

Development of Therapeutic Competencies: Educational Value and Learning Outcomes of a Virtual Learning Resource on Children of Parents with a Mental illness

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Abstract

Background: Students pursuing health professional education, are preparing for professions where they will interact with people in vulnerable life situations. Therefore, it is crucial that these students develop knowledge and skills in interaction, communication, and guidance during their education. In the context of health professions, this can be described as developing therapeutic competencies. Utilizing virtual learning environments, 360-degree video, and VR technology, the resource allows students to explore, observe, and practice therapeutic conversations in a safe setting.

Objective: This study explores the use of a virtual learning resource in the development of therapeutic competence among students training to become health care professionals.

Methods: The study was set up using an approach inspired by action research, in the sense that researchers have been closely involved in the development and testing process. An important prerequisite was to facilitate systematic development and improvement based on students' experiences with using the learning resource.

The testing of the learning resource was conducted with two different test groups, recruited from study program leaders at a faculty of health science. A total of twelve students participated. The students were interviewed in focus groups.

Results: The results indicated that students experienced increased engagement and learning outcomes compared to traditional teaching methods. They reported that the interactive approach provided a deeper understanding of complex topics, such as legislative frameworks and therapeutic practice, and that the resource promoted the development of practical skills.

Conclusions: The study concludes that VR technology can be valuable in healthcare education, helping to prepare students for challenges in professional practice.

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Original Manuscript

Development of Therapeutic Competencies: Educational Value and Learning Outcomes of a Virtual Learning Resource on Children of Parents with a Mental illness

Abstract

This study explores the use of a virtual learning resource in the development of therapeutic competence among students training to become health care professionals. Utilizing virtual learning environments, 360-degree video, and VR technology, the resource allows students to explore, observe, and practice therapeutic conversations in a safe setting. The results indicated that students experienced increased engagement and learning outcomes compared to traditional teaching methods. They reported that the interactive approach provided a deeper understanding of complex topics, such as legislative frameworks and therapeutic practice, and that the resource promoted the development of practical skills. The study concludes that VR technology can be valuable in healthcare education, helping to prepare students for challenges in professional practice.

Key words: healthcare education, virtual learning resources, virtual reality, therapeutic competence.

Introduction

Students pursuing health professional education, are preparing for professions where they will interact with people in vulnerable life situations. Therefore, it is crucial that these students develop knowledge and skills in interaction, communication, and guidance during their education. In the context of health professions, this can be described as developing therapeutic competencies. Therapeutic competence can be defined as specific skills in conversations and interactions with patients and their families. These are skills that can be acquired through interactions between students and teachers (Anonymous 1). In this article, we will explore how the development of therapeutic competence can be enhanced through an interactive virtual learning resource, in addition to using 360 video and VR technology in teaching. The learning resource is centered around supporting a family where one of the parents is suffering from mental illness. However, the methodology and therapeutic approach is quite generic and can be applied to several other severe conditions affecting a family, such as parental cancer, injuries or substance use disorders.

Therapeutic competence also refers to the ability to assess and understand the patient's overall situation, as part of a larger social and familial network. This holistic assessment includes the patient's roles and responsibilities, which may include caring for children. An important part of this competence is thus also understanding how the patient's illness affects their family and especially their children and adapting healthcare to the patient's life situation. Children who have parents suffering from significant illness, such as mental illness or substance use disorders, may need support, information, and follow-up. This is a take on therapeutic responsibilities that expands the unit of care provision in services from a narrow focus on the patient to the wider family and caregiving system and is commonly referred to as a family focus in health services (Foster, O'Brien & Korhonen, 2012).

In Norway, healthcare personnel have a legal obligation to identify whether patients have children,

following the revision of the Health Personnel Act in 2010 (Health Personnel Act § 10 a). This legal provision requires healthcare personnel providing care to adult patients not only to clarify whether the patient has minor children, but also to assess what information or needs for support the family might have. The legislation is applicable to all illnesses that might have an impact on everyday functioning and parenting, not just mental illnesses (Health Personnel Act § 10 a). However, extensive national evaluations show that the work to change practices in hospitals so that all patients with children are assessed and offered support is progressing very slowly (Anonymous 2; Anonymous 3; Anonymous 4; Ruud, Birkeland, and Faugli, 2015). It has also been revealed that children are rarely included in conversations with healthcare personnel when parents are severely ill (Anonymous 5). The challenges of successfully including children are related to obstacles both within the families themselves and within the healthcare system (Anonymous 5; Anonymous 6). Internationally, there are several studies documenting the same issues, i.e., health care personnel across professions struggle to establish systematic routines that encompass the family situation of the patient (Laetas et al., 2015, 2018; Grant et al., 2018).

