

EVALUATION

ITPDP'26, L13, W15/19

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Course Schedule 3/3

- L= lecture
- E=TØ sessions & practical exercises
- IW= Individual/group work
- A= Assignment hand ins
- P= Design or Demo presentation
- GIT= Delivered via gitlab.au.dk
- BS= Delivered via Brightspace
- I= Individual delivery
- G= Group delivery

26th Jun

	Week 15/19	Week 16/20	Week 17/21	Week 18/22	Week 19/23	Week 20/24	Week 22/26
Mon	P 4/5 Prototype Demo Day 12:00-15:00	IW 11/5 Conduct and report user evaluations	L14 18/5 Logo design (Minna)	L15. <u>Tue 26/5</u> Poster design 12:00-14 (Minna)	IW 1/6 Exam info (Minna / Simon)	P 11/6 1 st iteration poster presentation & feedback session at 10-12 (Minna & TAs)	P 22/6 Final prototype exhibition with a product poster
Wed	L13 + E13 6/5 Evaluation (Minna) + Evaluation planning (TAs) 10:15 ->	IW 13/5 Conduct and report user evaluations	E14 20/5 Logo design exercises	E15 27/5 Poster design exercises	IW 3/6 Final report writing & demo video	IW Finalizing the prototype and poster for the final exhibition	Exams 23-25/6 9:15-> 26/6 Chomsky cleaning & course evaluation discussion
IW	8/5 Supervision 10-11:30 (Simon)	22/5 Supervision 10-11:30 (Simon)	29/5 Supervision 10-11:30 (Simon)				
	- Write the design and implementation section - Prepare for the user evaluations	- Finish sub-assignment 5 by Tue	- Analyze user study results	- Finish sub-assignment 6 by Fri	- Finish the report by Thursday	- Finish the poster based on the feedback and upload it to Dropbox by <u>17th June at 12:00</u>	- Everyone needs to be present in the demonstration, exam, & cleaning of the Chomsky & Feedback discussion.

A **Sub-assignment 5:**
Design & implementation [BS/G]
DL: May 12th at 15:00
TAs feedback

Sub-assignment 6: Evaluation [BS/G]
DL: May 29th at 15:00
TAs feedback

Final report [BS/G]
DL: June 4th at 13:00

Product poster [BS/G]
DL: June 17th at 12:00

TODAY

- › Ways of evaluating
 - › Usability testing
 - › Early development phase UX evaluations
 - › Prototypes in early development phase evaluations
 - › Data gathering and recording methods
 - › Evaluation planning and roles in the evaluation
-
- › TA session: Planning of the evaluation of your own ITPDP product!





WAYS TO EVALUATE



WHY DO WE EVALUATE?

- > **We are not designing for ourselves**
 - > Feedback on the design process
 - > Iterative development
 - > "Fail early, fail often"



“Iterative design, with its repeating cycle of design and testing, is the only validated methodology in existence that will consistently produce successful results. If you don’t have user-testing as an integral part of your design process, you are going to throw buckets of money down the drain.”

(Bruce Tognazzini)

THREE WAYS TO EVALUATE

Usability testing/ UX evaluation

- Test and evaluation setting controlled by the evaluator
- With users

Field evaluation

- Evaluation in a natural environment with real users and their actions
- The user's surroundings and tasks set the evaluation frame

Analytical evaluation

- No users are involved!
- Heuristic evaluation
- Walkthroughs

You will learn this in the coming HCI course!

Combination of these!



DIFFERENCES OF EVAL. APPROACHES

	Usability testing	UX evaluation	Field studies	Analytical
Users	Do task	Do tasks/ natural interactions	Natural interactions	Not involved
Location	Lab/controlled	Lab/natural	Natural	Anywhere
When	Prototype	Early, prototype, late	Early + late	Prototype
Data	Quantitative	Qualitative/ mixed	Qualitative	Problems
Feedback	Measures & errors	Experiences/ feelings	Descriptions	Problems
Type	Applied	Applied/ naturalistic	naturalistic	Expert





USABILITY TESTING

PLEASE DO NOT USE THIS IN YOUR EVALUATION!



AIMS OF USABILITY TESTING

- › Interested of how **easy** it is for the user to use the system
- › Usability is defined by **5 quality components**:
 - **Learnability**: How easy is it for users to accomplish basic tasks the first time they encounter the design?
 - **Efficiency**: Once users have learned the design, how quickly can they perform tasks?
 - **Memorability**: When users return to the design after a period of not using it, how easily can they re-establish proficiency?
 - **Errors**: How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
 - **Satisfaction**: How pleasant is it to use the design?

