

BIRTH VR

Redefining
Childbirth Preparation
Through Virtual Reality

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ENGINEER

Usability engineer
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"Virtual Reality
Childbirth Education"



HEALTHCARE & CHILDBIRTH

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



EDUCATION & TECHNOLOGY

eLearning Manager for
Healthcare company with
37 000 employees.
Teacher, Childbirth Educator,
Doula Trainer



STARTING 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



USER REQUIREMENTS FROM USER STUDIES:

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

BIRTHVR

THE UNIQUE APPROACH TO PREPARE FOR
BIRTH IN VIRTUAL REALITY



20 ehdotusta lapsitoiveiden tukemiseksi

Selvitys syntyvyyden laskusta Suomessa

Anna Rotkirch

6.4.2 Perhevalmennukset ja synnytyskokemukset

Ehdotus #18

Kehitetään synnytysvalmennuksia kokonaisvaltaisesti ja tarjotaan synnyttäneille fysioterapiapalveluita.

Hyvä synnytysvalmennus voi tutkitusti vähentää synnytyksessä tarvittavien toimenpiteiden määrää ja synnytyspelkoa. Synnytyspelon parempi hoitaminen ehkäisisi siten pelon takia tehtäviä sektioita ja vähentäisi niihin liittyviä riskejä ja kustannuksia. Synnytyksestä toipuminen tukee synnyttäneen ja koko vauvaperheen hyvin-

Miten?

Sairaaloissa tapahtuvan synnytysvalmennuksen tulisi olla lakisääteistä. Valmennuksen tulisi tapahtua kasvotusten (ei etäyhteyksin), jollei maantieteellinen etäisyys sitä estä. Tavoitteena tulee olla kokonaisvaltainen synnytyksen hoito, joka sisältäisi valmennuksen, synnytyskokemuksen nykyistä paremman seurannan ja psykologisen tuen, jos siihen ilmenee tarvetta. Vahvistetaan synnytysturvallisuutta ja tarjotaan tukea synnytyspelkoisille. Jokaiselle synnyttäneelle äidille tarjotaan palveluseteli fysioterapeutille (1–3 kertaa) äidin fyysisen toipumisen tukemiseen.

> J Gynecol Obstet Hum Reprod. 2021 Oct;50(8):102144. doi: 10.1016/j.jogoh.2021.102144. Epub 2021 Apr 10.

Internet use by pregnant women seeking childbirth information

Pinar Serçekuş¹, Büşra Değirmenciler², Sevgi Özkan³

Affiliations + expand

PMID: 33848646 DOI: 10.1016/j.jogoh.2021.102144

Abstract

Background: During pregnancy period, women's information needs increases. Receiving information during this period affects the birth and postpartum period.

Objective: The aim of this study was to determine the use of the internet to receiving childbirth information by pregnant women.

Methods: The study was a descriptive study. Data were collected using an Information Form. The sample consisted of 162 pregnant women.

Results: The 92.4% of women used the internet as a source of information about childbirth. Blogs or web pages were the most frequently used internet sources with 85.8% usage, followed by mobile applications with 75.6%, and social media with 58.1%. Most of the women found the information they received from the internet partially useful and reliable. 24.3% of the women stated that receiving information on internet decreased their fears and 14.8% that it increased their fears.