Lack of time, competence, and competing tasks are reasons why many children do not receive the support and information they need when parents are severely ill (Anonymous 6). Part of the explanation may be that healthcare personnel perceive the work as additional rather than an integrated part of healthcare (Anonymous 6, Ruud et al., 2015). Additionally, healthcare personnel find it challenging to talk to children about difficult topics such as substance abuse and mental illness in parents (Anonymous 7). Acquiring skills in communication, interaction, and guidance to families is thus central to the education of healthcare personnel. Health professionals have to deal with situations that demand therapeutic competence on a daily basis (Mota et al., 2019). It requires an understanding of the situation and interaction with the patient in an appropriate manner (Weingarten et al., 2010). Therefore, it is important that education focuses on developing skills in

communication and interaction (Mota et al., 2019).

Approaches to learning therapeutic competencies

Emphasizing the active role of students in knowledge development and hence applying educational approaches that encompass inter-activity is an important starting point for developing therapeutic competence (Stenseth, 2021). Chi and Wylie (2014) describe four learning modes: passive, active, constructive, and interactive, which were tested in a five-year project (Chi et al., 2018). The results showed that constructive and interactive activities, involving interaction, increased learning outcomes. The students who participated learned significantly more through interactive learning forms compared to a more traditional one-way communication from teacher to student (Chi et al., 2018, 2014).

Observation can also be an important learning arena for students who are training to become health professionals. Studies have shown that healthcare personnel lack competence in how to have professional conversations with children (Hauger, Wiker, and Hamnes, 2020; Christiansen et al., 2019), and many are unsure of how to proceed in conversations with families (Anonymous 6; Hafting et al., 2018). However, by observing family and child conversations, one can gain knowledge about how such conversations can be conducted, although this is challenging to achieve in practice with families in very vulnerable life situations. Learning through observation is often referred to as the apprenticeship model, which mainly involves the master first explaining or showing how to perform various tasks, and then beginners observe and try themselves (Pettersen and Løkke, 2018; Skagen, 2014).

Interactive learning approaches and observation should be followed by a component of reflection to optimize the learning of new skills. Reflection is considered an essential component of the learning process, especially when it comes to acquiring new skills in practice (Schön, 1991). Reflection involves a conscious and systematic assessment of one's own experiences, actions, and results.

Another aspect to be aware of is that in the field of children of parents with severe illness, encounters with families where one or both parents have challenges due to illness, health professionals may uncover some children who are not receiving adequate care at home. Health professionals may in such situation have a legal obligation to report such situations to agencies like for instance social services. However, studies have shown that healthcare personnel largely underreport neglect (Anonymous 8). To fulfill their reporting responsibility, it is important that students training to become health professionals are also trained to recognize risk factors and signs of neglect when interacting with families where serious illness is involved. Reflection promotes a deeper understanding, as it develops the ability to think analytically and solve problems creatively (Kolb, 2015). Additionally, reflection can help build confidence in the role as a health professional, as one becomes more aware of one's own competence and potential for development.

Healthcare personnel report that it can be difficult to ask about difficult topics, and they are often unsure of what to do with the information they receive (Blair et al., 2021). A final aspect that should be emphasized when students are acquiring therapeutic competence and competence about family focused treatment is therefore the possibility to practice. To develop skills in terms of asking difficult questions and what to do with the responses you achieve, it is necessary to obtain practice. It is ethically challenging to allow students to practice on real patients as interns, especially when it involves complicated life challenges and illness profiles in patients. Practicing through role-play is common, and role-play can be a good way to train professionals for situations that will arise in real life as health professionals. However, it can be challenging to get all students to participate in role-play in a way that provides learning outcomes because many may find it demanding to be in focus (Nordkvælle et al., 2020). Furthermore, topics addressed through role-play can trigger negative emotions that may lead the learning process in an undesirable direction (Leming, 2016). Practicing in simulated and virtual situations can thus be a good alternative. By using virtual learning

resources, health science students can practice, among other things, establishing contact and building alliances in an arena where the student's skills have no consequences for the patient, as it could have had in an internship situation. Additionally, the virtual situation provides greater opportunities for practicing repeatedly.