(<https://www.nngroup.com/articles/ten-usability-heuristics/>)



USABILITY TESTING

› Three ways of conducting:

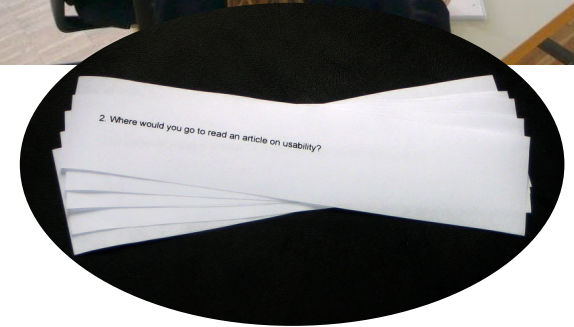
- **Laboratory-based** user observations
- **Controlled user testing**
 - › facilitator can help the user if the user does not know how to proceed, but this needs to be marked down in the observation notes!
- **Expert inspection techniques**
 - › Analytical evaluation methods you will be learning more in the HCI course

(Greenberg & Buxton, 2008)



USABILITY TESTING

› **Controlled laboratory-based** user (covert) observations & studies



<https://www.brighton.ac.uk/business-services/consultancy/user-centre-design-lab/index.aspx>

<https://www.volkside.com/2009/12/tip-print-out-your-usability-testing-tasks/>

<https://www.testingtime.com/en/blog/in-house-usability-tests/>

<https://ux247.com/usability-lab-dead/>



What are the challenges of usability evaluations conducted in an early design phase according to Greenberg & Buxton (2008)?

EARLY DESIGN IDEAS AND PROTOTYPES

- › **Early designs** are “sketches”
 - Illustrate the essence of an idea, but have many underdeveloped aspects to it
 - Can be represented in many forms
 - Work as externalization of the idea and help the designer to iterate the design

- › **Early prototypes**

- Have many holes and undeveloped attributes

(Greenberg & Buxton, 2008)

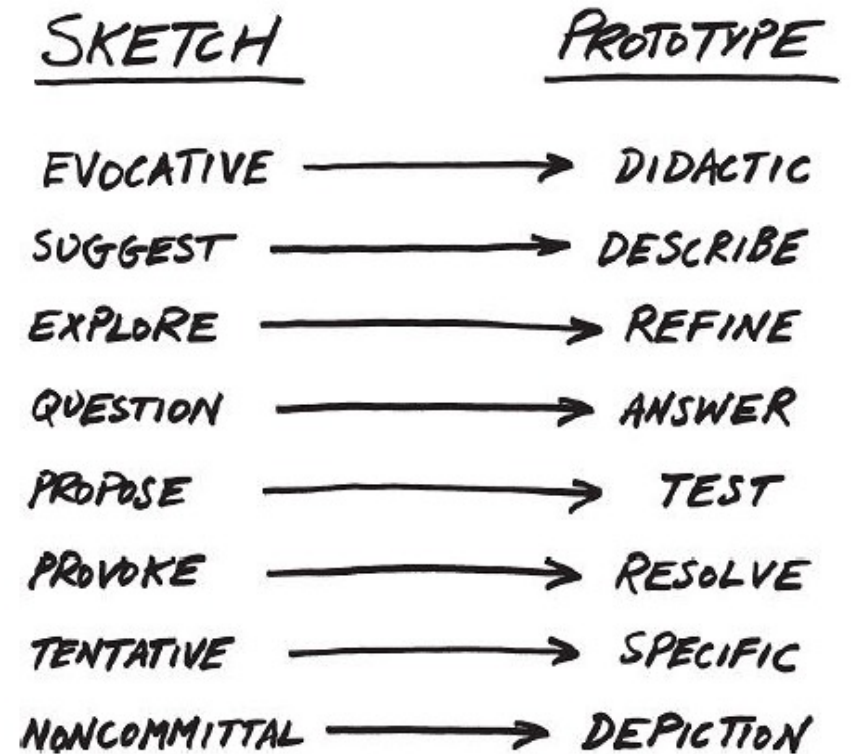


Figure 1. The sketch to prototype continuum [3].

CHALLENGES OF USABILITY STUDIES IN EARLY DESIGN PHASE

› Usability study is **not** the best approach to evaluate early designs or prototypes because

- **It focuses on negative aspects:**

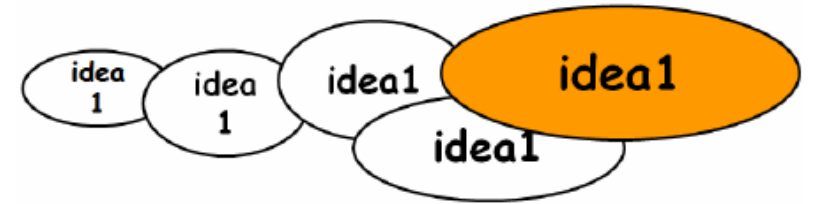
- Errors & bugs
- Task completion time: faster the better

-> **Abandoning a promising idea too early**

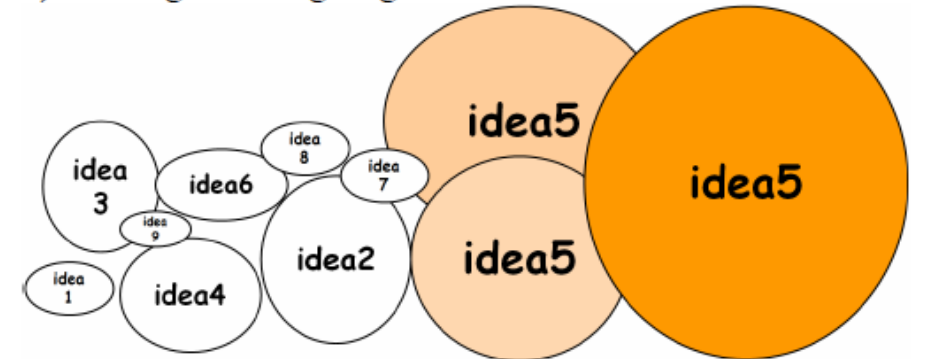
-> **Focus on developing aspects that can be measured, usually something we are already familiar with**