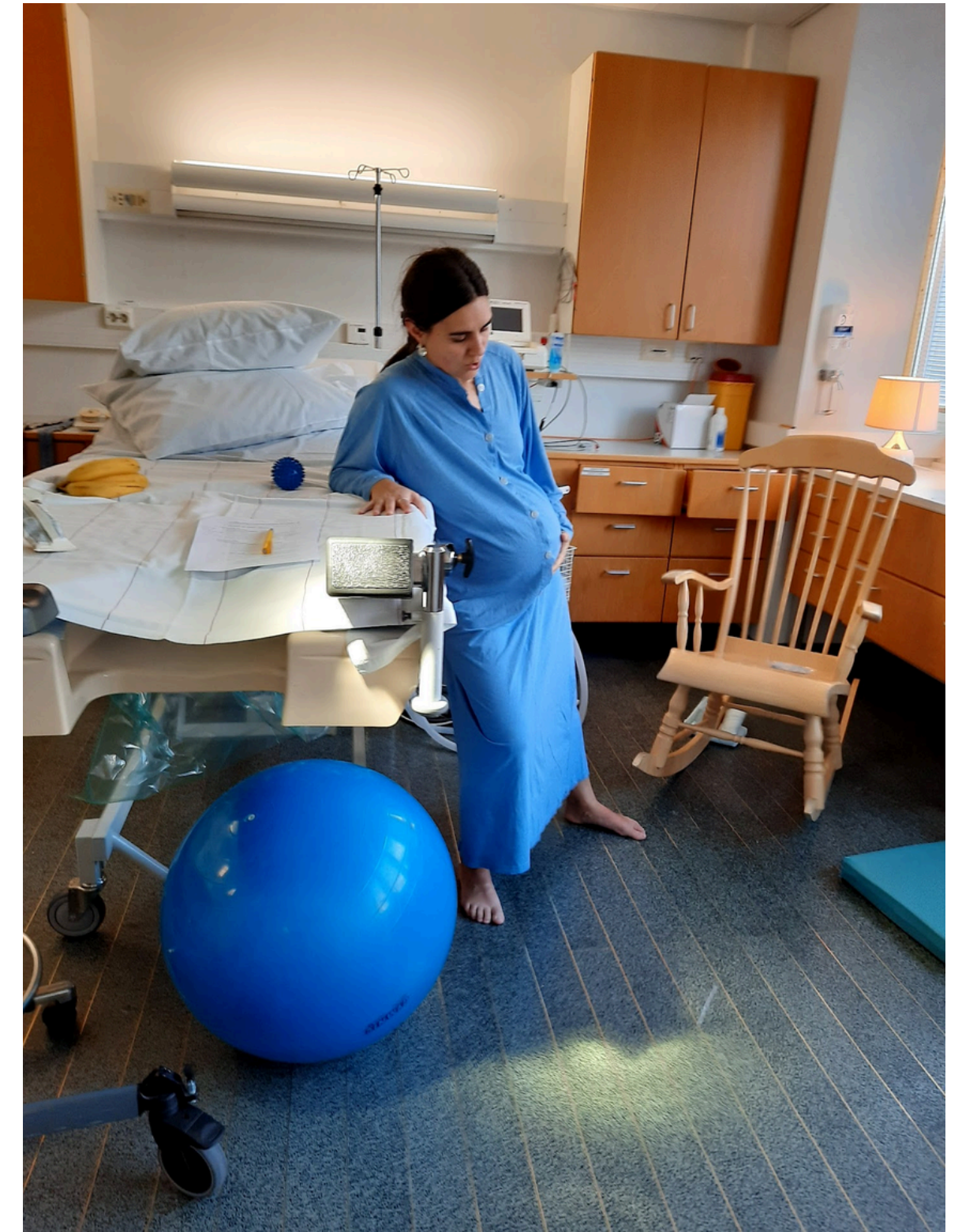
Conclusions: Most women used the internet as primary information source. Health professionals should orient people to reliable sources.

DESIGN

- Studied target group and their needs
- Looked who the participants 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
- Usability

