AXM - E0404

Designing and Creating Virtual Worlds

Aalto University

Agenda

- 0915 - 0935: Group 3 & 4 present the news and we all discuss
- 0935 - 1015: Lecture on evaluating your VR experiences

- 1015 - 1030: BREAK

- 1030 - 1115: Avatar design assignments and showcasing developments
- 1115 - 1130: Lecture on potential use of Augmented Reality
- 1130 - 1140: Practical info on VR Demo Day (Nov 27th)

Aalto University

Research and evaluation methods

https://edu.flinga.fi/s/EK3LTTL

Research and evaluation methods

Systematic techniques and procedures used by researchers to gather, analyze, and interpret data in order to answer specific questions or investigate a particular topic of interest.

Research and evaluation methods

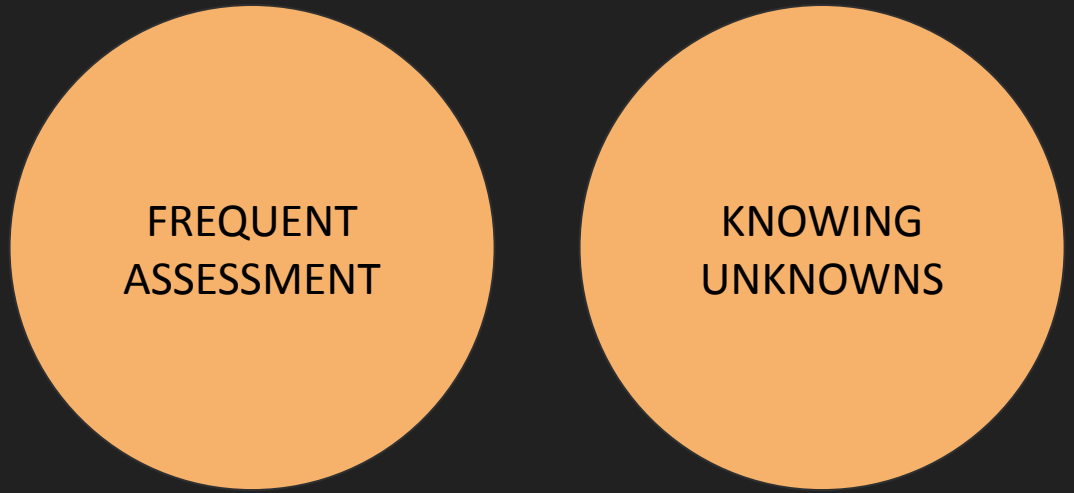
Why?

Research and evaluation methods

Why?

Research and evaluation methods

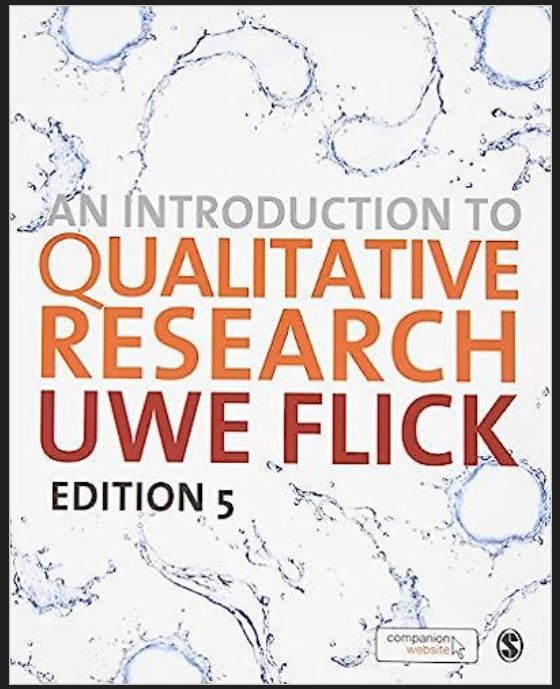
Why?



Research and evaluation methods

Why?

An Introduction to Qualitative Research - Uwe Flick



- Methodological approaches
- Practical examples
- Limitations
- Exercises

An Introduction to Qualitative Research - Uwe Flick

Some methods and approaches in the book:

- Case sampling
- Interviews:
  - Focused interviews
  - Semi-standardized interview
  - Ethnographic interview
- Participant observation:
  - Descriptive
  - Focused
- Visual data analysis
- Research diary

An Introduction to Qualitative Research - Uwe Flick

An example of a pre-interview thematic sampling:

"For me, technology has a reassuring side"

The interviewee is a female French information technology engineer, 43 years old and with a son of 15. She has been working for about 20 years in various research institutes. At present, she works in a big institute of social science research in the computer center and is responsible for developing software, teaching, and consulting employees. Technology has a lot to do with security and clarity for her. To mistrust technology would produce problems for her professional self-awareness. To master technology is important for her self-awareness. She narrates a lot using juxtapositions of leisure, nature, feeling, and family to technology and work and repeatedly mentions the cultural benefit from technologies, especially from television.

