DIRENE
Competences for the new era of user-driven digital rehabilitation

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Remote patient monitoring: User requirements of physicians and patients, visualized in a digital handbook for educators

Master Thesis

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Vienna, 22.05.2022 A. Stadler

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Place, Date Signature

Preface

The idea for this master thesis came about due to my personal interest in telemedical applications and the fact that I work professionally in software development for healthcare institutions. Through the suggestion of the supervisor Anita Kidritsch to combine the topic of the video consultation with the DIRENE project, the master thesis has taken shape.

In this sense, I would like to express my sincere gratitude to FH-Prof. Anita Kidritsch, PT, MSc, who has always accompanied me on the way to the completion of this thesis. Anita inspired, supported, and trusted me. All this has contributed to the completion of the thesis. I am very grateful to have had her support, which has allowed me to develop professionally and personally.

Finally, I would like to thank my friends who have motivated me, cheered me up and helped me to master the last step of my master's degree during the past months.

Abstract

Background: The need for remote patient monitoring is growing due to non-mobile patients as well as advancing technological development and has to be covered. Video consultation as a telemedicine application is one approach to achieve this. Successful implementation requires trained professionals and therefore educators to train video consultation using mobile devices.

Research Questions:

- What are the user requirements of physicians and patients for successfully applied remote patient monitoring, especially for video consultation?
- How should learning with mobile aspects be designed?

Method: To answer the two research questions, this master thesis was divided into two sections. First, literature was searched and analyzed to explain general terminology and to present the current state of research. The second step was a design thinking workshop with physicians and patients, which was evaluated qualitatively using inductive content analysis. The results of the two methods were visualized in the development of a digital handbook for educators to train video consultation.

Results: It has been shown that both physicians and patients are required to meet technical, organizational, data protection and communication requirements in order to use video consultation successfully. Physicians must also have specialist expertise and provide professional treatment. Furthermore, it became clear that concepts of mobile learning and the focus on the structure and design of the learning tool are of great importance.

Conclusion: Video consultation has great potential to replace the traditional face-to-face consultation for certain situations. The requirements for use must be considered by physicians and patients in order to be able to provide successful therapy. These requirements can be taught in the form of mobile learning.

Keywords: eHealth, video consultation, digital health competency, mobile learning

Kurzfassung

Hintergrund: Der Bedarf an einer Überwachung von PatientInnen aus der Ferne wächst aufgrund von nicht-mobilen PatientInnen sowie der fortschreitenden technischen Entwicklung und muss gedeckt werden. Die Videosprechstunde als telemedizinische Anwendung bietet eine Möglichkeit dazu. Die erfolgreiche Implementierung benötigt geschultes Personal und deshalb auch Lehrende, die die Videosprechstunde mittels mobiler Geräte schulen.

Forschungsfragen:

- Welche Anforderungen werden an ÄrztInnen und PatientInnen für eine erfolgreich eingesetzte Überwachung von PatientInnen aus der Ferne, insbesondere an die Videosprechstunde, gestellt?
- Wie sollte das Lernen mit mobilen Aspekten gestaltet werden?

Methode: Um die beiden Forschungsfragen zu beantworten, wurde die vorliegende Masterthesis in zwei Bereiche unterteilt. Zuerst wurde Literatur gesucht und analysiert, um allgemeine Begrifflichkeiten zu erklären und den aktuellen Stand der Forschung darzustellen. Im zweiten Schritt folgte ein Design Thinking Workshop mit ÄrztInnen und PatientInnen, der qualitativ mittels induktiver Inhaltsanalyse ausgewertet wurde. Die Ergebnisse der beiden Methoden wurden in der Entwicklung eines digitalen Handbuchs für Lehrende zur Schulung der Videosprechstunde visualisiert.

Ergebnisse: Es hat sich gezeigt, dass sowohl ÄrztInnen als auch PatientInnen technischen, organisatorischen, datenschutzrechtlichen und kommunikativen Anforderungen unterliegen, um die Videosprechstunde erfolgreich anzuwenden. ÄrztInnen müssen außerdem Fachexpertise mitbringen und professionell behandeln. Des Weiteren wurde deutlich, dass Konzepte des mobilen Lernens sowie der Fokus auf die Struktur und Gestaltung des Lerntools von großer Bedeutung sind.

Schlussfolgerung: Die Videosprechstunde hat großes Potenzial, die klassische persönliche Sprechstunde in bestimmten Anliegen zu ersetzen. Die Anforderungen zur Anwendung müssen von ÄrztInnen und PatientInnen berücksichtigt werden, um erfolgreich therapieren zu können. Diese Anforderungen können in Form des mobilen Lernens vermittelt werden.

Schlüsselwörter: eHealth, video consultation, digital health competency, mobile learning

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1 Introduction

“New information technologies have the potential to dramatically improve our healthcare system as it exists today”, is the comment of a U.S. presidential advisory board, because the benefit of information technology is that it can make health information available anywhere, anytime (Haas, 2006, p. 1ff.). Based on this commentary, the master thesis deals in detail with the implementation of video consultation as a telemedical information technology. For this purpose, the subchapters of the introduction further elaborate on the background and the goal of the thesis and on the underlying problem, motivation, and structure of this work.

1.1 Background and Aim

With the help of technology, scientists are able to share information more quickly and therefore information also becomes rapidly accessible to caregivers from anywhere, with the aim of providing patients with the best possible care (Haas, 2006, p. 1ff.). For example, in 1996, an operation was performed live over the internet at the Vienna University Clinic for Oral and Maxillofacial Surgery for the first time – a milestone in the field of technology (Singh et al., 2020). On the other hand, there has long been a need to reduce costs in the healthcare system. The reason for this is the aging population, as the proportion of consuming citizens in the healthcare system is rising while the proportion of financing citizens is decreasing. Consuming citizens are therefore those who burden the healthcare budget, i.e., above all older people, whose share is rising. Financing citizens on the other hand, whose share is decreasing, pay into the health insurance fund with their health insurance contribution (Haas, 2006, p. 219ff.).

To reduce costs in healthcare as well as to be able to benefit from the previously mentioned opportunities of technology in the healthcare sector, the development and use of information technology is being pushed forward politically (Haas, 2006, p. 219ff.). One approach to do so is the latest political motivation of the Hospital Future Act (“Krankenhauszukunftsgesetz”), which was introduced in October 2020 in Germany. It is an investment program of the German Federal Ministry of Health that requires German hospitals to update their digitalization and implement new

healthcare technologies (*Krankenhauszukunftsgesetz (KHZG)*, n.d.). Yet, healthcare technologies do not just have to be invested in and implemented but users of health technologies such as physicians, caregivers and patients should also be trained in how to use these technologies.

To educate users of health technologies correctly, mobile devices can be used as a learning tool. Smartphones have long since become part of daily life but apart from the disadvantages that this consumption brings with it, such as addiction, the potential of the smartphone, like wide range and simplicity, can be used too. Mobile learning refers to learning using mobile devices such as smartphones, which is developing as a trend in continuing education. Not only the private use of phones and tablets is attractive, but also the integration of learning processes so that learning can take place from anywhere. Mobile learning offers a way for educators to train users of digital health technologies (Witt & Sieber, 2013).

The purpose of this master thesis is therefore to develop educational materials, guidance, and support in remotely monitoring patients. A digital handbook will assist educators to train (future) medical staff like physicians and nurses in guiding patients towards accessing digital technologies, focusing on video consultation. This handbook emerges from a qualitatively evaluated design thinking workshop and considers the existing literature background to answer what the requirements for video consultation users are and how they can be visualized in a digital handbook.

1.2 Problem

A challenge that is presently occurring in healthcare is that in rural or even semi-urban areas, access to medical services may be restricted. Largely because of the Covid-19 pandemic, there has been a push to use technological tools such as remote consultations that allow patients to be monitored remotely (Eguia et al., 2020). The use of video consultation allows patients to speak to their physician whilst being in the comfort of their own home (Barsom et al., 2021; Turolla et al., 2020). However, physicians who want to integrate healthcare technologies into their consultation must be aware of certain requirements linked to this practice such as the adaption of their work environment or complying security rules (Percheron Vendeuvre et al., 2020).

The problem to be addressed in this master thesis is the lack of today's knowledge on the integration of digital health technologies in practice. The developed healthcare technologies should be used beneficially and sustainably in the medical

and nursing field (Kampylis et al., 2015). In order to improve healthcare, concepts must be developed on how to create access to telemedicine and therefore also to video consultation for physicians and patients. The users of these technologies should be adequately educated so that their digital skills can be expanded and applied accordingly. For this purpose, online teaching material is needed to support educators in training the use of digital technologies and for users to develop digital competencies (European Commission. Joint Research Centre., 2017).

1.3 Motivation

It is not only the aging society and the growing proportion of older people that pose challenges to healthcare systems worldwide. As already mentioned, the Covid-19 pandemic has made it particularly clear how relevant digital technologies are in terms of medical care (Eguia et al., 2020). The increasing attractiveness of online communication requires the healthcare sector to become more active and needs people with knowledge of digital technologies (Haas, 2006, p. 1ff.).

Also, digital health technologies can be key to improving health outcomes as they allow patients to seek diagnosis and treatment or other services from physicians, even though most physicians have not been trained in using telehealth technologies (Nazeha et al., 2020; Sprague, 2014). The current challenge is to meet the increasing demands on digital technologies in the healthcare sector and to implement these developments in practice while taking legal aspects into account (Haas, 2006, p. 1ff.).

The knowledge of digital technologies as well as their application can be used by educators to train users with the help of mobile learning techniques so that the developed solutions are optimally implemented in practice. Ultimately, the aim is to create the greatest possible benefit for physicians and patients so that they can gain all the advantages from a virtual session.

1.4 Structure of this Thesis

To answer the aim explained in chapter 1.1 and the resulting research questions (chapter 3.3) of the master thesis, this work is divided into a theoretical and an empirical part.

After chapter 1 introduced the field of digital technologies and more specific telemedicine, chapter 2 deals with the theoretical background of this thesis. Here, telemedicine applications are discussed in general terms (chapter 2.1), which

includes definitions, goals, opportunities, and risks (chapters 2.1.1 to 2.1.4). The thesis then focuses on video consultation as part of telemedicine (chapter 2.2) in order to answer part of the research questions. Video consultation is defined, and its organization explained, along with the requirements for users, communication, and data protection (chapters 2.2.1 to 2.2.5). The last theoretical part explains mobile learning together with its advantages and disadvantages, which concepts exist, and which requirements are placed on teachers (chapter 2.3).

The empirical part of this master thesis, beginning with chapter 3, describes how the study, as part of the master thesis, was conducted. For this purpose, the role of the DIRENE project is first described (chapter 3.1), followed by an explanation of the qualitative study design (chapter 3.2). In chapter 3.3 all main research questions and research sub-questions are listed as well as the data collection in chapter 3.4. Subsequently, the selection and an overview of the participants, including the recruitment method, are presented (chapter 3.5). Then, the planning, procedure and schedule of the study are described (chapter 3.6), before the evaluation method is explained in chapter 3.7. Chapter 3 concludes with the development output, which is presented as a digital handbook in form of a website.

Chapter 4 shows the research results based on the research questions, which are then interpreted and questioned (chapter 5). The master thesis concludes with a final review and an outlook on further, open research topics in chapter 6.

The following presentation (figure 1) gives an overview of the two main research questions and how they are addressed, as well as the goal of the master thesis, which is shown in the diagram as bold:

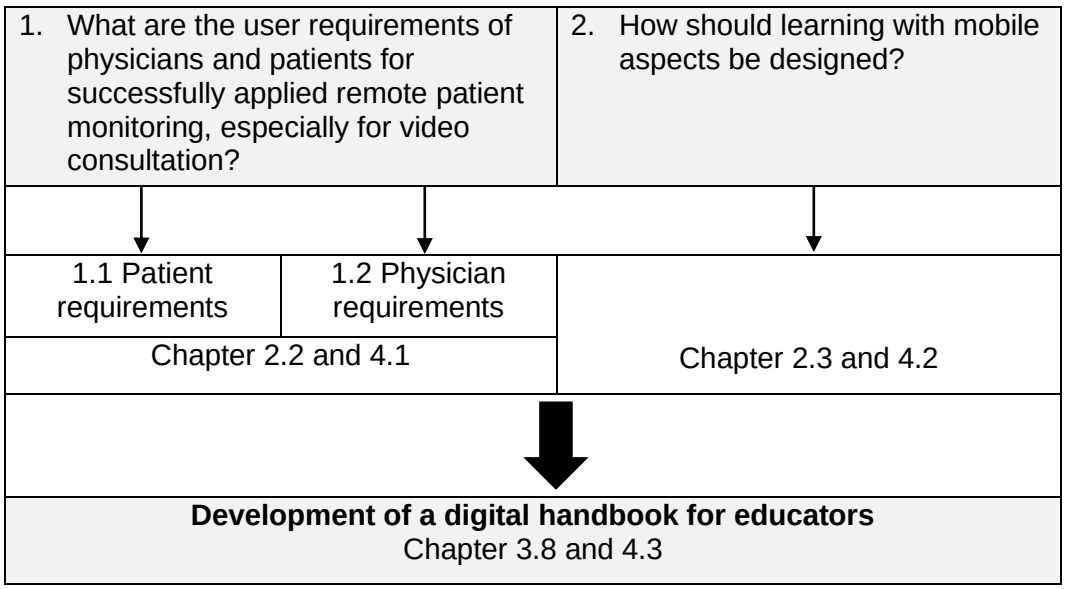

Figure 1 *Research questions and objective of the thesis*

2 Theoretical Background

The second chapter of the thesis covers the theoretical background in remotely monitoring patients, especially using video consultation, and learning with mobile devices. The theory refers primarily to the German-speaking region and serves to compile current knowledge on the topic, but also to explain general terminology. This should make the further parts of the thesis more understandable and clarify the relevance of the topic. The theory found also serves to generate the research questions of this thesis.

2.1 Telemedical Applications

The first theoretical part deals with telemedicine, how it is defined and what its goals are. Furthermore, the possibilities of telemedicine as well as risks and limitations are described.

2.1.1 Definitions

Health telematics is a subfield of medical informatics which uses health telematics applications with the help of technologies. However, health telematics does not develop these technologies itself but is provided by informatics and telematics and therefore is only the application of telecommunications technology and informatics in healthcare. Telematics applications are location-independent and cross-facility networked applications to bridge time and space where processes are handled or automated. Telemedicine is used to monitor and manage patients, using systems that enable quick expert advice and information for patients regardless of where this information is coming from, or where the patient is located. The technologies can be useful for patients, physicians, care facilities, nursing services and health insurance companies (Haas, 2006, p. 6ff.).

Telemedicine can be used as a synonym of the term health telematics (Haas, 2006, p. 6ff.) and defines itself as “overcoming temporal and/or spatial distances in the context of medical issues.” Information or the application of medical procedures are measured, recorded, and transmitted with the help of information and communication technology (*Telemedizin*, n.d.). Because the term telemedicine is not uniformly defined, there are other explanations for it. For example, the Federation of State Medical Boards defines telemedicine as “the practice of medicine by electronic communication, information technology, or other

means between a physician in one location and a patient in another location, with or without an intermediary healthcare provider" (Sprague, 2014). The American Telemedicine Association goes more into detail and includes in the definition of telemedicine a "variety of applications and services using two-way video, email, smartphones, wireless tools and other forms [...]" (Sprague, 2014).

The "Kassenärztliche Bundesvereinigung" (National Association of Statutory Health Insurance Physicians; short: KBV) in Germany differentiates the following concepts within telemedical applications:

- The professional exchange between two or more physicians and, if necessary, in the presence of the patient is used, for example, to assess findings. Especially in radiology, this increases the quality of diagnostics. Such an exchange is called a teleconsil.
- Video consultation takes place between a physician and a patient and can also be applied in psychotherapy. The remote exchange avoids travel and can provide complementary help, especially after surgery. During the video consultation further treatment steps can be clarified, or wound healing can be examined, for example.
- The KBV also describes the concept that a physician and a medical assistant can exchange information digitally. For example, the medical assistant is on a home visit to a patient and is guided remotely by the physician.
- Telemedicine can also allow a physician to communicate with a healthcare facility, such as a hospital or rehabilitation facility. This is possible, for example, in the context of patient admissions and discharges.
  (*Telemedizin*, n.d.)

Furthermore, according to Haas (2006), the term eHealth (also EHealth, e-Health or E-Health) has become common. eHealth stands for electronic health services, which refers to information and communication technologies in "health-related products, services and processes" and includes, for example, applications of the electronic health record or health insurance card. A prerequisite for the use of eHealth is the ability to securely transfer patient data from the entire patient journey, from preventive medicine to diagnosis, treatment and follow-up care (*eHealth*, n.d.).

In telemedicine, a further distinction is made between other approaches to digitization in healthcare, like digital health or mHealth, which are not relevant to the further understanding of this master thesis and are therefore disregarded.

Since the term has already been defined, the goals as well as the opportunities and risks of telecommunication applications are explained below.

2.1.2 Goals

In 2005, the World Health Organization described that health telematics tools "[...] bring about access to information and improvements in the quality and effectiveness of healthcare."

Haas (2006) lists several other goals of telemedicine that include:

- "Assure and improve quality of care
- Better coordinate patient care between care sectors
- Increase efficiency and effectiveness of healthcare
- Distribute available resources in a more targeted manner
- Patient-related use of medical data for collaborative care
- Integrated decision support based on current knowledge
- Comprehensive use of patient data for research and health reporting" (Haas, 2006, p. 8ff.)