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

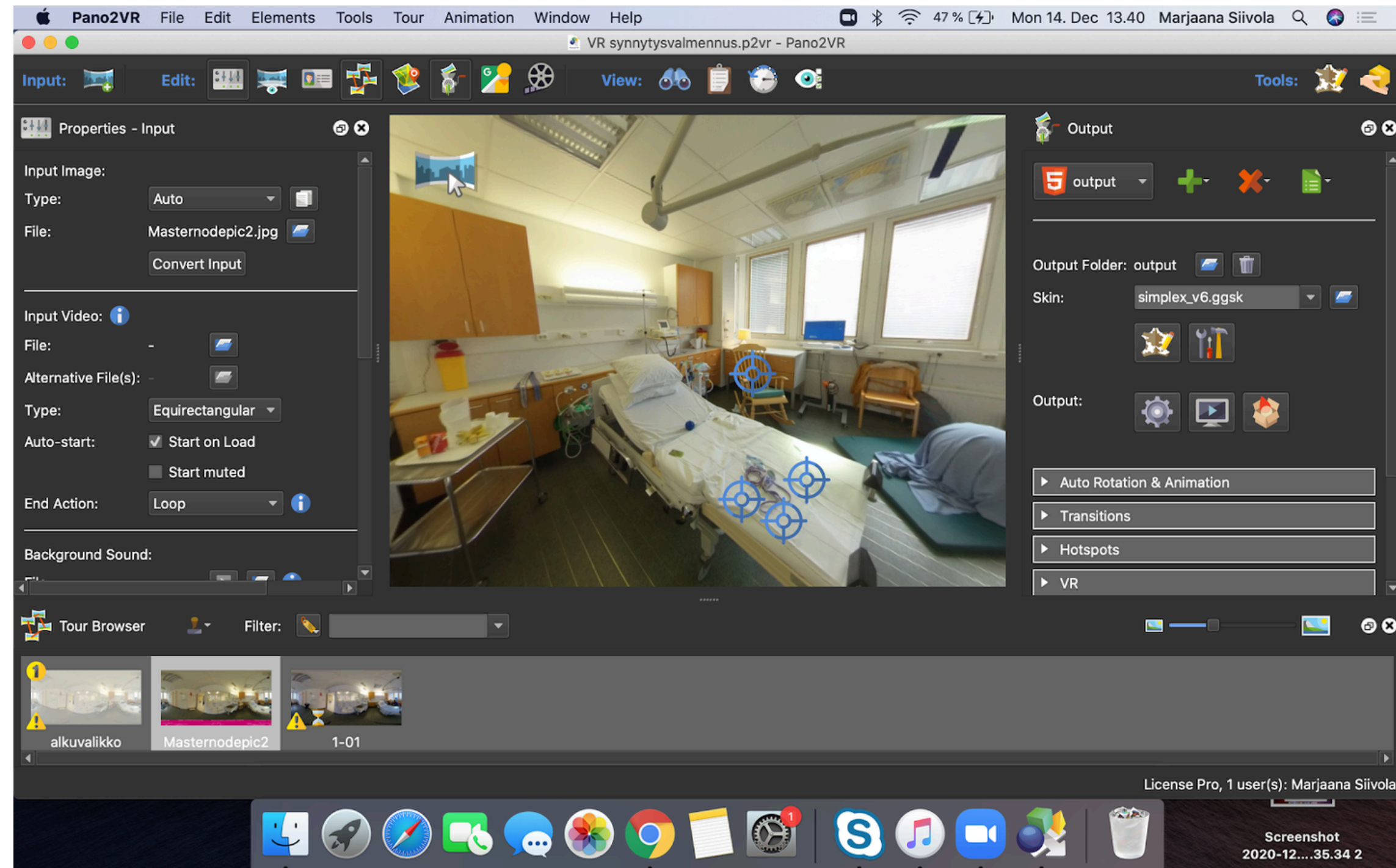


EDITING

- 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)
- 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 (usable with different devices)



USER STUDIES VALIDATED THAT BIRTHVR MEETS USERS' UNMET NEEDS

WE CONDUCTED USER STUDIES WITH

- Parents who had given birth (1st version)
- Expecting parents (2nd version)
- Midwives (2nd version)

