

Presentation Virtualizer Project Report

*HTIS84 Human-Technology Interaction Project
Work*

Tuomas Ahola, Mikael Latva, Jyri Mäkinen

Main idea

- Presentation Virtualizer - “Virtual reality learning service for practicing presentations in front of a virtually presented audience”
- With the Presentation Virtualizer service, the users can upload their presentations to the system, and practice their presentation skills in virtual reality environment through gaze, gesture and audio inputs.
- The service includes a virtual tutor giving user advice about user`s eye contact, remaining time and pace of speech.
- The service can be used in educational purposes together with a teacher or a presentation trainer, who can control the reactions of a tutor by using keyboard commands, helping the user to focus on specific areas when having a presentation.
- The service is effective tool to reduce stress towards presentations, as the user can practice presentations at her/his own pace and relax before presentations in calming virtual environments.

Usage environment

- Usage environment can be home or any vr-headset usage environment, such as in universities, workplaces and schools.
- Due to audio and gaze inputs, the location should be relatively quiet and peaceful, so there won't be distractions between the user and the system.



User 1

- Minna, 27, history student.
- Minna feels uncertain and nervous when having a presentation in the university. Taking eye contact to audience during the presentations is difficult for him.
- Minna needs a peaceful space, where she can calm down before the presentation. She usually listens to music before the presentation to decrease the stress level.
- Minna uses the service to practice to take eye contact to audience members.
- Minna also uses the service to learn to relax before virtual presentations by visiting in a calming VR-environments



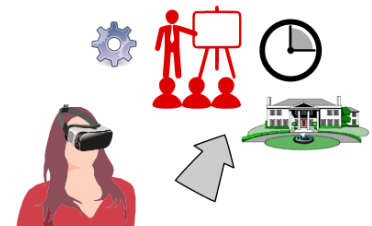
User 2



- Petteri, 40, marketing specialist.
- Due to her work, Petteri needs to present ideas effectively different audiences
- Petteri has problems with time management during presentations. Besides, she often loses focus if someone moves on the room, where the presentation is held, while presenting slides.
- Petteri wants to be more confident with the phasing of his speech in front of different audiences and uses the system with a presentation trainer.
- Petteri uses the service to get confidence of being in front of different audiences and how to pace his speech accordingly.
- He practices to present the slides in virtual environment and how to adapt to distractions, such as background noise or moving audience members, by using the VR service.

Usage scenario 1

- Minna is having a seminar presentation tomorrow in the university. She feels uncertain, when taking eye contact to audience. She feels unconfident when taking eye contact to audience. Minna has tried practicing in front of mirror, but she feels it unnatural way to sharpen her presentation skills.
- Minna opens the service and puts her VR headset on. She uploads her slides to the service and uses pointing gestures to select the audience and environment type to match the natural lecture room conditions. She selects the presentation time to match ten minutes.
- The virtual presentation starts, and Minna takes eye contact to virtual audience while speaking. A virtual tutor gives her hints, if she's not taking actively contact to audience. During the presentation, Minna will get information about how much time there is left.
- After the presentation, Minna gets data about her gaze and head position and phase and timing. She reads through hints to sharpen her skills and retries the virtual presentation.
- After couple of retries Minna gets better results and feels that she's ready for presentation tomorrow.



Usage scenario 2

- As Petteri is working as a marketing specialist in a bicycle company, he needs to be ready to present new product in front of different audiences next week. Unfortunately, he has often lot of problems with time management and keeping concentration if there are distractions in the audience. He wants to decrease his stress and practice the upcoming presentations with Presentation Virtualizer.
- Petteri starts the service and puts his VR-goggles on. Petteri uploads his slides to virtual environment service. As a marketing presentation takes place in schools, Petteri selects children as audience and to speak in school environment by using pointing gestures.
- Because Petteri feels a lot of stress before presenting the topic, he uses a virtual relaxation environment (main menu) to calm down by watching the virtual landscape and listening to peaceful music, before taking the presentation.
- Presentation starts and Petteri goes through the uploaded slides by using a virtual laptop in a VR environment and by moving between the slides with touch gestures. During the presentation, a virtual tutor gives him hints about time management and the phase of his speech.
- After the presentation, Petteri gets a feedback based on his success during presentation. is happy that his continuous practice with the service has a positive effect to his results.