-> **Limit the number of alternative ideas**

(Greenberg & Buxton, 2008)



a) Getting the design right



b) Generating designs, choosing the right design, and then getting the design right





EARLY PHASE USER EXPERIENCE EVALUATIONS



USER EXPERIENCE EVALUATION

> UX studies focus on lived experiences

- A **holistic view** of the user's interaction with a product
 - Emotions, enjoyment & aesthetics
- Focuses on **positive aspects** of the use
 - Hedonic and non-instrumental aspects of use (non-task related)
- Dynamic and situational aspects
 - **Different time spans** (before, during, after the use) and **momentary** experiences (changes over time spans)
 - Context impacts the experience

(Bargas-Avila & Hornbæk, 2011)



AIMS OF UX EVALUATIONS

› **To find out how the user feels about the system and interaction with it**

- Qualitative or mixed-methods approach in research
 - Interviews, focus groups, observations
 - Questionnaires
 - Constructive and creative techniques (drawing & collages)
- UX studies can be conducted at any phase of the design process (concept ideas – – – -->final products)

(Bargas-Avila & Hornbæk, 2011)



EARLY DEVELOPMENT PHASE UX EVALUATIONS

- › **Early phase user experience evaluations are done to**
 - › help to choose the best design for the development
 - › Evaluating that the development is on the right track
 - › Examining if the final product can meet the set UX targets

(Stone et al. 2005)



ANTICIPATED USER EXPERIENCE (AUX)

”Anticipated UX happens before the first use, or it can happen also within the other time spans of UX, e.g. during and after the use and over time, as a person may imagine also during those time spans. A person can have indirect experience prior the first use through formed expectations of existing experience with related technologies, brand, advertisements, presentations, and other peoples’ opinions.”

(Roto et al., 2011)



