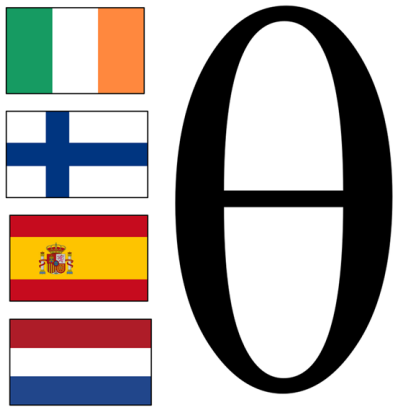
AR/VR Experiences on a Budget: Research informing ~~Practice~~

Dr. Praneschen (Che) Govender



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Transformative Hospitality Education through Tech Abilities:

A blueprint for creating immersive (learning) experiences using VR/AR

Co-funded by the Erasmus+ Programme of the European Union

21/02/22 → 20/02/24

IO1
AR/VR enhanced Learning Spaces

IO2
The development of educational courses using digitally enhanced spaces

IO3
Iterative Research

IO4
Preparing instruction manual and virtual training for faculty

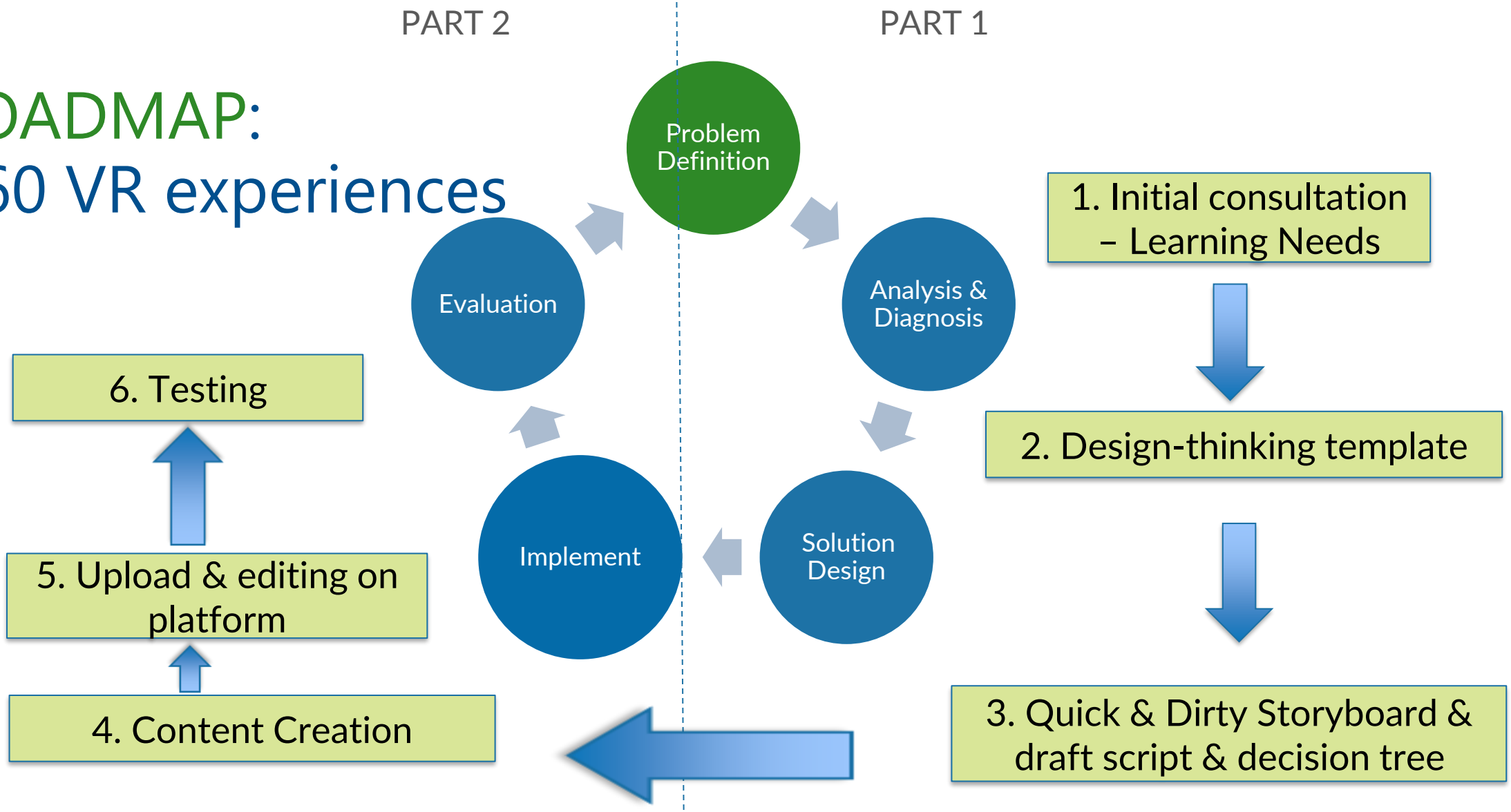
Universitat de les Illes Balears

HOTELSCHOOL THE HAGUE
Hospitality Business School

Haaga-Helia
University of Applied Sciences Ltd.

TU DUBLIN
Ollscoil Teicneolaíochta Bhaile Átha Cliath
Technological University Dublin