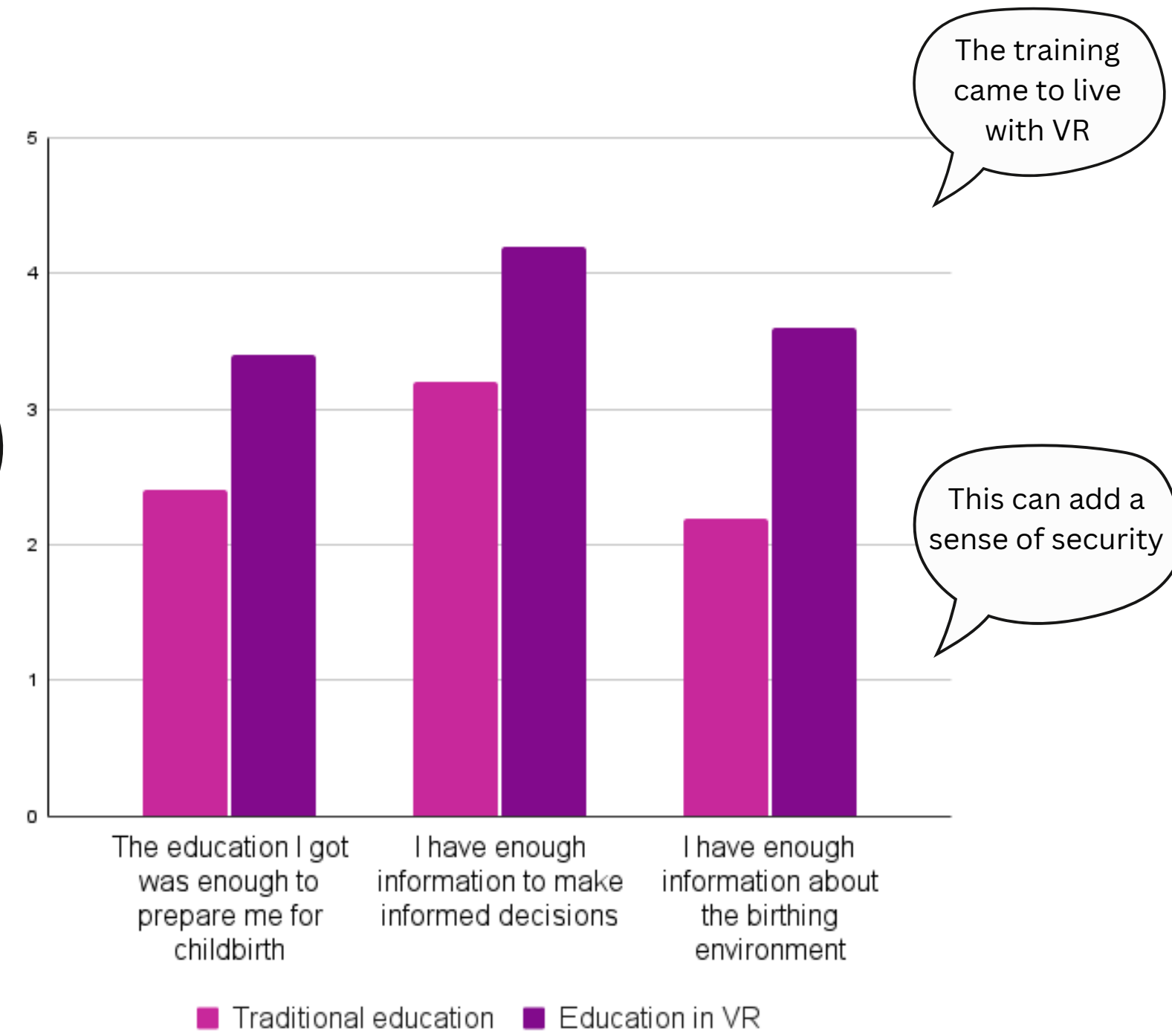
RESULTS

- 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)
- Learning outcomes saw positive change