Hardware 1

- VR-headset - main output device
- Output: Visual and audio
- Input: Head posture



Hardware 2

- Leap motion attached to vr-headset
- Input: Gestures



Hardware 3

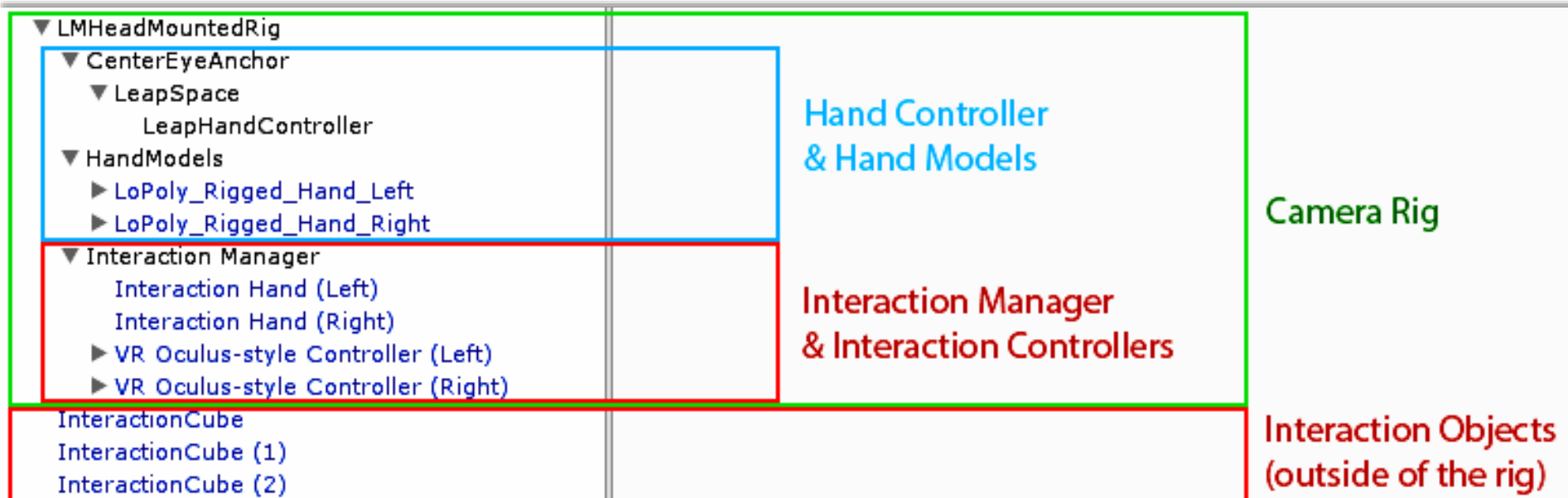
- Other (future developments)
 - Microphone, speech input
 - can be attached to headset or tabletop
 - Gaze tracker, gaze input
 - AR-device to be used during real presentation

Software 1 - Overview

- Application would be built with **Unity 3D**. It has very good libraries for relatively easy implementation
- **Leap motion** for Unity SDK would be used
- Depending on the availability either **HTC Vive** or **Oculus Rift** drivers are necessary.

Software 2 - Unity + VR + Leap

- Unity natively supports VR apps, very automagical
- Leap needs driver app and Unity Assets. You get a customizable object (below) that renders hands and manages interaction with the virtual environment and objects.