The learning resource: design, structure and learning objectives

To strengthen therapeutic competence development in assessing and offering support to patients who have children, we have developed a virtual learning resource for students training to become health professionals. The objective of the learning resource is to give students and healthcare personnel insight into family-focused practice, and to provide knowledge about how children are affected by parents' illness. Furthermore, the learning objective is to teach students what kind of information they need to understand the parents' illness and its consequences. Additionally, the resource provides an example of how to conduct conversations with parents and children of different ages. The learning resource facilitates an arena for students to practice and reflect on their own performance, and encompasses student-active learning forms, observational learning, reflection, and practice.

The learning resource consists of three modules. In module one, students go on a virtual home visit to an example family, the Hansen family's house. This is done as preparatory work through a flipped-classroom approach. Students follow a learning path where they gradually gain more and more insight into the family's risk and protective factors. The learning resource provides room for practice and reflection, with interactive tasks and exploration of the case (the family) that encourages participants to assess and develop their own practice. The virtual home visit is easily done using a computer and does not require special equipment. You get to walk through the family's home and acquire knowledge about both the topic area of children as relatives and the example family Hansen. This is done by exploring various clickable interactive elements placed in

different rooms in the home.

After finishing module one, the students move on to module two, where they get to observe conversations with families using 360 video and VR headsets. VR refers to Virtual Reality and is a technology that allows the user to interact in a computer-generated environment that mimics reality. VR for skill training has proven to be as effective in teaching as traditional exercises (Kaplan et al., 2020). One of the unique strengths of using VR is that it can provide experiences that would otherwise not be available, e.g., observation in virtual rooms and practicing specific skills. In this module, the use of VR offers auditory and visual experiences that create a sense of presence in situations that would otherwise not be accessible and can thus enrich the learning process through realistic and engaging simulations.

The final module of the learning resource, module three, opens up for practicing conversations with the family and the children. With VR headsets on, students sit in the therapy room and interact with the family themselves. The 360-degree videos provide the experience of the family coming into the room to the student as a therapist. There is no dialogue in this module, but the family enters the room and looks directly at the student. It is then up to the student to engage in conversations with the family and the children of different ages. Specific tasks have been created for the module to help the student practice how he or she should/can express themselves. The exercises for module three can be done alone or in groups of students. Figure 1 provides an overview of the entire learning resource.

(Insert Figure 1 here)

Study objectives and research questions

The aim of this study has been to investigate whether using a virtual and interactive learning resource promotes learning and skills development in students in terms of therapeutic competence.

Furthermore, we investigated perceived educational value and learning outcomes among students. The research question in the study is: How can a virtual learning resource promote knowledge and skills in therapeutic competencies when interacting with patients who have minor children?

Method

The current project aimed to strengthen therapeutic competence in students training to become health professionals by developing virtual and interactive learning resources. The project received funding from (anonymized information) to develop and test the learning resource. Alongside the development and testing of the resource, an approach inspired by action research was adapted, in the sense that researchers have been closely involved in the development and testing process (Ulvik et al., 2016). An important prerequisite was to facilitate systematic development and improvement based on students' experiences with using the learning resource.

Participants and Procedure in Testing the Learning Resource

The testing of the learning resource was conducted with two different test groups, recruited from study program leaders at a faculty of health science. A total of twelve students participated, divided into two groups of six participants each. Both groups consisted of two students from the occupational therapy program (3rd-year students), two students from the psychology program (3rd-year students), and two students from the dentistry program (4th-year students). The students had limited knowledge of family focused treatment before the testing. However, they had received some instruction in therapeutic competence and communication, mainly theoretical with elements of role-play. Module one was completed at home as preparation, while modules two and three were completed in a learning lab at the faculty. Based on the experiences from the first group, adjustments were made to the setup for test group two.

