German to English

00:10: Please tell me how the last two weeks went.

[...] The login worked well. I'm going to tell how I experienced it. The navigation worked nicely. I noticed that there are multiple places where I can navigate forward or backward. [...] I like that there are multiple ways of doing it. Depending on how people exercise it can work or not. I think for the navigation as a whole, you have to come up with a better way for getting back to the main menu. I think that wasn't always available, one or two times I had to click back one time [...]. Considering that, it's good, also the design with video and text below, that makes sense. I noticed that the videos had different sizes. [...] When I watched it my smartphone, I couldn't always zoom in. I assume that if [...], if you want to do something there (on the website) there will be a standard layout which fits the website, like dynamic rendering. [...] I noticed that all sessions were unlocked from the start. That was fine for me, I don't know if it could be bad for somebody else, if they can see what the future holds for them. [...] What I also noticed it there where many small steps. One exercise was split in five [...]. There are a lot of "Ah I've seen this already and then it's explained again. It needs to be estimated how well that works, because I clicked through it five times to see that "ok, I know this already". One could say there are variants, one exercise with five variants. That was about the general usage. Since I had relatively easy exercises, I opened it two or three times and had a peek in between. What I noticed, in the past two weeks what was nice where the small details. [...] If I asked myself in pasts two weeks "what did she say?" About the second exercise, I didn't write anything down because I thought that there will be a website to check but it know it's down of course. To check it's good, to have a quick peek, but I didn't use it during exercising [...] used it as an encyclopaedia. That was nice. [...]

I'd welcome it (the website) as an encyclopaedia to check at home. [...] I thought as input, a type of reminder [...] like you haven't logged in for two two weeks, if you want to check how to do the exercises correctly, receive an e-mail. I don't know how this would work with privacy concerns.

06:15: *During a pre-phase where I worked on this with another group we thought about gamification, for motivation, like, language apps. Login daily and get a bonus...*

Well, too much, you have to see if it's not too much. [...] It depends on who's going to work with it. People who work less with a computer, then you'd have to have it on the smartphone. There are also elderly who don't want to have to something with it. Then it has to be reduced, if there's no e-mail address then you send no e-mail, or send an SMS. Uni (referring to University Hospital) does it well, they send an SMS two days in advance. [...] If you see that someone has not been logged in for some time, send an SMS once: "You've got an appointment soon or you haven't logged in a while." That could be a reason to login and see if you do the exercises correctly.

07:46: *Anything else you want to tell me? Else I have one or two questions for you.*

No, that's what I noticed on the website and how I used it.

09:20: *Would you say the possibility to look up the exercises did influence your exercising behaviour? Did you exercise more frequently or where you more motivated because you could look it up?*

The problem is if you can't look it up and don't know if you are doing it correctly, then I feel you won't do it. It could help. [...] You have to make sure that the exercises are well explained. She did this well. Just have quick check. [...] It should not be overloaded. [...] I think the exercising behaviour gets affected, if you can, as an encyclopaedia, to see how an exercise is done correctly.

10:39: *You already talked about what you would add to the platform, can you think of anything else spontaneously?*

These were my points. Navigation was nice [...] size and format which I noticed. Video and text together are good. Info e-mail or SMS, I didn't need it but I thought that could be added as a goodie. [...]

One more thing, I told her that, she did upload all exercises, I don't know if the sessions were locked for the others. [...] If for example you have ten sessions and she prepares everything, it could stop people from exercising if they can see everything. [...] Like a website where you give a review first then it's activated.

12:57: *To conclude, could you imagine if you had to take more speech therapy, would you like to use it if it was available?*

Yes, for sure. [...] You don't have to take it home on paper etc., so for me it would be super if I had more speech therapy or elsewhere. It does not have to be limited to speech therapy, could also be physio or ergo therapy.


13:38: *Was it special because you knew miss A. from the sessions, would it have been different if it was a generic recording, and you wouldn't know that person?*


[...] this does not matter. [...] If it's a good recording, it could also be a comic or animated movie which shows certain things like stance. [...] For me it does not matter, it's important that there's a video and text which explain everything.