I learned how to use the birthing ball after seeing it

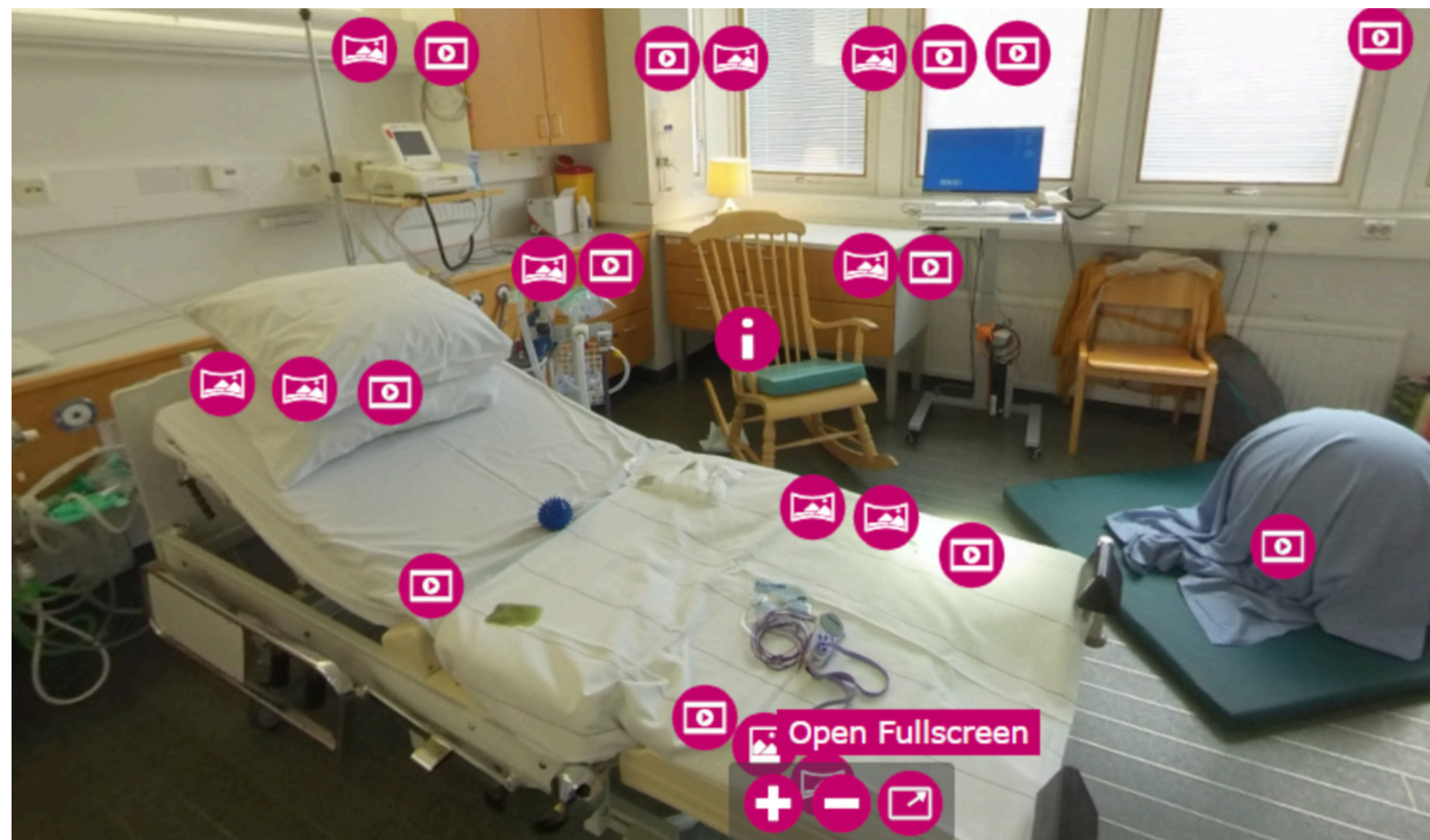
This provides a possibility to "be there"

Clearly, there is a need for this kind of program. It feels very concrete.