The students used VR headsets for module two and three. The researchers were present during the entire testing period, and took notes consecutively. After finishing the third module, two

researchers interviewed the students in focus groups. The interviews were transcribed by a transcription service and quality assured by the researchers who conducted the interviews. Analyses of the initial interview revealed minor errors and weaknesses in the learning resource, which were then adjusted before test group two tried the resource. The results from test group two led to further fine-tuning of the learning resource, and a teacher guide was developed for pedagogical support. The learning resource and guide were then made available in (anonymized open repository). The learning resource is published open access in line with the principles of open education. We are currently in the process of translating the resource to English, making it freely available for use in international education.

Analyses

The text data in this study were analyzed thematically. Thematic analysis is based on selected themes by comparing information from all informants in a study (Thagaard, 2018). Text data were systematically reviewed by the first author and the content sorted into categories by theme.

The overarching thematic basis for the analysis has been the educational value and learning outcomes of the learning resource. Through the analysis of the interviews, it was identified how the learning resource contributed to learning by a) exploration, b) observation, c) practicing, reflecting, discussing, and d) translation of theoretical knowledge into practical skills.

Results

In the analysis of the focus group interviews, several themes were identified that illustrate how a virtual learning resource can promote knowledge and skills in therapeutic competencies when interacting with patients who have minor children. Overall, the results showed that the learning resource engaged the students and contributed to an active exploration of the learning material, leading to a deeper understanding and better retention of information. Another overarching finding was that the learning resource was perceived by students as a more interactive and engaging

learning experience than traditional teaching. Below, we will delve into the four categories that emerged in the analysis.

Learning through exploration

Students found that the virtual resources facilitated an active exploration process where they could engage directly with the material in an interactive way. Students described how the preparatory work in module 1 allowed them to explore various aspects of the family's situation, not just by passively reading, but by investigating and assessing the family situation, and viewing the situation from different perspectives. The interactive exploration led to a deeper understanding of the topic and made it easier to remember what they had learned compared to traditional methods, e.g., receiving a lecture with PowerPoint on the subject matter. The dialogue below illustrates this:

Interviewer: Did it make it a bit easier to grasp the health legislation this way compared to having something presented on a PowerPoint? You're nodding, yes.

Student: Yes, that's a very good example, with the legislation... I hate when it's introduced on a slide. It's something I can't manage to learn when it comes on PowerPoint, whereas here I could almost remember the paragraph word by word afterwards.

Student 2: I found it very helpful when the legislation was very connected to the situations and the examples. They were tailored to the situations you had either gone through or were going to go through, so it was a bit like: "okay, that applies here, and that applies there". It made much more sense. Because when you're reading it in a text-book, it's like: "Yes, it probably applies there". But when you could see why, it was way better.

Interviewer: So, it was easier to remember it?

Student 2: Yes, really.

Student 1: Speaking of what he said about retaining the information, because in our educational program, we constantly ask for clinical examples. Put it into context, give us something to attach it to, and don't just list an 80-page PowerPoint with legislation. We can't grasp that. But receiving something concrete, I think can be used in many other contexts too, and it is so much easier to learn when you have something to attach it to.

In both focus groups, there was broad agreement that being able to explore the topic themselves, in this case through a virtual home visit, was perceived as promoting learning. It made abstract theory about the consequences of being a child of parents with various life challenges, as well as training in health legislation, more concrete and comprehensible.

Some students found it somewhat intense to work with the topic in this way. The quote below

illustrates this:

Student: Before I came here, I had an expectation that it would be interesting and educational. I'm generally interested in therapeutic competence, communication forms, and such things. But I didn't think it would be as all-encompassing as it actually was. When I did module one on the PC at home yesterday, I even found it more educational than a PowerPoint. So, now in VR mode I almost felt my brain boiling, because there was so much info. I started thinking like: "Who should I look at? Should I look at her or him? Who am I most curious about in this family?" And that's a good thing, but yes, very intensive learning. So, it's a great resource, but I noticed I was a bit caught off guard. I didn't know it would be so many stimuli and impressions.