DMH

Pop-up VR Museum application

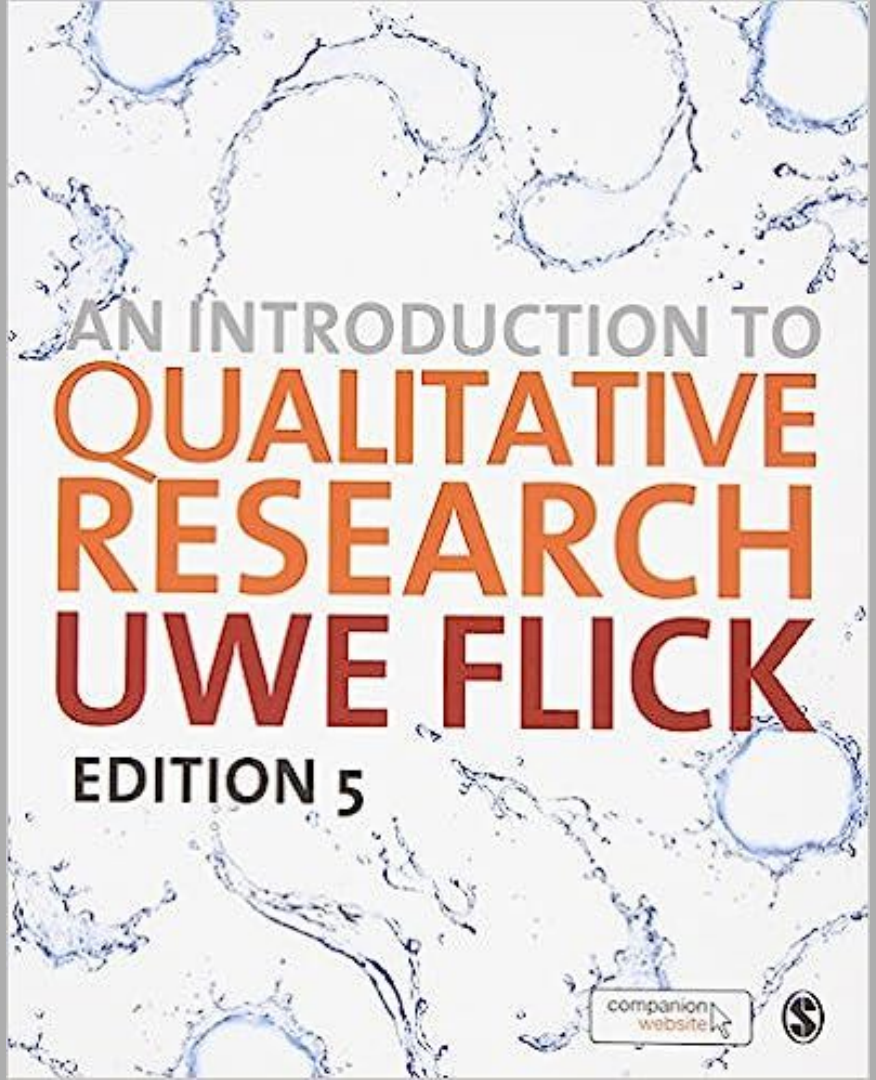
Maija

70-80 years old
Former school teacher

Interested in art, music, and Finnish design and cultural heritage.

Has never used virtual reality devices before and would prefer a seated experience.

Touchpoints	Main scene: Listen to stories	Main scene: Immerse in an object
Actions	Chooses this option	Chooses this option
Emotions	Nostalgia	Scared
Breakdowns	Can't hear too well and read at the same time	Giant objects appear to be scary
Ethics	Is the sound clearly audible and text readable?	Fear in an unknown virtual space
Recommendations	Sentence by sentence subtitling and louder audio	Smoother transitions during immersion