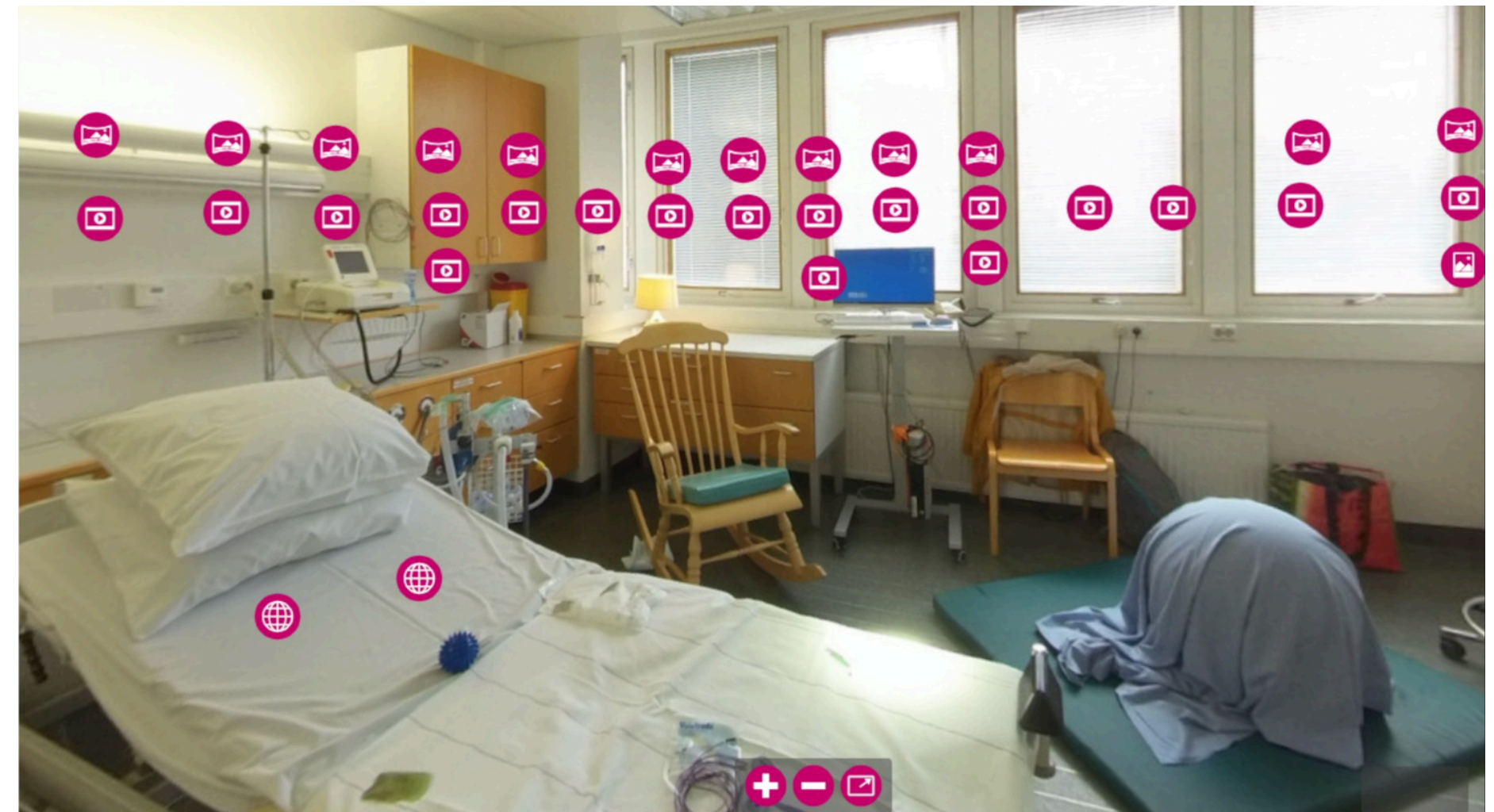


CONTENT PLACEMENT MATTERS

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.