This finding shows that it can also be overwhelming to work with such topics in VR, and that teachers therefore must consider that various reactions may arise in the student group. Discomfort can also be a source of development and lead to students experiencing a high learning outcome. Being able to explore the case on their own and become familiar with the challenges the example family had was perceived as relevant and educational. Another student expressed this as follows:

Student: I think that often when do case-based learning, the information that is important in the case is pointed out to you. But in this exploration, you get a lot of information to assess yourself. With being in such an interactive resource, you get the opportunity to choose yourself what you want to focus your attention on. You practice much more on noticing the important things, compared to when you just get presented something. When you have to look for it yourself, you also practice focusing your attention. So, I thought that was very cool.

In the conversation about exploring the topic area on their own using the interactive, virtual home visit in module one, the students reported that it had a high educational value. The students said that it resembled reality. When students are in internships or start practicing as healthcare personnel after their education is finished, they don't necessarily know what the patient's or family's issues are. They have to use their developing therapeutic competence and knowledge to assess risks and problem areas to work on moving forward. The overarching finding in this category was that the learning resource was perceived as a very practice-oriented and effective way to learn these skills.

Learning through observation

The students reported that observing therapeutic conversations and communication between the

therapist, patient, and the patient's family was very educational. The observations gave them the opportunity to see acquired theory applied into practice. Students discussed how they observed different communication styles in conversations with children versus adults, and how the therapist adapted their language and methods according to the client's age and level of understanding. This provided students with a practical understanding of how to tailor therapeutic techniques to different client groups.

Student: Observing these conversations can be used as a starting point for skills training and give us the opportunity to practice therapeutic competence aimed at both children, adolescents, adults, and the elderly. It gives us the opportunity to see what we need to do as therapists to bring out the best possible information about their life situation, and in what way we can use ourselves as tools to acquire information.

Another student expressed it as follows:

Student: It was very educational because you get to see a real situation of how both the therapist and those coming to the therapist express themselves, and how their body language is. In my case, I learn a lot by viewing examples, like in an internship, by watching how my supervisor does it, and this was similar.

The overarching finding from this category showed that students experienced high learning outcomes from observing a conversation between a therapist and a family.

Learning through practicing, reflection and discussion

VR offers a unique opportunity not only to observe but also to actively engage through simulated therapeutic sessions. This leads to reflection and discussion, which are crucial for learning and developing therapeutic competence. Participants appreciated the opportunity to discuss and reflect on their actions and decisions in the VR scenarios, as shown in the dialogue below.

Interviewer: How did you find reflecting along the way? Useful or not useful?

Student 1: I generally think just seeing that you have different ways of perceiving things, and that someone can make you aware of something you absolutely weren't aware of. We discovered that we disagreed on how we perceived the situation, and I think it's great to see different viewpoints.

Student 2: Yes, and it triggers a much longer thought process too.

Student 3: I thought it was very educational, even though I felt tired at the end.

Student 4: I thought the questions were good. The questions gave us the opportunity to reflect on several possibilities and perspectives instead of giving us the answer immediately.

This excerpt from one of the focus group interviews highlights the value of questions that stimulate

reflection. This helps them understand and internalize the learning material better.

Another important pedagogical value that emerged in the focus groups was the opportunities the VR resource provided for practice. The dialogue below illustrates this:

Student 1: I noticed that for me to practice my therapeutic competence, I need a certain calm. Because I noticed that I didn't quite know where to start at first because I was stressed by them [the family] staring at me. It takes practice, I think, because you have to be able to be in a certain situation several times to be able to do it well. So, I felt that I got into it the more I practiced.

Student 2: To get into a kind of flow. I started to think about my body language eventually. After a while, I started to think: "How am I sitting now actually? Is it okay to sit like this?" But at first, I couldn't even think about what to say.

The overarching result in this category is that students experienced good learning outcomes from trying out, practicing, reflecting, and discussing with each other using this learning resource.