AN INTRODUCTION TO
QUALITATIVE RESEARCH
UWE FLICK
EDITION 5
companion website

Ethical considerations

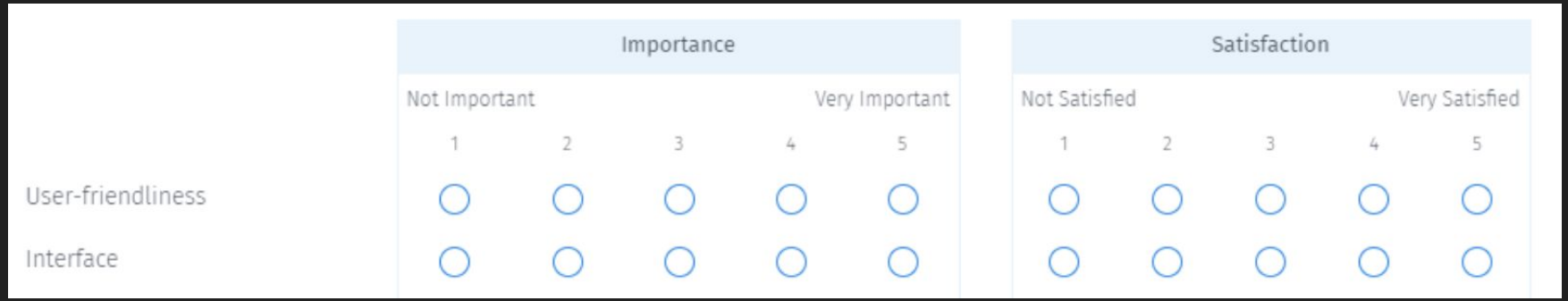
- GDPR guidelines:
  - Informed consent
  - Right to privacy
  - Data deletion
- Ensuring that participant is comfortable and can quit any time
- VR sickness

Quantitative methods

Involves the collection and analysis of numerical data to measure and quantify relationships between variables.

Quantitative methods

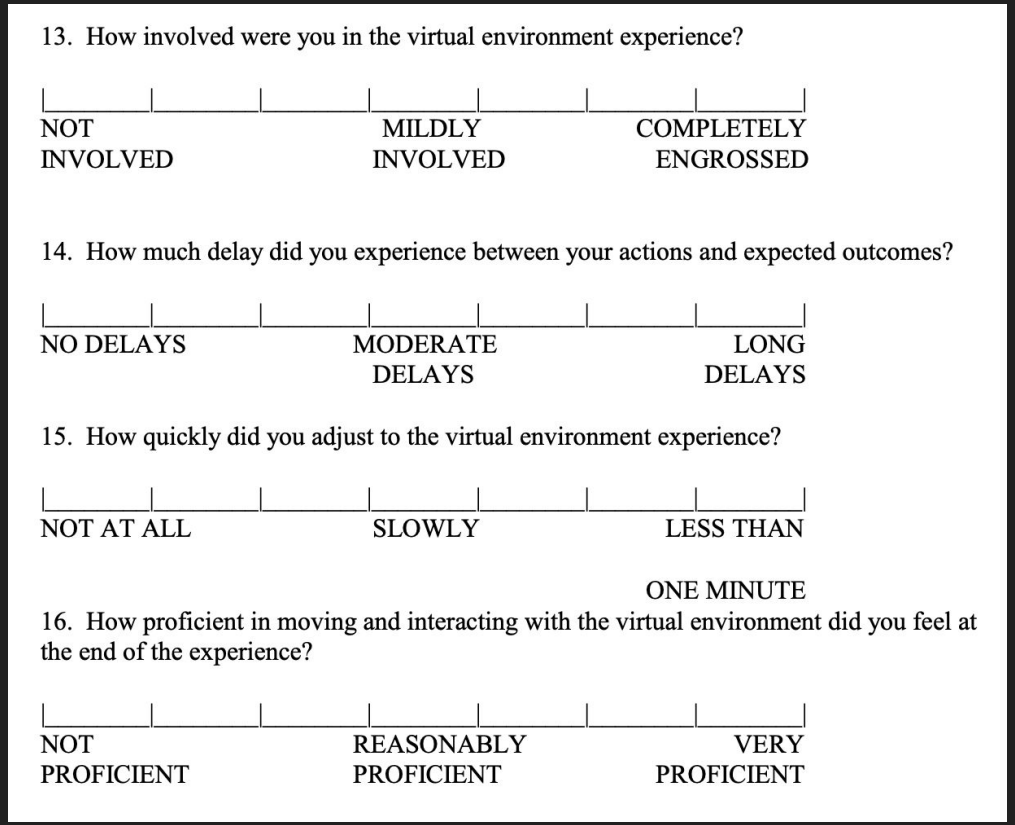
Survey with a likert scale: 1-to-5



	Importance					Satisfaction				
	Not Important				Very Important	Not Satisfied				Very Satisfied
	1	2	3	4	5	1	2	3	4	5
User-friendliness	○	○	○	○	○	○	○	○	○	○
Interface	○	○	○	○	○	○	○	○	○	○