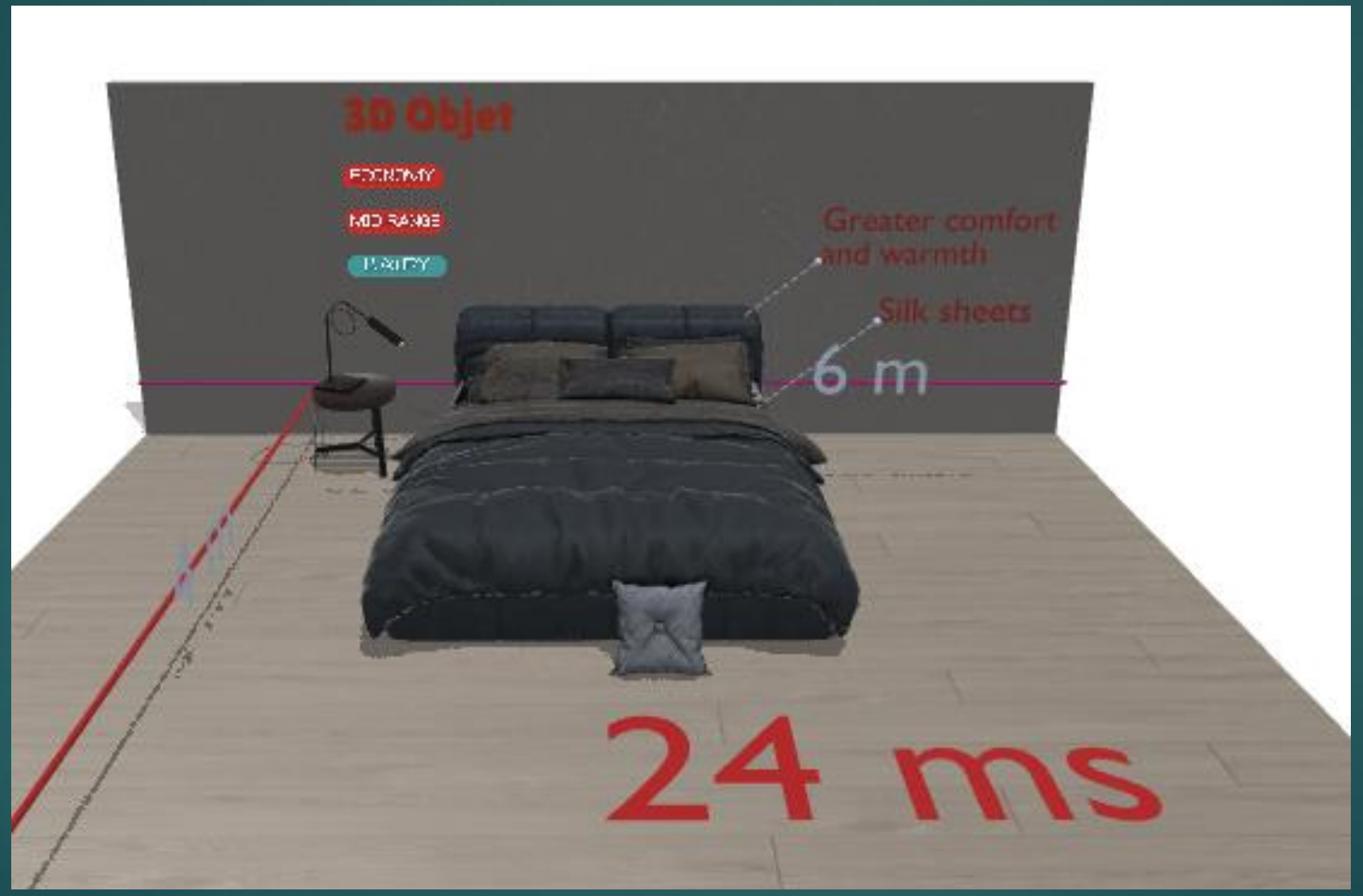
ROADMAP:
eating 360 VR experiences



Prototype: Holographic Avatar

- Holographic character that provides step by step instructions that can be projected into a space
- Builds a personal connection

Prototype: AR Hotelroom



Illustrate the difference between room categories

https://share.fectar.com/VZBZF

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Matterport: Room Assessment

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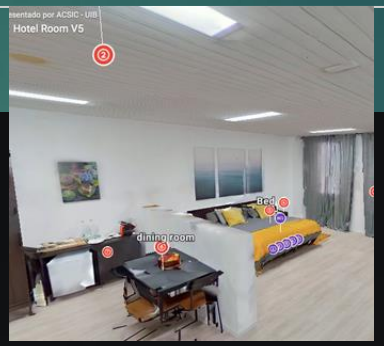