Software 3 - Code & Assets

- Relying on Unity free assets and custom built components
- “Brains” of the application are C# scripts
- Other: 360 relaxing picture and audience video loop

Interaction 1 - Gaze/Eye contact

1. Service opens. Minna has VR-goggles on.
2. She sees the virtual audience and starts to speak to the audience.
3. Minna takes gaze contact to the audience while she speaks.
4. Her gaze wanders around and her head is not stable. She also spends a lot of time focusing on the slides, instead of looking the audience.
5. The virtual tutor shows a visual indicator with eye icon, meaning that Minna should take more eye contact to audience.
6. Based on the data gathered from Minna's gaze and head positioning the service returns feedback and praises Minna's good performance and as well helps her by giving directions how to improve her eye contact in the future (future design implementation).



Interaction 2 - Keeping the presentation on time

- Scenario: Matias, 14, pupil in junior high school
- Matias has problems of keeping the sections of the presentation too short or too long. He uses the application to inform him about the presentations' length.



1. Application starts. Matias puts on his VR-glasses and the main menu opens.
2. Matias uses pointing gestures to select the audience-type to pupils and environment-type to classroom.
3. Matias can set the length of the presentation by pointing the time icon of the start-menu and swiping his hand to select the wanted time length. Matias sets the length of his presentation to 10 minutes.
4. As Matias is having a presentation, he gets visual information about how much time there is left in his presentation, as he sees live running clock and virtual tutor giving hints about the remaining time.

Interaction 3: Reading and changing the slides

1. Service opens. Outi puts her VR glasses on.
2. Outi starts the presentation by touch gestures from the main menu.
3. She sees the presentation slides she has uploaded to the service on the screen on the speaker box in a VR environment
4. Outi can navigate between the slides by touching the arrow buttons on the speaker box. As Outi touches the button, she hears a subtle sound.
5. As Outi's gaze focuses on the slide, she can see the text content more in detail.



Interaction 4: Controlling the tutor

- The service can be used with a teacher or a presentation trainer, who can improve the teaching by using a VR service as an education tool.
1. The service opens and user puts the VR set on.
 2. The user selects the presentation and the settings from the main menu. Presentation starts.
 3. As the user is holding the presentation, the teacher can control the states of the virtual tutor by controlling the keyboard.
 4. As the teacher presses buttons 1,2,3,4 and 5, the tutor switches between different states, such as indicating that time is running out, depending on how the presentation is going and what kind of feedback is needed.



Interaction 5: Relaxing in main menu

- Petteri needs to calm down before his presentation. He uses services relaxing main menu to decrease the stress before going to virtual stage.
1. Petteri turns opens the service and puts his VR glasses on.
 2. The main menu starts.
 3. Petteri moves his head and stares different elements in a relaxing outdoor environment.
 4. By moving his head, he sees how the view changes. Simultaneously, he hears relaxing sounds of nature from the ear pluggs.



Interaction 6: Gestures

1. After the main menu, Petteri chooses the settings and starts the presentation by using pointing gestures.
2. The presentation starts.
3. Petteri sees and hears the virtual environment.
4. As Petteri moves his hands, he sees them as virtual objects in the virtual space.
5. Petteri can focus on the presentation as in normal life, as he sees his hands and can use the gestures to support the content of his presentation.

(Future) Interaction 7: Moving on Stage

Matias feels uncertain that he moves too much on the stage.

1.By using pointing gestures, he taps the Movement feedback feature on from the main menu.

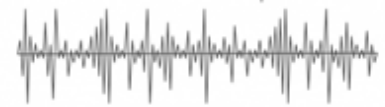
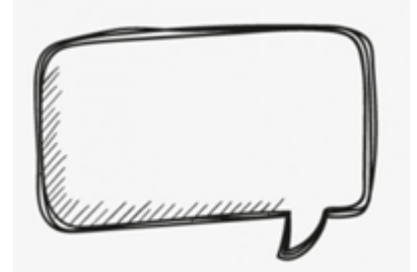
2.Matias starts the presentation. During the presentation he gets feedback from the virtual tutor about how he stays on the presentation area. This is based on the use of gyroscopes/motion sensors for tracking head/body positions.

3.After the presentation Matias gets information about how he has managed to stay on his position and is his body language restless/peaceful based on the amount of his movement during presentation.

