

BIRTH VR

Redefining
Childbirth Preparation
Through Virtual Reality

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ENGINEER

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HEALTHCARE & CHILDBIRTH

Career in Healthcare Sector
Adult continuing education in
healthcare and with families



EDUCATION & TECHNOLOGY

Teacher, childbirth educator,
eLearning Manager for
Healthcare company with
50 000 employees in 7
countries.



CURRENT SITUATION

50%

of parents do not participate in childbirth education

ONLY 33%

of parents who participated, reached the main learning goals



CONSEQUENCES

INCREASED

- Stress
- Fear of childbirth
- Complications

DECREASED

- Mental health
- Coping
- Ability to make informed decisions



CURRENT GAPS

USER NEEDS ARE NOT MET

- More flexibility
- Better accessibility
- More realistic information and knowledge to be applied in their own birth



“With this Advisory, I am calling for a fundamental shift in how we value and prioritize the mental health and well-being of parents. I am also outlining policies, programs, and individual actions we can all take to support parents and caregivers.”

FOR IMMEDIATE RELEASE

August 28, 2024

Contact: HHS Press Office

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U.S. Surgeon General Issues Advisory on the Mental Health and Well-Being of Parents

Washington, D.C. – Today, United States Surgeon General Dr. Vivek Murthy released a *Surgeon General’s Advisory on the Mental Health and Well-Being of Parents*, highlighting the urgent need to better support parents, caregivers, and families to help our communities thrive.

Over the last decade, parents have been consistently more likely to report experiencing high levels of stress compared to other adults. 33% of parents reporting high levels of stress in the past month compared to 20% of other adults. When stress is severe or prolonged, it can have a harmful effect on the mental health of parents and caregivers, which in turn also affects the well-being of the children they raise. Children of parents with mental health conditions may face heightened risks for symptoms of depression and anxiety and for earlier onset, recurrence, and prolonged functional impairment from mental health conditions.

Maternal Mental Health

Women generally have a higher prevalence of mental health conditions than men.⁸³ For women, the perinatal period is particularly important. Postpartum depressive symptoms affect approximately 1-in-8 mothers, with a disproportionate impact on women of color,^{84, 85} and can occur anytime in the first year after giving birth.⁸⁶ In fact, the leading cause of pregnancy-related deaths is mental health conditions (22.7%), including from suicides and overdose/poisoning related to substance use disorders.⁸⁷ Past history of a mental health condition, the experience of racism and discrimination, poor social support, and extreme or traumatic stress, among other factors, can contribute to vulnerability during this period.^{88, 89, 90} Another critical period for maternal mental health is a child’s early years. Nurturing relationships and secure attachments during this period are pivotal to fostering positive outcomes for both mother and child.^{91, 92, 93, 94, 95, 96}

<https://www.hhs.gov/sites/default/files/parents-under-pressure.pdf>

THE SOLUTION

EXPERIENCE WHAT IT IS TO GIVE BIRTH

BIRTH VR

BIRTHVR

THE UNIQUE APPROACH TO PREPARE FOR
BIRTH IN VIRTUAL REALITY

USER REQUIREMENTS:

- Flexible - online, available 24/7
- Realistic - easy to apply knowledge
- Tour of the hospital birth ward
- Accessible - can be used with different end-user devices