Appendix E

Screenshots

This appendix contains screenshots of LogoHub.

 Logo App

**Universität
Zürich^{UZH}**

ANMELDEN

[Passwort Vergessen?](#)

Figure E.1: Login page

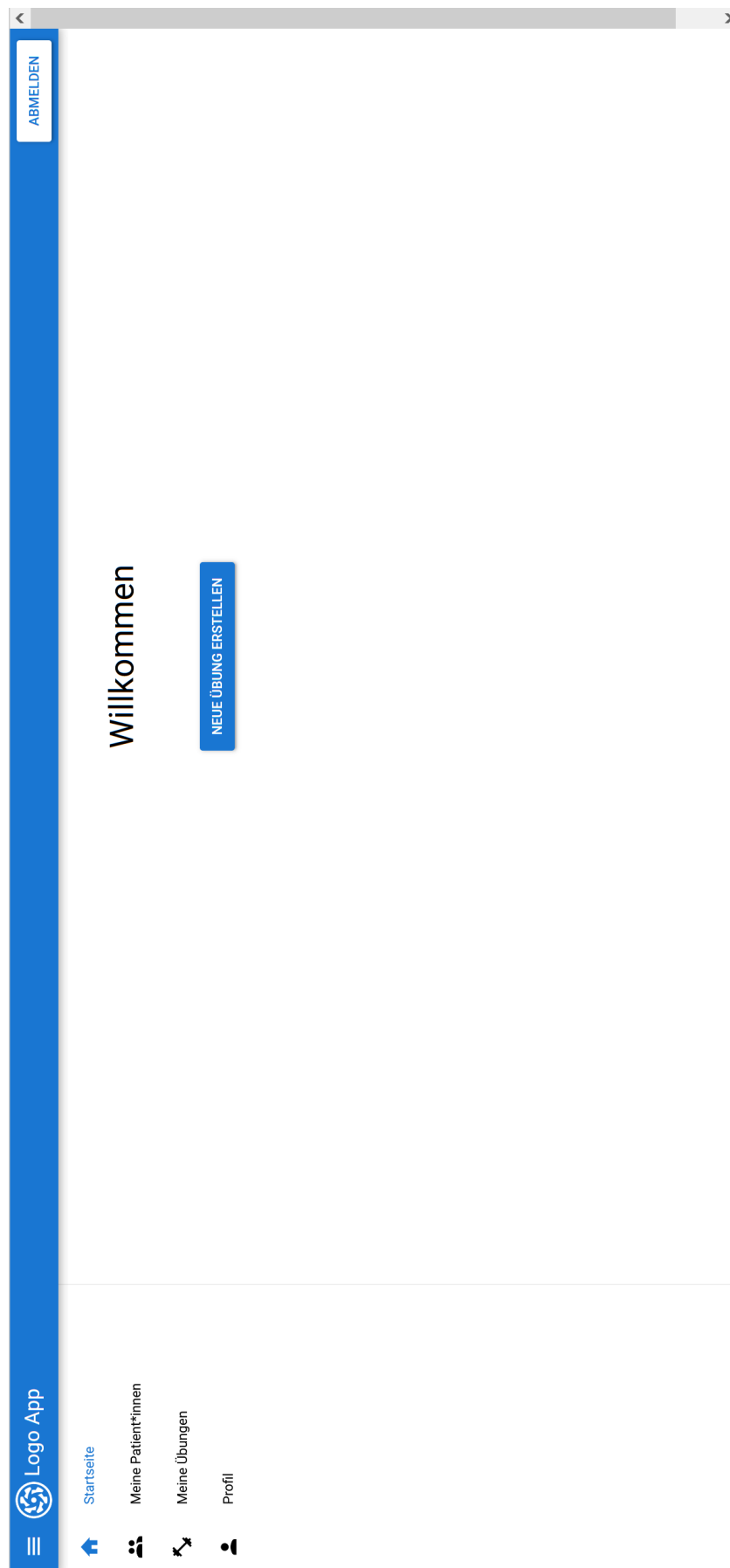


Figure E.2: Therapist's home page

[Startseite](#)
[Meine Patient*innen](#)
[Meine Übungen](#)
[Profil](#)