Translating What Has Been Learned into Practical Skills

Finally, the students discussed how they can apply what they have learned through VR in their professional practice. This includes applying knowledge and skills in real therapeutic situations, such as handling sensitive topics with clients or adapting communication styles based on the client's needs and situation. Students reflected on how they can use insights from the learning resource to improve their practice, especially in how they interact with clients and handle complex and sensitive issues. The dialogue below illustrates this:

Interviewer: So, what do you think about conducting such a conversation now? What would it be like?

Student: One of the things I'm a bit nervous about is exactly that. But it feels a bit easier now. I feel like I know more.

Students also reported that they have become more aware of what the term therapeutic competence entails. They also mentioned that they had become more attentive to the whole family and the importance of involving relatives. The dialogue below illustrates this:

Interviewer: I'm also a bit curious about what you now consider to be therapeutic competence. What do you think now? Is it clear to you what it is?

Student 1: It's a whole bag of things, with listening and hearing, tips, tricks, what works, what doesn't, reflecting, getting them to become aware of things, and not just like: "Pull yourself together, get well!"

Student 2: I became much more aware that maybe we should try to involve families more

often.

The overarching result in this category is that in terms of translating theoretical knowledge into actual therapeutic competence, the students had positive learning outcomes by using the learning resource.

Discussion

The starting point for this study has been the significant need for students in health sciences to develop therapeutic competence. In this project, interaction with patients and their family provided the context for the development of such skills. Students found that exploring the context independently through a virtual home visit with relevant sources of knowledge available in the learning resource was a very practice-oriented and effective way to learn. Exploring the topic of children of parents with mental illness through the virtual home visit in module one was considered an activating way to learn compared to the more traditional lecture format. The transition from traditional lecture-based teaching to more interactive learning forms has proven beneficial for students' learning outcomes. This learning resource promotes an active exploration process, where students can engage directly with the material in an interactive way. Students reported that the virtual home visit made it easier to understand and remember complex topics such as legislation, indicating that interactive learning can lead to a deeper understanding and better acquisition of knowledge. The results show that the exploration increased the students' engagement and learning outcomes. This aligns with learning theories that emphasize the importance of active participation in the learning process to improve understanding (Chi et al., 2014; Croxton, 2014).

The results also showed that the learning resource provided students with the opportunity to observe and practice therapeutic conversations in a safe environment. This aligns with the need to develop skills in adapting communication and interaction to different patient groups. These skills are crucial for responsible professional practice. VR technology offers a unique opportunity to learn

through observing simulated, yet realistic therapeutic conversations. VR technology can simulate complex interactions with patients and their families, providing students with some experience, yet avoiding the ethical concerns that may arise from practicing directly on patients. This is particularly relevant in education where direct practice with real patients can be challenging or difficult to achieve, such as in the early stages of educating health professionals. Compared to role-play where students themselves play the different roles, using films of relevant scenarios where students practice being a therapist who observes, listens, and interacts through VR technology appears more direct and thus professionally relevant than inventing thoughts, feelings, and behaviors in people they play themselves. Furthermore, the students developed new concepts and understanding through reflection and discussion of what they had observed in the scenarios. They could relate legislation and therapeutic techniques to practical situations, showing that they moved from concrete experience to abstract conceptualization (Kolb, 2015). Translating what they had observed into concrete skills seemed therefore easier using this learning resource.

The learning resource is designed for students to reflect on their observations, often referred to as reflective observation (Kolb, 2015). Using reflection as a key component in the learning process, the opportunity to reflect on their observations was provided, and the students appreciated this option. The students found that the questions in the learning resource stimulated deeper thinking, reflection and discussion, which is crucial for developing a deeper understanding and ability to adapt to new challenges. By discussing how the VR experience allowed them to see theory applied in practice, they felt they gained a deeper understanding of the material. Reflection on what they observed, such as communication styles and the therapist's adaptation to the client's age, thus helped strengthen their learning.