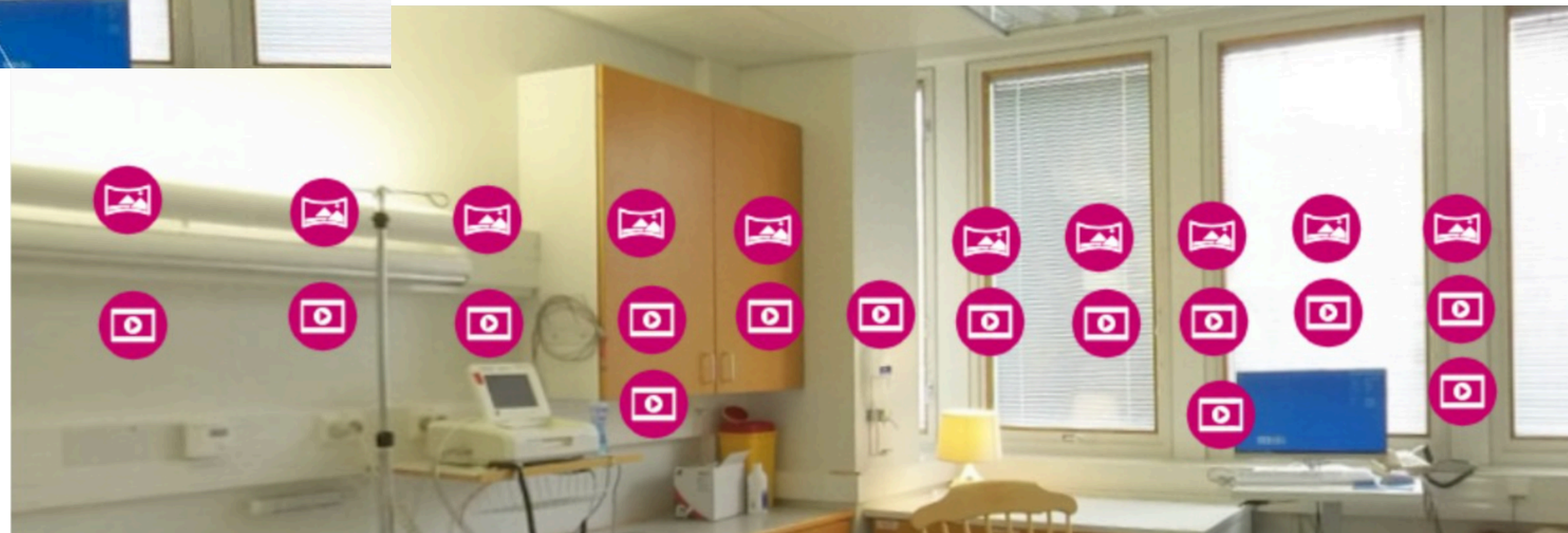
- When the actor came too close to the camera a few times, users moved away in the natural world.
- The VR World was slightly bigger and floor level a bit different than the natural world causing discomfort.



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.



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)
- Peer support gained even without camera on and a real name.



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.

Studies confirmed
BirthVR fulfills
current needs

Parents
understood
content better in
VR

Professionals
agree BirthVR
enhances current
education needs

Lessons learned
can be used in
continuing and
patient education



THANK YOU

BIRTH VR

NEXT

- Networking with people in VR, education and healthcare space
- Looking for partners to continue developing BirthVR into a product

PUBLICATIONS

- Siivola, Marjaana; Leinonen, Teemu. 2022. Perhe- ja synnytysvalmennus perheiden hyvinvoinnin tukijana: Voisiko virtuaalitodellisuudesta olla apua? Yhteiskuntapolitiikka 3/2022. <https://urn.fi/URN:NBN:fi-fe2022060844642>
- Siivola, Marjaana; Malmi, Lauri. 2024. **Flipping Childbirth Education**. Journal of Perinatal Education 33(3): 127-147, July 2024, <https://doi.org/10.1891/JPE-2023-0014>
- Siivola, Marjaana; Tiainen, Eero; Ekholm, Eeva; Leinonen, Teemu; Malmi, Lauri. 2023. **Virtual Reality Childbirth Education with 360° Content**. 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>
- Siivola, Marjaana; Leinonen, Teemu; Malmi, Lauri. 2024. **Effectiveness of Virtual Reality Childbirth Education**. Computers and Education: X Reality 2024, volume 4. <https://doi.org/10.1016/j.cexr.2024.100058>
- Siivola, Marjaana; Malmi, Lauri. 2024. **Midwives' account of Virtual Reality Childbirth Education**. Finnish Journal of eHealth and eWellfare Vol. 16 No. 3 (2024) <https://doi.org/10.23996/fjhw.143462>