ABMELDEN

Meine Übungen

	Titel	Kategorie	Erstellt	
+	Kräftiges Schlucken	Dysphagie	14.12.2021	DETAILS LÖSCHEN

Zugewiesen zu

	Name ↑	Übungseinheit	
<input type="checkbox"/>	Patient 1	Woche 1	
<input type="checkbox"/>	Patient 2	Woche 1	

ZUWEISEN
ENTFERNEN

Records per page: 5 1-2 of 2

+	Modifiziertes Valsalva Manöver	Dysphagie	14.12.2021	DETAILS LÖSCHEN
+	Entspannung durch Ausstreichen	Dysphonie	15.12.2021	DETAILS LÖSCHEN
+	Kiefer Entspannung		15.12.2021	DETAILS LÖSCHEN
+	Mobilisieren Kehlkopf	Dysphonie	15.12.2021	DETAILS LÖSCHEN

Figure E.3: Therapist's exercise overview

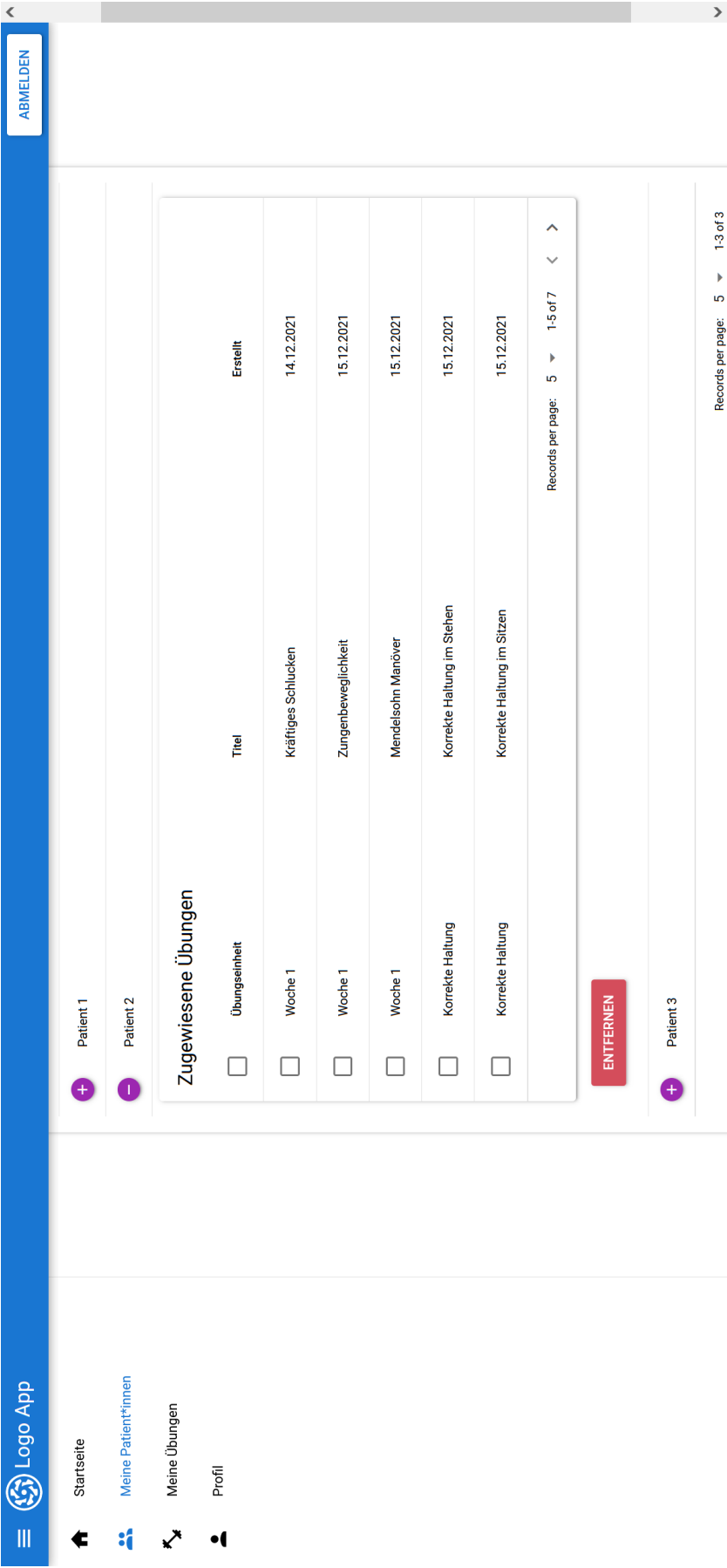