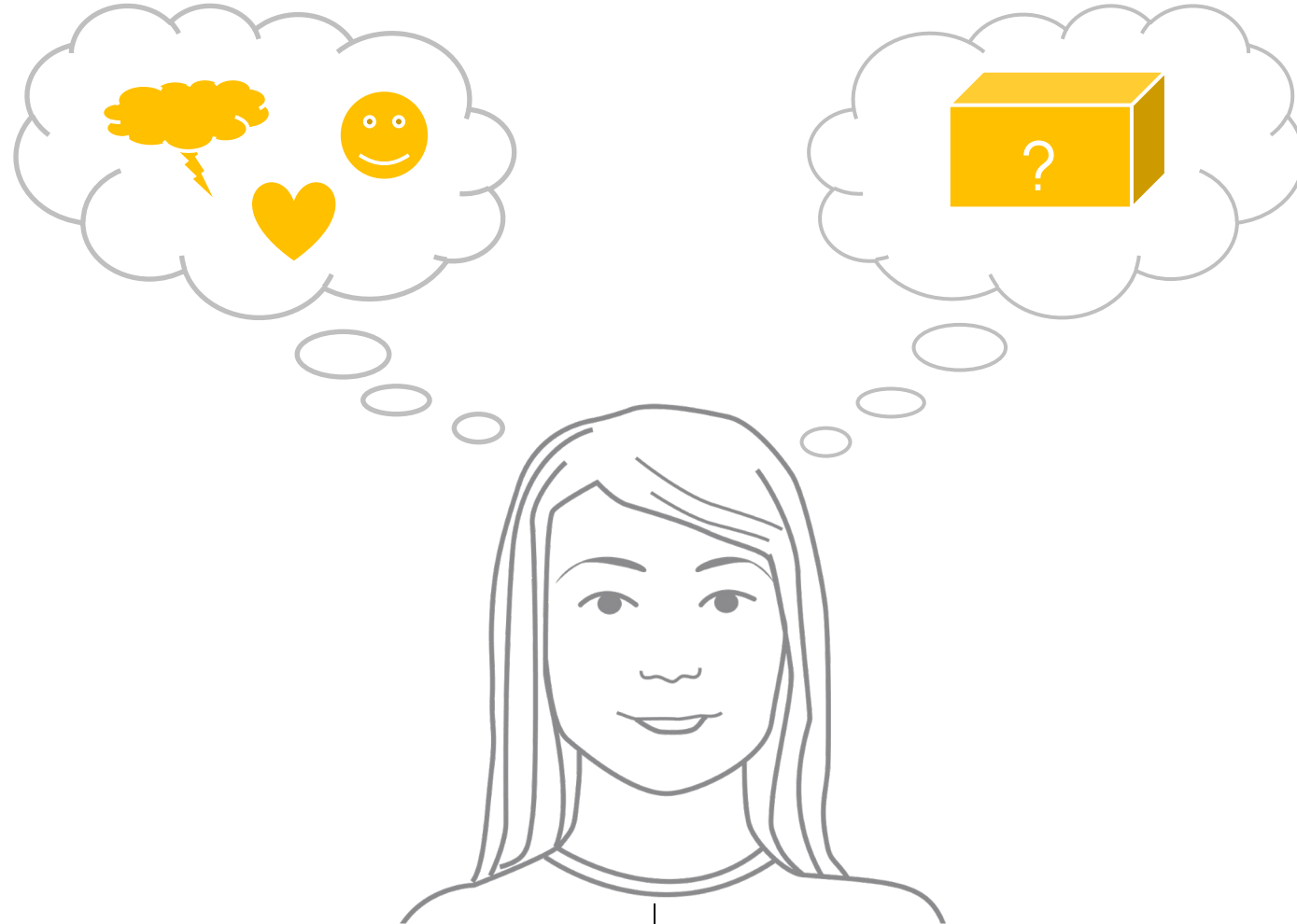
ANTICIPATED EXPERIENCE

”Anticipated user experience means the experiences and feelings that are expected to occur when the user is imagining using an interactive product.”

(Yogasara et al., 2011)



PROBLEMS WITH THIS DEFINITION?



ANTICIPATED USER EXPERIENCE (AUX)

Users should not be put in a situation where they have to **imagine their future needs without giving concrete options for them.**

(Von Hippel, 1986)



ANTICIPATED USER EXPERIENCE (AUX)

”Experiences, needs, and wishes that result from anticipated interaction with a concept of the product before the actual product exists.”

(Pakanen, 2015)





PROTOTYPES IN EARLY DEVELOPMENT PHASE UX EVALUATIONS



PROTOTYPES IN AUX EVALUATIONS

> Prototypes should

- › evoke people's dreams for the future (van den Hende 2010)
- › give a sense of experience before the actual artefact exists (Roto et al. 2011)
- › allow envisioning the concept and prevent unwanted confusion (Kuutti et al. 2001, Gegner & Runonen 2012)
- › focus subject's attention on studied things (Lim & Stolterman 2008)
- › allow utilizing concepts key characteristics directly to the design (Law 2011).



MIXED FIDELITY PROTOTYPES

5 filter dimensions of prototypes

- **Appearance**
 - size; color; shape; margin; form; weight; texture; proportion; hardness; transparency; gradation; haptic; sound
- **The functionality**
 - system function; users' functionality need
- **The interactivity**
 - input behavior; output behavior; feedback behavior; information behavior
- **The data**
 - data size; data type (e.g., number; string; media); data use; privacy type; hierarchy; organization
- **The spatial structure**
 - arrangement of interface or information elements; relationship among interface or information elements—which can be either two- or three-dimensional, intangible or tangible, or mixed

(Lim & Stolterman, 2008)



MANIFESTATION DIMENSIONS

Manifestation Dimension	Definition	Example Variables
<i>Material</i>	Medium (either visible or invisible) used to form a prototype	Physical media, e.g., paper, wood, and plastic; tools for manipulating physical matters, e.g., knife, scissors, pen, and sandpaper; computational prototyping tools, e.g., Macromedia Flash and Visual Basic; physical computing tools, e.g., Phidgets and Basic Stamps; available existing artifacts, e.g., a beeper to simulate an heart attack
<i>Resolution</i>	Level of detail or sophistication of what is manifested (corresponding to fidelity)	Accuracy of performance, e.g., feedback time responding to an input by a user—giving user feedback in a paper prototype is slower than in a computer-based one); appearance details; interactivity details; realistic versus faked data
<i>Scope</i>	Range of what is covered to be manifested	Level of contextualization, e.g., website color scheme testing with only color scheme charts or color schemes placed in a website layout structure; book search navigation usability testing with only the book search related interface or the whole navigation interface

(Lim & Stolterman, 2008)



FILTER-FIDELITY-PROFILES IN EVALUATION

5 filter-dimensions of prototypes

- Appearance
 - Size, color, shape, weight, hardness, haptic, sound, & arrangement
- **The functionality**
 - Breadth (functions realized) & depth (completeness)
- The interactivity
 - Action, reaction, input modality, & output modality
- **The data**
 - Closeness to the reality, information architecture, data model, & amount and type of data
- **The physicality**
 - Spatial position, coherence of tangibles, & tangible embodiment

(Kohler & Hochreuter, 2014)



PROTOTYPES IN EARLY UX EVALUATIONS



COMPARABLE VISUAL MATERIALS IN AUX EVALUATIONS

Extending the existing prototype and comparing alternative visualization styles for GUIs