(Future) Interaction 8: Voice Control

- Scenario: Mikko, 45, business CEO, wants to train speaking to different audiences and voice control. As his new business is related to remote-controlled cars, he wants to act interestingly for the target audience.

- 1.Application starts. Mikko puts on VR-goggles. Main menu opens.
- 2.Mikko uses pointing gestures to select audience-type (ie. children)
- 3.Mikko uses pointing gestures to select focus on voice control
- 4.Presentation practice starts, audience of children is visualized and Mikko starts speaking out his presentation
- 5.Based on the speech input the application gives guidelines and notifies when when Mikko's voice control is wrong for the audience of children (ie. relatively loudly or monotonously or using complex words).



(Future) Interaction 9: Feedback about the poses

- Scenario: Jannika, 17, is a pupil in high school. She isn't sure about how to use her gestures and body language effectively during presentations and would like to get feedback real-time.
 - She uses the service's 3D tutor feature to help her mimic positive postures.
1. Application starts and Jannika puts her VR glasses on. Main menu opens.
 2. Jannika uses the **pointing gestures** to select the tutor feature on.
 3. During the presentation, Jannika **sees** the tutor avatar in the virtual environment giving her clues about signals as postures, which help her to **mimic** the postures and body language of virtual tutor.
 4. After the presentation Jannika can **see** and **read** information about how her gestures matched with the virtual tutor

(Future) Interaction 10: Easing the Heart Beat

1. Application starts and Jannika puts her VR glasses on. Main menu opens.
2. As Jannika's **heartbeat** starts getting too high in the beginning of the presentation, she sees the tutor taking relaxing poses and calming her down with the body language.
3. After the presentation Jannika can see and read information about how she can act more calmly and reduce stress before and during the presentation.



Implementation 1

- Firstly, the group organized 3 in-detail interviews to gather background data in April.
- The interviews were based on experiences when having a presentation, aspects that effect on the experience and increase/decrease the stress.
- The interviewees were also asked about hopes for a VR service, which could help presenting in front of live audience.
- Interviews were conducted 1-2 days after the interviewees had a presentation, for example, in a thesis seminar.
- The interviewees hoped for example feedback for their gaze to audience members and phase of the speech. Also, a lively virtual audience and possibility to watch relaxing pictures, were mentioned as positive ideas.
- The interview data was analyzed and utilized in the next design phases.

Implementation 2

- Design ideation sessions, where the group analyzed the interview data and discussed about different alternatives with UI elements, gamification ideas, inputs/outputs and how encouraging feedback could be given for the user.
- Based on these ideation sessions, we chose the design goals and UI elements, which we would focus on.

Implementation 3

- Sketches about possible and alternative looks of the VR view, including different UI elements and potential atmosphere of the service.
- These were created to conceptualize the idea and to be used as a background for further VR mockup implementations.



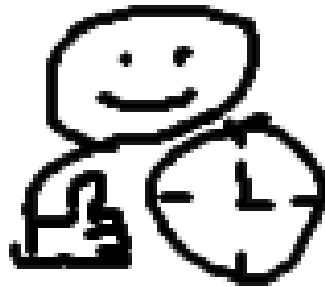
Implementation 4 (First Mockup features)

- 360 audience video-loop
- Gesture input interface
- Speaker Box:
 - Screen for slides
 - 2 buttons to change slides
- Tutor:
 - with 5 “messages”: good, neutral, eye-contact, slow down, proceed faster
 - “poorly drawn” tutor states
- Language support for English and Finnish!