Strategically, telemedicine aims to save costs, increase the quality of care, create more transparency in the treatment process, and strengthen the healthcare industry, as telemedicine applications can open new markets. Operational goals are to simplify administrative processes, provide easy cross-institutional access to patient data, and improve individual patient management. In addition, medical knowledge should be available promptly and up-to-date, and continuing education should be offered independent of location and time (Haas, 2006, p. 8ff.).

2.1.3 Opportunities

The KBV of Germany justifies the importance of expanding and promoting information and communication technology in the growing challenges of the healthcare system, which include the increasing number of elderly and chronically ill people as well as the medical undersupply in rural areas. Telemedicine represents a chance to address these challenges, but also brings some opportunities and risks, which are explained below (*Telemedizin*, n.d.).

The foundation for telemedicine has already been laid by low internet costs and by available internet access to everyone. Also, smart devices like smartphones and tablets have arrived in everyday life and applications like Skype, Zoom or Microsoft Teams are no longer new territory for many patients and physicians (Turolla et al., 2020). Telemedicine offers benefits to both the patient and the physician because

patients do not have to travel to the doctor's office or hospital to be treated, but can still contact the physician and discuss urgent events such as complaints using telemedicine applications (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020). In some cases, patients are not even treated in another location, but only second opinions are obtained. Such journeys can be avoided with the help of telemedicine, as information and consultation sessions take place online (Singh et al., 2020). This is particularly relevant as state regulation reduces the number of hospitals which results in longer travel distances (Stommel et al., 2019). With the help of telemedicine, patients can be better integrated due to the strengthened patient-physician relationship and because telemedicine applications can be used regardless of location and time, patients are increasingly informed and educated which improves transparency about treatment. Another opportunity is patient self-organization. As patients become more integrated into the treatment process, they can, for example, create their own health records, which ultimately results in increased adherence. This means that the patient can be picked up from his/her point of view and feels committed to changing his/her state of health (Haas, 2006, p. 239ff.). The World Health Organization defined the word adherence as “the extent to which a person's behavior – taking medications, following a diet, and/or making lifestyle changes – meets the agreed-upon recommendations of a healthcare provider” (Sabaté & World Health Organization, 2003).

A paper from 2020 investigated whether telerehabilitation as part of telemedicine can replace traditional rehabilitation. They found out that the acceptance of telerehabilitation is generally considered good in terms of user experience, adherence, and satisfaction. Shifting from the traditional in-person therapy to online therapy reduces not only hospital stays, but also readmissions. It also reduces the length of hospital stays by allowing patients to be discharged sooner and continue therapy remotely. Quality of life can also be improved by remotely monitoring patients, as they can return to their familiar environment – home and work – sooner (Turolla et al., 2020).

For medical staff, the main advantage of telemedicine is that treatment programs can be adapted to the individual patient. This means that the intensity, frequency, and duration of sessions can be adapted to patient needs. A great opportunity is expected by chronically ill people, as their conditions can be monitored continuously and permanently at a distance. The paper also shows that verbal and non-verbal communication between physicians and patients can be intensified, for example by giving clear instructions and responding to the posture of the patient (Turolla et al., 2020). Sprague (2014) mentions the reduction in the workload of medical staff as a further advantage since telemedicine applications usually require only one physician to be present. In a traditional visit to the doctor's office or

hospital, far more people are involved in the treatment process. Not only do patients save travel costs and time, but physicians can also communicate more quickly and easily with patients and gain deeper insights into their well-being (Haas, 2006, p. 239ff.; Sprague, 2014). Telemedicine also allows physicians to continue therapy from one location, and they do not have to travel long distances to or from the hospital (Sprague, 2014).

2.1.4 Risks and Limitations

Convenience, time, and cost savings are paramount these days, which can be achieved through the advancement of telemedicine. However, telemedicine applications also bring risks. Patients with complex diseases who would need a face-to-face meeting with a physician rate telemedicine application such as video consultation as negative. In particular, the organization and the ratio of online and face-to-face appointments must be well regulated. Examinations that require physical contact with the patient cannot be replaced by the online consultation (Salisbury et al., 2020).

Treating patients remotely is currently possible for simple issues like skin changes in dermatology. However, the patient cannot be examined physically in detail. Jens Wagenknecht, a general practitioner, has the following to say on the subject: “In the case of shortness of breath, for example, I can at best make an assessment of whether it is a critical overall condition”, however, he cannot treat such conditions remotely (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020). Another risk that can occur in the use of telemedicine is that serious diagnoses are missing, or that even incorrect diagnoses are made. This is the case when symptoms are not fully communicated and a disadvantage of non-personal examination. Therefore, a different communication approach is needed in remote treatment (Dobson, 2020). Telemedicine is not suitable for all patients, especially for those who have reservations about new healthcare approaches, and some patients may also be inhibited during an on-camera video consultation.

If types of remote care are met with positive feedback, patients still need to bring technical skills to the table. For example, they need to know or learn how to use a telemedicine application which can be an obstacle for patients with little or no technical affinity (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020). Negative effects of telemedicine also include losing personal relationships due to reduced face-to-face contact. Not only the patient-physician relationship can suffer in online conversations, but the guarantee of data protection is also particularly relevant for online consultations and must be strongly observed. If there is a feeling

that sensitive health information is being given to unauthorized parties, there will be a loss of trust on the part of the patient (Haas, 2006, p. 239ff.).

Even though today's medical professionals in training know how to use online communication tools – both on laptops and smartphones – they need to learn how to use them properly on a professional level. For example, the image quality required for diagnostic analysis, as well as the establishment of a strong patient-physician relationship, system security, and patient documentation must be taught (Sprague, 2014).

In summary, telemedicine can provide an advantage for monitoring chronically ill and elderly patients, saving costs and long travel distances for patients. However, data must be secured, and medical education must be adapted to modern applications (Sprague, 2014).

2.2 Video Consultation

Video consultation is a telemedicine application and an alternative to the traditional face-to-face consultation (Stommel et al., 2019). In the context of this master thesis, the focus is specifically on video consultation in German-speaking countries as part of remote patient monitoring. Since video consultation is regulated by different regulations in Austria and Germany, both countries are considered. However, the regulations of Switzerland are disregarded. This chapter includes an explanation of the differentiation to other telemedical applications, the areas of application, the procedure as well as which requirements are relevant for the users of video consultation.

2.2.1 Definition and Relevance

Video consultation can be defined as “the use of video for interaction [which] allows patients to speak and see their caregiver whilst being in the comfort of their own home or workplace” (Barsom et al., 2021). As described earlier, according to the agreement on the requirements of video consultation, it serves to enable a physician and a patient to communicate. If necessary, an assistant such as one or more caregivers may also be present with the patient to guide him/her through instructions (*Vereinbarung Über Die Anforderungen an Die Technischen Verfahren Zur Videosprechstunde Gemäß § 365 Absatz 1 SGB V*, 2016). The video consultation differs from the traditional face-to-face consultation in the aspect that it takes place online, but also in real time. During the video consultation, the patient and the physician are in different locations (Sprague, 2014). Video consultation is

also understood to be a medical case conference or discussion between physicians or nurses (*Vereinbarung Über Die Anforderungen an Die Technischen Verfahren Zur Videosprechstunde Gemäß § 365 Absatz 1 SGB V*, 2016). In this thesis, video consultation is meant as the exchange between a patient and a physician.

Video consultation is particularly useful for follow-up consultations, for example after operations, but also further treatment can be described to the patient on video and the healing process can be observed, or even psychotherapeutic discussions can take place online (*Videosprechstunde*, 2021). The benefits of video consultations have already been named with the convenience of easily accessing medical advice, saving travel costs and time, reaching patients from rural areas, and avoiding face-to-face contact, in particular in times of a pandemic (Salisbury et al., 2020; Stommel et al., 2019).

Some studies have compared the effectiveness of video consultation versus face-to-face contact. Salisbury et al. (2020) surveyed users of the 24-hour video consult provider Babylon GP at Hand (BGPaH). Results show that patients are generally very satisfied with the care they receive. Over 70 percent of BGPaH respondents said they received better quality care there than with the previous face-to-face process. Only about eleven percent rated the quality as worse. It could be assumed that the better quality comes from the faster access and convenience of the service, as well as the length of the consultation hours (Salisbury et al., 2020).

Another study examined the attitude and satisfaction of video consultation in 2021. 42 percent of respondents – which are primarily respondents who also use video calls privately – would prefer video consultation in the future. Regarding patient satisfaction and quality, there were no differences between video consultation and face-to-face therapy. No video consultation user of that study had a personal consultation requested as a follow-up, and 95 percent would recommend video consultation to others (Barsom et al., 2021).

2.2.2 Organization

This part explains how video consultation found its way into practice, what needs to be considered before using it, and how it works. Therefore, the regulations of Austria and Germany will be considered.

Video consultation is by far not as extensively regulated in Austria as it is in Germany. The Austrian social insurance system offers contract physicians their own video consultation tool (visit-e) to conduct patient appointments online via video. This digital service may be offered in addition to the regular practice. The

decision as to which patients can be treated online and which offline lies solely with the physician. The advantage of visit-e is that it is free of charge and both physician and patient only need a suitable device such as a laptop, tablet, or smartphone as well as a microphone, camera and internet access. No software needs to be installed, as visit-e can be used via a link sent by e-mail or direct message. The data protection of the tool is complied with the Basic Data Protection Regulation and the Health Telematics Act (*Startseite*, n.d.; *visit-e – Mein digitaler Ordinations-besuch*, n.d.).

Compared to Austria, video consultation in Germany has already been allowed to be carried out and can be billed since April 2017. Two years later, video consultation was expanded to include all indicators, so that it was also permitted in psychotherapy. In the period from October 2019 to October 2021, physicians using video consultation were paid start-up funding of up to 500 euros per quarter. Accounting for video consultation is regulated in the "Gebührenordnungspositionen" (GOP). When video consultation was introduced in Germany, it was regulated that only 20 percent of all patients of a physician or psychotherapist could be treated exclusively via video consultation and therefore the flat rates and surcharges of the billing are reduced for these patients. Between the second quarter of 2020 and March 31, 2022, this restriction was removed in order to reduce face-to-face contacts due to the pandemic. This limit for patients treated exclusively by video was raised to 30 percent effective April 1, 2022. However, this does not include patients who once presented in person (Kassenärztliche Vereinigung Bayerns (KVB), n.d.).

If patients request a video consultation with their physician, or it is recommended by the physician, the process in Germany is as follows. The procedure differs little or not at all in other German-speaking countries:

1. To be able to offer the video consultation, the physician or psychotherapist registers with a video service provider. The physician or psychotherapist then receives the dial-up data from the provider.
2. The patient is offered a free appointment for the video consultation and receives a consent form that he/she must sign before the first video consultation – either via his/her physician or psychotherapist or the video service provider.
3. At the agreed appointment, the patient and physician or psychotherapist log in to the video service provider's tool using the information sent in advance. Until the patient is connected to the physician or psychotherapist, he waits in a virtual waiting room.
4. After connection, the video consultation can begin.

5. Once the session is over, the patient and the physician or psychotherapist log out of the video service provider's website. The physician is responsible for documentation.
   (*Videosprechstunde*, 2021)

Patients can also book an appointment with video service providers right away. Many providers list physicians and psychotherapists who offer consultation hours remotely. Patients can book their own physician, if listed, or any physician (open consultation). For new and yet unknown patients, their identity is checked by showing their electronic health card via the camera at the start of the video consultation and checked by the doctor's office staff. Additional insurance data is then requested. The patient also verbally confirms the existence of insurance coverage. The reason for this is that the video consultation is paid for by health insurance companies and does not involve any costs for the patient (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020; *Videosprechstunde*, 2021).

2.2.3 User Requirements

Having already explained the definition and organization of the video consultation, this chapter explains the requirements. As already described, the same rules apply to remote consultations as to face-to-face consultations. However, the list of requirements is extended by a few aspects to ensure that the video consultation is successful. Technical, legal and data protection requirements must be observed by the users, i.e., by patients, physicians and psychotherapists, as well as by video service providers (Percheron Vendeuvre et al., 2020).

In the "Agreement on the Requirements for Technical Procedures for Video Consultations in Accordance with Section 365 (1) of the German Social Code, Book V," (in German: "Vereinbarung über die Anforderungen an die technischen Verfahren zur Videosprechstunde gemäß § 365 Absatz 1 SGB V") the KBV and the National Association of Health Insurance Funds ("Spitzenverband Bund der Krankenkassen"; short: GKV-Spitzenverband) have worked out these requirements as of November 30, 2021 (Kassenärztliche Bundesvereinigung, 2021).

§ 3 of the agreement requires that all participants of the video consultation voluntarily take part in it. The participants should be in closed rooms to guarantee a smooth process. This is to ensure adequate privacy. The procedure of the video consultation is also described here, as all participants must introduce themselves at the beginning. Recordings of the consultation are only permitted with consent

and are used for documentation purposes (Kassenärztliche Bundesvereinigung, 2021).

Both the physician and the video provider have requirements to meet. A video consultation may only be performed by a contract physician, i.e. a physician who has been approved by the health insurance company in Germany. Physicians who wish to use video consultation must additionally apply for authorization. This approval process has been simplified due to the Covid-19 pandemic, so that face-to-face contact is shortened as quickly as possible (Kassenärztliche Vereinigung Bayerns (KVB), n.d.). The technical equipment must include a screen (at least three inches, resolution of at least 640x480 px), camera, microphone as well as a speaker, integrated in several or one device. The bandwidth must be at least 2000 kbit/s in download. The patient must consent to the online treatment and be informed of the requirements before it is carried out (Kassenärztliche Bundesvereinigung, 2021; Kassenärztliche Vereinigung Bayerns (KVB), n.d.). The patient must also have a screen, for example on a cell phone, computer, or tablet, with a camera, microphone, and speaker. He/she must also guarantee a sufficient internet connection (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020).

§ 5 of Annex 31b BMV-Ä explains the requirements for the video service provider for whose service the physician must register. “The video service provider must be certified and have submitted a self-disclosure to the KBV and the GKV-Spitzenverband” (*Videosprechstunde*, 2021). The certification is handled by agencies that are allowed to verify such services. A list of video service providers certified to date can be found on the website of the KBV. After choosing the provider, the contract physician receives a certificate. For organizational purposes, practice staff may receive secondary access in addition to the contracted physician. However, the physician's access is intended exclusively for the video consultation. Patients and caregivers can use the video service without prior registration (Kassenärztliche Bundesvereinigung, 2021; Kassenärztliche Vereinigung Bayerns (KVB), n.d.; *Videosprechstunde*, 2021).

The following illustration (figure 2) summarizes the requirements for physicians, patients, and video service providers.

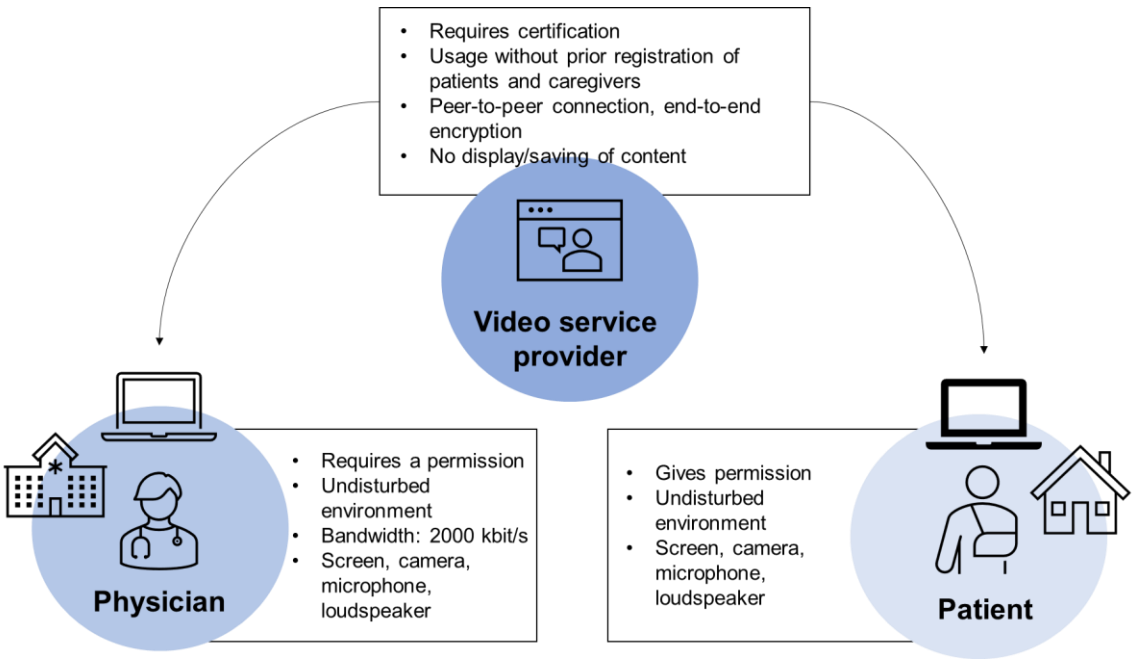

Figure 2 *Requirements of the video consultation for the users*

2.2.4 Communicational Requirements

Furthermore, physicians should train their communication skills in remote patient treatment because it differs from the traditional face-to-face consultation. It is advantageous if the initial contact between patient and physician has already taken place in person. The first contact before an online consultation is a must in psychotherapeutic video consultations, which has been temporarily dropped due to the Covid-19 pandemic (*Ablauf und Hürden einer Videosprechstunde beim Arzt*, 2020).