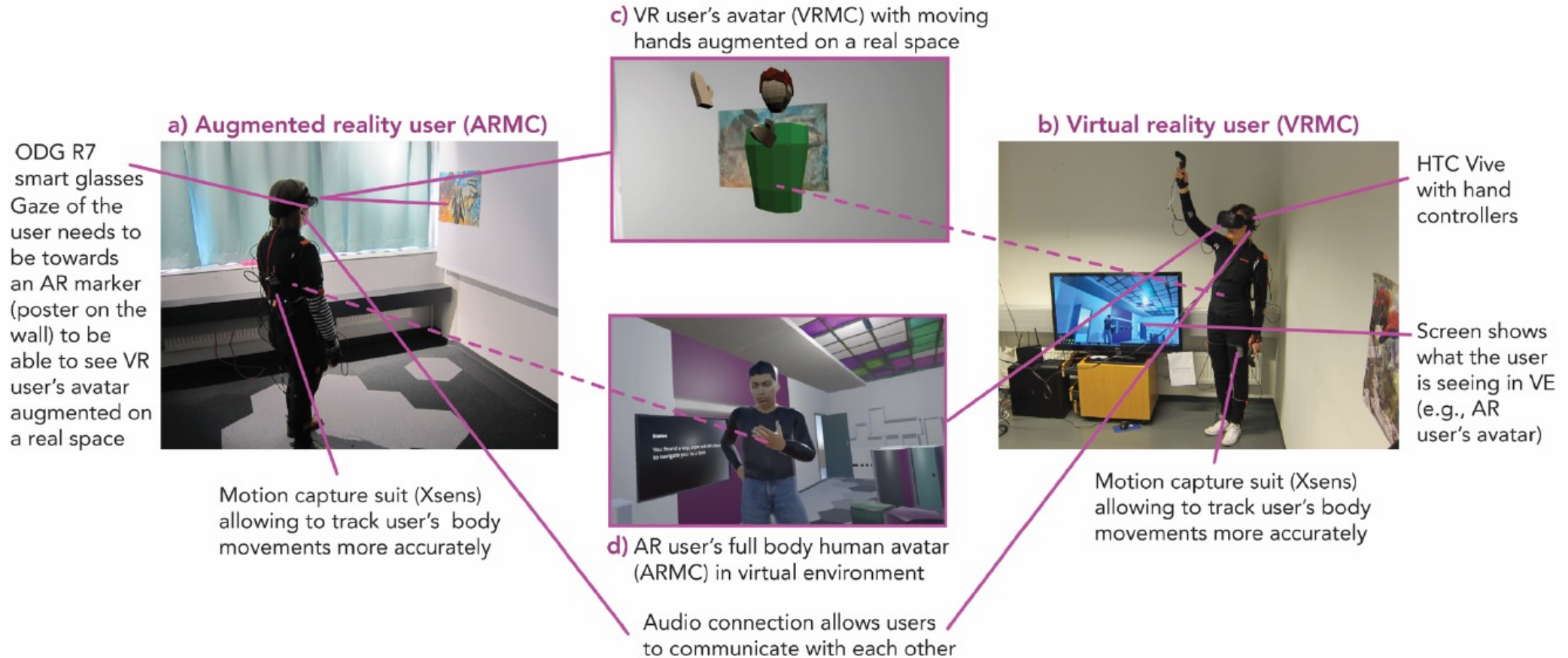
When preparing comparable visual materials, make sure the comparable examples and items under evaluation are same in:

- 1) Relative size
- 2) Color scheme, unless you compare different color options
- 3) Level of detail and visualization style (sketch, line drawing, shaded, ...)

Note that your alternative visualizations should all be presented in same application context (contextualization).