Quantitative methods

Presence questionnaires



13. How involved were you in the virtual environment experience?

|_____|_____|_____|_____|_____|_____|_____|

NOT INVOLVED — MILDLY INVOLVED — COMPLETELY ENGROSSED

14. How much delay did you experience between your actions and expected outcomes?

|_____|_____|_____|_____|_____|_____|_____|

NO DELAYS — MODERATE DELAYS — LONG DELAYS

15. How quickly did you adjust to the virtual environment experience?

|_____|_____|_____|_____|_____|_____|_____|

NOT AT ALL — SLOWLY — LESS THAN ONE MINUTE

16. How proficient in moving and interacting with the virtual environment did you feel at the end of the experience?

|_____|_____|_____|_____|_____|_____|_____|

NOT PROFICIENT — REASONABLY PROFICIENT — VERY PROFICIENT

Witmer, B. G., & Singer, M. J. (1998). Presence Questionnaire (PQ) [Database record]. APA PsycTests.

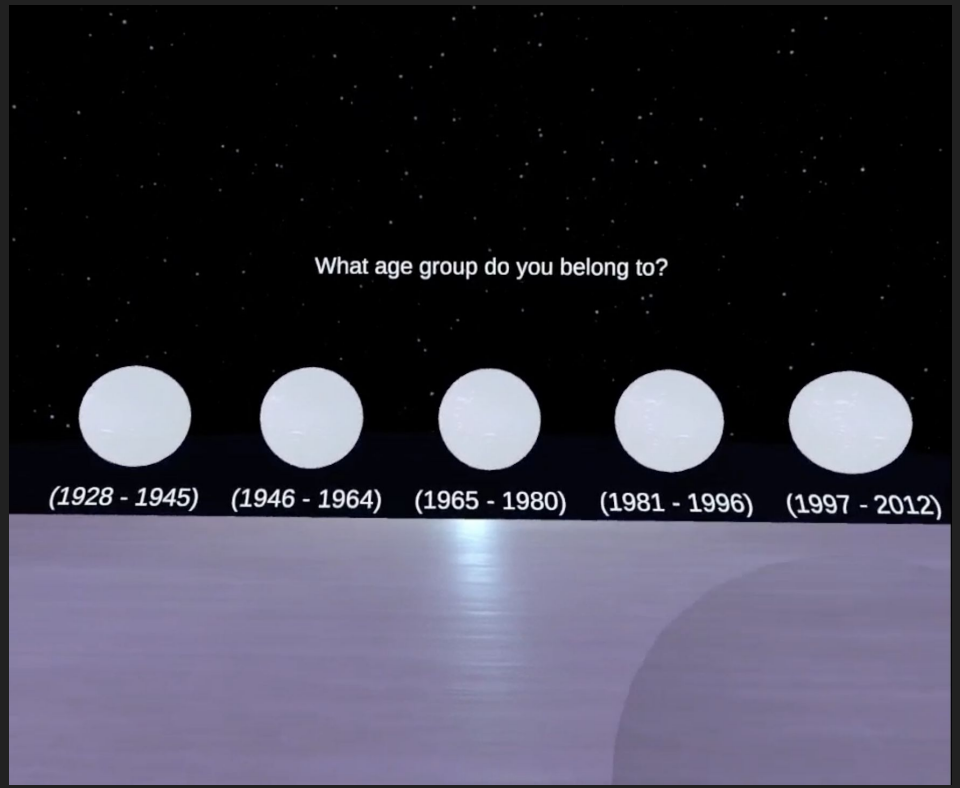
Quantitative methods

Observational studies: Recording specific aspects of gameplay

Quantitative methods

Example from the Pop-up VR Museum:

- Age group
- Artefacts selected
- Stories listened to
- Artefacts immersed in
- Artefacts collected
- Gameplay time