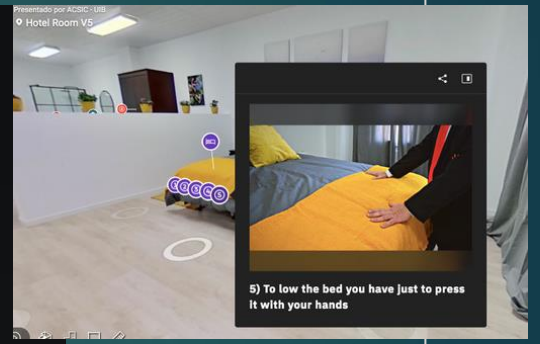

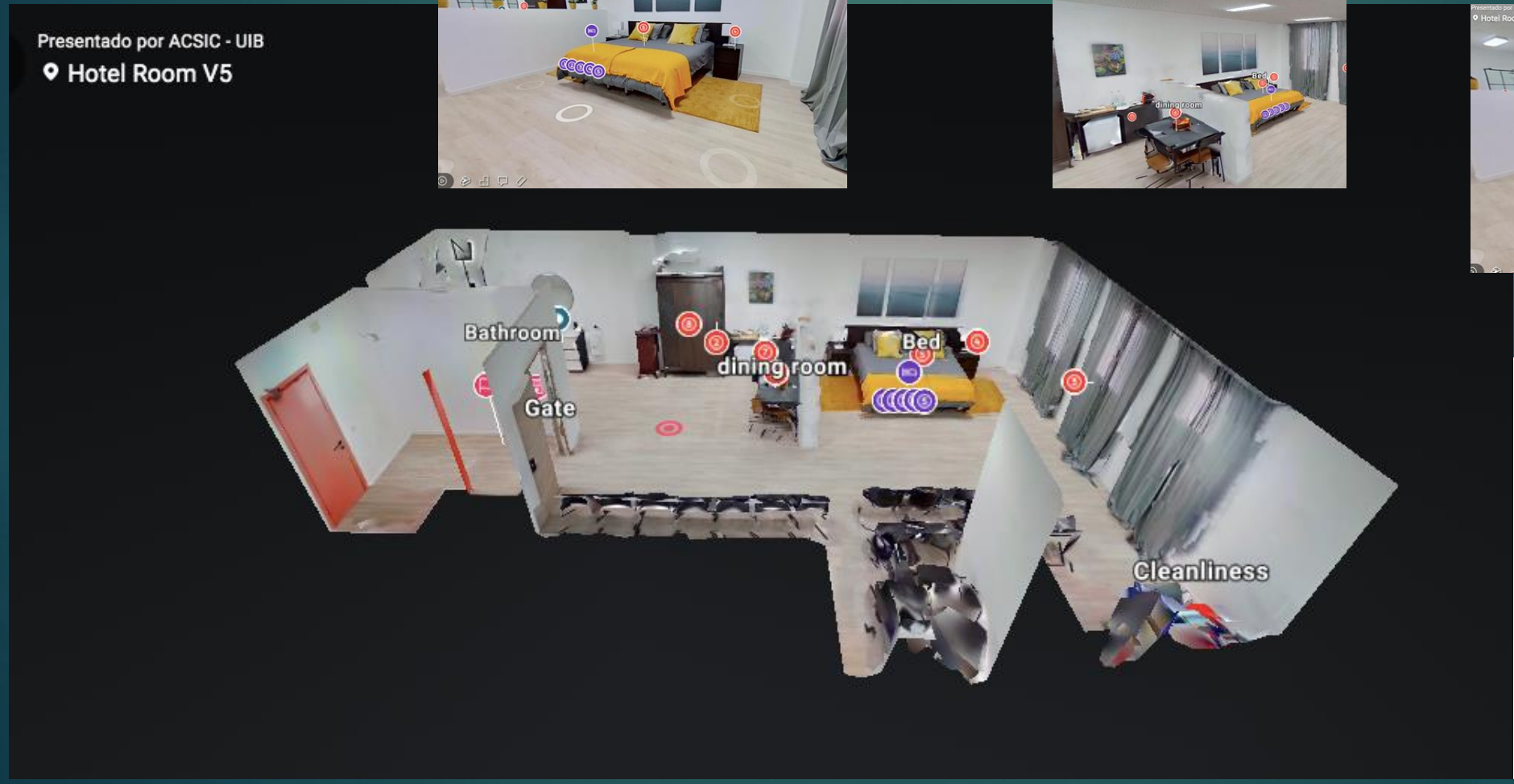

Prototype: The Difficult Customer

Warp VR

Case Study Findings: Student-centric Iterative Development

- Students want:
  - Interaction
  - Gamification
  - 3D NOT 2D

- Difficult Customer & AR Hotelroom received highest engagement scores
- Health concerns (discomfort, motion sickness)
- Ability to practice repeatedly without consequence in a safe environment
- AR/VR as a complementary tool

Findings: Facial Expression Analysis & Usability

- A study using facial expression analysis to compare engagement of 2D video and augmented reality (AR) versions of the holographic chef
- Using AR technology for delivering educational content may lead to higher measured engagement levels.

- A study measuring the usability of the prototypes found that Matterport scored the highest on usability, followed by WarpVR and Fectar holographic chef
- A correlation between usability and positive learning experience
- Prototypes that scored high on user experience achieved greater acceptance, suggesting a need for user-centred design

Cases Studies on Integrating AR/VR into Curriculum after Train the Trainer

- Many attendees see AR/VR as having high application within tourism and hospitality education, language training, pre-work placement
- Fectar seen as the platform with the most potential due to flexibility
- Emphasis on student-created content

Barriers include:

- Cost of equipment/licenses
- Time & workload
- Need for continuous educator skills development

Comparison of Prototypes across different mediums

- Dealing with a difficult guest prototype shown in a VR headset achieved the highest scores in terms of presence, intrinsic motivation, self-efficacy, interest and embodiment.

- The AR Hotel room achieved the highest score on meeting learning outcomes.