Figure E.4: Therapist’s patient overview

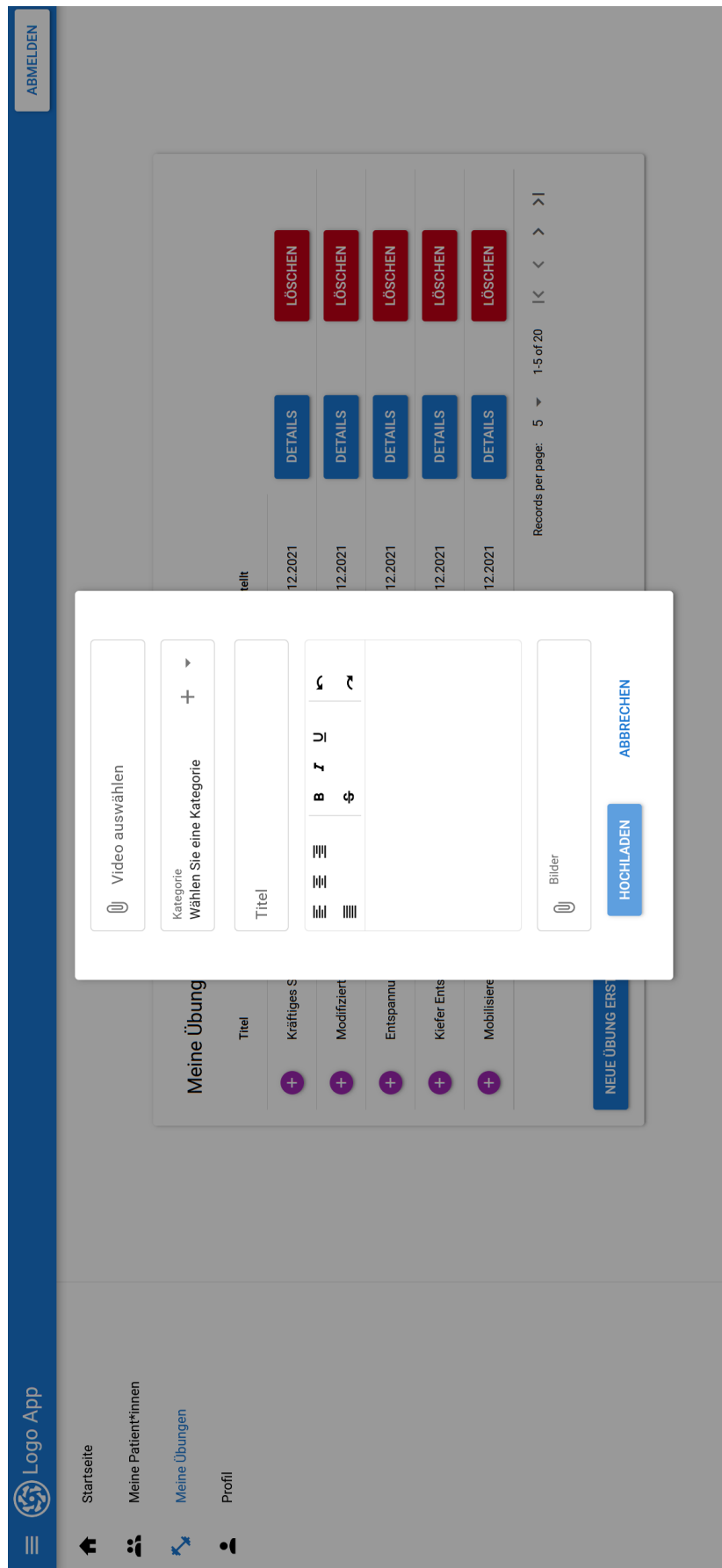




Figure E.5: Dialog to create exercise



Startseite

Meine Patient*innen

Meine Übungen

Profil

ABMELDEN

Neues Passwort