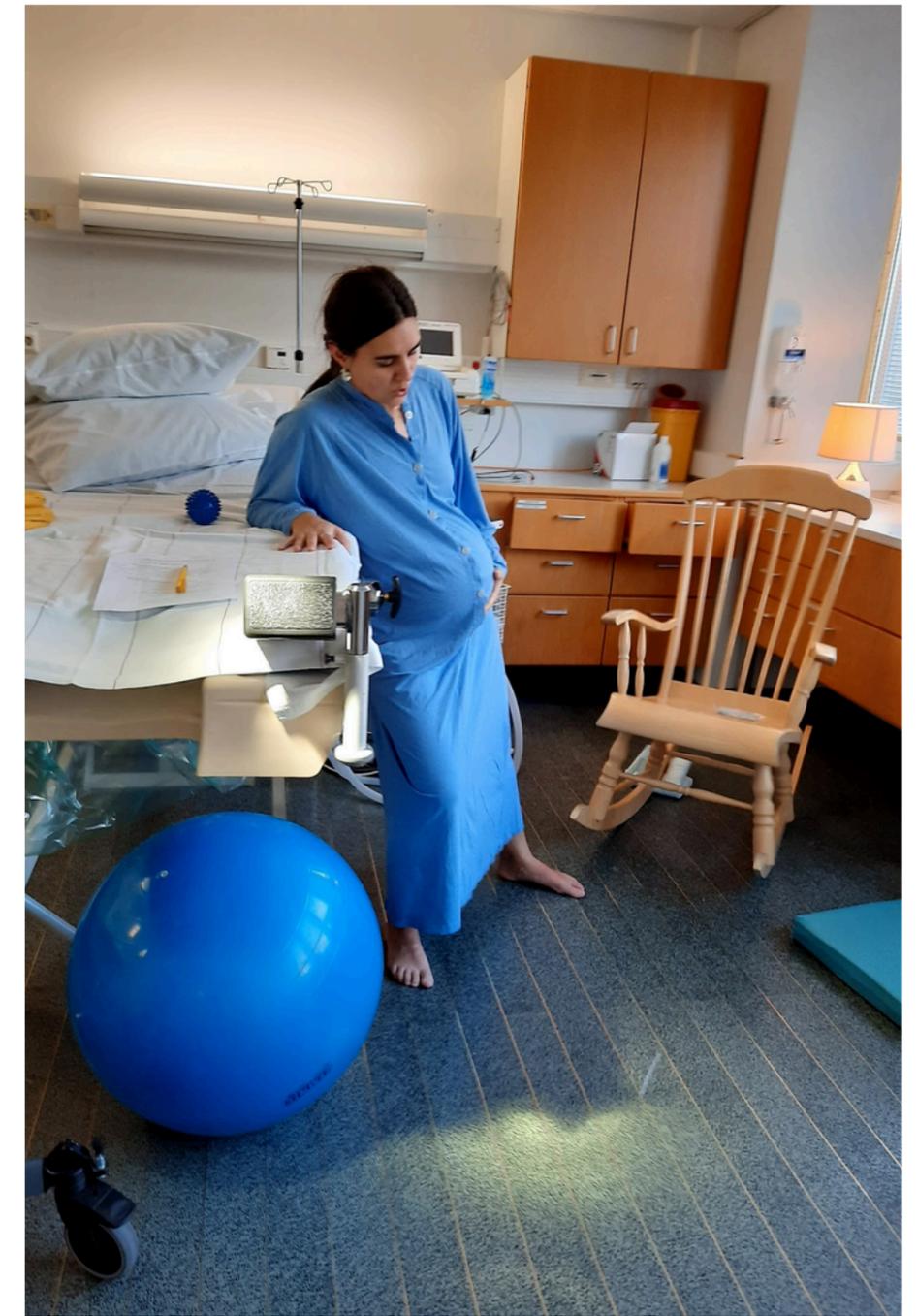


HUMAN-CENTRIC DESIGN

- Defined target users and their needs (pregnant, their spouses, hospital, prenatal care, students)
- Looked who the participants and stakeholders are and their level of knowledge
- Designed the content into a script
- Planned how the content was laid out: Intro + Master node + Content films
- Accessibility - usable in different devices
- Usability - intuitive, no guidance needed

FILMING

- Cast: A pregnant person and a midwife
- Capturing audio separately with a hidden mic
- Capturing with max. resolution of Pano2VR: 4K with Insta360 Pro