- The room assessment prototype shown on a 4K HD projector performed best on cognitive load and agency, suggesting that the use of projectors for immersive learning could address cognitive load

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THE CASE OF HOTELSCHOOL THE HAGUE

25 March 2024

Current Use cases in Education at HTH

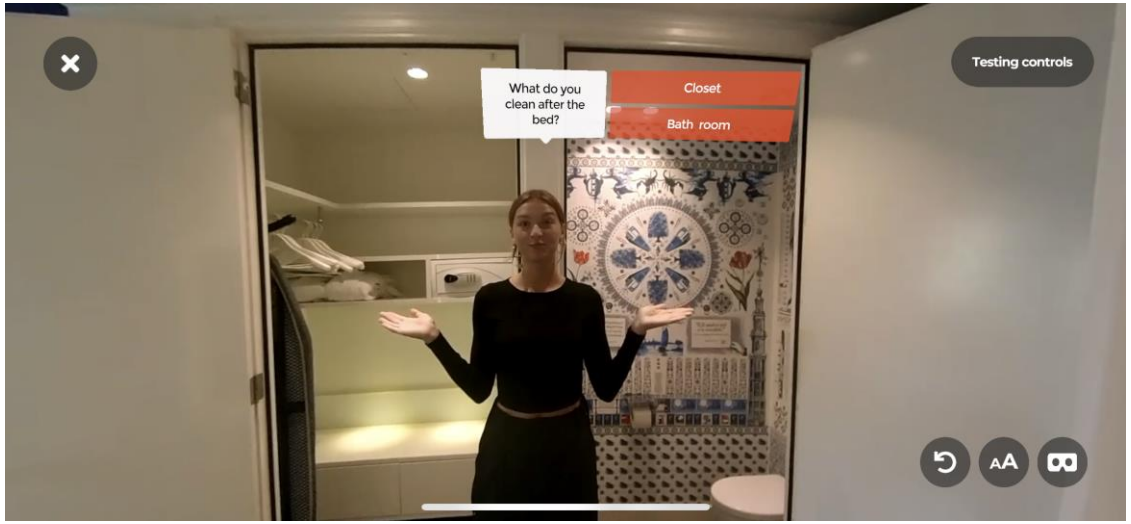
Medium	Benefits	Use Case
360 video WarpVR	Empathy, emotion, learning through exposure to environment	Softs skills Standard Operating Procedures Virtual tours, induction Pre-experience (destination) or outlets (job readiness) Language training
Fectar AR / Adobe Aero	Drop 3D objects into camera view on phone to take a different perspective Drop hologram into camera view for personal connection	3, 4, 5 star bed comparison Operational procedures, safety
Matterport	Walk-through of environments	Room cleaning SOP's, design narrative, virtual tours
AR/VR Headsets (Pico Neo 4 Enterprise)	Highly immersive and highly interactive, learning by doing	Room design Immersive storyboarding & concept design (All above)

Level up on AR/VR Experience

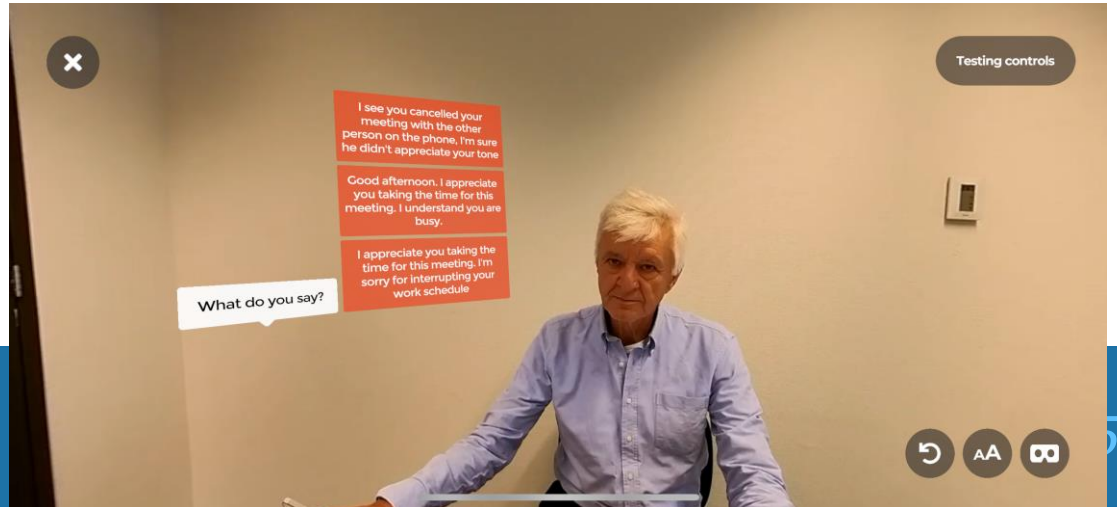
Level	Type	Description
1	Augmented Reality experience on mobile	Fectar – 2D holograms, mixed reality to visualize operational procedure Drop 3D objects into camera view Adobe Aero
2	Interactive 360VR on mobile (Google Cardboard) or Pico Neo 4 headset	WarpVR platform (branched storytelling) – decision tree testing critical-thinking & problem-solving
3	VR on special devices Matterport/Mozilla Hubs	Pico Neo 4 Enterprise off-the-shelf experiences Recreation of HTH environments / outlets