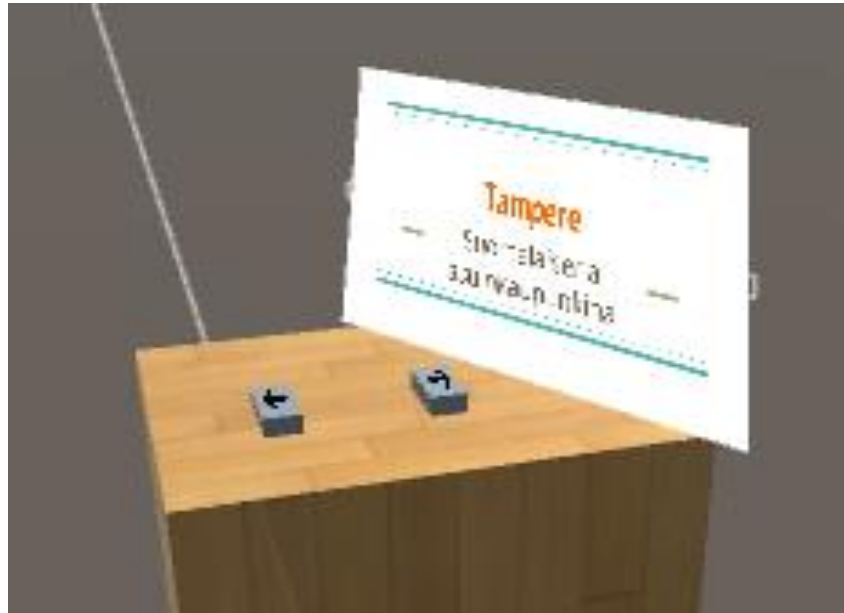
Implementation 5 (First Mockup in detail)

- Tutor component:
 - **Moderator controls** states with keyboard commands:
 - Primary states: 1, 2, 3, 4, 5
 - Secondary (In neutral case): e, r, t
 - If **user focuses** into tutor a message appears



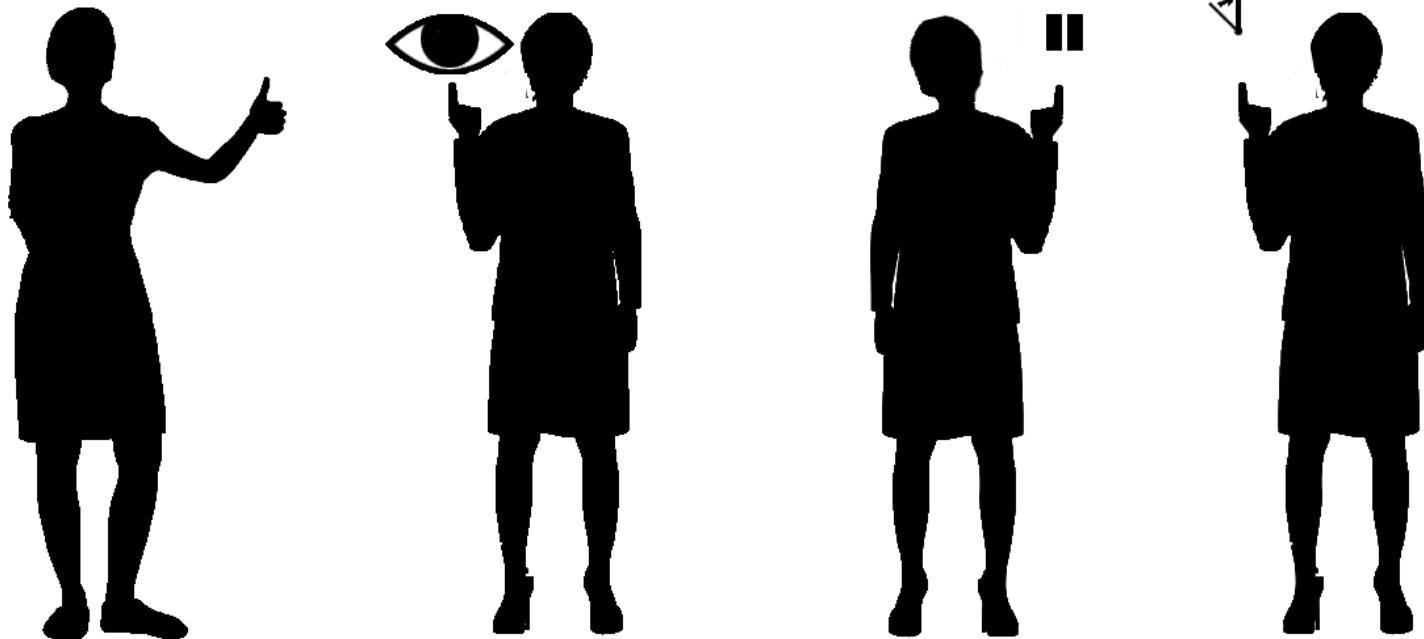
Implementation 6 (First Mockup in detail)