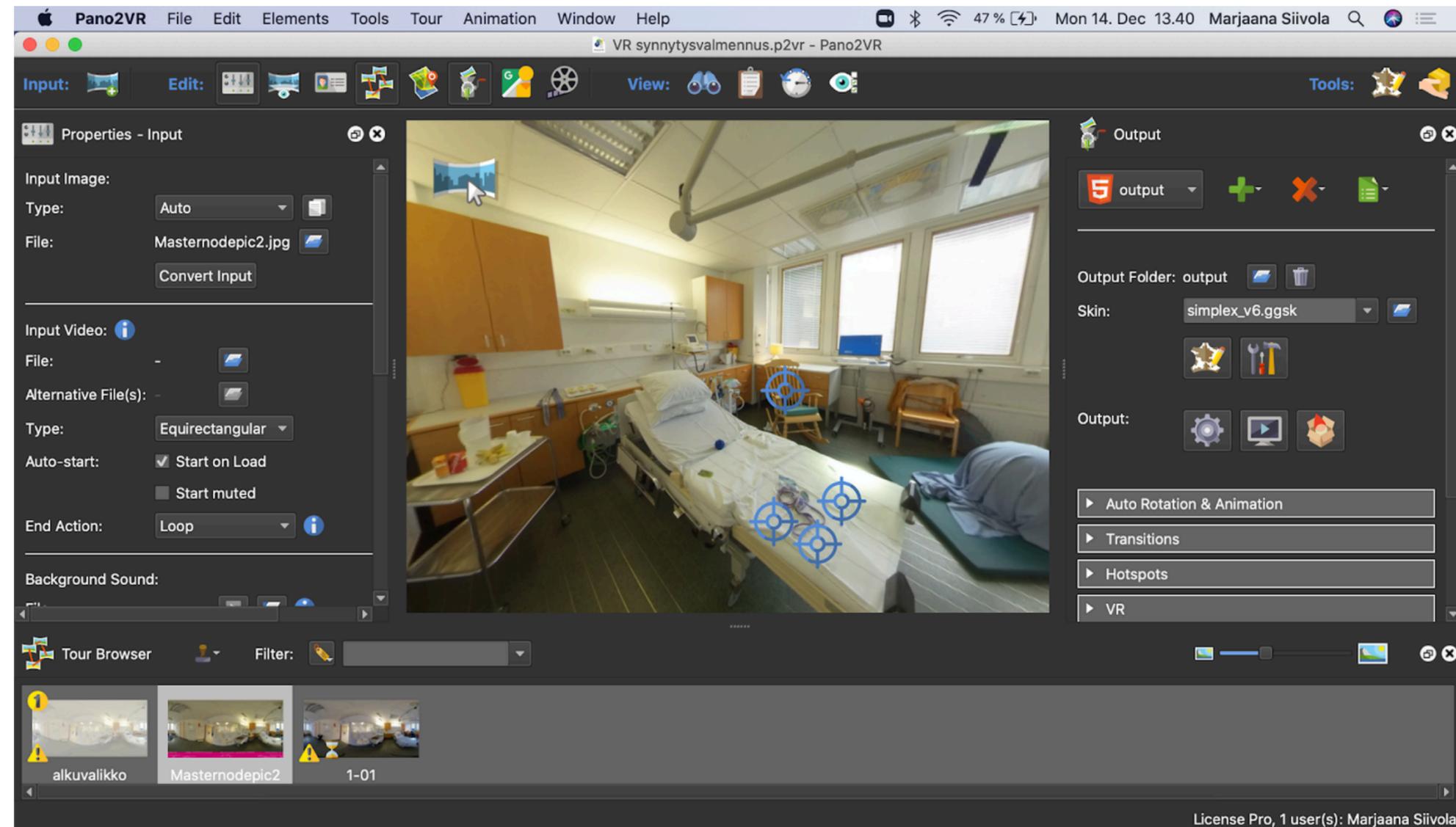


EDITING

- Stitching 6 cameras to equirectangular (mono) videos with Premier Pro
- Matching audiofiles with video
- Creating Master sequence with all the clips for script
- Recording voice over narrative (in APod) for making shorted films
- Editing clips based on script