In healthcare, the SBAR principle is often used to communicate information clearly but concisely. This principle is recommended by the World Health Organization and professional societies and is used worldwide:

- S = Situation: the patient's current condition or the reason for the conversation is stated succinctly.
- B = Background: the patient's medical history is given succinctly, e.g. previous illnesses.
- A = Assessment: the patient's overall situation and an assessment are given.
- R = Recommendation: a recommendation is made as to how to proceed and what is expected of the patient.

The SBAR principle improves communication and provides reassurance to the patient. Its use among teams improves teamwork and the working atmosphere and shows a decrease in readmissions in intensive care units (Ärzteblatt, 2018).

In their study, Stommel and van Goor (2019) analyzed how conversations differ between an in-person and video consultation. The analysis focused on the opening of postoperative consultations. In video settings, a distinction is made between openings and beginnings of the conversation. In the opening, after the patient is greeted, it may be helpful to address the technology by checking that cameras, screens and speakers are working. After these are in working condition or fixed, the beginning of the conversation follows. Openings can also be pro-social topics or attentive conversations regarding the weather, time of day, etc. to make the patient feel more comfortable. Asking about the patient's current condition (“How are you?”) can either be done as a polite gesture, to which a neutral response is given, or as a reason for the consultation, thereby initiating a diagnostic procedure. After all, if the patient explains his or her complaints at this point, this can also be used as a conversation starter. If not, the actual beginning of the conversation is started with the reason for the consultation. In the traditional face-to-face consultation, the reason is usually given along with the greeting to the patient. The reason subsequently also usually becomes the topic of conversation (Stommel et al., 2019).

2.2.5 Data Protection Requirements

Data protection plays a particularly important role in telemedical treatment, as personal medical data is collected and transmitted there (*Telemedizin*, n.d.). Unauthorized parties must not be given access to sensitive patient data. In order for patient and physician to communicate securely via video, a reliable transmission medium is needed (Haas, 2006, p. 50ff.), which is why video service providers must first be certified in Germany. In Austria, the data protection regulations for video consultations are not explicitly regulated, but the General Data Protection Regulation applies in any case. Due to the particularly high protection value of patient data, the following requirements must be placed on telemedical applications:

- The patient must be able to decide for him/herself which data is recorded and deleted.
- The patient must be allowed to decide which data is shared with a service provider, e.g. a physician.
- The patient has the right to inspect stored data.
  (Haas, 2006, p. 229f.)

According to the Federal Data Protection Act in Germany, certain controls must be ensured for telemedical applications:

- Access control: Unauthorized parties have no access to IT systems. Only authorized parties have access to data of their access authorization.
- Disclosure control: Unauthorized parties are not allowed to read, copy, modify or remove personal data.
- Input control: It must be possible to trace who enters, changes, or removes personal data.
  (Haas, 2006, p. 234ff.)

To guarantee data protection, the video service provider must comply with the following requirements:

- The provider must be able to verify this as well as information security and content.
- The video service provider is not allowed to view or store any meeting content.
- The video service must be end-to-end encrypted, and the connection is peer-to-peer. Servers must be used exclusively in the EU.
- No data may be shared.
- The sound and picture quality must be adjustable in the software in case of connection fluctuations.
- Terms of use are available in German and can be viewed without registration.
- Advertising may not display the video service.
  (Kassenärztliche Bundesvereinigung, 2021; Kassenärztliche Vereinigung Bayerns (KVB), n.d.; *Videosprechstunde*, 2021)

Only if physicians or psychotherapists have indicated to the KBV that they will use a certified video service provider can the video consultation be billed (*Videosprechstunde*, 2021).

It can be concluded that telemedicine applications, including video consultation, are useful for consultation and treatment. Nevertheless, the requirements that such applications bring with them must be considered. At best, the goal of such methods should be to improve healthcare.

2.3 Mobile Learning

The second part of this theoretical background deals with mobile learning. Mobile learning should be explained so that a mobile handbook for educators can be developed from the results of this theory section, and the results of the qualitative study. After the theoretical basics of telemedicine with a focus on video consultation have already been explained, mobile learning is now defined, the opportunities and challenges are elaborated, and current approaches are presented.

It is expected that by 2025, almost three quarters of the web population will use the internet exclusively via their cell phones (Sărăcin & Stănculescu, 2021). Smartphone use may not only be beneficial, but also carries risks and can lead to internet addiction (Mulyani et al., 2019). In addition, the rapidly changing world of work (Witt & Sieber, 2013), the Covid-19 pandemic (Tudor Car et al., 2021) and the global shortage of healthcare professionals are pushing to transform traditional learning into mobile learning. Mobile devices such as smartphones or tablets can be used as a tool of mobile learning to improve the quality of education in healthcare professions (Mulyani et al., 2019; Posadzki et al., 2019). Companies are also increasingly investing in mobile learning programs for their employees due to the necessity to make knowledge available where it is needed (Sărăcin & Stănculescu, 2021; Witt & Sieber, 2013).

2.3.1 Definition and Relevance

Mobile learning (also m-learning or mLearning) refers to learning with mobile devices such as smartphones, personal digital assistants, tablets, or laptop PCs, but not on desktops. This means that information and knowledge can be accessed and students as well as educators can connect – at any time, from any place and at the student's own pace. The prerequisites for mobile learning are already in place: Mobile devices are being constantly used, and permanent network access is available (Eom & Laouar, 2020; Witt & Sieber, 2013).

Mobile learning can be defined as "learning across multiple contexts, through social and content interactions" (Helen, 2013, p. 3ff.). Learning can use web-based or stored resources, such as platforms, tools, applications, and programs. But learning materials such as books, podcasts or learning videos can also be used. Access to such resources can require an internet connection (online) or can be provided asynchronously (offline) via cloud-based solutions. Mobile learning does not necessarily have to take place at a distance but can also be used in a live setting for example, by accessing a learning platform during lessons. The

previously dominant teacher-driven learning is shifting so that the user with his or her requirements is at the center of learning (Egilsdottir et al., 2021).

In order to provide quality education, accommodate different types of learners, and at the same time use the smartphone to its advantage, personalized and fun-based learning opportunities are needed, which mobile learning provides (Lamia, 2021; Mulyani et al., 2019).

2.3.2 Opportunities and Challenges

The impact of mobile learning settings has been investigated in several studies. Mobile learning technologies are already seen as helpful and easy to use by students. This is because content can be customized for students, which means they learn better (Eom & Laouar, 2020). The advantage of this type of learning is its convenience and the fact that knowledge can be obtained immediately when it is needed (Witt & Sieber, 2013). Learners no longer hide behind large screens but interact more with educators and other students. Mobile learning allows students to complete assignments, access content and learn, and interact with others on the go. Beneficial are also e-books, which replace heavy books, are easy to carry, and are available from anywhere (Camilleri & Camilleri, 2019; Eom & Laouar, 2020).

Vaona et al. (2018) found small positive effects of mobile learning compared to face-to-face learning. The low cost, high flexibility, and location independence of mobile learning were positively evaluated. Mobile learning also has the advantages of easier access to information and regular updates. The exchange between learners among themselves or with educators is particularly valued (Vaona et al., 2018).

However, mobile learning can also have disadvantages. For example, there are high acquisition costs of mobile devices, production costs of learning programs, possible technical problems, or loss of motivation due to the absence of physical presence. Mobile learning requires a high degree of self-discipline (Vaona et al., 2018).

2.3.3 Concepts

Today, many learners belong to a generation that has grown up with mobile technologies. They find it easy to locate information and interact online. Mobile learning can motivate them to choose their own modalities of interest and learn on their own (Egilsdottir et al., 2021). This section describes how mobile learning can be designed.

Different learning types should be considered when learning, which is why educational content should be available in different varieties. Based on the smartphone activities of learners, three approaches to mobile learning are explained:

- **Fun based learning:** Smartphones are used for entertainment these days. Videos are watched and audios are listened to. In mobile learning, such features can be used, for example, by providing learning content via video or audio or by integrating images.
- **Collaborative learning:** Besides the entertainment factor in smartphones, they are also used for exchanges. Instant messaging allows staying in constant contact with family and friends. A collaborative tool can be integrated into a mobile learning platform that allows students to talk with other students or with educators. Ultimately, knowledge should be shared through such interactions.
- **Online game learning:** Another approach of mobile learning is to teach and learn content playfully. Learning games can be used online to motivate students and make learning fun, but still require concentration.
  (Mulyani et al., 2019)

Learning materials that can be used in mobile learning are podcasts in addition to video lectures and instruction videos. Such materials also make it possible to pause them or play them repeatedly. In any case, high video and audio quality must be ensured. Additional learning materials such as multiple-choice tests, written assignments or tests with multiple clinical cases help students to process the content better. A major advantage of mobile learning is that feedback can be given to students immediately, allowing them to learn from their own mistakes right away. This feedback can also be designed visually with audio or effects. Learning platforms should be logically structured, can be used on the go, and have links to other helpful online resources. For example, learning content can only be switched on gradually, depending on learning success, so as not to overwhelm students with too much information (Egilsdottir et al., 2021).

2.3.4 Requirements for Educators

Theoretical concepts of mobile learning alone are not enough to communicate knowledge. Requirements for educators, who are responsible for transferring knowledge to students, change for mobile learning. Educators need certain skills to use the potential of digital technologies to further educate students which are the following:

- Professional engagement: The digital competence of educators should be used to improve knowledge transfer on the one hand, and to get in touch and exchange with colleagues, students, and other interested parties on the other hand. The goal is the continuous innovation of learning.
- Digital resources: The variety of possible knowledge resources is large and growing. Educators must decide which resources are helpful to a learning group and want to share them. Among other things, copyright regulations must be observed.
- Teaching and learning: The shift from teacher-led to learner-led processes requires educators to decide how to design, plan, and implement the use of digital technologies. Educators are increasingly taking on the role of mentor or guide for students.
- Assessment: Digital technologies in the learning process allow to create and improve assessment strategies. Providing feedback is easier because learners' progress can be better monitored, and new learning strategies can be developed from it.
- Empowering learners and professional development: Digital technologies can better integrate students into the learning process because content can be personalized. As a result, students feel more engaged and empowered in the learning process. It is important to ensure that access to digital technologies is possible for every level of education, so that inequalities are evened out.
- Encouraging digital competence among learners: Students must also be taught how to use digital technologies creatively but responsibly.
  (European Commission. Joint Research Centre., 2017)

The acquired theoretical knowledge of mobile learning shows that this kind of learning will be the future. However, mobile learning is not identical to traditional learning in all facets and therefore needs to be learned. The described approaches of mobile learning and competences for educators can help to make mobile learning successful and serve the development of a digital handbook for educators.

3 Methodology

Although telemedicine was first used in 1876 by making an emergency medical call of a few meters, telemedicine applications are still being developed today (Deutscher Bundestag, 2011; “Digitale Gesundheitsanwendungen,” 2022). New telemedicine applications, such as video consultation, have not yet been widely explored.

This master thesis aims to contribute to the research of video consultation. For this purpose, this thesis is divided into two parts. In the first step, literature was searched for and analyzed, followed by a design thinking workshop which was qualitatively analyzed. These parts were brought together to answer the research questions. The results were then visualized in the development of a digital handbook for educators on training video consultation. This chapter describes the methodological approach of the study.

3.1 DIRENE

The master thesis works towards the DIRENE project using the workshop approach. The DIRENE project is briefly described here.

Because digital technologies open new ways to meet the challenges in the rehabilitation sector, healthcare professionals should increase their competencies in using these new technologies. However, this requires access to reliable sources of information and evidence-based knowledge, as well as guidance on how to integrate digital technologies into the services offered by rehabilitation facilities. More specifically, skills need to be strengthened in developing use cases for existing digital solutions and for other emerging technologies. To facilitate knowledge transfer and disseminate different approaches in digital rehabilitation as widely as possible, transnational collaboration in higher education is essential.

Erasmus+ funds research projects to develop innovative teaching. The DIRENE project (2020-1-FI01-KA226-HE-092634) runs from April 2021 to March 2023 and aims to develop a digital handbook that guides educators of health and social professions to design user-centered learning modules using digital technologies (*DIRENE*, n.d.). In the DIRENE project, different methods are applied in several countries, including Austria and Greece. One method used is information gathering

by means of workshops. The results of this study will complement the project's information material.

3.2 Study Design

In this master thesis, a qualitative research design was chosen. Qualitative studies are increasingly applied in health science. There, all results are to be compiled to obtain an overall picture around the research questions. A qualitative study design has a descriptive or understanding character, which sets it apart from the quantitative study. Qualitative studies are usually used to develop and conceptualize constructs in order to transform them into theories (Goldenstein et al., 2018, p. 91ff.; *Sozialpsychologie und Sozialtheorie. Band 1*, 2018, p. 205ff.).

Since little is known about the practical implementation of video consultation and the design of a mobile handbook for educators, the qualitative research approach was chosen. In order to answer the research questions, a design thinking workshop was executed in this thesis in addition to the literature review. The results of the workshop were evaluated by using an inductive, content structuring qualitative content analysis according to Mayring (Mayring & Fenzl, 2019).

Qualitative Research

In qualitative research, openness, communication, strangeness, and reflexivity are essential principles:

- Openness means that the researchers are open to the researched, but also form hypotheses and research questions only in the course of the research process, e.g. during theory development.
- The principle of communication says that in research and data analysis, a researcher should interact with the researched as well as researchers with each other.
- Strangeness means that researchers put aside their own interpretations. Especially in “cultures” known to the researchers, they should free themselves from what is supposedly familiar and adopt a neutral attitude.
- The fourth principle of reflexivity means that researchers should reflect on the way they work, because they structure their research through their own planned approach and interests.
  (*Sozialpsychologie und Sozialtheorie. Band 1*, 2018)

Quality Criteria

As mentioned earlier, qualitative research is flexible and an open-ended process that can evolve and be adapted during the actual research (Goldenstein et al., 2018). Therefore, the following quality criteria must be observed to keep the research transparent and comprehensible:

- Transparency: The entire research process must be documented. This means that research questions and the choice of methods must be justified. Data evaluation and interpretation must also be comprehensible.
- Intersubjectivity: The results of the research should be reflected. This ensures that subjectively perceived findings leave open to interpretations so that outsiders can form their own opinions.
- Scope: Qualitative studies involve a much smaller number of cases than quantitative studies. It should be described how the results of the research can be generalized.
  (*Sozialpsychologie und Sozialtheorie. Band 1*, 2018)

How the quality criteria of transparency, intersubjectivity, and scope were met is presented in this methodology description (chapter 3) and the discussion (chapter 5). Transparency is ensured by explaining all steps of data collection and analysis. The discussion allows reflection and interpretation as well as generalization of the results.

3.3 Research Questions

In order to gain added value and new research insights in the field of video counseling as well as mobile learning, and ultimately to develop a digital handbook for educators, this master thesis answers two research questions. This chapter is dedicated to the research questions because the research sub-questions result from the initial familiarization with the topic and the DIRENE project (see chapter 3.2) as well as from the literature review. The first research question is divided into the requirements of two different users of video consultation, the second research question is specified based on the sub-questions:

1. **Research question:**
   What are the user requirements of physicians and patients for successfully applied remote patient monitoring, especially for video consultation?

1.1. Patient requirements:

a) *What will the patient need for being able to attend this appointment?*
b) *What will the patient need within the appointment?*
c) *What would be needed in group settings?*
d) *On which competences is the patient standing on?*
e) *Which competences and resources will the patient develop?*
f) *Which emotions or wishes does the patient experience within the appointment?*
g) *What concerns might the patient have about video consultation?*
h) *What are the strengths, weaknesses, opportunities, and threats of video consultation?*

1.2. Physician requirements:

a) *Which competencies does a physician need to support the patient in a mobile appointment?*
b) *Which competencies does an educator need who trains (future) physicians in video consultation in a mobile way?*

2. Research question:
How should learning with mobile aspects be designed?

a) *Why would a physician/student want to learn more about how to apply video consultation?*
b) *In which situations would a physician/student invest into learning?*
c) *What content would a physician/student be interested in?*
d) *What would be the benefit from mobile learning?*
e) *What concerns would a physician/student have regarding mobile learning?*

With the help of the data collection methods presented in the following chapters, these research questions will be answered.

3.4 Data Collection

The data to answer the research questions was collected in two ways. On the one hand, literature research was conducted, which already answered part of the research questions and formed the basis for the research sub-questions. In addition, a design thinking workshop was executed, the results of which were analyzed qualitatively. The illustration of figure 3 shows the course of action of the

study in comparison to part of the course of action of the DIRENE project. DIRENE started before this master's thesis began and influenced it primarily in workshop development. The detailed approach and how the workshop took place can be found in the following chapters.

