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# Towards a scenario of virtual mental health environments for school-aged children

## Poster

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## ABSTRACT

This study explores student teachers' future design scenarios focusing on promoting children's mental health literacy through virtual reality (VR) environments. VR use is on the verge of many breakthroughs in several areas of lived experience. One such area pertains to educational contexts. Student teachers were chosen as the subjects of this study due to the likelihood that they will be the primary users and disseminators of these emerging technologies in educational contexts. The students created five types of future scenarios that contained different environments and activity modes, including those that are still not yet feasible to realize with current technological capabilities. The aims students set for the VR worlds were closely in-line with the transversal competences defined in the Finnish curriculum framework. They also reflected many topics of mental health learning.

## CCS CONCEPTS

• **Applied computing** → **Education**; Interactive learning environments • **Human centered computing** → **Interaction paradigms**; Virtual reality

## KEYWORDS

Virtual reality (VR), mental health, student teacher, school-aged children, digital literacy, scenario

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## 1 INTRODUCTION

The need for efficient and high quality digital programs for learning mental health literacy is accentuated in current school development initiatives and efforts in many countries. School communities are seen as instrumental components of the digital mental health literacy pursuit. In particular, schools are vehicles through which students are introduced to a range of alternative services and environments in the digital realm. For example, in Finland the new curriculum framework [1] has a strong emphasis on arranging schoolwork in such a way that supports both learning and wellbeing. Furthermore, it additionally focuses on so-called transversal competences, or 21st century skills [2]. This entails that issues related to mental health should also be addressed throughout the curriculum.

The digital space opens up opportunities for people to seek information, interact, and take action in a manner through which they may maintain relative anonymity [3]. It enables the ability to distance oneself from familiar circles in order to engage in mental health issues. Moreover, it affords extra opportunities for gaining knowledge regarding the nature, characteristics and prominence of mental health related issues.

Digitally based mental health solutions that are currently available include serious gaming for children, youth and adults [4] as well as online therapies, chats and motivational interviews [5]. Furthermore, rather than seeing cyberspace as detached from the physical world, it should be acknowledged that children and teenagers are spending increasing amounts of time in cyberspace. They are not only playing games, engaging in entertainment and learning, but also managing offline experiences such as friendships, meetings and events. In order to thrive in online and offline environments, children and teenagers need multiple digital literacies [6].

The aim of this poster is to explore future scenarios that were created by student teachers, regarding the design of virtual reality (VR) environments intended to promote mental health literacy. The reason for conducting the study with student teachers is due to the likelihood that they will be the primary users and disseminators of these emerging technologies in educational contexts. The study is a part of a multi-disciplinary consortium "Awareness, prevention and early intervention" (APEX) that focuses on digital mental health literacy and its promotion among children and young people, in their families, as well as social and school environments.

### Virtual reality (VR) in promoting mental health and digital mental health literacy

It is predicted that VR will be an instrumental tool in healthcare in the near future, covering areas from surgery, surgical planning, training and rehabilitation [7] [8]. VR has also enabled the development of tailored mental health interventions which are high in fidelity, for the purposes of e.g., simulations, cognitive behavioral therapy and psychotherapy [9] [10]. Earlier studies have emphasized the potential of VR for assisting in the treatment of diverse phobias [11]. VR has additionally been utilised in the treatment of eating, self-esteem and self-image related disorders [12] [13]. Despite the fairly extensive research on the usage of VR in adults, there has not been much research targeting the effects of immersive technologies on children [14].

From the educational point of view, there have been some studies attempting to explore the learning and teaching potential of immersive environments. The potential of using augmented reality (AR) in teaching and especially in the context of elementary math education has been explored in cooperation with elementary school teachers and game designers teaching [15] and a game that leverages AR has been designed in the attempt to improve literacy skills in preschool-aged children [16]. In recent studies [15] [17], it has been shown that teachers often do not have a realistic understanding of the capabilities of AR technologies. They might overestimate the current capabilities of the technology, or present ideas that are not, in fact related to AR [15]. This highlights the need to improve teachers' knowledge of immersive technologies.

## 2 METHOD AND DATA

The study included two teacher education courses that were conducted during the spring term of 2017, at the Department of Teacher Education, University of Jyväskylä, as a part of a Master of Education degree program. Two student teacher groups (21 and 17 students) participated in a phenomena based course which combined Finnish language and literature with health education. The main phenomenon of the course was digital mental health literacy which was a logical theme for an interdisciplinary course of the two subjects. This poster focuses on part 3 of the course (see table 1).