COMPOSITION & ANNOTATION

- Composing all the material to scenes and hot spots in Pano2VR
- Exporting project and embedding it to the web site



USER STUDIES VALIDATED THAT BIRTHVR MEETS USERS' UNMET NEEDS

WE CONDUCTED USER STUDIES WITH

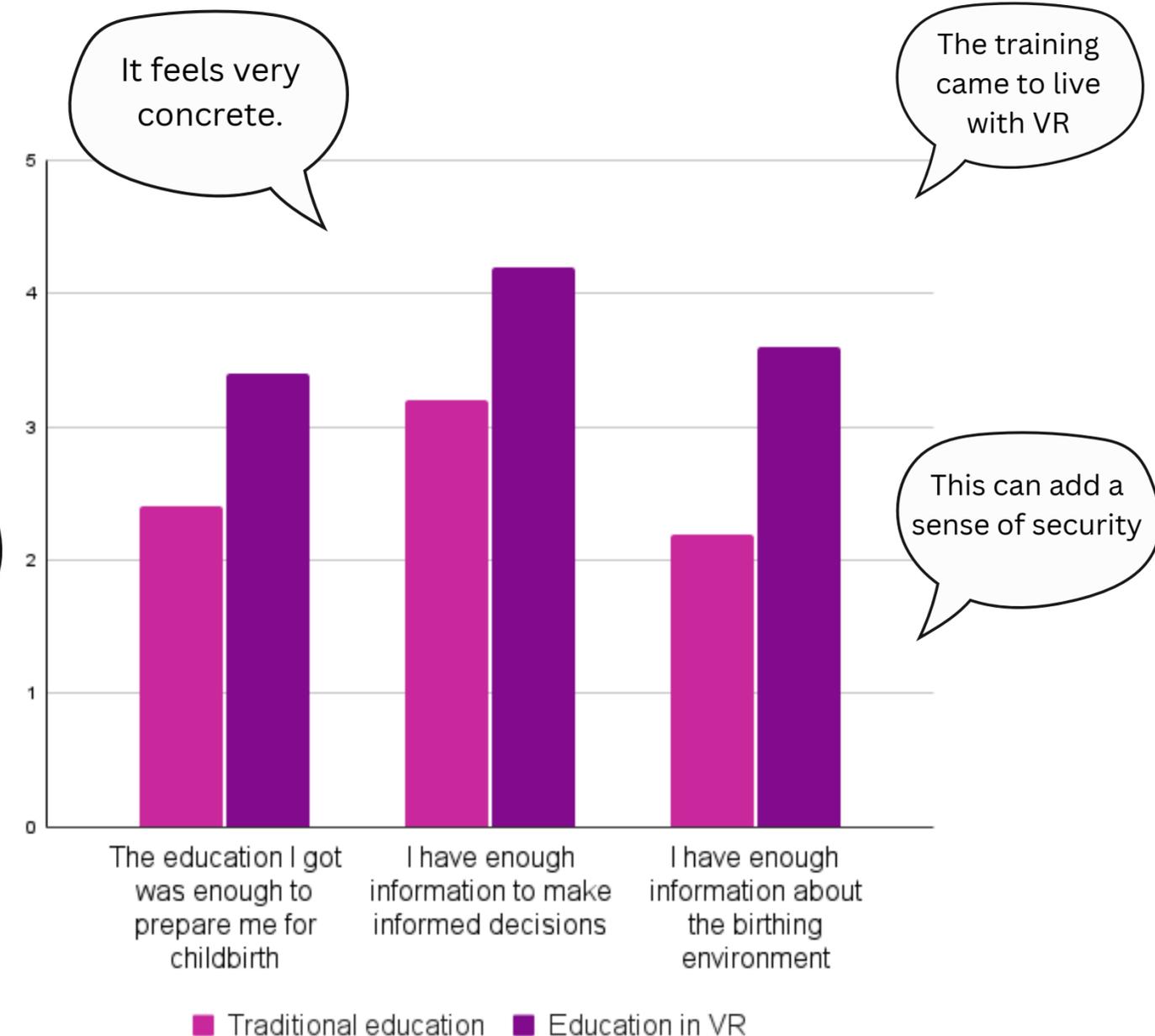
1. Parents who had given birth
2. Expecting parents
3. Midwives