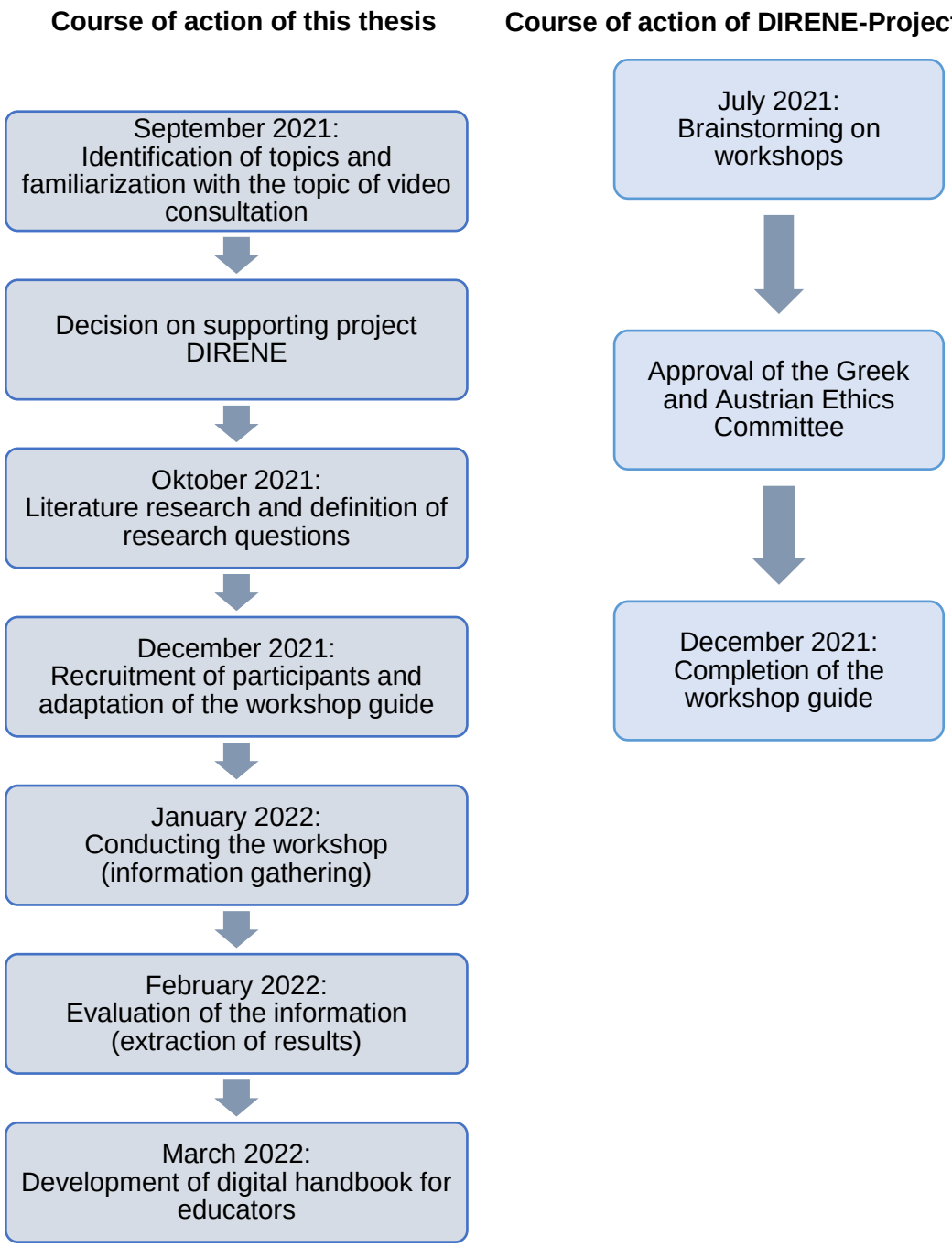

Figure 3 *Course of action plans of this study and the DIRENE-project*

3.4.1 Literature Research

Literature was searched for, analyzed, and summarized in the time frame of September 2021 to March 2022, covering both telemedicine with focus on video consultation and mobile learning. Literature in English and German was used, mainly from 2018 to 2022. Only occasionally older literature was used, dating back to 2003. The literature search was performed in the databases PubMed, ScienceDirect, ACM Digital Library, IEEE Explore and Cochrane as well as in grey literature sources such as Google Scholar and websites of relevant associations. Keywords used are eHealth, video consultation, digital health competency and mobile learning.

Studies explaining terms, objectives, advantages and disadvantages of telemedicine and mobile learning were included to get a general understanding of the topic. In addition, studies were included that focus on the application of these areas, on legal and technical requirements as well as optimal implementation. Also, studies were included that refer in particular to video consultation, excluding those that refer to video consultation in terms of exchanges between medical staff.

The results of the literature review can be found in chapter 2 on the theoretical background.

3.4.2 Design Thinking Workshop

A design thinking workshop took place as a qualitative research method, with participation from physicians and potential patients. The participants were asked to develop the user requirements of video consultation and to gather ideas on what mobile learning could look like. The following describes the planning and implementation of the workshop.

3.5 Sampling

This part describes how participants were recruited for the workshop, what criteria they had to meet, and how they were composed. Since the number of cases in qualitative studies is usually small, the selection of cases (sampling) is of great importance. It must be selected in such a way that statements can nevertheless be generalized (*Sozialpsychologie und Sozialtheorie. Band 1*, 2018, p. 210f.).

Inclusion and exclusion criteria

Planning for workshop participant recruitment began in November 2021, with actual recruitment beginning one month later. Before the beginning of the recruitment, the ethics committee of the Federal State Lower Austria stated that there is no obligation for this study to be submitted to an ethics committee (GS1-EK-4/776-2022).

Since this master thesis focuses on video consultation used by physicians and patients, participants were sought from these target groups. The following criteria were considered to achieve a high diversity of participants:

- At least 18 years old and from as many age groups as possible
- Female, male or other participants
- Group of two to four physicians:
    - With several years of professional experience and their own teaching or learning activities OR
    - with teaching or learning activity OR
    - still undergoing training or continuing education
- Group of two to four potential or former patients: individuals with primary prevention and secondary prevention concerns are chosen to create a high level of diversity

In addition to the defined inclusion criteria, there are no explicit exclusion criteria to consider.

Recruitment methods

Participants were recruited from Germany and Austria using the snowball and gatekeeper approach (Kruse, 2021). Recruitment of physicians was started first, as this was expected to be more difficult than recruitment of patients. The reason for this is that there are generally fewer physicians in the researcher's environment, but potentially many have been or are patients. The goal was to achieve the highest possible diversity (e.g., age and gender) among participants. Therefore, after recruitment of physicians, diversity could be adjusted by recruitment of patients.

By means of the snowball principle, people were approached who in turn knew suitable participants or could approach people again until suitable participants were found (Kruse, 2021). Therefore, in the first step, potential physician participants were spoken to in the personal and professional environment of the

researcher, who in turn were asked to ask physicians in their environment. Because this process of recruiting physicians took several weeks, a parallel process of asking potential patients to participate in the workshop began. For this purpose, the search was mainly conducted in the private environment of the researcher. Considering diversity, four participant patients could be found, to whom the workshop invitation was sent in advance.

In addition to the snowball principle, the gatekeeper principle was applied, by which so-called gatekeepers, who have access and contact to potential participants, were asked to approach and name suitable cases (Kruse, 2021). This was intended to support physician recruitment. Gatekeepers were educators and researchers at universities, public offices such as Austrian medical associations, and organizations of physicians. Finally, through a gatekeeper and personal contact with physicians from the researcher's environment, five physicians could be recruited, of whom one participant did not show up at the agreed workshop date. A total of eight participants took part in the workshop.

Included documents

Initial contact with potential participants was made in person, via email or via phone. During the initial contact, it was already explained briefly what the workshop was about and why this person was needed. All participants received an invitation at initial contact that included the workshop objectives and content, timing, and contact information for the researcher. Patients and physicians were invited through different letters, which can be found in attachment A and B of this thesis. This ensured that patients understood the structure and content of the workshop through simple language.

In addition, participants received an informed consent form (attachment C) prior to the workshop that contained further information about the workshop and had to be signed and returned to the researcher. This consent form contained information about the research, the purpose and process of data collection and processing, and the link to an online platform. It was made clear that all responses to the workshop would be processed solely for the purpose of data analysis and would only be published anonymously, so that it would not be possible to trace them back to an individual.

Furthermore, all participants were asked to complete a short questionnaire (attachment D) that revealed information about themselves. This asked for name, date of birth, gender, and profession. It also asked how many residents there were

in their locality, whether there were any family care hours, and whether there was a physical or mental disability and therefore needed assistance during the workshop. All participants declined the last. Recruitment for the workshop was completed by mid-January 2022.

Overview of participants

Table 1 gives an overview of the participants. A total of eight participants between the ages of 24 and 62 were recruited, of which five were female and three were male. Three participants were also from a rural region, that is a town with a population of less than 10,000 (STATISTIK AUSTRIA, 2020). This query was significant because video consultation can be particularly helpful in reaching isolated individuals in such rural regions. In addition, the participants were asked whether there was care time in the family, e.g., by children or caregivers, which was answered in the affirmative by two participants.

Table 1 *Overview of workshop participants*

Participant number	Role in workshop	Age	Gender	Profession
1	Physician	24	female	
2	Physician	31	female	
3	Physician	30	female	
4	Physician	55	male	
5	Patient	24	female	*not specified*
6	Patient	35	female	Police officer
7	Patient	44	male	Graduate businessman
8	Patient	62	male	Field service technician

3.6 Setting

This section describes the creation as well as the contents of the workshop guide (full guide in attachment E) and the process of the design thinking workshop.

Development of the workshop guide

As already shown in the figure on the course of action of the DIRENE project, the actual process of data collection does not begin with this study. As this study is working towards the DIRENE project, the members of the project developed the workshop guide, which was used for several workshops. For this purpose, a first brainstorming on the contents of the guide took place in July 2021. After translation into Greek, the project was submitted to the Greek Ethics Committee and confirmed. The German translation, the adaptation and elaboration of the entire workshop guide as well as the facilitation process were made in December 2021. The ethics committee of the Federal State Lower Austria stated that there was no obligation for the DIRENE project to be submitted to an ethics committee (GS1-EK-4/776-2022). After this, the researcher of this study received the guide. The guide was subsequently edited by her and adapted to the topic and participants of her workshop.

Contents and time schedule of the workshop guide

The workshop guide contains all the content planned during the workshop. The workshop was scheduled for a Friday at the end of January 2022 from 5:30 to 9 pm. It was held using the Zoom online meeting tool because an online workshop was safer for all participants due to the Covid-19 pandemic and some participants did not want to commute to St. Pölten University of Applied Sciences. On the online flip chart Mural, which was prepared in advance by the researcher, all participants could work and write down ideas simultaneously. The workshop was held in German, also the Mural board was used in German. In addition to the researcher of this study and the participating physicians and patients, two members of St. Pölten University of Applied Sciences were present to act as moderators while the researcher focused on taking notes. If the participants had problems working on the Mural board, one of the three researchers was there as a support. The entire workshop, including the breakout rooms, was recorded by the researchers after obtaining consent from the participants.

1. *5.30 – 5.45 pm: Check-in and moderator introduction*
   At the beginning of the workshop guide is the agenda and schedule. After participants joined the Zoom meeting and were welcomed, all eleven participants introduced themselves. The physicians and patients were then asked to explain what they thought video consultation would be. Only then was the DIRENE project introduced, and the researcher defined video consultation and explained the goals of the workshop.

Three major components were then addressed: the patients' perspectives, the professionals' perspectives, and concerns or motivations for using mobile learning.

2. *5.45 – 6.30 pm: Patient's perspective – empathizing and recognizing needs (RQ1)*
   The first component addressed the patient's perspective on video consultation and answers part of the first research question. Participants were divided into groups of two and sent to breakout rooms. Each group was assigned one of four personas. The task was to put themselves in the place of the assigned persona by means of a case study and to answer seven questions. The aim of this part was to explore the demands of video consultation on patients. The answers of the four groups could be written down on the Mural board. Still in the role of the user personas, the participants were then asked to answer further questions using a sociodrama, this time in a group setting. Afterwards, time was allotted to supplement the collected results if necessary.

3. *6.45 – 7.30 pm: Perspectives of professionals and the educational environment (RQ1)*
   After a 15-minute break, the second part of the workshop looked at the perspectives of the experts and the educational field and is another part of the first research question. The goal here was also to work out the requirements for physicians. Again, the participating physicians and patients were divided into two groups and sent to breakout rooms. Here, the method of silent brainstorming was used, where everyone was allowed to answer and write down the questions for themselves.

4. *7.45 – 8.30 pm: Concerns or motivations for using mobile learning (RQ2)*
   After another 15-minute break, all participants were divided into two groups and were encouraged to discuss the concerns and motivations they have regarding mobile learning. This discussion should answer the second research question of this thesis. They were asked to imagine themselves

in an ideal future and send messages from that future. The resulting discussion posts were noted on the Mural board by the facilitator or researcher of each group. Afterwards, the ideas for mobile learning were presented to the other group and discussed.

5. *8.30 – 9 pm: Round of flashes in plenary*
   Finally, there was a flashes round in the plenum, where each participant could give feedback on the workshop.

The workshop was originally planned for 3.5 hours. The actual length was approximately three hours. The audio and video recordings were used to supplement the ideas on the Mural board, on which the workshop guide's questions were answered. The guide's specific questions are reflected in the results of this study.

3.7 Data Evaluation

This section explains how the material obtained from the design thinking workshop was analyzed.

Types of qualitative content analysis

Category-guided qualitative oriented text analysis was first used in the 1980s. The goal was to find a method that could handle large amounts of data, did not just consist of counting parts of the text, and still allowed room for interpretation of the material (Mayring & Fenzl, 2019, p. 635f.). Qualitative content analysis makes it possible to analyze texts while coping with large amounts of material. At the same time, content analysis remains qualitative-interpretative and can capture latent meaning (*Sozialpsychologie und Sozialtheorie. Band 1*, 2018, p. 225f.).

Mayring's qualitative content analysis is characterized by categories that develop from theory in advance or from the material obtained and are reviewed and revised during the analysis (Mayring & Fenzl, 2019, p. 633f.). There is a process model that must be followed. Three content analyses are distinguished:

- **Inductive category formation:** the categories are reported directly on the material in the text passages, without further reducing the material. In the next step, main categories can be formed from the categories.
- **Deductive category application:** the data is based on a category system derived from theory and the content is sorted into this ordering scheme.

- **Summarizing content analysis:** in a first step, the data material obtained is reformulated into paraphrases and then reduced or summarized step by step.
  (Mayring & Fenzl, 2019, p. 637ff.)

Procedure of the inductive content analysis

In this study, the inductive content analysis according to Mayring was applied. The goal is a system of categories that represent the material and relate it to each other (superordinate and subordinate categories). Since the achieved results of the workshop were collected in note form on Mural (attachment F), this virtual flip chart was also used for the evaluation. The following steps preceded the category formation:

1. The Mural board was revised after the workshop. That is, the audio and video recordings of the workshop were used to fill in missing content and discussion contributions. This is because not all ideas from the discussions were written down during the workshop. The missing ideas were filled in. Duplicate content was also removed, and spelling errors were corrected.
2. The Mural was additionally provided with a code structure during the evaluation so that statements in the results of this thesis can be traced back to the Mural board. The Mural board was sorted into two top chapters that answer the first research question – the perspective of the client (“1”) and the perspective of the professionals and the educational environment (“2”). The respective questions of these brainstorming sessions reflect the research sub-questions and were given a letter as a code. Thus, the patient requirements from the first research question are presented under the code “1” with the sub-questions in “a” to “h”, the requirements for physicians and teachers can be found on the board under the code “2” with the questions “a” and “b”.
3. The final content section of the workshop, addressing concerns or motivations for using mobile learning, should answer the second research question and was transcribed. The transcription occurred because workshop participants did not write down ideas on the Mural board themselves. In that case, the Mural served only as a summary for the moderators and the researcher and therefore was not coded. For this reason, the results were recorded in a transcription. In the results of this thesis, quotes from workshop participants are referenced to the corresponding lines in the transcript.

4. Since the workshop was held in German, literal quotes from the workshop discussions are translated into English in the presentation of results in this paper.