Passwort muss mindestens 8 Zeichen enthalten

Neues Passwort wiederholen

AKTUALISIEREN

Figure E.6: Profile settings

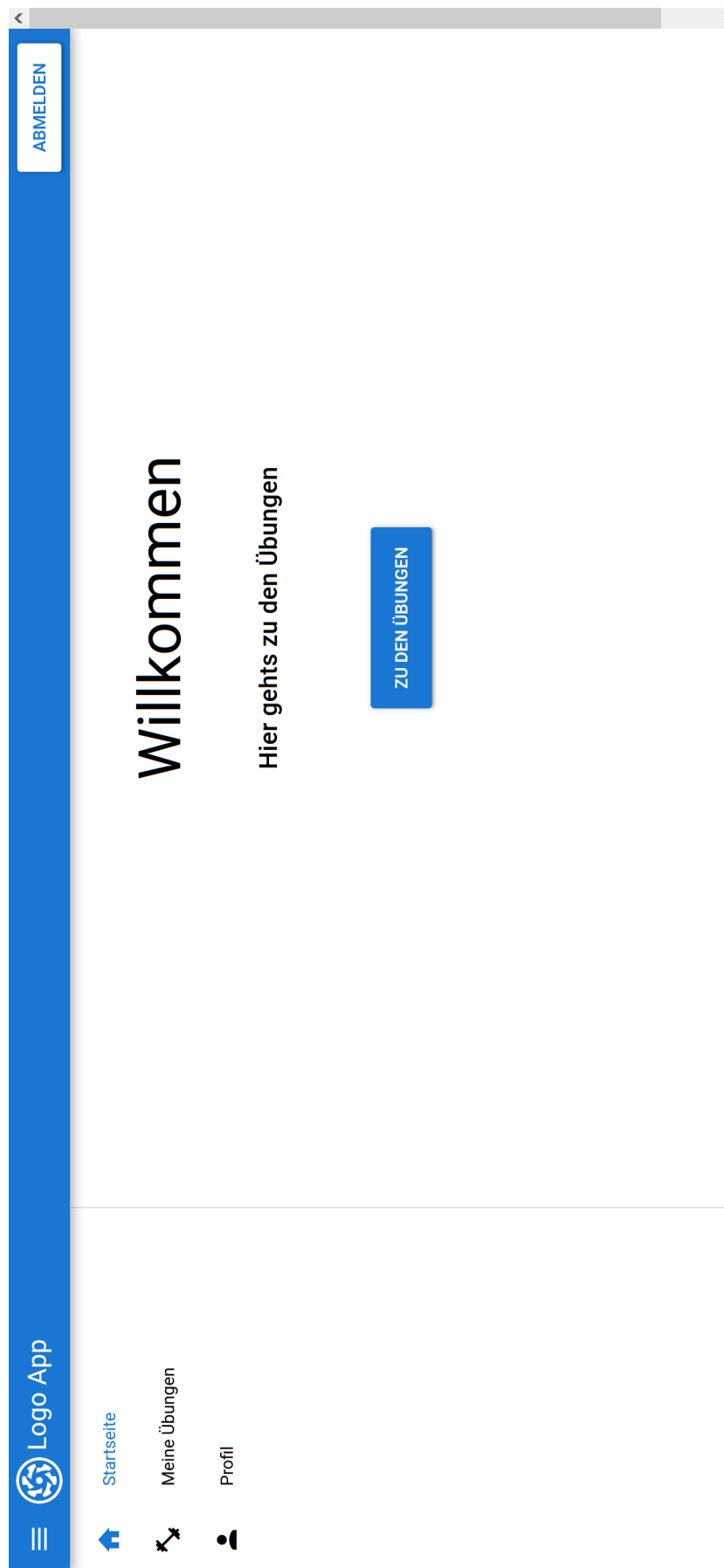


Figure E.7: Patient's home page

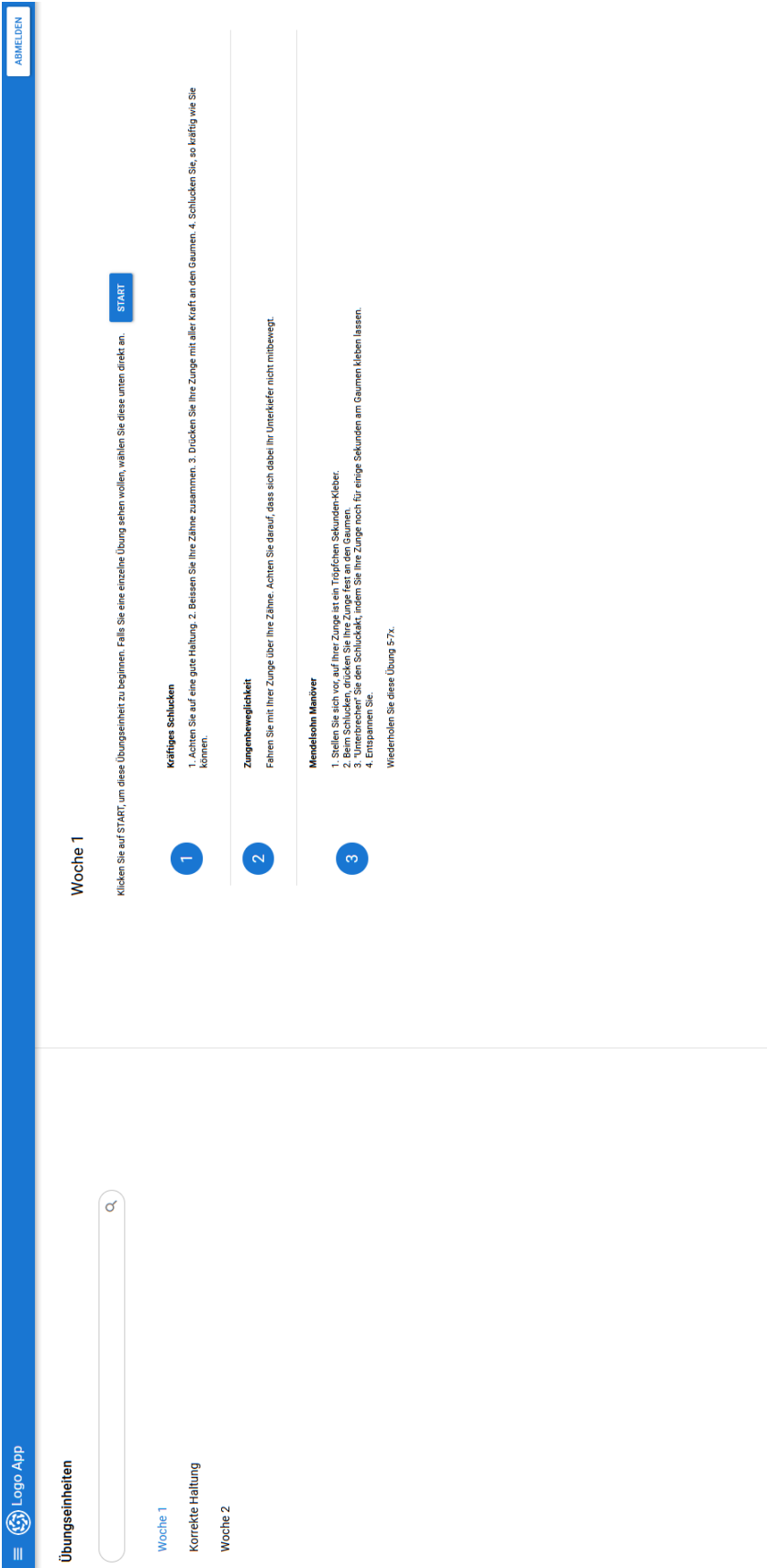