RESULTS

- The learning outcomes improved. Larger studies needed to see how much
- Users felt they visited the birth room (4.2/5)
- Usability score
 - A+ (PSUS 87/100) for VR
 - B (PSUS 76/100) for other devices
- 360° videos bring added value (4,6/5)
- VR brings less added value (3,6/5)

I learned how to use the birthing ball after seeing it

This provides a possibility to "be there"

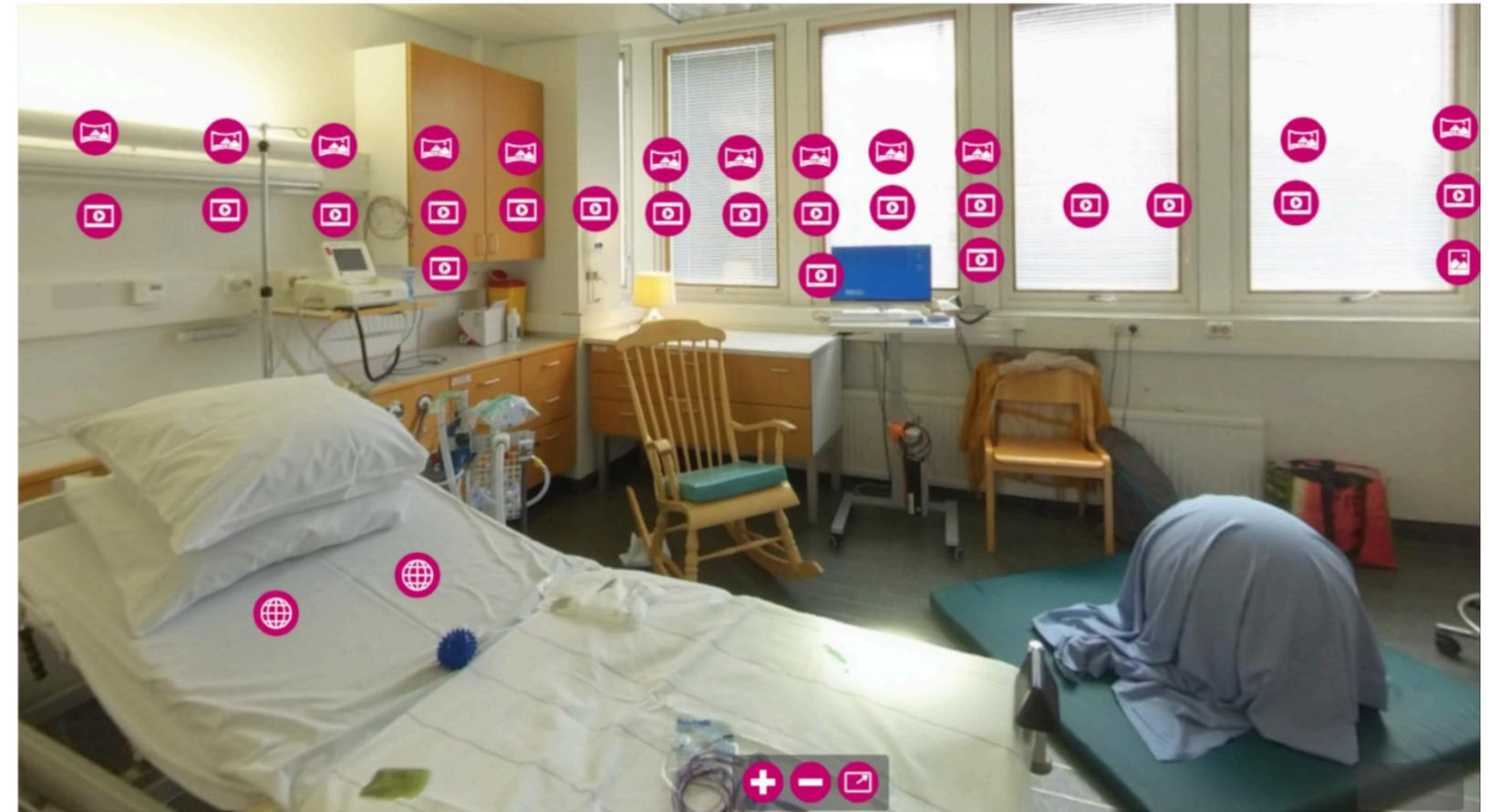


CONTENT PLACEMENT MATTERS

In the first version, the videos were placed where the action happened.