The categories were formed in the next step from the results of the Mural board as well as from the transcription. The following illustration (figure 4) explains the process of material reduction:

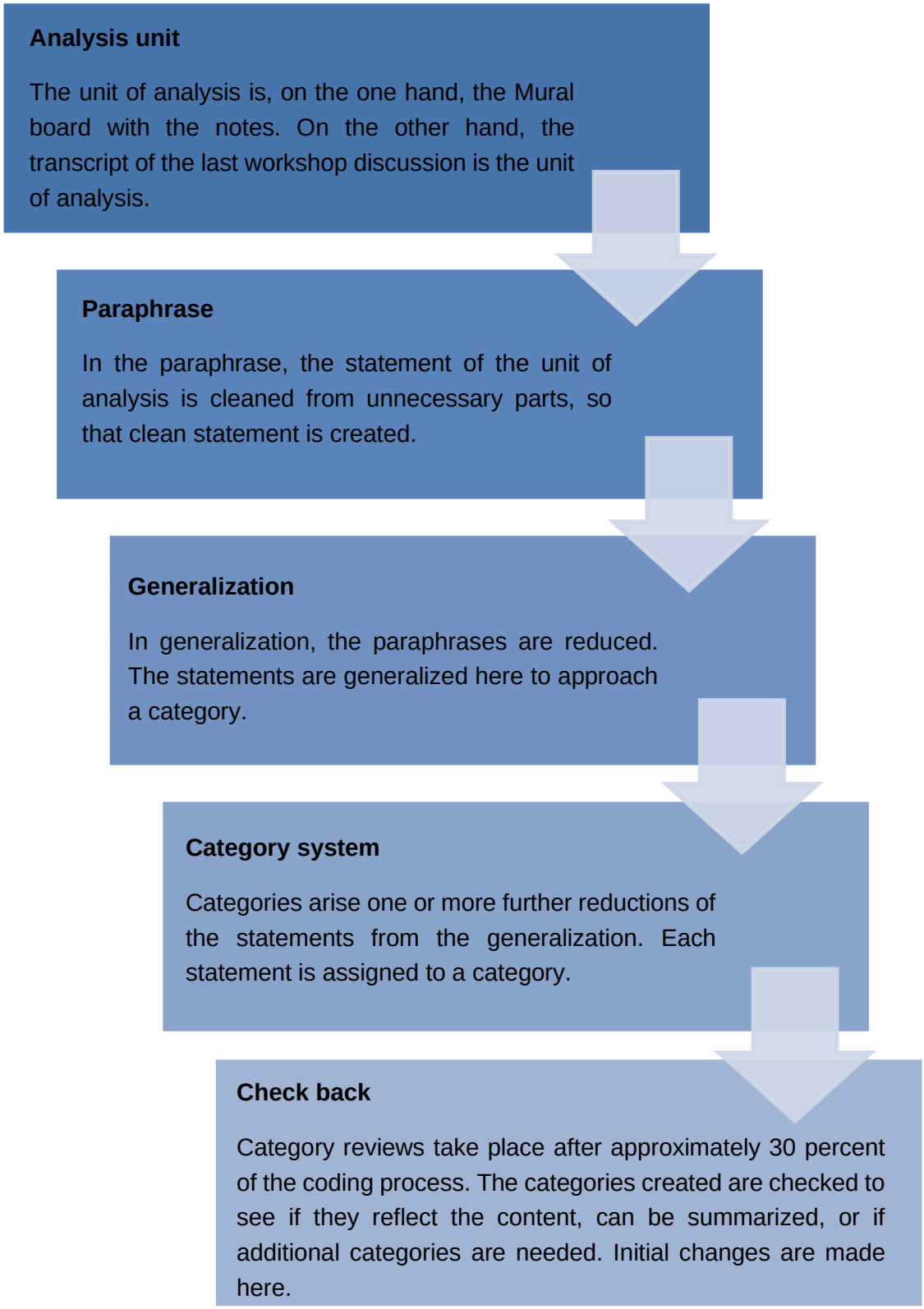

Figure 4 *Process of material reduction in an inductive content analysis*

Coding was carried out using Excel. To answer the first research question about user requirements, the research sub-questions were listed in Excel and the answers were assigned to each. Because the content was taken directly from the Mural board, there are no direct quotes. Therefore, the results of the Mural correspond to the paraphrase. The paraphrases were then reduced. Because the categories could be formed from the generalization, no second reduction was necessary. It was also considered that some contents covered two categories.

For the second research question regarding mobile learning, the workshop content of the group discussions was transcribed. The transcript was divided into individual statements of the participants and listed in Excel. Each statement was broken down to its core content, resulting in the paraphrase. By reducing, generalization of statements came about, followed by category formation. Again, no second reduction was necessary. If required, multiple categories were assigned to a statement.

The sub-categories have resulted from the contributions of the workshop participants and give a detailed insight into the content of the category. The categories and sub-categories can be found in the results in chapter 4 of this thesis.

3.8 Development of a Digital Handbook for Educators

The aim of this master thesis is to develop a digital handbook that can be used by educators to teach the use of video consultation. It contains teaching materials and instructions to train physicians who offer video consultation to their patients and to facilitate their access to the technology.

A handbook is usually defined as a concise instruction manual or compendium on a particular subject, usually offered in book form. However, if a handbook is not offered in book form but digitally, this means that it is based on the transmission of data by electrical or electromagnetic signals or that it is based on telecommunications (*digital - Wortbedeutung.info*, n.d.; *Handbuch - Wortbedeutung.info*, n.d.).

This handbook is based on the results of the literature review and the empirical study, which are compiled on a website for educators. The primary target group are educators, the target group of these educators are physicians and their patients. The website was developed using the templates of the provider Wix.com and is responsive on the laptop, as well as in mobile form on tablets or smartphones. Wix is a cloud-based platform that offers design templates to create

HTML5 websites by the user itself. With the templates, design and content are separated from each other. Here, features developed by Wix and third-party developers can be integrated into the user's own website. In the case of the web-based website construction kits, the servers are found at the provider Wix, which also takes over the hosting of the website and offers domains. Editing takes place under one's own user account and in the web browser, without having to install additional software (*Hilfe-Center | Wix.com*, n.d.; *Über uns | Wix.com*, n.d.).

The main focus of the handbook is on how educators can best understand it, which is why the website structure is relevant. It guides readers through the content, which logically and thematically fit together. The typical structure of a website is based on the tree structure, where a home page is the starting point and there are different topics, which should be on their own HTML pages. Therefore, subpages are created on the website, and the content is divided on several pages instead of presenting it on a one-pager. An HTML page usually consists of a header, which contains the title and/or a second-order heading, followed by the actual content. The page should close with a footer, where further links or contact information are provided. Links to subpages should be accessible from the home page in no more than two clicks, making a navigation box helpful (“Website Struktur - Textbroker,” n.d.).

On the website, a homepage serves as an introduction, six different learning modules guide educators in terms of content to an overall view of video consultation and its practical application, and a page about the creation of the handbook and the background of the study is included. The structure of the website is based on the priority of the target groups that are addressed. First target group are educators, secondary physicians, then patients. The considerations shown in figure 5 were made to integrate the results into the website:

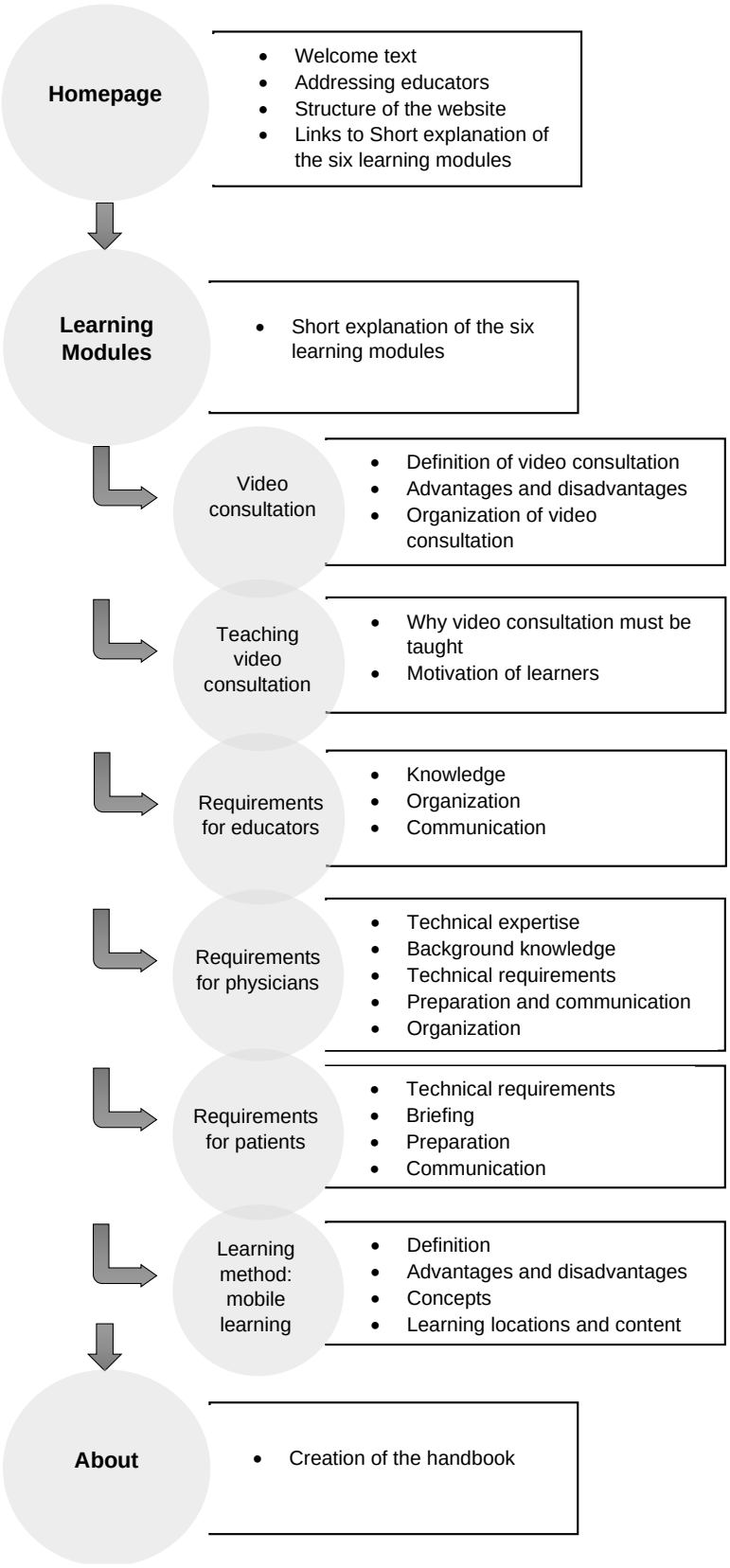

Figure 5 *Storyboard of the digital handbook as a website*

The website is in German because the target group is from German-speaking countries (educators) and thus the handbook is user-centered and can be applied in practice. The German polite form of address is also used because the main target group is educators, who are usually addressed by their last name in German-speaking countries.

The individual modules of the web page resulted on the one hand from the results of the empiricism, on the other hand literature was consulted, to supplement general. The first learning module “Video consultation” comes predominantly from the literature review and provides an overview of video consultation. The modules "Requirements for educators", "Requirements for physicians" and "Requirements for patients" result from the first research question, while the second research question reflects the modules "Teaching video consultation" and "Learning method: mobile learning". The theory of telemedicine applications of the literature analysis is almost entirely left out of the handbook, as it serves as a guide to video consultation in the master thesis and does not necessarily need to be taught. Some advantages and disadvantages of telemedicine are considered because they are generalized to video consultations as well.

The content of a website should not only consist of text, but should be enriched by images, graphics, and videos. If text is included, it should be informative and provide added value for the reader (“Aufbau einer guten Website,” n.d.). The results of the literature analysis are translated into German and provide information mainly about legal aspects that need to be considered when using video consultation. To simplify the reading flow and to clarify what has been written, illustrations are included, which are mainly derived from the categories and subcategories of the empirical study. These illustrations can be reused by educators when addressing learners. In order to appeal to as many educators as possible, audio data is included in addition to illustrations, which read out the entire learning module or a chapter. This allows educators to listen to the content of the handbook on the go, i.e. mobile. The results of the development services can be found in chapter 4.3.

4 Results

This chapter describes all the results that emerged from the inductive content analysis. The results are presented in their categories in such a way that they follow the workshop structure and therefore the research questions and sub-questions.

4.1 Results of the First Research Question

On the next pages, the results for the first and in the following described research questions are going to be shown.

1. **What are the user requirements of physicians and patients for successfully applied remote patient monitoring, especially for video consultation?**

The first research question about patient and physician requirements when using video consultation was broken down into several research sub-questions. It is started with the patient requirements which resulted from the Mural board, using the described code.

1.1. Patient requirements:

a) What will the patient need for being able to attend this appointment?
To find out what patients need as a first step to participate in a video consultation (table 2), e.g., if they are first experiencing this kind of consultation, the workshop participants responded that the technical requirements, such as appropriate equipment, are needed. The opinion of the workshop participants was divided regarding the required clothing style of the patient during a video consultation. If relevant parts of the body need to be shown, the clothing must allow this, otherwise there is no need for special clothing during the online consultation. In addition, the patient should prepare for the consultation by having his/her health data ready and dress appropriately. The patient will also need an introduction to the video consultation process and how to prepare. Furthermore, he/she must be able to describe his/her concerns (1a).

Table 2 *Inductively built categories for research sub-question "What will the patient need for being able to attend this appointment?"*

Category	Sub-category
Technical requirements	• Net coverage • Suitable device • Technical know-how
Briefing	• Procedure guide • Information about required data (e.g. vital data)
Appearance of the patient	• Appropriate clothing (for showing relevant places) • No specific clothes
Preparation of the patient	• Required data, e.g. side effects documentation
Communication	• Description of the concern

b) What will the patient need within the appointment?

The patient is now attending a video consultation and during the ongoing consultation, the patient must also ensure the technical conditions, such as a stable internet connection, and a quiet place where he/she will not be disturbed. At the beginning of the video consultation, the patient should be told (again) about the course of the consultation. The patient also expects the physician to have familiarized him/herself with the patient's medical history and to lead the conversation with a structured but open attitude. The patient should be given the feeling of a secure physician-patient relationship (1b). The results to this research sub-question are shown in table 3.

Table 3 *Inductively built categories for research sub-question "What will the patient need within the appointment?"*

Category	Sub-category
Privacy	• Place away from disturbances
Technical requirements	• Stable internet connection • Working audio and video equipment
Preparation of the patient	• Medical history documentation • Taking time
Preparation of the professional	• Knows patient history
Interpersonal competence	• Provide safety • Secure physician-patient relationship
Conversation technique	• Open conversation • Introduction of the physician • Structured conversation
Briefing	• Procedure guide

c) What would be needed in group settings?

The question of what is needed in a group video consultation formed four categories in the evaluation (table 4). Some participants answered that a group setting cannot be used at all in video consultation, while others think that the group setting is only possible to a limited extent, for example if video consultations have already taken place in person before. If consultation takes place in the group, rules must be defined, and the technical requirements must also be met here (1c).

Table 4 *Inductively built categories for research sub-question "What would be needed in group settings?"*

Category	Sub-category
Group setting cannot be applied	
Limited possibility of group setting	• Create trust • Previous “offline” experience • Specialty-specific possible
Rules in group setting	• Rules of conduct • Communication rules
Technical requirements	

d) On which competences is the patient standing on?

The results to this question can be found in table 5. In an online appointment, the patient relies on the fact that his/her data is secured and that there is a relationship of trust with the physician. Patients expect that the physician is professional, for example, in terms of his/her appearance, knowledge and in providing solutions. In addition, video consultations should be organized in such a way that the reference person (physician) remains the same (1d).

Table 5 *Inductively built categories for research sub-question "On which competences is the patient standing on?"*

Category	**Sub-category**
Data protection	
Professional expertise	• Professional appearance • Professional and technical knowledge • Professional treatment • Perceive the problems • Provide solutions
Organization	• Reference person remains the same • Accounting
Interpersonal competence	• Create trust
Preparation of the professional	• Punctuality

e) Which competences and resources will the patient develop?

Patients who participate in video consultations will primarily develop their technical skills and how to safely use technical devices. They will also learn how to prepare for a video consultation, for example, they have prepared documentation of their medical history and will learn how to schedule time for a video consultation. Video consultation especially enables people with disabilities to provide appropriate assistance (1e). Table 6 shows the results regarding this question.

Table 6 *Inductively built categories for research sub-question "Which competences and resources will the patient develop?"*

Category	Sub-category
Technical skills	• Operate camera and microphone • Trying out technology beforehand • Safety with technology • Technical versatility
Preparation of the patient	• Medical history documentation
Organization	• Patient support possible for disabled people • Time management

f) Which emotions or wishes does the patient experience within the appointment?
The wishes and emotions of a video consultation patient can be diverse (table 7). Patients can be embarrassed because the situation is new to them. They may be reserved about the new type of consultation, find it impersonal, and be nervous before or during it. The patient's wishes are to be taken seriously by the physician, to have efficient organization and communication, and to find help during the video consultation (1f).

Table 7 *Inductively built categories for research sub-question "Which emotions or wishes does the patient experience within the appointment?"*

Category	Sub-category
Emotions of the patient	• Embarrassment • Impersonality • Nervousness • Reservations
Wishes of the patient	• Offer of help • Seriousness • Organization • Communication

g) What concerns might the patient have about video consultation?
A patient who participates in a video consultation for the first time may be apprehensive about it (table 8). Concerns of patients who use video consultations are mainly the incompetence of the physician, that his/her data is not secure, and that the conversation is impersonal (1g).

Table 8 *Inductively built categories for research sub-question "What concerns might the patient have about video consultation?"*

Category	Sub-category
Missing professional expertise	• No thorough examination
Data protection	
Impersonality	

h) What are the strengths, weaknesses, opportunities, and threats of video consultation?

Table 9 represents a simplified form of the SWOT analysis, showing categories that workshop participants mentioned regarding the use of video consultation. This again shows the advantages and disadvantages of video consultation. Particular emphasis was placed on the location-independent nature and the ability to prepare the patient for the video consultation. One weakness of video consultation is that technical requirements must be met to participate. However, video consultation offers the opportunity to have a personal conversation online and there is also the risk that there is no personal relationship between physician and patient, personal data is insufficiently protected, and communication suffers (1h).

Table 9 *Inductively built categories illustrated in a SWOT analysis*

Strengths	Weaknesses
+ Location independence	- Uncertainty with technology
+ Preparation of the patient	- Technical requirements
Opportunities	**Threats**
+ Personality	- Impersonality
+ Briefing	- Privacy concerns
+ Communication by translator	- Lack of expertise
	- Data protection
	- Communication

1.2. Physician requirements:

Having described the results of patient requirements for video consultation, the requirements for a physician providing video consultation are presented now.

a) Which competences does a physician need to support the patient in a mobile appointment?

In order to provide the best possible support to a patient during a video consultation, the physician should meet a number of requirements which are shown in table 10. For his own benefit, the physician should know how to account for the video consultation and how prescriptions can be issued online. In addition, the physician should also have basic technical knowledge and at the best have attended further training in video consultation and know how to use it.

