User-centered qualitative evaluation of a fully immersive, head-mounted VR prototype device to facilitate real-life transfer in voice therapy (ProVoiceVR)

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Background

- Problem in (voice) therapy:

  Therapy room circumstances differ from everyday life situations

- Relevant stressors are hard to practice
- Successful transfer might be hindered[1]
  - Finishing therapy takes longer

  → Possibly frustrating for patients

„Transfer“:

Applying voice-relevant behaviors and techniques to everyday life with the aim of automating them.

Background

Our solution:

Simulating everyday life situations with Virtual Reality (VR)

- Customizable virtual environments allow complex everyday situations to be practiced[2]
- Can be tailored to patients' needs and goals
- Protected therapy setting is maintained

What exactly is VR?

- When wearing VR goggles, the real environment is hidden and replaced by a simulated one
- 2 high-resolution displays (1 per eye)
  → Perceived as 3D
- Motion sensors and cameras detect the position in the real world and adjust the generated image accordingly

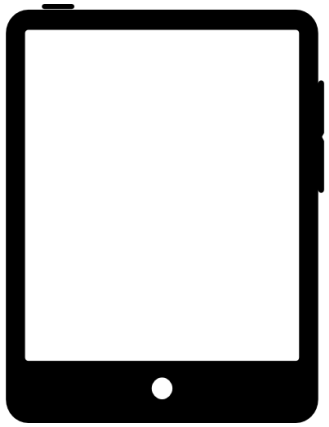
Source: vr-expert.de

Source: dustin.fi

Background

- Funding: Federal Ministry of Education and Research
- Our application **ProVoiceVR** is being developed in cooperation with a tech startup
- Prototype: application for rhetoric skills training
- Aim: Further development of the prototype for therapy use

The VR application



Source: flaticon.com

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Source: vr-expert.de

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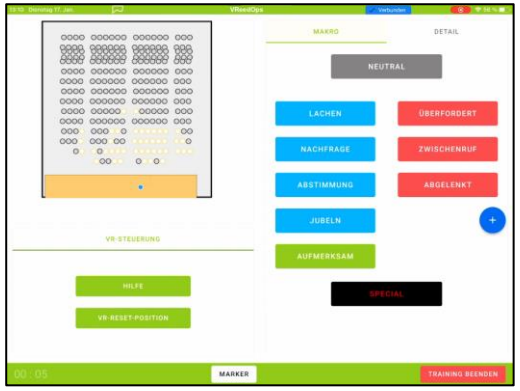
Source: VReedback GmbH



Source: VReedback GmbH

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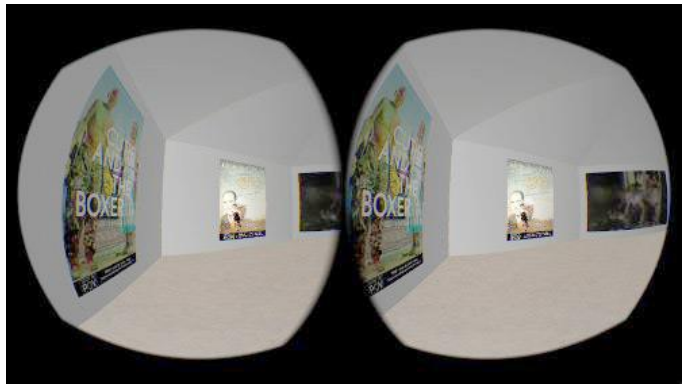

Source: pov.org

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Source: VReedback GmbH

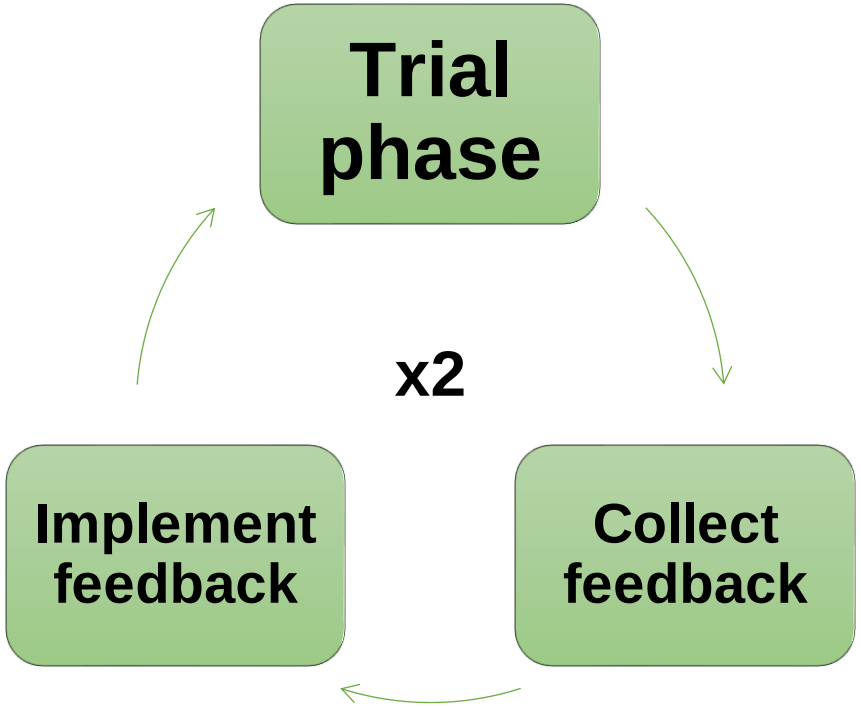
Research questions

- What do voice therapists and patients think about the use of VR in voice therapy?

- What development needs exist for the application prototype in order to optimize its benefits for voice therapy?

Methods

- Two trial phases
- Phase I: 2023
  - 7 TH + 13 PAT
    - PAT selection by TH
  - 3 sessions with VR per PAT
  - 20 semi-structured qualitative individual interviews[3]
    - Evaluation via content analysis[4]
  - Further development based on feedback



- Phase II: 2024
  - Ongoing with 8 TH + 8 PAT

Results

In general:

- VR can be a **useful tool** to support therapy
- Not suitable for all patients
  - Technology acceptance
- **Not only interesting for voice therapy**, but essentially all disorders that can benefit from in-vivo training
- Plenty of development requirements for the application prototype

Results

Main use cases reported by participants:

- **Practicing transfer** in relevant everyday life situations
- Identification of undesirable behaviors through **observation of patients** in the simulation
- Easy usage of **biofeedback** methods

„I find that it makes role-playing and transfer easier, because otherwise I have to role-play a group alone as a therapist, for example. That's not so easy to do.“ (TH1)

„For **me**, the exciting thing is that **I**, as a therapist, can experience, understand and correct the patients in this moment. They simply immerse themselves more in this other world and thus physically show a different body tension pattern than they would do here in therapy.“ (TH5)

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Prototype development needs

- More stable wireless connection (VR headset ↔ Tablet)
- Adjustable background noise
- Less passive audience (interaction)
- Customizable biofeedback functionality
- Home training with biofeedback

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Conclusion

- VR generally useful as a tool in therapy, but actual use depends on therapeutic approach and personal preferences
- Application needs to be highly customizable, but at the same time remain intuitive and user-friendly
- Potential uses not limited to voice therapy

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Outlook

- Second trial phase with updated prototype currently underway
- Second development phase followed by beta testing
- Selling finished product and training therapists in using it
- Support for other languages possible if requested

Thank you for your attention!

Contact details

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