In the second version, the content was lined up according to the progression of birth.



BEING SEATED AND FILMING ISSUES

- If the program does not require moving, have the person sitting on a turning chair without rolling wheels.

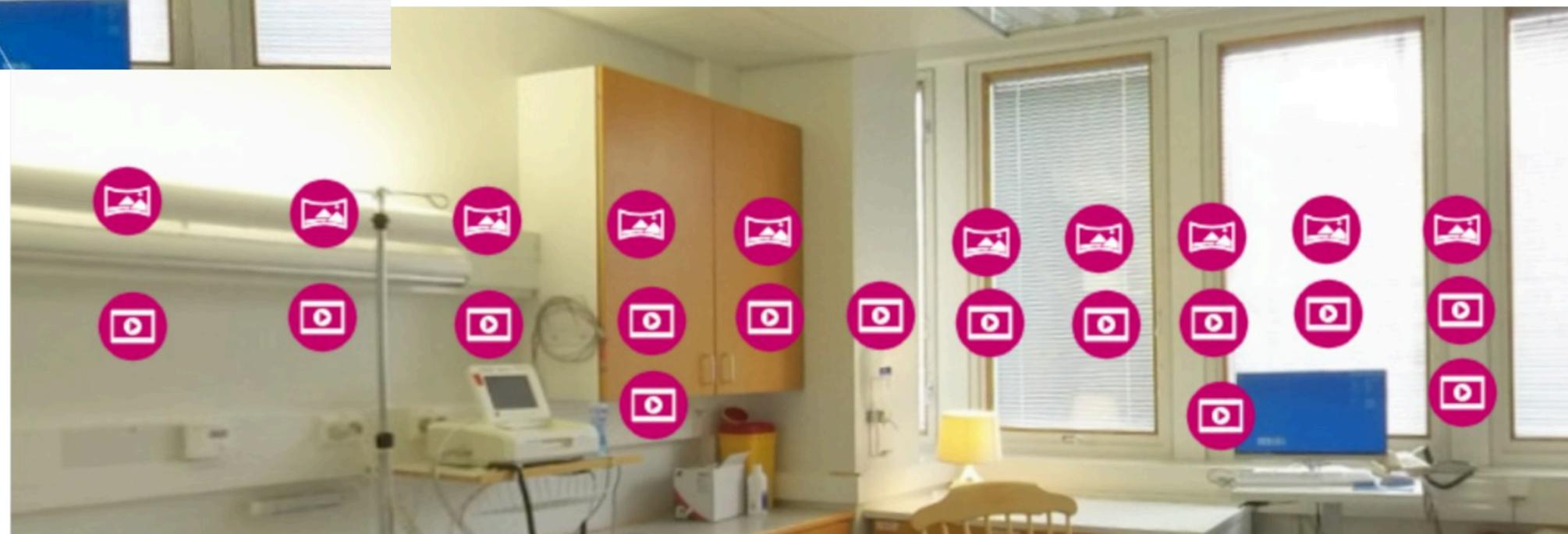
- When the actor came too close to the camera, the users moved away in the natural world.
- The VR World was slightly bigger and floor level a bit different than the natural world causing discomfort.