**Table 1: The structure of the Finnish language and literature and Health education combined course.**

<i>Course structure</i>	<i>Related question</i>	<i>Related tasks</i>
Part 1: Theoretical background	How can we (as future primary school teachers) promote pupils' digital mental health literacy?	1) Building knowledge of digital literacy and digital mental health literacy based on literature 2) Participating in group discussions about literature
Part 2: Practical understanding	How do I describe my own digital health literacy and how can I support pupils' literacy?	1) Evaluating and testing own information retrieval skills 2) Creating criteria for pupils to evaluate digital mental health solutions 3) Organising an evaluation session with children
Part 3: Future scenarios	How can virtual reality environments support pupils' mental health?	1) Personally trying on a head-mounted display (HMD) 2) A group discussion about virtual environment planning 3) Planning a virtual environment targeted to children or teenagers: VR Scenario Stories

The data consists of 34 VR scenario stories written by student teachers. Most stories are one page in length, describing VR environments in which students envision how mental health literacy may be fostered. The stories were a part of the students' final reports where they reflected what they had learned during the course.

Stories were analyzed by conventional content analysis, where the coding categories were derived directly from the text data [18]. In our case, the stories were read by two researchers, categorized and classified firstly on the basis of their main themes.

### 3 RESULTS

The results focus on describing students' scenario types and characteristics of the VR worlds. Although many students described more than one kind of VR scenario, the scenarios can be categorized into five main scenario types of virtual worlds. Table 2 presents these scenario types, aims and activities children would be able to do in the VR worlds in the order of frequency.

**Table 2: Categories of the scenario types, included aims for mental health learning and activity affordances.**

<i>Scenario type</i>	<i>Aim</i>	<i>Activity</i>
1. Dreamland worlds	To make children's dreams visible and strengthen their mental well-being resources.	For situations when children want to relax or escape when they feel very sad or distressed. Children can experience positive and happy feelings, feel dignified and important.
2. My worlds	To learn about feelings and communication skills in safe conditions.	To practice empathy and how to be in a group. The environments are e.g. cafés.
3. Travel, culture and lifestyle world	To raise cultural knowledge, language skills and through these self-awareness.	The possibility to travel in different worlds and cultures as well as in the home country. Travel in place or in time to see, e.g., cities and go sightseeing, and see nature during different seasons.
3. Win your fears and/or develop your self-knowledge worlds	To win challenging situations and fears.	Step by step programs where children move from easy to more difficult levels to face their fears in safe conditions. Tasks to promote their self-esteem at every level. Worlds are adapted to users' individual needs.
5. Healthy worlds	To raise consciousness about the importance of sleep and physical activities in relation to well-being.	Ties, e.g., real world information from a sleep tracker to the VR world and helps children understand the meaning of good sleep. Possibilities for example trying various types of sport to find out which one interests them.

### Characteristics of the VR worlds

The characteristics of the VR worlds can additionally be described through the operational logic of the worlds, i.e., in terms of the way the virtual worlds are designed to support the idea of the world and its affordances to serve user's needs. The analysis revealed the following overlapping categories: 1) SIMS like simulation worlds where children can choose elements and create their own environments, 2) guided, ready worlds where children obey instructions and solve problems, 3) playful game worlds, and 4) step by step worlds where children walk through a path comprising various stages.

### 4 DISCUSSION

The study was a tentative effort to explore possible VR scenarios for the promotion of children's mental health literacy. Currently, many virtual environments designed for mental health purposes focus on medical-related issues and mental disorders. Notably, earlier studies have indicated the positive effects of treating adults' mental health disorders in VR worlds. However, in the near future, VR use will experience many breakthroughs in various areas of people's daily lives, including educational contexts. Thus, in this study, we aimed at the comprehensive conceptualization of mental health issues that could be covered by the Finnish primary education curriculum. The results – the students VR scenarios – offered inspiring insights regarding the diverse affordances of future technologies (VR technologies) in enabling children to strengthen their capabilities in digital mental health literacy.

The student teachers created five kinds of future scenarios to support children's mental health. Students' imaginary worlds contained different environments and activity modes - even those that are currently not realizable with today's technologies. The aims students set for the VR worlds were closely in-line with the transversal competences defined in the Finnish curriculum framework. They also reflected many topics of mental health learning.

There is a need for more in-depth study to be undertaken regarding how we construe and understand the type of digital literacies needed in when venturing into the worlds of VR. The results of this scenario study indicated precisely this. According to the students' scenarios, there are clear similarities with many digital game genres [19], and VR worlds entail diverse types of literacies such as game literacy, procedural literacy and seemingly new forms of literacies that remain to be seen in the next phases of our studies on digital mental health literacy [20].

From the educational perspective, we will next invite children and young people with their teachers to evaluate student teachers' VR scenarios. We will also invite them to imagine their own scenarios. From the design perspective, we will determine design principles essential for the actual design of such mental health VR worlds. Future scenarios are needed to guide both the design of quality VR worlds as well as to develop teaching and learning practices for the versatile use of such VR worlds in diverse learning contexts – both at school and informal learning contexts.

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