The workshop participants mentioned organizational aspects that a physician should consider. Not only does the physician have to decide whether the consultation can take place online or in person, but in the case of video consultation, the anamnesis scheme should be adapted, and it should also be possible to offer the patient help with technical questions. Participants also felt that physicians who provide video consultation should be verified before offering such a service.

In addition to the organizational requirement, the physician should demonstrate expertise in the needed area and prepare for the patient by, for example, reviewing previous findings. Interpersonal skills are also helpful in making the patient feel safe, respected, and empathetic. The physician should be the one guiding through the video consultation conversation and should accordingly structure the meeting, choose an adequate language, and interact with the patient (2a).

Table 10 *Inductively built categories for research sub-question "Which competences does a physician need to support the patient in a mobile appointment?"*

Category	Sub-category
Knowledge acquisition	• Accounting • Prescription • Technical knowledge • Advanced training for video consultation • Application knowledge
Organization	• Medical history scheme • Decision about online or offline appointment • Third party support (e.g. secretary) • Patient support in non-medical problems • Physician verification • Emergency number as backup
Technical requirements	• Technical knowledge
Privacy	• Place away from disturbances
Professional expertise	• Subject specific questioning • Professional knowledge • Using networks
Preparation of the professional	• Preliminary information and findings of the patient • Knows patient
Briefing	• Technical explanation • Functionality explanation
Conversation technique	• Manner of conversation • Structure of conversation • Clear and slow language • Summary of conversation • Interaction with patients
Interpersonal competence	• Provide safety • Patience • Empathy • Listening • Respect

b) Which competences does an educator need who trains (future) physicians in video consultation in a mobile way?

Since educators need certain skills (table 11) to teach physicians who are already working or are still in training, this master thesis aims to develop a digital handbook. Educators should have background knowledge about telemedicine and video consultation, what needs to be considered when documenting and which legal regulations need to be observed, for example with regard to data protection. In addition, teachers as well as physicians can visit pioneers of video consultation in order to learn from already experienced physicians. Physicians should be taught how to organize a video consultation, when it is useful and how it should be structured. Furthermore, physicians should learn wider interpersonal skills to strengthen the physician-patient relationship and be familiar with the technology used. Workshop participants also mentioned that virtual reality and augmented reality can be integrated in the learning process (2b).

Table 11 *Inductively built categories for research sub-question "Which competences does an educator need who trains (future) physicians in video consultation in a mobile way?"*

Category	Sub-category
Background knowledge	• Accounting • Video consultation procedure • Hospitation with pioneers • Telemedical development • Conversation documentation • Information gathering • Equipment for self-examination of the patient • Suitable online examinations
Required organization	• Prescription and referral issuance • Personal contact • Decision about online or offline appointment • Structuring of a long-term online support • Video consultation procedure
Required technical knowledge	• Technical competence and skills • Anticipation and alternative solution of technical barriers
Legal knowledge	• Data protection • Liability • Safety
Required interpersonal competence	• Trust building • Humor • Physician-patient relationship
Knowledge of conversation technique	• Communication between physician and patient • General communication • Patient briefing
Involvement	• VR and AR for increased integration • Willingness to train • Suffering ability

4.2 Results of the Second Research Question

Having described the findings on the demands on patients and physicians, those of the second research question are now presented below. The results were formed from the transcript; in the case of direct quotations, the lines were included.

2. How should learning with mobile aspects be designed?

The second research question addresses what mobile learning can look like, with a focus on how educators can teach video consultation. This question was divided into five sub-questions, shown in the following.

a) Why would a student want to learn more about how to apply video consultation?
Workshop participants identified reasons for what motivates physicians, as students or as working learners, to learn more about using video consultation (table 12). The technical circumstances are nowadays developed so far that many imagine the application of video consultation to be easy ("We have broadband Internet everywhere, nobody has connection problems, the technology works perfectly [...]"; ll. 843–846).
"Keeping in touch with the patient or support (them)" was mentioned, which makes the communication between physician and patient significantly easier through video consultation (ll. 2590–2592). In addition, video consultation is simplified when the programs used are intuitive and new technical possibilities allow the vital data of patients to be automatically recorded and read out: "The Apple Watch [...] can share [...] recorded vital signs and include them" (ll. 2640–2643).
Another motivation of learning video consultation is the way of communication. Patients can be reached much faster and there are no more delays. One participant mentioned: "[...] that there are no more self-diagnoses via Google, because you can talk to each other faster" (ll. 725–727).
"The biggest motivation for me is always that I know [...] it helps patients, that patients want to use it" (ll. 2483–2487), was the statement of another participant. Not only patients benefit from the video consultation, but also other organizational advantages were mentioned, for example that non-mobile patients from rural areas can be included and less material such as paper is used.

Table 12 *Inductively built categories for research sub-question "Why would a student want to learn more about how to apply video consultation?"*

Category	Sub-category
Technical circumstances	• Equipment of devices • Broadband access • Working software • Functioning technology
Simplicity	• Intuitive programs • Simplicity and regulation of the accounting • Record and automatic reading vital functions at a distance • AI and VR support • Uncomplicated maintenance of patient contact
Velocity	• Speed of communication • Immediate feedback from a professional • No delays
Organizational advantage	• Application of the practical experience in video consultation • Data protection • Patient benefit • Advantage for non-mobile patients • Central information platform for all specializations • Mobile learning is the future • Feedback for improvement • Reach group of people • Including self-monitoring • Coverage of video consultation by health insurances • Less paper and material consumption

b) In which situations would a student invest into learning?

The question of when and where learning can take place in mobile learning was answered clearly (table 13). “[...] that I can be anywhere and learn anywhere. I can also go to another country, gain practical experience there and at the same time I can still learn my theoretical part digitally in my studies” (ll. 290–296). Mobile learning also makes it possible “[...] to break off at any time and pick up where you left off” which means that learning can be done chapter by chapter, for example (ll. 2441–2446).

Table 13 *Inductively built categories for research sub-question "In which situations would a student invest into learning?"*

Category	**Sub-category**
Places of learning	• Learning from everywhere • Location independence • Interrupt at any time • Use any free time for learning

c) What content would a student be interested in?

Participants put themselves in the situation of a mobile learner and would be interested in different learning contents regarding video consultation (table 14). On the one hand, legal knowledge was mentioned that they would like to learn how the communication between physician and patient should look like and which instruments exist that support the video consultation. Data protection also plays a major role here, as “access to the data should be clearly regulated, [...] as they have planned in the electronic health record” (ll. 426–432). The participants agreed that “interpersonal contact, which must not be allowed to disappear in the future either, must not be lacking. Despite the digital media [...] the interpersonal must not be forgotten. [...] We have already seen that if this is lost, it leads increasingly to psychological problems, and this should be avoided” (ll. 932–943). Virtual reality and augmented reality were mentioned as ways to expand video consultation in the future. So were “new examination techniques and new devices” (ll. 899–901).

Table 14 *Inductively built categories for research sub-question "What content would a student be interested in?"*

Category	Sub-category
Legal content	• Data protection • Liability • Veracity of information
Communication	• Interdisciplinary communication • Consideration of social competence • Patient briefing • Take the patient's point of view into account • Interactivity in mobile learning • Clear formulations • Easy language • Explanation of foreign words • Interactive learning
Supportive instruments	• VR and AI support • New examination techniques and equipment • Varied instruments for learning

d) What would be the benefit from mobile learning?

The advantages of mobile learning mentioned (table 15) were that no one is lost, and everyone can participate in mobile learning. “We no longer lose low-income or educationally disadvantaged groups” (ll. 372–379). Another advantage of mobile learning is that “people are trained, the physicians are trained, the nursing staff as well” (ll. 465–467).

Table 15 *Inductively built categories for research sub-question "What would be the benefit from mobile learning?"*

Category	Sub-category
Advantage of mobile learning	• Not losing anyone e.g., people with low-income • People are trained • Impact of parallel teaching • Some families can create financial and time resources

e) What concerns would a student have regarding mobile learning?
However, workshop participants not only saw the benefits of mobile learning, but also had concerns about it, which can be found in table 16. While all educational and income levels can be picked up in mobile learning, these "must also have the technical possibilities to use it" (ll. 588–591). Once again, social competence was mentioned here, which is lost "if everyone sits in front of their device at home" (ll. 642–649). Not only social competence, but also "everything non-verbal and gesticulated and facial expressions are lost over the distance of the screen" (ll. 2650–2653).

Table 16 *Inductively built categories for research sub-question "What concerns would a student have regarding mobile learning?"*

Category	Sub-category
Concerns of mobile learning	• Observing educational conditions in families • Impact of parallel teaching • Technology provision • Many get lost on the way • No guaranteed energy stability • Increased mental problems • Unclear formulations • Losing nonverbal communication • Missing important topics or content • Losing gestures and facial expressions

4.3 Visualization of the Results in a Digital Handbook for Educators

For the development of the digital handbook for educators on how to teach video consultation, a website was created which contains all necessary information for educators to teach (future) physicians and can be found under the following link: https://dh201807.wixsite.com/teachingvc. As described in the storyboard, the website is structured into several sites. The following pages give an insight into the created website. Screenshots of the entire website are included as supplementary material to this master thesis. On the homepage (figure 6), an introduction to the handbook is given, the main target group is addressed, and the learning modules are listed, including their links to the corresponding page of a single module.

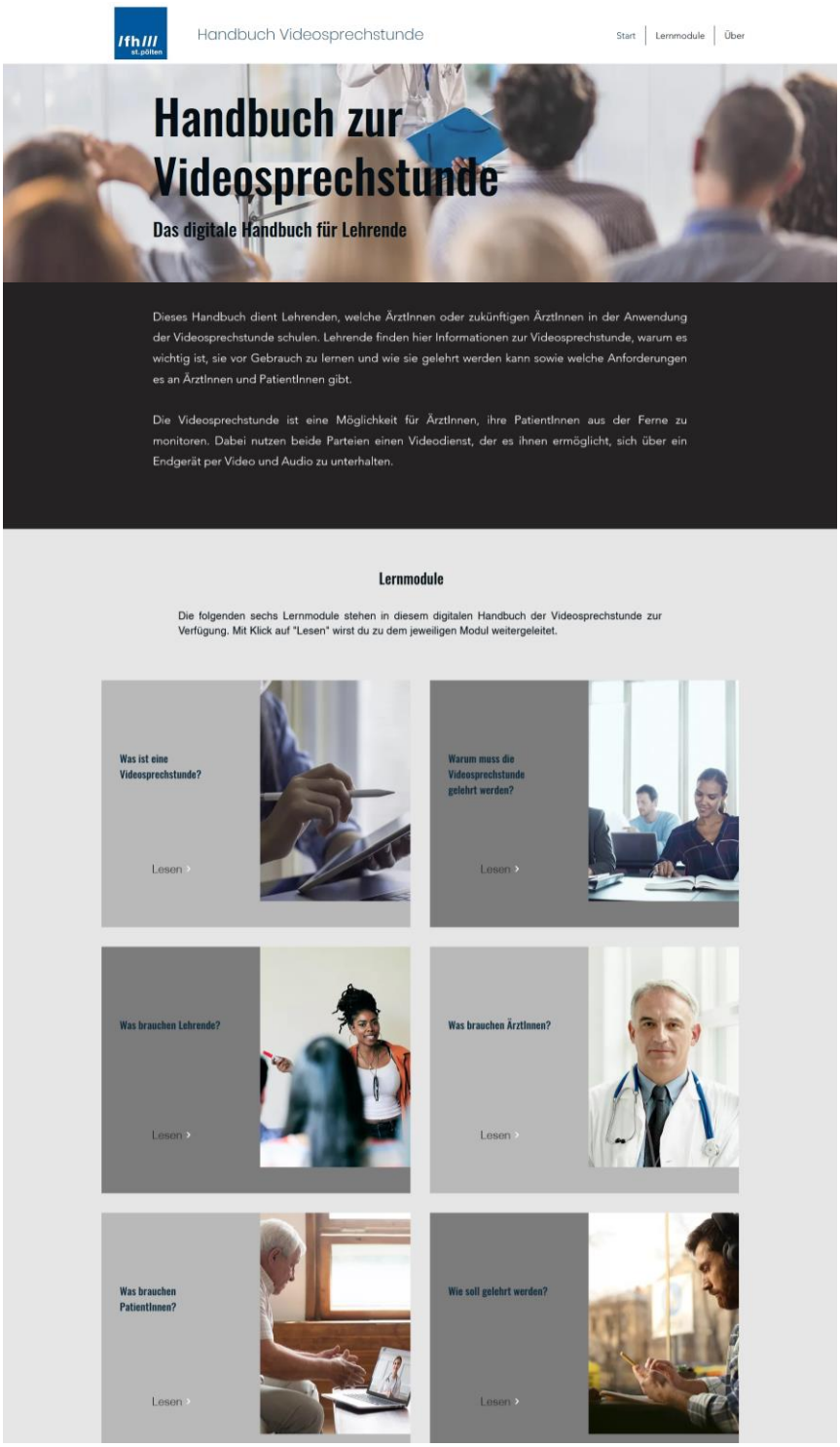

Figure 6 *Screenshot of the digital handbook homepage (https://dh201807.wixsite.com/teachingvc)*

The learning modules page (figure 7) gives a short insight into the topics of the six different modules and links to the first learning module. In addition, on each page

there is a header with the relevant titles and a footer that contains the contact information of the researcher of this work, as well as the contact information of the DIRENE project management.

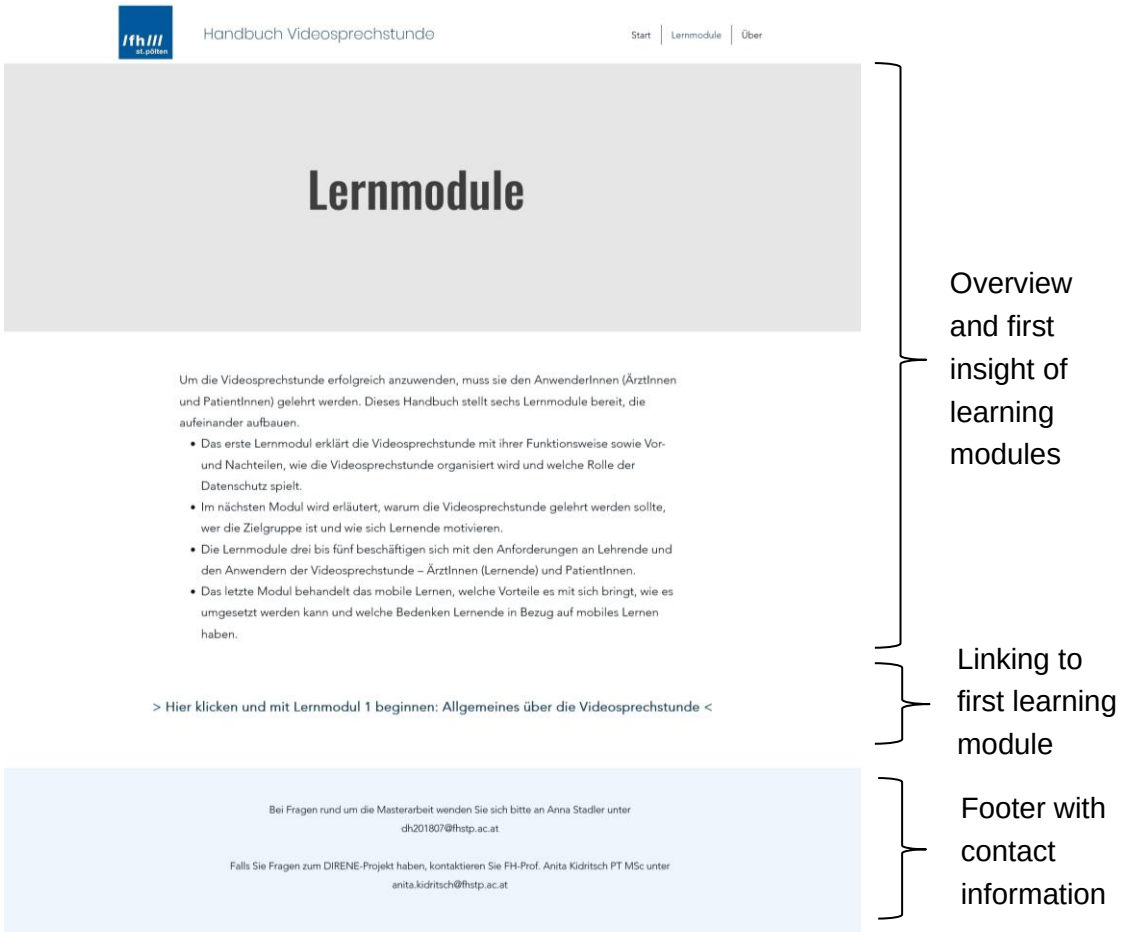

Figure 7 *Screenshot of the module overview of the digital handbook (https://dh201807.wixsite.com/teachingvc/lernmodule)*

The learning modules can then be found on six subpages, in which the learning content is described in detail. Graphics, illustrations, and audio data have been included for easy use, clarification as well as summaries of chapters that contain a lot of text. Each module links to the following module, with the last module linking to the homepage. Figure 8 shows an example of a subpage: “Requirements for patients”.

Audio file reads out the content of the learning module.

Learning module "Requirements for patients". Content is split into several sections and supported by illustrations and summary.