EXAMPLE: VIRTUAL AVATARS FOR AR & VR IN COLLABORATIVE SETTING



EXAMPLE: RESEARCH/ BENCHMARKING

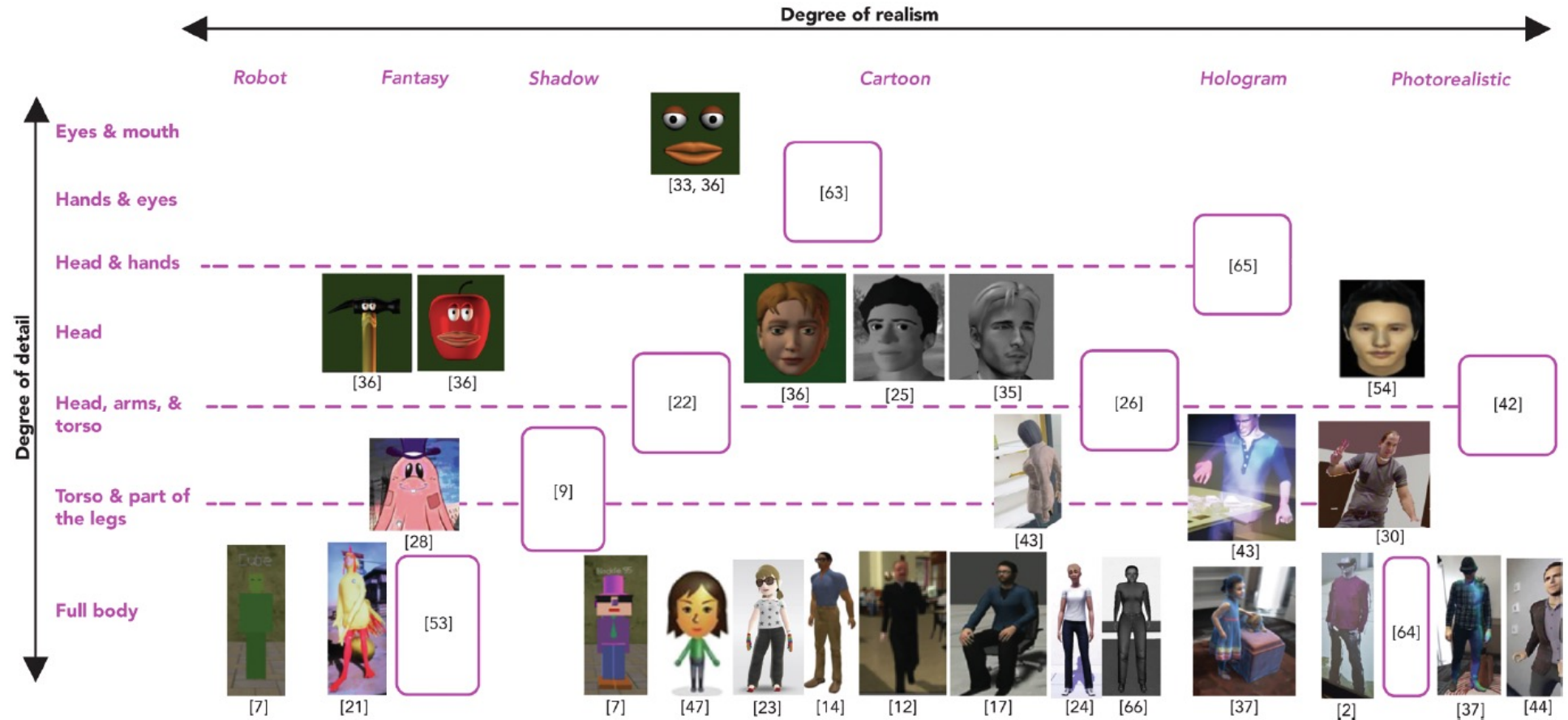


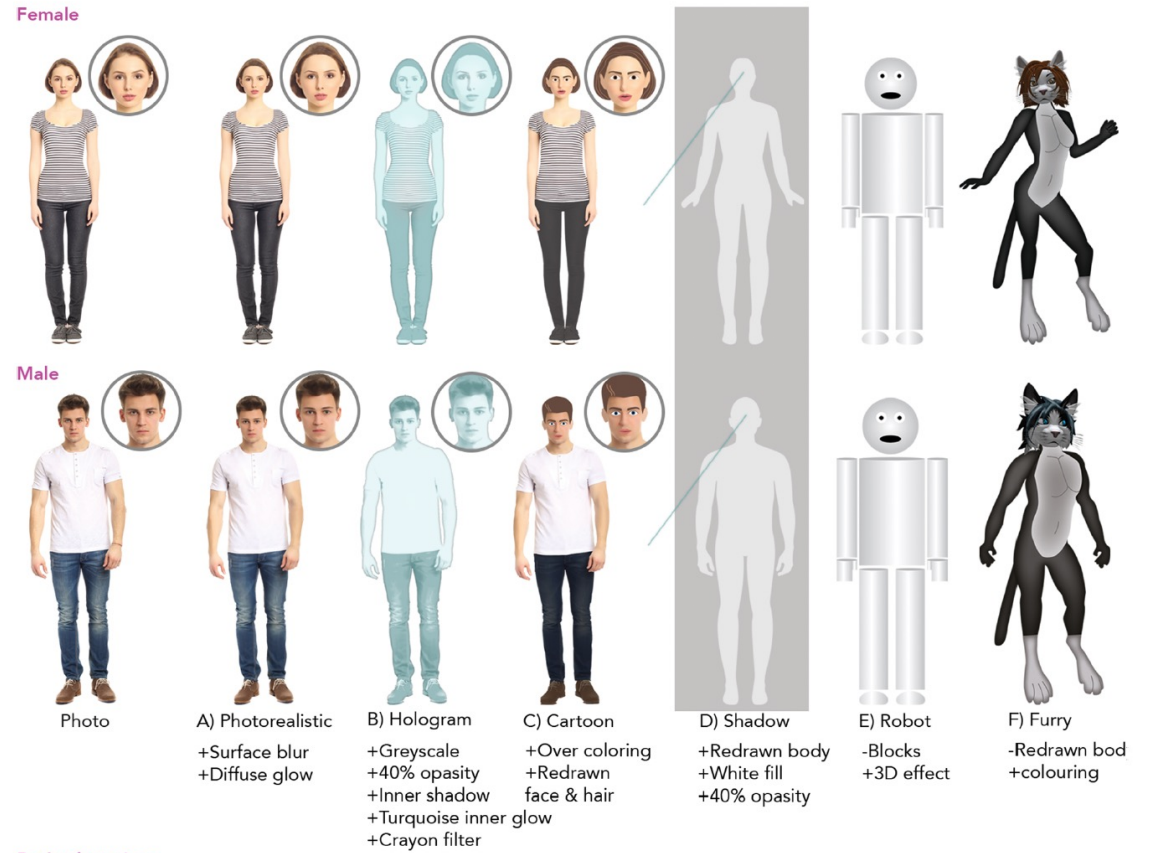
Fig. 5. Identified avatar designs categorized based on their visual characteristics.