MORE RESEARCH NEEDED ON THE AMOUNT OF CONTENT PRESENTED FOR THE USER



- VR had only 360 videos visible (technical issues with Pano2VR).
- A computer, tablet and smartphone had audio clips, photos, and links.
- Additional content got negative feedback as well “too much”.



BIRTHABC

FURTHER USER REQUIREMENTS:

- Contact with professional
- Peer-support
- Flexibility

ONLINE FLIPPED LEARNING

- Online course for self-learning
- Regular online meetings for Q&A and discussion

Main takeaway

- Have a way to provide connection to the user (professional/teacher and peers)!



RESULTS

Virtual reality offers a concrete and realistic experiential learning environment, helping parents understand what to expect during childbirth, how to communicate with midwives, and what to anticipate in the birthing room.

Flipped learning introduces much-needed flexibility, provides interaction with professionals, and fosters peer support.

Research produced

- **Usability** considerations for VR educational program
- **Instructional model** for online flipped learning for informal adult continuing education

Next

- **Multuser** VR childbirth education for contact with professional and peer support incorporated into the VR program



Studies confirmed
BirthVR fulfills
current needs

Lessons learned
can be used in
continuing and
patient education

Professionals
agree BirthVR
enhances current
education needs



DOULES.FI/VR



Virtual Reality Childbirth Education demo

Welcome to the virtual childbirth education program! Fear of childbirth is growing alarmingly and is currently 20-25% in the US. The cesarean rate is 30%. Anxiety and stress during pregnancy are rising. All of that can...

 Synnytyksen ABC /

THANK YOU

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ACADEMIC PUBLICATIONS

- **Family and Childbirth Education Supporting the Well-being of Families: Could Virtual Reality Help?** Perhe- ja synnytysvalmennus perheiden hyvinvoinnin tukijana: Voisiko virtuaalitodellisuudesta olla apua? Siivola, Marjaana; Leinonen, Teemu. 2022. Yhteiskuntapolitiikka 3/2022. <https://urn.fi/URN:NBN:fi-fe2022060844642>
- **Flipping Childbirth Education.** Siivola, Marjaana; Malmi, Lauri. 2024. Journal of Perinatal Education 33(3): 127-147, July 2024, <https://doi.org/10.1891/JPE-2023-0014>
- **Virtual Reality Childbirth Education with 360° Content.** Siivola, Marjaana; Tiainen, Eero; Ekholm, Eeva; Leinonen, Teemu; Malmi, Lauri. 2023. Journal of Perinatal Education. 2023 Jan 1; 32(1): 35–47. doi: 10.1891/JPE-2021-0021 <https://doi.org/10.1891/JPE-2021-0021>
- **Effectiveness of Virtual Reality Childbirth Education.** Siivola, Marjaana; Leinonen, Teemu; Malmi, Lauri. 2024. Computers and Education: X Reality 2024, volume 4. <https://doi.org/10.1016/j.cexr.2024.100058>
- **Midwives' account of Virtual Reality Childbirth Education.** Siivola, Marjaana; Malmi, Lauri. 2024. Finnish Journal of eHealth and eWellfare Vol. 16 No. 3 (2024) <https://doi.org/10.23996/fjhw.143462>
- **The Impact of Online Flipped Childbirth Education with Virtual Reality.** Marjaana Siivola. Aalto University publication series, Doctoral Theses 65/2025

QUESTIONS?

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[DOULES.FI/VR](https://doules.fi/vr)

LinkedIn



Watch video on YouTube

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Video player configuration error



Video link