Figure E.8: Patient’s exercise overview

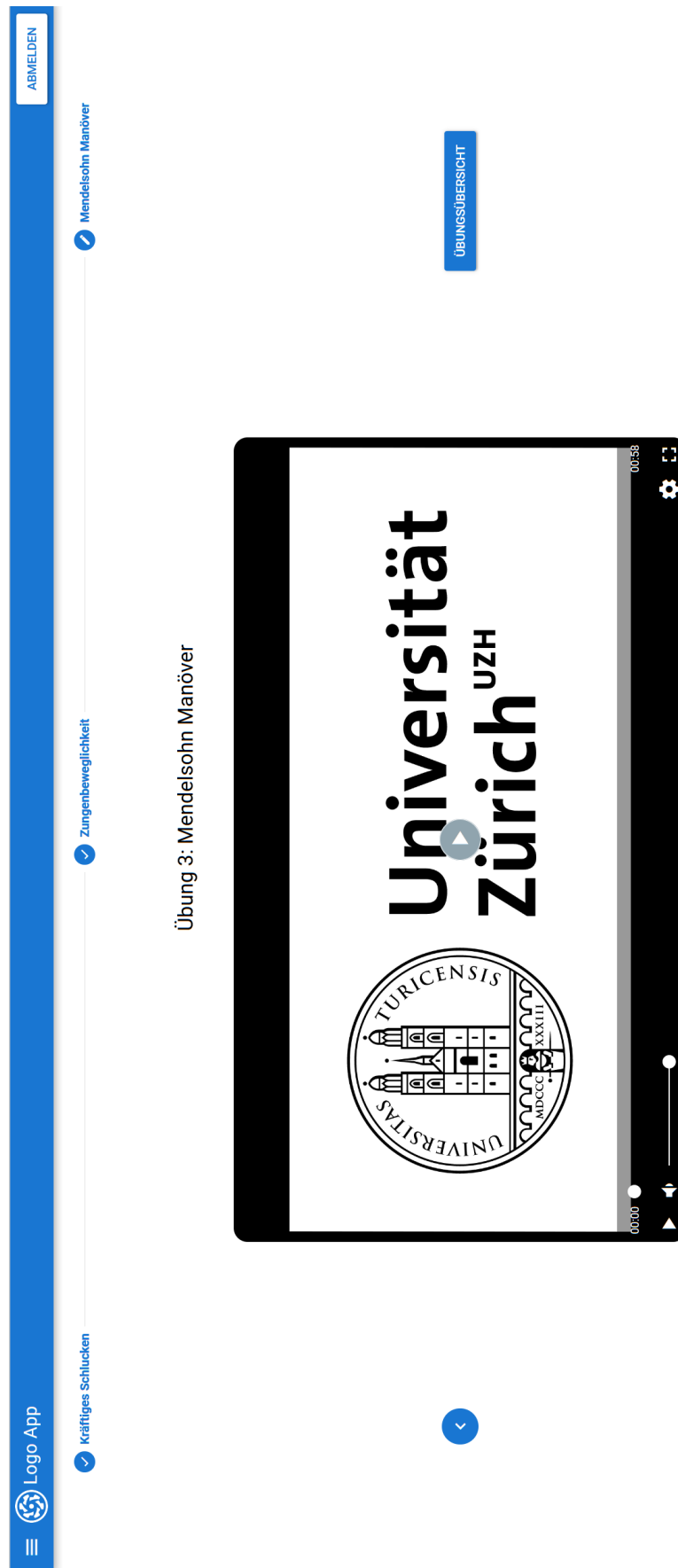


Figure E.9: Exercise page

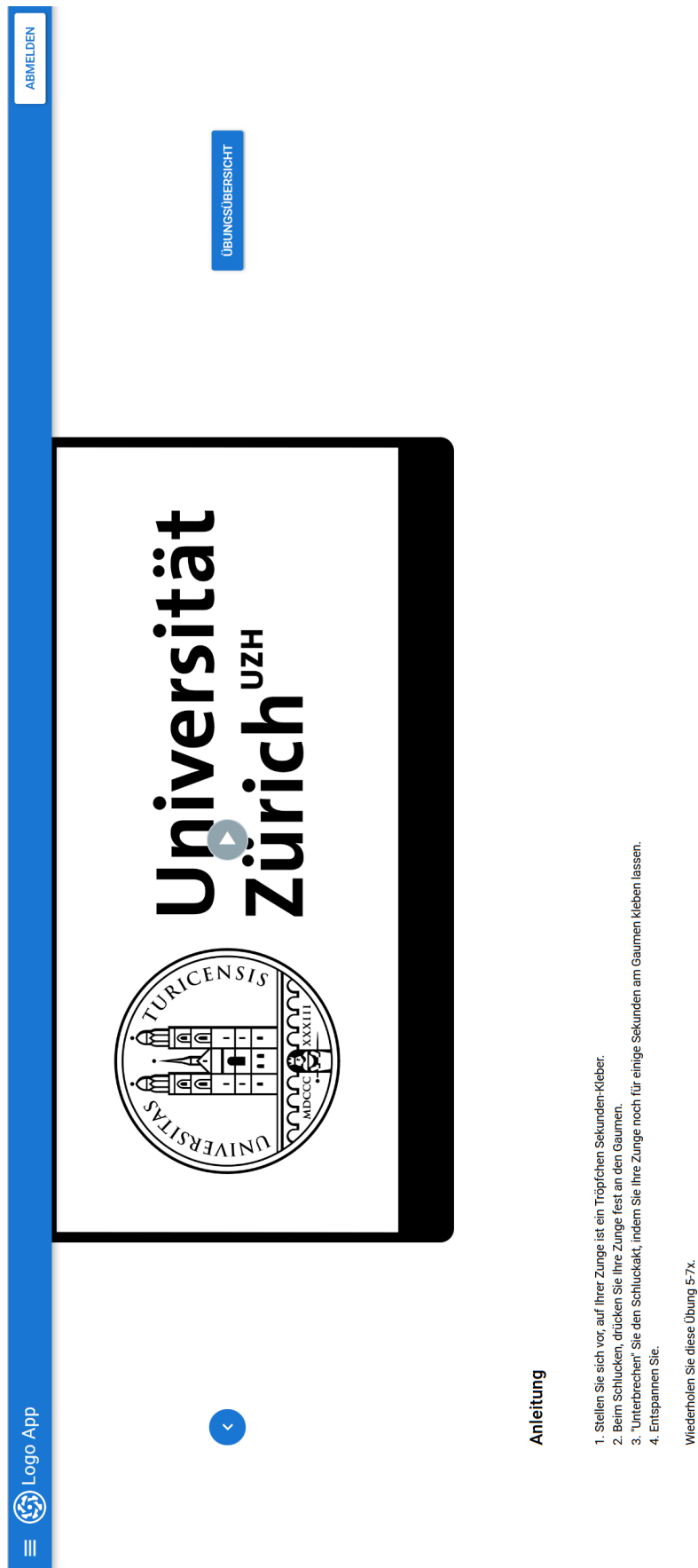


Figure E.10: Exercise page scrolled down