(Pakanen et al. 2022)

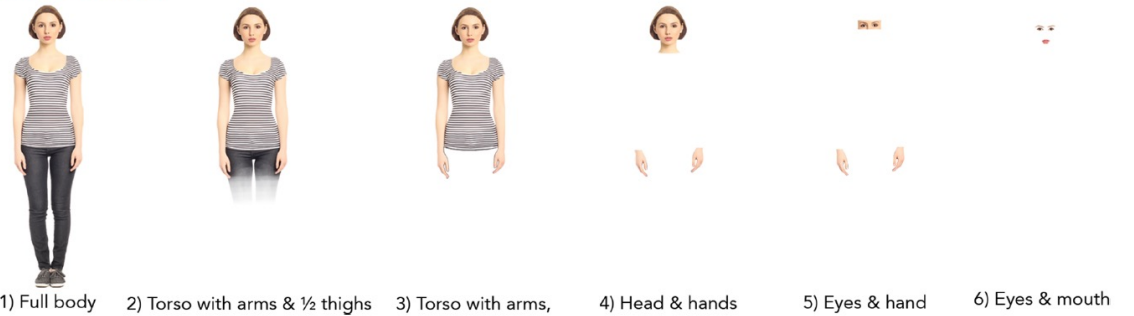


EXAMPLE: EXAMPLES

- 1) Relative size
- 2) Color scheme
- 3) Level of detail & visualization style

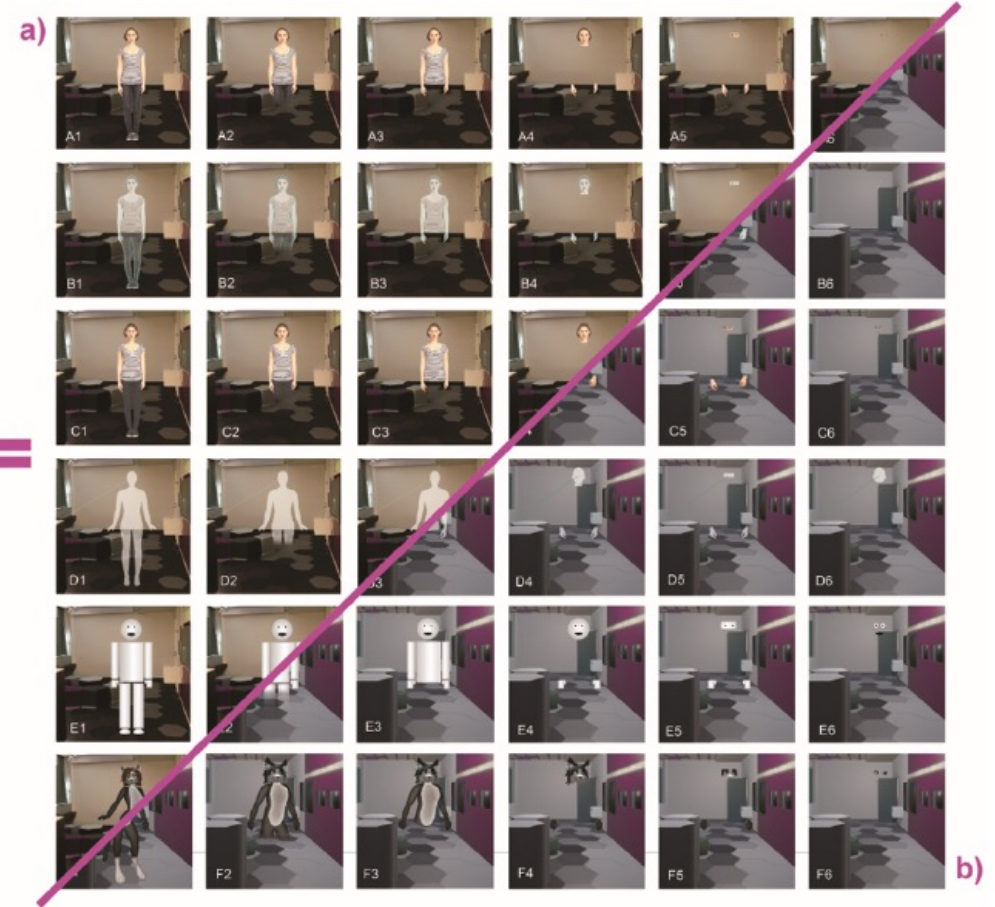


Body alterations
(applied to all A-F)