Figure 8 *Screenshot of a module of the digital handbook (https://dh201807.wixsite.com/teachingvc/anforderungen-patientinnen)*

The last page (figure 9) gives information about the creation of the handbook and the relation to the DIRENE project. Furthermore, the sources used in the master thesis are indicated.

Figure 9 *Screenshot of the about page of the digital handbook (https://dh201807.wixsite.com/teachingvc/%C3%BCber)*

5 Discussion

In the following, the two main research questions are answered by comparing the results of the literature and empirical research. Furthermore, the approach is discussed, and the limitations of this work are pointed out before an outlook on further steps are given.

5.1 User Requirements for Physicians and Patients

To answer the first research question, “What are the user requirements of physicians and patients for successfully deployed remote patient monitoring, especially for video consultation?”, the requirements for physicians are addressed first. To guarantee a successful usage of video consultation, physicians must meet **technical requirements** on the one hand. These include a suitable device, such as a laptop, tablet or smartphone, a camera, microphone, and speakers, as well as secure internet access and network stability. On the other hand, there are **organizational requirements** for physicians, for example that they must be authenticated before they can offer video consultations. But also, that they have to instruct patients in video consultation and provide them with information about what data they need during the consultation, how video consultation works and what they needed technically. Physicians should also prepare for the patient and know their medical history. Patients also expect **professionalism**, such as a professional appearance from their physician, professional knowledge, including video consultation billing and prescription writing, and professional treatment. In addition, the physician must meet **communication requirements** by using patient-friendly language, thinking about the structure of the conversation, taking charge of the conversation, and applying the SBAR principle, for example, to communicate information clearly. The physician plays an important role in the physician-patient relationship, which he/she builds and strengthens through trust, conveying safety, patience, empathy, respect, listening and punctuality. Besides, there are **privacy requirements**, which are fulfilled by respecting data protection and conducting the video consultation in an undisturbed place.

In addition to the requirements for physicians, there are also requirements for patients participating in the video consultation. First of all, the same **technical requirements** apply as for physicians, i.e. the use of a suitable device with a

camera, microphone and loudspeaker, as well as internet access that ensures network stability. The **organizational requirements** for patients are ensured by giving their consent to the use of video consultation, dressing appropriately, and preparing the necessary data before participating. **Communication** to the physician should be such that patients clearly express their complaints so that they can be responded to and treated accordingly. With regard to **privacy**, the patient must also participate in the video consultation in an undisturbed place so that it is not interrupted, or unauthorized persons gain access to personal and sensitive patient data.

For this research question, the literature and empirical findings were very similar in the areas of technical, organizational, and privacy requirements. The literature was helpful in highlighting the mandated legal requirements. In the interpersonal competencies such as communication and professionalism, the content could be drawn mostly from the empirical results. The two methodological approaches complemented each other with regard to the first research question in order to obtain an overall picture of the user requirements.

5.2 Designing Mobile Learning

The second main research question “How should learning with mobile aspects be designed?” was answered through theory-based concepts and results from the design thinking workshop. Mobile learning has the **advantage** that it is low cost, can be used regardless of location, and no one is lost because different groups of people can be targeted. **Concepts** that can be built into mobile learning are fun-based learning using videos, audios and images, collaborative learning by enabling (knowledge) exchange between learners and/or educators for example with a chat tool, and online game learning where knowledge is imparted playfully, and learners stay motivated. Care should be taken to use concepts that can be paused and continued at any time, such as videos, and that the videos and audios are of high quality. By using **tests and assignments** for learners, the learning motivation increases, and the learners can be given direct digital feedback, for example through audios. A learning platform should have a **structure** that guides learners through the process and be compatible with mobile devices such as smartphones. Mobile learning related to video consultation should cover **content** on legal regulations such as privacy and liability, as well as communication with patients and applicable supporting tools such as VR and AI.

The content of the second research question was covered more from the literature review and less from the design thinking workshop. However, the goal of this question in the workshop was to get an idea for mobile learning rather than to get professional answers. To be able to answer the question anyway, more literature had to be consulted.

5.3 Limitations

One quality criterion of qualitative work is intersubjectivity, which ensures that results are subjective assessments and leave interpretations open. Therefore, the limitations of the work are listed here.

Workshop schedule

The design thinking workshop was originally scheduled for a Friday morning, beginning at 9 am. During the recruitment of workshop participants, no physician could be found who showed interest at that time, because most of the inquiries went to family physicians who opened their offices on Friday mornings and therefore could not create any resources in terms of time. Therefore, the workshop was moved to a Friday evening at short notice, which enabled four physicians to be recruited. In the future, when planning a workshop or other group survey, care should be taken to choose times that can best be integrated into participants' daily lives.

Workshop execution

At the beginning of the workshop, all participants introduced themselves, for which only five minutes were originally scheduled. As this round of introductions took longer than expected, the organizers were under pressure to work through the subsequent points and tasks more quickly in order to make up for the lost time. Therefore, the following tasks were not answered in as much detail as they should have been, reducing the quality of the results. One way to avoid this is to build in buffers in the workshop planning to better respond to such unforeseen events.

The tools used during the workshop (Zoom and Mural) could not be adequately explained due to the time lost, which meant that some participants did not know how to use them and later needed help from the facilitators or the researcher. Here, an advance information would have been helpful, explaining the basic functions.

The first task of the participants was to find out the requirements for patients based on seven sub-questions, for which too little time was allocated. Due to the limited time, many participants could only answer part of the questions and left others unanswered. Also, from this it can be learned that workshop planning has to be very well thought through.

The workshop included a sociodrama in which three questions were to be discussed in the entire round. Since there was little to no input from the participants on these questions, presumably because of the way the questions were phrased or because they had already been answered previously, this task was cut short and moved on to the next. Such flexibility and spontaneity are positive and should be possible for workshop facilitators.

The task on mobile learning and how it can be designed was supposed to take place in two group discussions. However, in one of the groups there was hardly any upright discussion, which meant that the moderator had to guide the participants with many questions. In both groups, the focus was still very much on video consultation, which could have been ignored in mobile learning. It would have been helpful if it had been made clear to the participants that they could drop the previous roles on the video consultation and now start a new topic. This would have allowed a more detailed discussion to take place. Also, the question about concerns of mobile learning was in the wrong place in the group discussion because the participants were supposed to put themselves in the positive aspects and the question about concerns of mobile learning is negative.

Handbook development

In developing the digital handbook in the form of a web page for teachers, the provider wix.com was chosen after the researcher of the master thesis received this tip from a UI/UX designer and these templates are compatible for smartphone use, which has to be considered in terms of mobile learning. For the handbook, attention was paid to a clear structure that guides teachers through the handbook. Not only learners, but also teachers who use the handbook have different learning types. For example, some learn by seeing lots of pictures and videos, while others learn by having things read to them. In this handbook not every type of learner could be considered and therefore leaves room for improvement, for example in the further development of this handbook.

Furthermore, not all contents of this master thesis are reproduced in the handbook. Rather, it serves as a summary of the most important findings, but at the same

time to mention theoretical knowledge. Not all research sub-questions were listed directly in the handbook, but they were included in individual chapters. This also means that the order of the research questions was not presented sequentially as in the thesis but were presented in a meaningful order. Therefore, the handbook is not a complete record of all findings and is also only a snapshot due to changing legal regulations.

6 Conclusion

In summary, video consultation as a telemedicine application has potential to establish itself with physicians in the future and gain reach if reservations about it are removed.

Based on literature research, which consisted of basic definitions of video consultation and mobile learning, including their advantages and disadvantages as well as application examples, the state of the art could be shown. Considering the theory and using the qualitative content analysis and the inductively formed categories from the design thinking workshop, the results could be compiled to answer the following two research questions:

1. *What are the user requirements of physicians and patients for successfully deployed remote patient monitoring, especially for video consultation?*
2. *How should learning with mobile aspects be designed?*

It has been found that physicians and patients are subject to technical, organizational, data protection and communication requirements. Physicians must also be professional in their knowledge and treatment in order to use video consultation successfully (1.). Furthermore, it could be shown which advantages mobile learning brings with it and then there are different concepts to design mobile learning to reach many learners. Especially, the structure and design of the mobile learning tool is of great importance (2.).

Further steps in the digital handbook development process may include sending the completed DIRENE handbook to interested colleagues for feedback and adjusting the handbook accordingly. Another option would be to test the usability of the handbook, for example, by conducting another qualitative or quantitative test. This increases the quality of the handbook and at the same time increases its reach, because potential users (educators) are already made aware of the handbook through the research process. After initial use and testing of the digital handbook, future hypotheses may be as follows:

- The digital handbook increases the quality of teaching as well as the use of video consultation among physicians.
- The video consultation achieves better results in terms of treatment quality compared to the traditional consultation.

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Appendix

A. Workshop invitation letter to physicians

ST. PÖLTEN UNIVERSITY
OF APPLIED SCIENCES

/Medien & Digitale Technologien /fh/// st.pölten

Einladung zum Workshop

Im Rahmen meiner Masterarbeit in Digital Healthcare an der Fachhochschule St. Pölten beschäftige ich mich mit dem Thema **Begleitung von Personen über die Ferne zu Gesundheitsthemen** (Remote patient monitoring: Required competences of professionals as well as patients and development of a digital handbook for educators). Dazu zählt beispielsweise die Videosprechstunde, welche einem virtuellen Arztbesuch gleicht.

Das Ziel meines Forschungsprojektes ist es, erforderliche Kompetenzen der Videosprechstunde von Fachpersonal und Patient*innen zu erforschen. Auf dieser Grundlage möchte ich eruieren, wie ein digitales Handbuch für Lehrende entwickelt werden kann. Das Ergebnis wird das Informationsmaterial des DIRENE Projekts ergänzen. Erasmus+ fördert Forschungsprojekte zur Entwicklung innovativer Lehre. Im Projekt DIRENE (2020-1-FI01-KA226-HE-092634) soll daher ein digitales Handbuch entwickelt werden, welches Lehrende von Gesundheits- und Sozialberufen exemplarisch anleitet, Lernmodule über die Anwendung digitaler Technologien user-zentriert zu gestalten.

Um Ideen und Informationen zur optimalen Umsetzung digitaler Gesundheitstechnologien in der Praxis zu gewinnen, wird ein **Design Thinking Workshop** durchgeführt. Die Proband*innen schließen Ärzt*innen (in Fort/Weiterbildung befindend oder mit eigener Lehrtätigkeit) sowie Patient*innen ein. Inhaltlich folgt der Workshop folgendem Aufbau:

1. Nach der Diskussion über den Anwendungsfall einer/eines Klient*in, die/der eine Videosprechstunde besucht,
2. werden die möglicherweise erforderlichen Kompetenzen der erfahrenen behandelnden Fachkraft herausgearbeitet, indem die Teilnehmer*innen gebeten werden, imaginär in diese Rollen zu wechseln.
3. Zurück in den Rollen der einzelnen Personen werden mögliche Bildungssettings und die Didaktik des mobilen Lernens diskutiert, ebenso wie die Bedenken und Motivationen der Teilnehmer*innen, mobiles Lernen anzuwenden.

Der Design Thinking Workshop wird am **28. Jänner 2022** in der Zeit von **17.30 bis 21 Uhr** online stattfinden, mit einer Dauer von insgesamt 3,5 Stunden mit jeweils zwei 15-minütigen Pausen.

Wenn Sie sich als Arzt/Ärztin angesprochen fühlen, würde ich mich sehr freuen, wenn Sie Teil der zukünftigen Gesundheitstechnologien werden wollen. Bei Interesse und Rückfragen können Sie mich jederzeit per Mail unter dh201807@fhstp.ac.at erreichen.

Mit freundlichen Grüßen
Anna Stadler

B. Workshop invitation letter to patients

ST. PÖLTEN UNIVERSITY
OF APPLIED SCIENCES

/Medien & Digitale Technologien /fh/// st.pölten

Einladung zum Workshop

Im Rahmen meiner Masterarbeit in Digital Healthcare an der Fachhochschule St. Pölten beschäftige ich mich mit dem Thema **Begleitung von Personen über die Ferne zu Gesundheitsthemen** (Remote patient monitoring: Required competences of professionals as well as patients and development of a digital handbook for educators). Dazu zählt beispielsweise die Videosprechstunde, welche einem virtuellen Arztbesuch gleicht.

Ziel:

- Erforderliche Kompetenzen und benötigte Vorbereitung zur Videosprechstunde von Fachpersonal und Patient*innen erforschen. Die Ergebnisse dienen der Entwicklung eines digitalen Handbuches für Lehrende.
- Projekt DIRENE: Die Masterarbeit trägt dem EU-Projekt DIRENE bei, welches unterstützende Lernangebote für Gesundheits- und Sozialberufe in der Anwendung digitaler Technologien entwickelt. Lehrende sollen angeleitet werden, Lernmodule über die Anwendung digitaler Technologien anwenderzentriert zu gestalten.

Was & Wer:

Design Thinking Workshop: Zusammentragen von Ideen und Informationen zur optimalen Umsetzung digitaler Gesundheitstechnologien in der Praxis. Teilnehmer sind Ärzt*innen und Personen mit potenziellen oder ehemaligen Gesundheitsanliegen.

Wann:

28. Jänner 2022
17.30 bis 21 Uhr
Über Online-Plattform (hier kann bei Bedarf unterstützt werden)

Inhalt des Workshops:

1. Nach der Diskussion über den Fall einer/eines Klient*in, die/der eine Videosprechstunde besucht,
2. werden die möglicherweise erforderlichen Kompetenzen der erfahrenen behandelnden Fachkraft herausgearbeitet, indem die Teilnehmer*innen gebeten werden, imaginär in diese Rollen zu wechseln.
3. Zurück in den Rollen der einzelnen Personen wird diskutiert, wie Fachpersonen die Vorbereitung zur Videosprechstunde unterstützen können.
4. Abschließend werden Bedenken und Motivationen der Teilnehmer*innen zu Lernen in mobilen Settings diskutiert.

Interesse geweckt?

Wenn Sie sich als potenzieller bzw. ehemalige/r Patient*in angesprochen fühlen, würde ich mich sehr freuen, wenn Sie Teil der zukünftigen Gesundheitstechnologien werden wollen!

Bei Interesse und Rückfragen können Sie mich per Mail unter dh201807@fhstp.ac.at erreichen.

Mit freundlichen Grüßen
Anna Stadler

C. Declaration of consent for participants

St. Pölten University of Applied Sciences

/gesundheit /fh/// st. pölten

TeilnehmerInnen-Information und Einwilligungserklärung

Masterarbeit zum Thema

„Begleitung von Personen über die Ferne zu Gesundheitsthemen“

Sehr geehrte/r Teilnehmer/in!

Herzlichen Dank, dass Sie an einem Interview in einer Gruppe teilnehmen.

Kurzinformation über die Forschungsarbeit

Digitale Technologien können zur Gesundheitsversorgung unserer Gesellschaft beitragen, indem sie beispielsweise einen virtuellen Arztbesuch mittels der Videosprechstunde ermöglichen. Damit Gesundheitsberufe Kompetenzen in der Anwendung der Videosprechstunde von Klient*innen entwickeln können, benötigen sie unterstützende Lernangebote.

Das Ziel der Masterarbeit ist es, erforderliche Kompetenzen und benötigte Vorbereitungen zur Videosprechstunde von Fachpersonal und Patient*innen zu erforschen. Die Ergebnisse dienen der Entwicklung eines digitalen Handbuchs für Lehrende. Die Masterarbeit trägt dabei dem EU-Projekt DIRENE bei, das unterstützende Lernangebote für Gesundheits- und Sozialberufe in der Anwendung digitaler Technologien entwickelt.

Zweck und Ablauf der Datenerhebung und -verarbeitung

In einem Design Thinking Workshop werden Gedanken zum Thema „Begleitung von Personen über die Ferne“ erfragt und Diskussion mit den anwesenden Teilnehmer*innen angeregt.

Der Workshop findet am **28.01.2022 von 17.30 bis 21 Uhr** inklusive Pausen online statt. Bitte wählen Sie sich unter folgendem Teilnahmelink ein: https://us02web.zoom.us/j/82402621430?pwd=dTk3Z2srYmsvRFpNeilkMXqwK1h3QT09 (Meeting-ID: 824 0262 1430; Kenncode: 612531)

Bitte übermitteln Sie vorab die Erklärung der folgenden Seite.

1

Zu Protokollzwecken wird der Termin aufgezeichnet (Videoaufnahmen). Verantwortliche Forscherin ist **Anna Stadler, BSc (dh201807@fhstp.ac.at).**

Ihre Antworten werden zum Zweck der Datenanalyse verschriftlicht, wobei die Daten anonymisiert werden. Kontaktdaten, die eine Identifizierung der teilnehmenden Person zu einem späteren Zeitpunkt ermöglichen würden, werden aus Dokumentationsgründen lediglich den Gutachter*innen der wissenschaftlichen Ausarbeitung zur Verfügung gestellt.

Welche Daten werden gespeichert?

- indirekt personenbezogene Audio- und Videodaten
- nicht personenbezogene, anonymisierte Protokolle
- Schriftliche Notizen in Online-Arbeitsplattformen (Padlet, Mural, Google-Drive)

Wer hat Zugriff auf die Daten?

Nur der/die Organisator/in des Online-Termins hat Zugriff auf die Rohdaten. Das anonymisierte Protokoll wird auf Englisch den Mitarbeiter/innen des DIRENE-Projekts zugänglich gemacht. Ausschnitte des Protokolls können als Teil eines Berichts an ERASMUS+ übermittelt werden.