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  "_id": "6384bed7784d110d88092940",
  "User ID": "90007877",
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  "Selected language": "FIN",
  "Selected age": "1981-1996",
  "End-user community": "General audience",
  "Selected avatar": "41768",
  "Game experience": "*",
  "Objects available for selection": "44165, 41793, C370, 8182, 44185, 44163,
  "Objects selected": "44185, 8182, ",
  "Objects listened to": "44185, 8182, ",
  "Objects immersed in": "8182, ",
  "Objects collected": "8182, ",
  "Stories listened to": "#44185S2, #8182S4, ",
  "Emotional reaction to stories": "#8182S4 joy, ",
  "Gameplay time": "Gameplay time: 159.3187, End time: 8/30/2022 1:46:38 PM",
```


How did the previous story make you feel? (Select multiple)
Joy
Delight
Love
Optimism
Hope
Anxiety
Outrage
Pessimism
Disapproval
Curiosity
Shame

Quantitative methods

Example from the Pop-up VR Museum:

Gautam Vishwanath. 2023. Enhancing Engagement through Digital Cultural Heritage: A Case Study about Senior Citizens using a Virtual Reality Museum. In ACM International Conference on Interactive Media Experiences (IMX '23), June 12--15, 2023, Nantes, France. ACM, New York, NY, USA 7 Pages. https://doi.org/10.1145/3573381.3596154

Quantitative methods

Example from the Pop-up VR Museum:

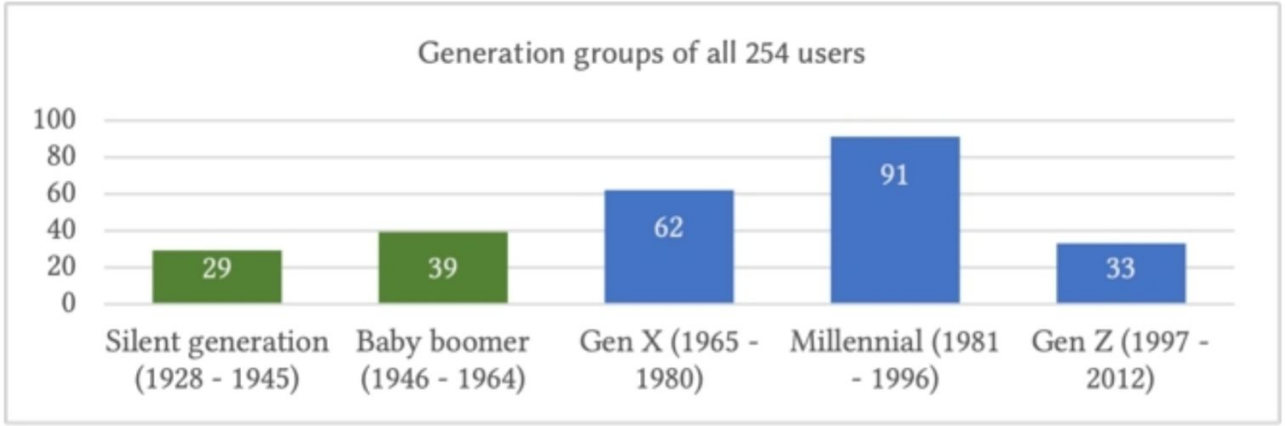

Figure 1: Generation groups of all 254 (68 seniors indicated in green and 186 non-seniors indicated in blue) users who tested the Pop-up VR Museum.

Quantitative methods

Example from the Pop-up VR Museum:

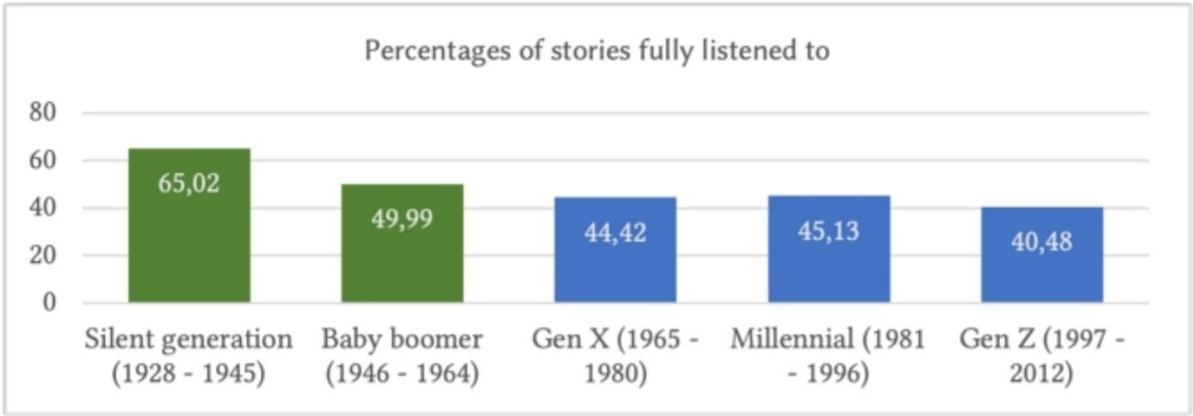

Figure 5: Seniors (green) using the Pop-up VR Museum were far more likely to listen to stories without skipping them in between.