- Speaker box (table, 2 buttons and a screen)
 - Main functionality: Screen controller script
 - 2 lists that hold English and Finnish slides
 - Language setting defines which list is in use
 - If **user presses** a button a slide changes to next/previous



Implementation 7 (Final Mockup)

- Tutor component:
 - Users didn't notice the tutor well in the first tests
 - > Tutor moved to the front
 - Greatly improved graphic models



Implementation 8 (Final Mockup)

- Main scene features:
 - Sounds: “classroom” background noise, sounds for speakerbox buttons
 - Live running clock



Implementation 9 (Final Mockup)

- Relaxing main menu
 - User has a chance to calm down and get ready
 - “Relaxing but formal” 360 image with audio of birds chirping in the background



Evaluation: Background

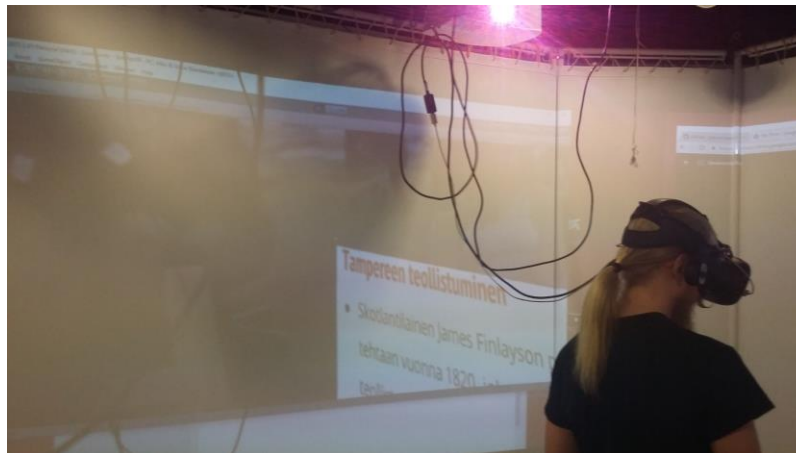
- User tests for the vr-mockup were conducted on 16th May in Simlab in the University of Tampere and included three participants
- The test purpose of the test, usage of the material and rights of the participant were introduced in-detail by using a script made for the test situation.
- The participants filled a consent to record/take photos from the usability test and a background survey, concentrating on the background of the user and previous experience with the VR services

HTS84 Human-Technology Project Work	University of Tampere
CONSENT TO RECORD A USABILITY TEST	
We ask you to participate in a usability test that is part of our project work on the Human-Technology Project Work course at the University of Tampere. By participating in the usability test you will help us to evaluate the usability and user experience of VR service.	
You will try VR service and we will discuss about your user experience with the service. In addition, we will ask you to fill in questionnaires and we will interview you about the use of the service. The test will be recorded.	
During the test, we will record the test situation and audio. The materials recorded during the test will be used only to evaluate the usability of the service in our course project work. In addition to our test team, the instructors of the course will view the materials from the test. The materials are not used outside the course purposes.	
The results of the test will be reported anonymously. The results are only used to improve the quality of the service. Video recordings or participants' personal data will not be revealed.	
You can stop participating in the usability test at any point. We are happy to answer, if you have any questions.	
By signing this form, you will accept the above terms.	
Date and place:	16/5/2018, LT1A
Signature:	[Redacted]
Name clarification:	[Redacted]
Test team fills in:	
Group name:	