The learning resource gave the students an opportunity to practice and refine their interaction skills in a controlled environment before applying them in real situations. Practice is essential for

developing skills. Students reported that they experienced increased confidence and flow in communication after repeated exercises in the VR environment. This underscores the importance of practice for achieving mastery and confidence in therapeutic practice. Trying out new skills in a safe environment can be essential for active experimentation. The students reported that practice in VR helped them achieve flow and confidence in therapeutic conversations, which is a critical part of the learning process. Practicing in VR was perceived as activating and engaging, and the students found that the resource provided a deeper understanding as well as promoted the development of skills. Translating theoretical knowledge into practical skills can be difficult to achieve with traditional learning methods. Students reported that the VR experience provided a more vivid and realistic understanding of the subject matter, contributing to more effective learning. Students described the VR experience as particularly valuable because it allowed them to "step into" scenarios relevant to their field of study. This feeling of being part of the scenario contributed to a more authentic and engaging learning experience. The students felt that visualization contributed to a better understanding of complex subject matter. The learning resource created a unique opportunity to explore, observe, and interact in complex situations in a way that text or images cannot. In light of Kolb's experiential learning cycle (Kolb, 2015), one can say that the learning resource provides a concrete experience that is essential to start the learning cycle. Students could see body language, hear tone of voice, and observe interactions in a controlled but realistic environment. This helped them understand complex subject matter and integrate theoretical and practical aspects of the therapeutic competence they will need in practice. Through exploration, observation, reflection, and discussion, the learning resource thus contributes to the acquisition of experience, laying the foundation for the development of therapeutic competence.

Practical Implications

Although VR can have significant educational benefits, several challenges must be addressed to

maximize educational value and learning outcomes. It is important to consider and assess ethical aspects of using VR in education, because simulations of sensitive topics can have unforeseen consequences. Teachers using such learning resources should be prepared for emotional reactions and have a plan for how to handle such reactions. As with all teaching on sensitive topics that are perceived as challenging for students, it requires educators to help students navigate these challenges by providing support and guidance throughout the learning process and through supervision.

User-friendliness and technical support are important prerequisites when applying virtual resources to teaching situations (Lie et al., 2023). Participants in the focus groups reported the need for technical support and guidance when using VR, emphasizing the importance of accessible and effective technical assistance. Another challenge is the cost and availability of VR technology. Although the prices of VR equipment have fallen in recent years, costs can still be a barrier for many educational institutions. Furthermore, effective use of VR requires appropriate software and updates, which can also incur significant costs. It also requires some logistics to ensure that equipment is charged and updated with new software so that it can be easily used.

It is also important to consider how VR can be integrated and systematically implemented in educational programs to maximize learning outcomes. To ensure that VR technology becomes an integrated part of educational programs, educational institutions must consider both infrastructural and pedagogical adjustments. This requires anchoring with management, investment in necessary technology, organization of training, use, and guidance at the institution. By using VR technology, however, one can achieve more targeted competence development. In many health professions, VR scenarios can be tailored to meet the need for developing specific clinical and therapeutic skills.

Conclusion

Overall, the results show that the virtual learning resource has high educational value and

effectively promotes the learning of therapeutic competence. Interactive learning, practice, and reflection are important elements that contribute to students' development of skills necessary to meet the demands of health professions. By integrating VR into education, educators can offer a holistic approach that not only addresses knowledge but also actively develops skills and conveys important professional attitudes. This can prepare students for the complexity and challenges they will face in professional health care, while also considering their individual dispositions and needs.

Limitations

The result of this study is based on interviews from 12 students. Although the analyses indicate some positive outcomes in terms of learning and pedagogical value, the learning resource should in future studies be tested in larger groups of students to increase generalizability of the results.

Ethical Considerations

The project was not required to apply for approval by the Regional Ethical Committee (REK) as it does not involve the collection of health information. Privacy considerations have been assessed and approved by SIKT (Norwegian Agency for Shared Services in Education and Research). All informants in the study have been presented with written information material and have signed consent forms.

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AI disclosure

We used a locally adapted Large Language Model (LLM) for translation and language editing purposes. Name of LLM will be disclosed after peer-review, as it contains the name of the university the authors are affiliated with. The used model is based on Open AI Chat GPT-3.5.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author contributions

Will be added after peer-review.

Funding

Information about funding will be shared after peer-review.

Open education resource depository

Anonymized. The link to the learning resource will be added after peer-review.

Data Availability Statement

In this study, we have not obtained consent to store raw data in open data repositories and hence will not make the data available openly.

Supplementary Files