Quantitative methods

Example from the Pop-up VR Museum:

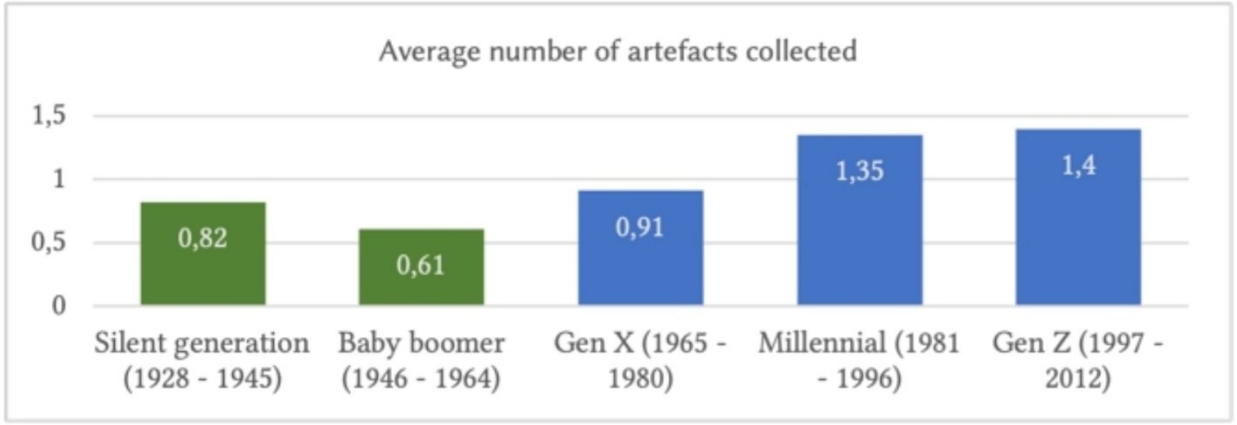

Figure 7: Seniors (green) using the Pop-up VR Museum collected fewer artefacts when compared to younger (blue) generations.

Qualitative methods

Focuses on understanding the meaning and interpretation of social phenomena from the perspectives of the participants.

Qualitative methods

Body-storming:

- A way of subjecting a researcher’s own body to physically experience a situation in order to ideate further.

Qualitative methods

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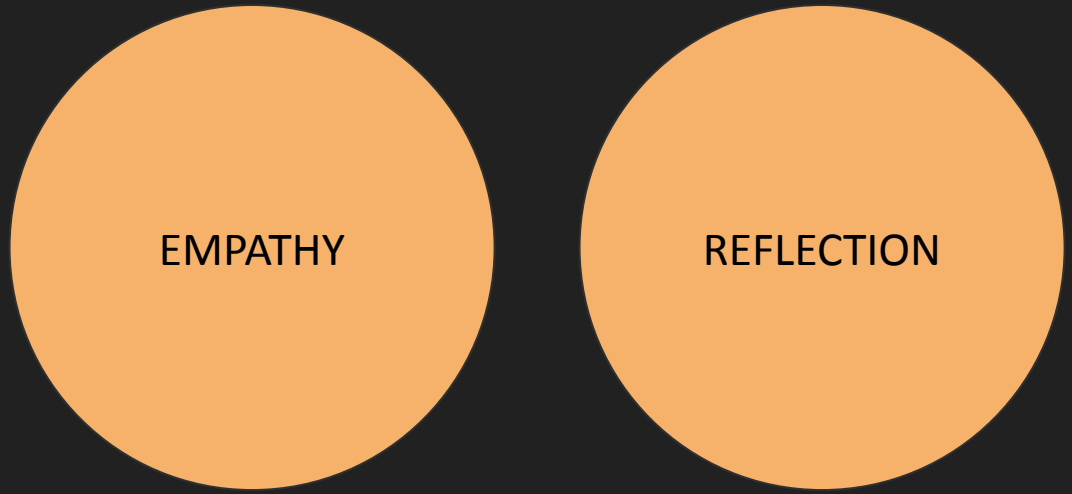


Qualitative methods

Body-storming:

- A way of subjecting a researcher's own body to physically experience a situation in order to ideate further.

Qualitative methods

Body-storming:

Qualitative methods

Think aloud:

Qualitative methods

Autoethnography:

A form of self-reflection and storytelling where the researcher explores and analyzes their personal experiences within the context of a larger cultural or social phenomenon.

Qualitative methods

Autoethnography:

A form of self-reflection and storytelling where the researcher explores and analyzes their personal experiences within the context of a larger cultural or social phenomenon.

Key characteristics:

- Subjectivity
- Personal narrative
- Context
- Emotions

Qualitative methods

Questionnaires:
Collecting information from participants in a structured and standardized manner.

Technique to consider:
Open-ended questions such as: “describe” or “why do you think?”

Qualitative methods

Question	Research aims