HTS84 Human-Technology Interaction Project Work	University of Tampere
BACKGROUND QUESTIONNAIRE	
Background Information	
Age: 28	
Gender: <input type="checkbox"/> Male <input checked="" type="checkbox"/> Female <input type="checkbox"/> Other	
Occupation:	Education (highest finished degree):
<input type="checkbox"/> Student	<input type="checkbox"/> Comprehensive or elementary school
<input checked="" type="checkbox"/> Teacher / lecturer / professor	<input type="checkbox"/> High school
<input type="checkbox"/> Researcher	<input checked="" type="checkbox"/> College / University degree
<input type="checkbox"/> Else:	<input type="checkbox"/> Else:
Have you used following services to practice your presentation skills?	
<input type="checkbox"/> Videos, audio recordings or other recordings.	
<input type="checkbox"/> Books, articles or other informative materials.	
<input type="checkbox"/> Courses focusing on improving presentation skills.	
<input checked="" type="checkbox"/> I haven't used following services to practice presentation skills.	
Have you used before Virtual Reality (VR) or Augmented Reality (AR) products/services before?	
<input checked="" type="checkbox"/> Yes	
<input type="checkbox"/> No	
If you answered yes, how often have you used Virtual Reality or Augmented Reality products/services?	
<input type="checkbox"/> Weekly	
<input type="checkbox"/> Monthly	
<input type="checkbox"/> Once in half a year	
<input checked="" type="checkbox"/> Once in a year	
<input type="checkbox"/> Less than once in a year	
Which Virtual Reality/Augmented Reality systems you have used? (such as Oculus Rift, PlayStation VR, HTC Vive, Samsung VR Gear)?	
Oculus Rift, HTC Vive, HTC Vive, Samsung VR Gear	
Test team fills in:	
Group name:	
Participant ID: 03	

Evaluation: Test Task

- In the test, the participants were asked to give a presentation about a general topic (Tampere as a city in Finland) in a VR environment.
- Before the presentation, the participants could read through the slides about the topic.
- These slides were found in a VR environment on a screen and the user could navigate the slides by pressing buttons with touch gestures. The participants could present the slides freely and using their own words.



Evaluation: Test Task

- The purpose was not to test how the participant succeed in the presentation. Instead, the focus was on the user experience and possible problems with the service.



Evaluation: Measurement

- After the test phase, the users filled a User Satisfaction Questionnaire based on 5-point Likert-Scale, to measure the satisfaction with the user experience.
- The users were interviewed about the user experience, possible problems and wishes towards the service.
- According to the feedback analysis, the experience with the service was mainly positive (Overall grades for the service: 4, 4 and 3).
- Still, there were wishes that the virtual tutor should be more visible, sounds could support the immersion and the quality of the 360 video could be better.

HTIS84 Human-Technology Interaction Project Work University of Tampere

USER SATISFACTION QUESTIONNAIRE

Below are some statements related to the VR service you tested. Please select the option that best matches your level of disagreement of agreement with the statement.

Evaluate the following statements	Strongly disagree				Strongly agree
The service was easy to use.	1	2	3	4	5
It was hard to perform the given task.	1	2	3	4	5
The appearance of the service was pleasant.	1	2	3	4	5
I felt that the experience was authentic.	1	2	3	4	5
The service included unfamiliar terms.	1	2	3	4	5
It was easy to move (gestures) in the VR-service.	1	2	3	4	5
The information provided by the service is valuable to me.	1	2	3	4	5
I would like to use the service also later.	1	2	3	4	5

Which overall grade would you give to the service (on a scale from 1=poor to 5=very good)?