Im Falle von Rückfragen oder bei technischen Problemen in Zusammenhang mit der Teilnahme wenden Sie sich bitte an Anna Stadler +49 176 47725236.

Kofinanziert durch das Programm Erasmus+ der Europäischen Union

Einwilligungserklärung

/gesundheit /fh/// st.pölten

Ich, _____ (Vor- und Nachname),

wohnhaft in _____ (Adresse),

geboren am _____ (Geburtsdatum),

stimme ausdrücklich zu, dass meine personenbezogenen Daten, in Form von

- Bildverarbeitungen (sowohl in Form von Videos als auch Fotos)
- Tonaufnahmen
- Fragebögen
- schriftlichen Notizen zu meiner Person
- Einträge in Online-Arbeitsplattformen (Mural, Padlet, Google-Drive)

welche keine Daten besonderer Kategorien personenbezogener Daten enthalten, im Rahmen des Lehrforschungsprojektes DIRENE durch die Fachhochschule St. Pölten ForschungsGmbH verarbeitet werden.

In wissenschaftlichen Veröffentlichungen werden keine personenbezogenen Daten bekannt gegeben, um gegenüber Dritten sicherzustellen, dass es nicht zu einer Identifizierung der Person führen kann. Auch stellt die Fachhochschule St. Pölten ForschungsGmbH sicher, dass die Daten nicht an unberechtigte Dritte gelangen, und die Speicherung auf sicheren, verschlüsselten Servern bzw. in versperrten Bereichen erfolgt. Sollte eine Datenverarbeitung in externen Cloud-Systemen (Dropbox, Dropbox for Business, Tresorit, ...) unumgänglich sein, stellen die Forschungsmitarbeiter/innen sicher, dass diese Daten durch eine separate Verschlüsselung von unberechtigten Zugriffen Dritter geschützt werden.

Es gelten die nationalen und internationalen datenschutzrechtlichen Bestimmungen. Nach Beendigung des Forschungsprojekts werden die Daten („Rohdaten") zum Nachweis der Richtigkeit der Forschungsergebnisse 10 Jahre aufbewahrt und danach gelöscht.

_____

Datum, Unterschrift der/des Teilnehmenden

Bitte Folgeseite beachten!

Meine Einwilligung stellt die rechtliche Grundlage für die Verarbeitung der personenbezogenen Daten dar.
Diese Einwilligungserklärungen können jederzeit, auch separat voneinander widerrufen werden, ohne dass dadurch die Rechtmäßigkeit der Verarbeitung bis zum Widerruf berührt wird. In diesem Fall werden die von mir erhobenen persönlichen Daten und Gesprächsaufzeichnungen umgehend gelöscht.

Ich bin berechtigt, gegenüber der Fachhochschule St. Pölten ForschungsGmbH um eine umfangreiche Auskunftserteilung zu den zu meiner Person gespeicherten Daten zu ersuchen. Weiters kann ich die Berichtigung, Löschung, ab 25.05.2018 die Datenübertragung und Einschränkung der Verarbeitung verlangen, und habe ab 25.05.2018 ein Beschwerderecht bei der Österreichischen Datenschutzbehörde, welche bei dieser als zuständige Aufsichtsbehörde einzubringen ist.

D. Short questionnaire for participants

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Medien & Digitale Technologien

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Kurzfragebogen Workshop

Ihre personenbezogenen Daten werden im Rahmen des Workshops erhoben und innerhalb der wissenschaftlichen Ausarbeitung anonymisiert.
Bitte schicken Sie den Fragenbogen ausgefüllt an dh201807@fhstp.ac.at zurück.

Name: _____

Vorname: _____

Geburtsdatum: _____

Bitte ankreuzen. Geschlecht:

☐ Männlich

☐ Weiblich

☐ Divers

Bitte ankreuzen. Rolle im Workshop:

☐ Patient/in. Folgenden Beruf übe/übte ich aus: _____

☐ Ärzt/in.

Bitte ankreuzen. Bescheinigte körperliche oder geistige Behinderung vorhanden?

☐ Ja.
Brauchen Sie Unterstützung bei der Workshop-Teilnahme? ☐ Ja. ☐ Nein.

☐ Nein.

Bitte ankreuzen. Einwohnerzahl in Wohnort?

☐ mehr als 10 000 Einwohner.

☐ weniger als 10 000 Einwohner.

Bitte ankreuzen. Betreuungszeiten in der Familie (Kinder, Pflege, Angehörige)?

☐ Ja.

☐ Nein.

E. Workshop guide

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/health sciences /fh/// st.pölten

Workshop-Anleitung Videosprechstunde

Der Workshop findet am 28. Januar von 17.30 bis 21 Uhr statt.

AGENDA

1. 17.30-17.35: Check in
2. 17.35-17.45: Einleitung des Moderators
3. 17.45-18.30: Perspektive des Klienten - Einfühlen und Bedürfnisse erkennen
4. 18.30-18.45: PAUSE
5. 18.45-19.30: Perspektiven der Fachleute und das Bildungsumfeld
6. 19.30-19.45: PAUSE
7. 19.45-20.30: Bedenken oder Beweggründe für die Anwendung von mobilem Lernen
8. 20.30-21.00: Abschließende Schlussfolgerungen (Plenardiskussion) und Blitzlichtrunde im Plenum

Es sind zwei Pausen von je 15 Minuten vorgesehen. Die Pausenzeiten können variieren und an die tatsächlichen Bedürfnisse des Workshops angepasst werden.

1. Check in (5 Minuten)

AUFZEICHNUNG STARTEN!!!

Die Teilnehmer stellen sich der Reihe nach in der Rolle der jeweiligen Person vor.

1) Hallo, mein Name ist....
2) Videosprechstunde als Teil der digitalen Rehabilitation bedeutet für mich....

ODER

Wenn ich an Videosprechstunde als Teil der digitalen Rehabilitation denke, denke ich an ...

2. Einleitung des Moderators (10 Minuten)

Erklärung DIRENE:
"Erasmus + unterstützt Forschungsprojekte zur Entwicklung eines innovativen Unterrichts. Im Projekt DIRENE soll ein digitales Handbuch entwickelt werden, das Lehrkräfte in Gesundheits- und

Sozialberufen anleitet, wie sie Lernmodule nutzerzentriert unter Verwendung digitaler Technologien gestalten können."

Anna: Erklärung Videosprechstunde anhand Präsentation:
Eine Videosprechstunde ist als virtueller Arztbesuch zu verstehen. Dabei kann der Arzt den Patienten beispielsweise zu seinen Symptomen und zur Krankengeschichte befragen, sichtbare Krankheitsanzeichen in Augenschein nehmen und - sofern möglich - eine Diagnose stellen. Videosprechstunden können auch in der Psychotherapie angewandt werden.

Erläuterung der Ziele des heutigen Workshops:
Im heutigen Workshop wird auf die Videosprechstunde anhand von zwei Zielgruppen geblickt, die diese digitale Technologie anwenden. Es werden die Perspektiven von Klienten/Patienten sowie von Fachleuten ausgearbeitet. Dadurch werden Kompetenzen herausgearbeitet, die bei der Anwendung der Videosprechstunde benötigt werden. Am Ende dieses Arbeitspakets soll ein digitales Handbuch für Lehrende digitaler Technologien zur Verfügung stehen, weshalb hierfür Bedenken und Gründe für die Anwendung von mobilem Lernen gefunden werden. Heute werden wir gemeinsam Ideen für dieses Handbuch finden und weiterentwickeln. Ein Prototyp des Handbuchs wird im Juni getestet.

3. Perspektive der Klienten/Patienten – Einfühlungsvermögen und Bedürfnisse erkennen (45 Minuten)

Einleitung:
Der Moderator beschreibt verbal eine Situation und das spezifische Gesundheitsthema. Diese kann individuell für die Gruppe gestaltet werden.

Anna: Versetzen Sie sich in die Lage eines Patienten: Stellen Sie sich eine/n PatientIn vor, die/der einen langen Krankenhausaufenthalt hinter sich hat, sich nun in Rehabilitation befindet und mehrere Folgegespräche mit ÄrztenInnen führt. Da die/der PatientIn in ihrer/seiner Mobilität eingeschränkt ist und im ländlichen Raum wohnt, wird ihr/ihm in einem persönlichen Gespräch mit einer ärztlichen Fachkraft die Videosprechstunde angeboten/vorgestellt. In einer ihr/ihm gewohnten Umgebung wird der virtuelle Arztbesuch durchgeführt.
(Welcher gesundheitliche Bedarf bestand? Welche gesundheitlichen Interventionen wurden bereits durchgeführt? Welche Informationen hat der Klient über seinen Gesundheitszustand und/oder mögliche Schritte zur Umgestaltung des persönlichen Lebensstils? Was sind seine/ihre dringendsten Wünsche an das Ergebnis der Videosprechstunde oder einzelne Schritte davon?)

A.

1) Was, glauben Sie, benötigt der Kunde, um bei diesem Termin zu erscheinen?
   a) Muss sich der Klient auf besondere Weise kleiden? Muss er etwas vorbereiten? Um Daten wie Körpertemperatur und -gewicht, Blutdruck, Schmerzniveau, Reaktionen auf Medikamente oder Dinge, die er/sie in den Tagen zuvor gegessen hat zu sammeln?

2) Was, glauben Sie, wird der Kunde beim Termin benötigen?
   a) Was ist notwendig, um während des Termins eine Atmosphäre der Adhärenz zu schaffen/aufrechtzuerhalten?
3) Was würde bei einem Gruppentermin benötigt werden und was bei einem Einzeltermin?
4) Worauf verlässt sich der Leistungsempfänger/Kunde?
5) Welche Fähigkeiten/Fertigkeiten wird er entwickeln müssen?
6) Welche Gefühle oder Wünsche wird er beim Termin haben?
7) Welche Bedenken könnte die/der Kund*in gegenüber der Videosprechstunde haben?

3.1 Entwicklungsphase 1 – Brainstorming (15 Minuten)

Finden Sie sich in Paaren zusammen und wählen Sie eine Benutzer-Persona, aus deren Perspektive Sie die Fragen beantworten. Es gibt vier Benutzer-Personas:

USER PERSONA 2

- Mrs. Mayer
- 25 years
- Single; lives in a students home
- Psychology student

USER PERSONA 3

- Mr. Maxwell
- 72 years
- Widowed; lives alone
- Retired technical officer

Durchführung

Bereiten Sie vier Flipcharts (Mural) vor, auf denen in der Mitte das Bild einer User Persona zu sehen ist. Schließen Sie die Augen und denken Sie an Fragen wie:

- Was ist die Körperform der Person? Wie wählt sie/er typischerweise Kleidung aus?
- Wie bewegt er/sie sich typischerweise beim Sprechen, Kochen, bei typischen täglichen Aufgaben?
- Auf welche Weise spricht er/sie (langsam <> schnell / kurze <> lange Sätze / leise <> kräftige Stimme / Blickkontakt halten <> vermeiden ...)?
- Atmen Sie dreimal tief durch und Sie SIND JETZT diese Person!

Die Paare beantworten jede Frage aus der Perspektive ihrer gewählten User Persona und machen sich Notizen auf dem digitalen Flipchart.

3.2 Entwicklungsphase 2 – Soziodrama (20 Minuten)

Stellen Sie sich einen Leistungsempfänger/Kunden vor, der gerade einen Termin bei einem Gesundheitsdienstleister hatte. Er wird aufgefordert, seine Arztgespräche mithilfe von unterstützenden mobilen Geräten fortzusetzen/die Videosprechstunde in Anspruch zu nehmen.

1) Welche der Aspekte, die bei den persönlichen Terminen (traditioneller Arztbesuch in Person) angewandt wurden, wird der Klient bei der Videosprechstunde wiederfinden?
2) Wie, glauben Sie, wird sich seine Haltung gegenüber seines Arztgespräches ändern, wenn von ihm verlangt wird, dass dieses online erfolgen soll?

Durchführung

Die Workshop-TeilnehmerInnen führen das Soziodrama gemeinsam durch. Der Moderator macht sich Notizen auf Mural.

3.3 Nachbesprechung (10 Minuten)

Nach 3.2.: Abschütteln der Rolle (wortwörtlich!), sind Sie wieder Sie selbst! Betrachten Sie gemeinsam die gesammelten Ergebnisse der Notizen und ergänzen Sie weitere Erkenntnisse / wichtige Aspekte auch durch zusätzliche Impulsfragen wie:

1) Wie ist es bei der Videosprechstunde möglich, Fragen an die Fachkraft zu stellen?
2) Wie kann der Patient seine Handlungen/veränderten Gesundheitsparameter von zu Hause aus dokumentieren?

Der Moderator macht sich Notizen in Mural.

4. PAUSE (15 MINUTEN)

5. Perspektiven der Fachleute und das Bildungsumfeld – Benötigte Kompetenzen (45 Minuten)

Die Teilnehmer antworten in der Rolle eines Berufstätigen.

C. Nehmen Sie jetzt bitte an, dass Sie sich in der Rolle eines Gesundheitsdienstleisters oder eines Studenten, der sein Praktikum macht und den Leistungsempfänger/Kunden unterstützt, befinden.

a) Welche Fähigkeiten werden benötigt, damit der Leistungsempfänger/Kunde bei einem mobilen Termin unterstützt wird?
b) Wie wird die durchgehende Unterstützung des Kunden organisiert?
c) Wenn der Dienstleister nicht an ein Arztgespräch per Video gewöhnt ist (z. B. nicht weiß, wie er es anwenden soll): Welche Fähigkeiten muss der Dienstleister entwickeln?

D. Der/die in Aus- oder Fortbildung befindende Arzt/Ärztin kehrt an seine/ihre Hochschule für angewandte Wissenschaften zurück.
   a. Was, glauben Sie, wird er*sie von seinen*ihren Lehrer*innen über die Videosprechstunde erfahren wollen?
   b. Wenn der Lehrer sich nicht mit der Videosprechstunde auskennt: Welche Fähigkeiten, glauben Sie, würde er benötigen, um den Studenten auszubilden?

Durchführung

Sie müssen ein Mural mit einer geschlechtsneutralen Form einer Fachkraft und eines Lehrenden vorbereiten. Schreiben Sie die Kompetenzen, die diese Person haben muss/sollte, in die Nähe der Figur und ordnen Sie sie den Körperteilen zu (z. B. Wissen, Nutzung der fünf Sinne, der "Boden, auf dem die Person steht", benötigte Ressourcen für bestimmte Handlungen (in der Nähe der Hände), ...).

6. PAUSE (15 MINUTEN)

7. Bedenken oder Beweggründe für die Anwendung von mobilem Lernen (45 Minuten)

Die Beschreibung einer idealen Zukunft. Wenn du in der Zukunft wärst und eine Postkarte in die Vergangenheit schicken würdest, was würde darauf stehen. Ich denke für mich selbst einen Satz, der die Fragen E. 1-9 beantwortet. Die Fragen sind die Leitgedanken für das Schreiben.

Botschaften aus einer wunderbaren Zukunft, mit den folgenden Fragen als Inspiration

E.

Wenn Sie als Dienstleister bzw. Kunde Fähigkeiten für die Videosprechstunde (zur besseren medizinischen Behandlung) entwickeln möchten, überlegen Sie und beantworten Sie bitte Folgendes (die Schulung könnte ebenfalls mittels eines mobilen Geräts angeboten werden).

1. Wieso möchten Sie mehr über die Art der Anwendung der Videosprechstunde in der alltäglichen Praxis erfahren?
2. Wann / in welchen Situationen / wo werden Sie in die Schulung solcher Ansätze investieren?
3. Welche Inhalte würden Sie interessieren?
4. Wieviel Zeit würden Sie investieren? / Wieviel würden Sie je Lehreinheit lernen (anhand Ihrer Antwort auf die vorhergehende Frage)?
5. Auf welche Weise wäre Ihre Motivation, diesen Inhalt zu lernen, größer?
6. Welche Motivation hätten Sie, um über mobile Geräte zu lernen?
7. Welche Bedenken haben Sie in Bezug auf die Schulung mit mobilen Geräten?
8. Haben Sie Bedenken in Bezug auf die Kosten, die möglicherweise mit der Nutzung der Videosprechstunde verbunden sind?
9. Was wäre für Sie ein Mehrwert aus der Schulung mit mobilen Geräten?

Durchführung

Die Gruppe teilt sich in zwei Gruppen auf, die sich in verschiedenen Räumen treffen; jede Gruppe macht ein 30-minütiges Brainstorming zu Botschaften, die aus einer Zukunft in fünf oder sechs Jahren stammen, in der sich das Lernen im Umgang mit digitalen Werkzeugen und die Art der Kommunikation auf wirklich befriedigende, fantastische und umwerfende Weise entwickelt haben: Schreiben Sie Tweets oder Postkarten aus dieser Zukunft und/oder zeichnen Sie ein Bild. → 2 Padlets vorbereiten
→ Gegenseitig in 15 Minuten Ideen vorstellen und diskutieren

8. Abschließende Schlussfolgerungen (Diskussion im Plenum) und Blitzlichtrunde im Plenum (30 Minuten)

Finale Diskussion: Sie können Ihre zündendsten Ideen über die Zukunft aus der Diskussion des vorherigen Schrittes mit der ganzen Gruppe teilen.

Die Teilnehmer beantworten abwechselnd die folgenden Fragen:

1) Wie war der Workshop für mich?
2) Was werde ich mitnehmen?
3) Was ich noch sagen wollte...

Teilnehmer geben Feedback zum Workshop.

F. Screenshot of the Mural board