Prior to experiencing the Pop-up VR Museum, have you ever tried using Virtual Reality - VR to experience any film or game or other content?	The aim here is to ascertain digital literacy and specifically familiarity with VR as a medium.
Which artefact was the most interesting to you and why? Which story was the most striking/memorable to you and why?	To understand the level of engagement with cultural heritage, description about users' interests, familiarity, and relation with the artefacts and stories is beneficial.
While engaged, did you ever feel a "sense of presence" / "immersed" / "that you were there"? If yes, how strong (between 1-5).	Engagement with the experience is also bound to be affected by the degree of presence in VR.
Did you find the experience challenging or uncomfortable at any point?	We wanted to analyze the difficulties and make improvements to newer iterations of the prototype.
Anything else you would like to let us know.	Other comments were also welcome.

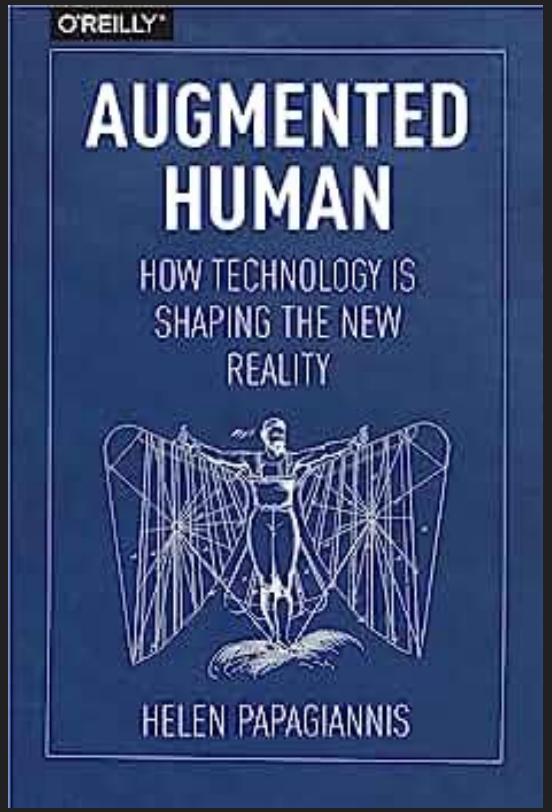
Definition of Augmented Reality

Augmented reality (AR) is a medium that blends digital content with the real-world environment to create an interactive and enhanced user experience.

Important characteristics:

- Real world
- Digital content
- Interface

Augmented Human - Helen Papagiannis



- How augmented reality is evolving.
- Cameras, sensors, machine learning.
- Storytelling and examples
- Discusses the future of AR

Augmented Human - Helen Papagiannis

Different industries using AR:

- Health
- Education
- Retail
- Entertainment

(Image credit: Southgate Medical Center)

Augmented Human - Helen Papagiannis

Augmented audio:

- Navigating urban spaces for visually impaired.
- Imagination and play