Use Cases in Education

Student-created Prototypes



Staff created experience (BTR)



Courses where VR/AR have been used

Marketing Fundamentals (1 experience)	Business Transformation BTR (4 experiences)	International Fast Track PIFT (2 experiences)	Practical Outlet: Kitchen (2 experiences)	Current Projects
Minor Future of Work (7 experiences)	Minor Future of Guest Experience	Minor Future of Food	Minor Future of Digitalisation (2 experiences)	Entrepreneurship Spanish Language Immersive MO outlets MO Leadership lab Lycar Prototyping HR & Culture Media centre
Masters Hotel Transformation (Culture & Innovation - 3 experiences)	MBA (2 experiences)	LYCAR commissioner	Pre-Master (panel discussion)	
Courses where VR/AR has been embedded: Minor Future of Work BTS, Master Culture & Innovation, Minor Future of Digitalisation, Minor Future of Food				

Challenges

- Resistance
- Funding
- **Cost of developing content**
- High workloads, staff time for developing content
- Equipment maintenance, transporting headsets across campuses
- Getting IT on board
- Making time for Marketing

Lessons Learned

- **Continuous prototyping** always wins
- You need energy and perseverance to outlast forces holding back the project
- Link AR/VR project to the institutional strategy/vision, show benefits & ROI
- **Support of top leadership** clears the path of obstacles and unlocks resources
- **Student evaluations** make decisions
- Build a network of specialist with skills you don't have
- Media strategy: Linkedin, blogs, webinars
- Co-creation and involvement
- **Link an externally funded research project to the internal AR/VR project**….

THETA Train the Trainer

Helsinki

Scan this QR for step-by-step instructions on how to create these AR/VR experiences

Prototype Manuals aka Cookbooks

- We created a cookbook type manual for each of the prototypes
- The cookbooks contain:
  - Overview
  - Preparation time
  - Ingredients
  - Needed equipment
  - Instructions
  - Links

https://theta-project.eu/

3D SPACE CAPTURE (*DIGITAL TWIN REAL ENVIRONMENT SCAN*) - *HOTEL ROOM*

3D space capture software can transform real-life spaces into immersive digital 3D models and is effective for visualizing environments and creating virtual tours for Hospitality Education.

This software can help guests visualize their stay in a hotel or showcase the wonders of a destination.

Matterport is one of the leading 3D space capture software companies focused on digitizing and indexing the built world. The Matterport Capture app (which you can download from the App Store or Google Play) will allow you to scan any space as illustrated in the diagram below.

- Allo… conducting a room assessment before doing it in real-life.

Preparation Time:

Brainstorming: 3 ~ 4 hours

Decision Tree/Flowcharts: 1 hour

Filming and Editing: 4 ~ 5 hours

Total time: 7 ~ 9 hours (a full day)

Level of Complexity: 3

Service Scenario: 3D Space Capture (Digital Twin Real Environment Scan)

INGREDIENTS:

- Equipment required includes a 360-camera compatible with Matterport, a cell phone or a mid-range tablet
- A starter pack for creating a 360-degree educational environment costs around €450 (excluding a phone or tablet).
- Click on this link to see a suggested list with prices: 360 Camera Prices
- Software *(list of software and suppliers and link to website)*