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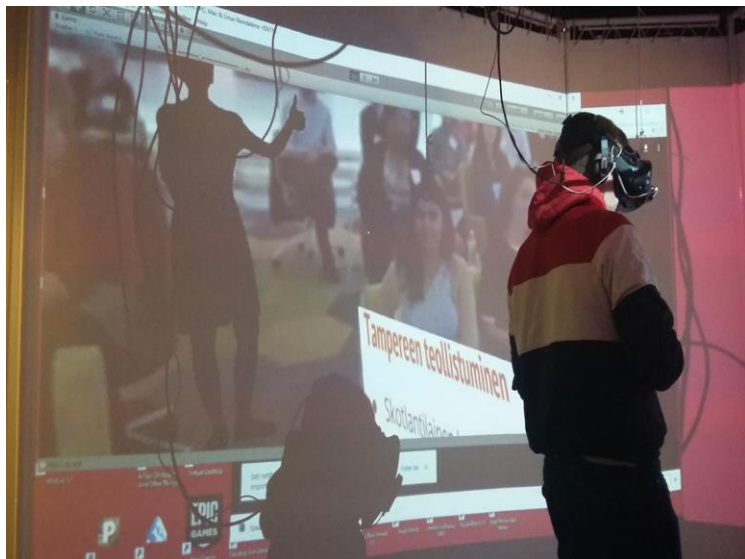
Thank you! Your responses will be processed confidentially.

Test team fills in:

Group name: _____ Participant ID: 03

Evaluation for Iterated VR-mockup

- The evaluation for the iterated VR-mockup was conducted in Simlab on 18th May.
- For the iterated mockup, we created more visible tutor with more clear hints for the user, 360 environment with better image quality, immersive background sounds and a relaxing main menu.
- The test procedure stayed otherwise the same, but before the presentation phase, the user tested the relaxing environment in the main menu. We also asked about the menu experience in the interview.



Evaluation for Iterated Mockup: Feedback

- The experience was considered “authentic” and it was compared to having a presentation in real life.
- Some future improvements were mentioned with the sound loop, as there was some repetition. Also, there was a mention that in real life, members in the audience can ask questions during the presentation, and there could be feedback for repetition of spoken words.
- The relaxing main menu was considered positive element as the user didn't need to go to the stage straight away.
- The possibility to upload the slides and navigate them behind the speaker box was seen as a good addition. According to the feedback, we added sounds for speaker box buttons, as the user changes the slides, for the final iteration.

HTS84 Human-Technology Interaction Project Work Tampereen yliopisto

KÄYTTÄJÄTYYTYVÄISYSLOMAKE

Alla on muutamia väittämiä liittyen juuri testaamaasi VR-palveluun.

Arvioi seuraavat väittämät ympyröimällä mielipidettäsi vastaava vastausvaihtoehto.	Täysin eri mieltä	Täysin samaa mieltä
Palvelua oli helppo käyttää.	1 2 3 4 5	
Annetun tehtävän suorittaminen oli vaikeaa.	1 2 3 4 5	
Palvelun ulkoasu oli miellyttävä.	1 2 3 4 5	
Koin käyttökokemuksen autenttiseksi.	1 2 3 4 5	
Palvelussa oli vieraita/hankalia termejä tai sanoja.	1 2 3 4 5	
Palvelussa liikkuminen (eleet) oli hankalaa.	1 2 3 4 5	
Palvelu tarjosi minulle hyödyllistä informaatiota.	1 2 3 4 5	
Haluaisin käyttää palvelua myös jatkossa.	1 2 3 4 5	

Millaisen arvosanan antaisit palvelulle kokonaisuudessaan (asteikolla 1=kehnö, 5=erinomainen)?

5

Kiitos vastauksistasi! Antamiasi tietoja käsitellään luottamuksellisesti.

Testin järjestäjän tyytyväisyys:

Ryhmän nimi: _____ Osaallistujan koodi: 04

Future Development Ideas

- Feedback in the end/after of the presentation training session
 - Body language
 - Gestures as an orator
 - Motion
 - Interactivity

Future Development Ideas

- Feedback in the end/after of the presentation training session
 - speech recognition
 - repetition
 - use of slides
 - difficult terms
 - difficult phrases
 - Styles

Future Development Ideas

- Various Modes
 - Users own slides mode
 - Analysing the slides and the performance with ai
 - Disturbance mode
 - Wrong material
 - missing slides
 - no presentation slides

Future Development Ideas

- Continuing future training sessions tuned by the skills and advancement of the user
 - Tailored training sessions to build the skills in need of training
 - Tailored sessions to support user's advancement in affection by self in emotional state
 - Tailored sessions in stress relief self management