- Biometric sensors that are always listening to your body

(Image credit: Canva)

Augmented Human - Helen Papagiannis

Storytelling conventions:

- Virtual try-ons
- Hole in the wall
- Ghosts
- Living pictures
- X-Ray vision

Augmented Human - Helen Papagiannis

Virtual try-ons

Augmented Human - Helen Papagiannis

Hole in the wall:

Relation to real space

(Image credit: Microsoft)

Augmented Human - Helen Papagiannis

Ghost

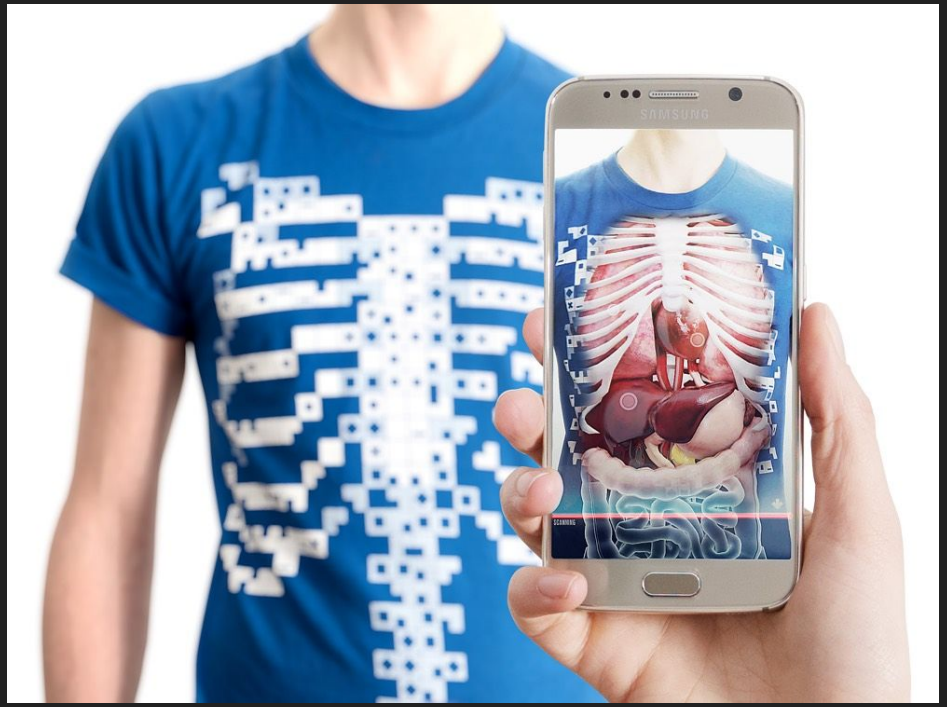
(Image credit: Niantic)

Augmented Human - Helen Papagiannis

Living pictures

Augmented Human - Helen Papagiannis

X-Ray vision



(Image credit: Curiscope)

Augmented Human - Helen Papagiannis

Future of AR:

- As a visualization experience
- As an annotated experience
- As a real-time translation experience
- As a magical experience
- As a multi sensorial experience
- As a superhuman experience
- As a highly customised personal experience

- AI?

O'REILLY

AUGMENTED HUMAN

HOW TECHNOLOGY IS SHAPING THE NEW REALITY

HELEN PAPAGIANNIS

Convergence of AR and VR

- Delineation
- Mediums and technologies merging: mixed-reality

(Image credit: MedCity)

(Image credit: Appen)

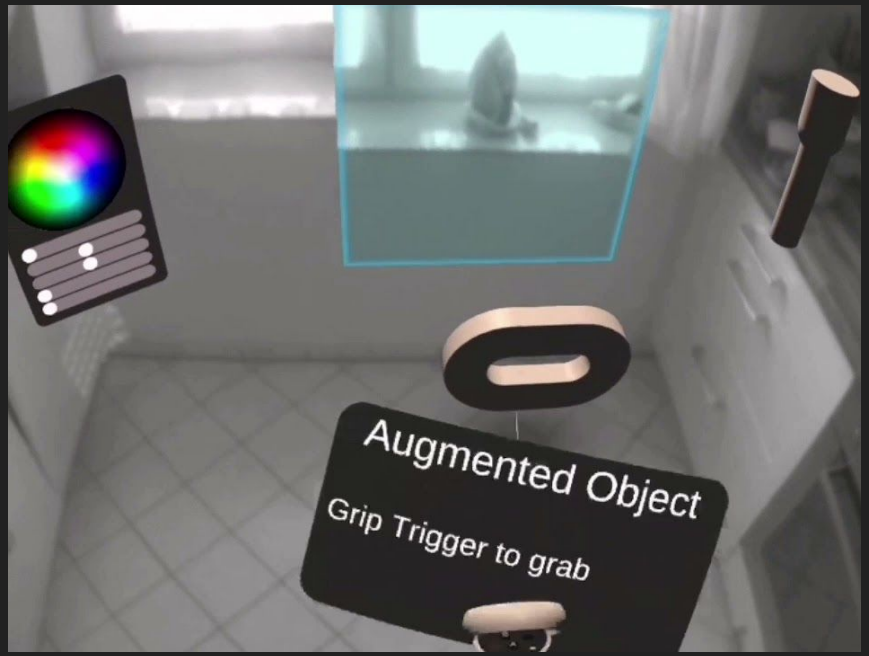
Prominent AR experiences - Ingress Prime

Prominent AR experiences - Cultural heritage example

Design considerations

- Physical space
- Image detection
- Storytelling conventions
- Accessibility and inclusivity
- Frequent testing and iteration

SideQuest



AR Demo

Cactus Cowboy

Artivive

Agenda VR Demo Day

- 0915 - 0930: Group 1 & 2 sharing the news
- 0930 - 1000: Each group’s presentation of their final prototype

- 1000 - 1015: BREAK and setting up in your spots

- 1015 - 1200: Going around and testing each prototype with feedback