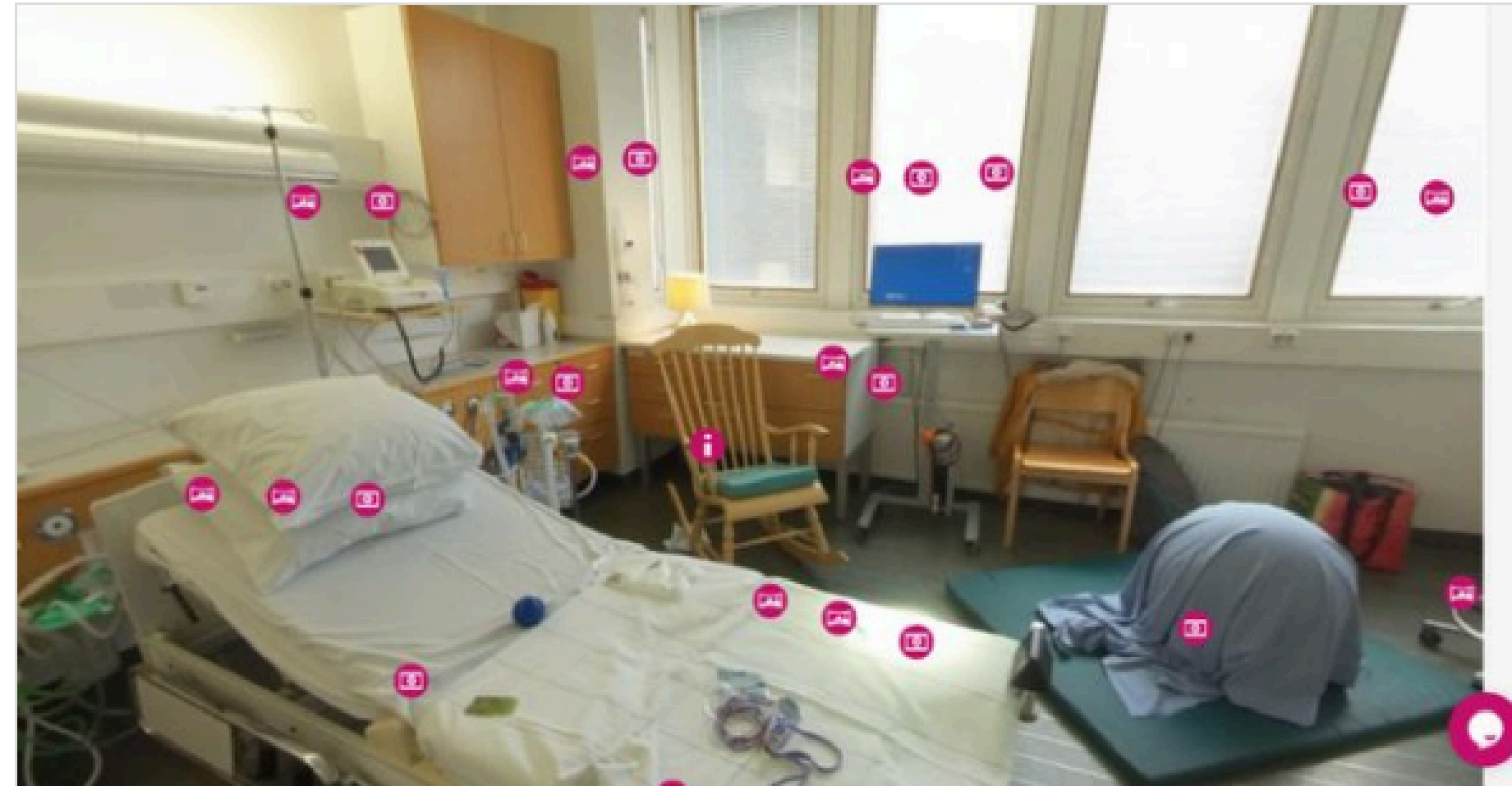
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PhD researcher at Aalto University
(VR/usability/adult learning/health e...)



DOULES.FI/VR



Virtual Reality Childbirth Education demo

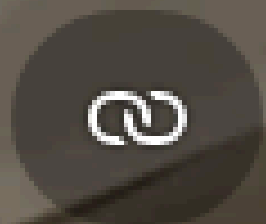
Welcome to the virtual childbirth education program! Fear of childbirth is growing alarmingly and is currently 20-25% in the US. The cesarean rate is 30%. Anxiety and stress during pregnancy are rising. All of that can cause unnecessary visits to...

 Synnytyksen ABC /



BirthVR clips

Marjaana Siivola



Watch on  YouTube