EXAMPLE: CONTEXT

Examples are shown both in AR & VR context



COMPARABLE VISUAL MATERIALS



a) study 1



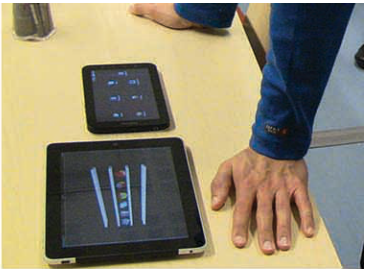
b) study 2



c) study 2



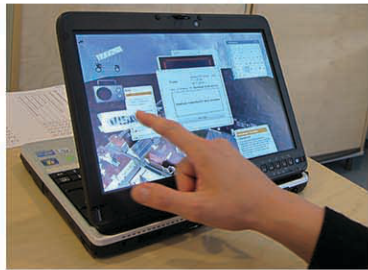
d) study 2



e) study 3



f) study 3



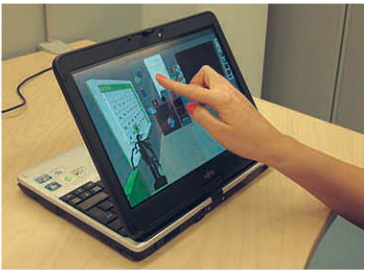
g) study 4



h) study 5/ E1



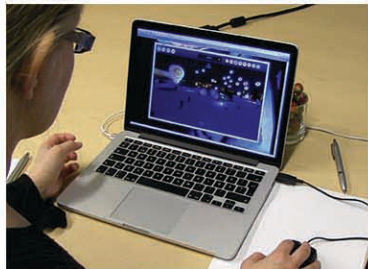
i) study 5/ E1



j) study 5/ E2



k) study 5/ E2



l) study 6/ E1 & 2



m) study 7/ E1



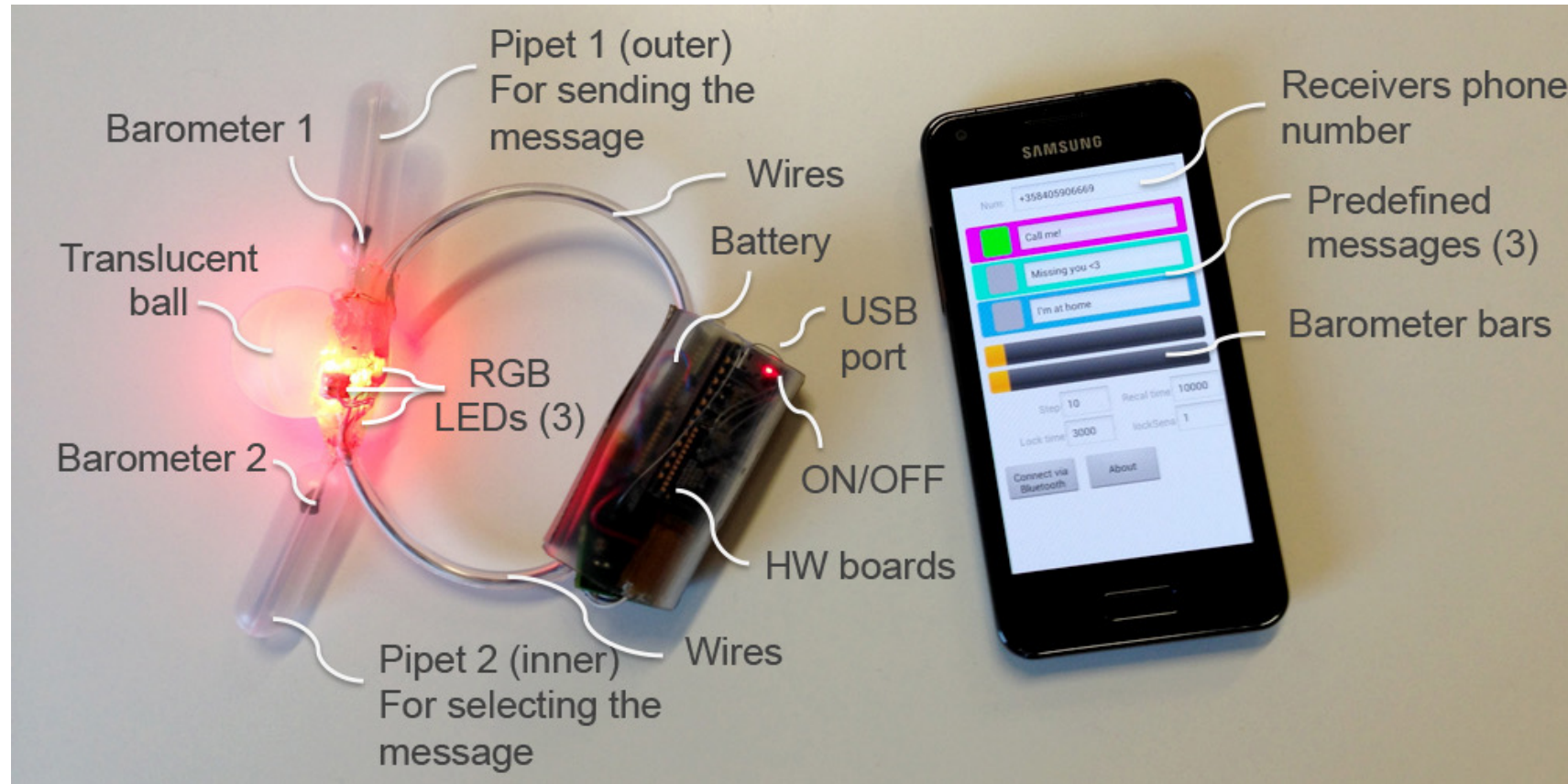
n) study 7/ E2



o) study 7/ E2



PROTOTYPES IN EARLY UX EVALUATIONS



VISUAL MATERIALS TO HELP EVALUATING PROTOTYPES



Reporting of the study in your report:

- > How the visual materials were used?**
- > When they were used in the evaluation?**

VISUAL MATERIALS IN AUX EVALUATIONS

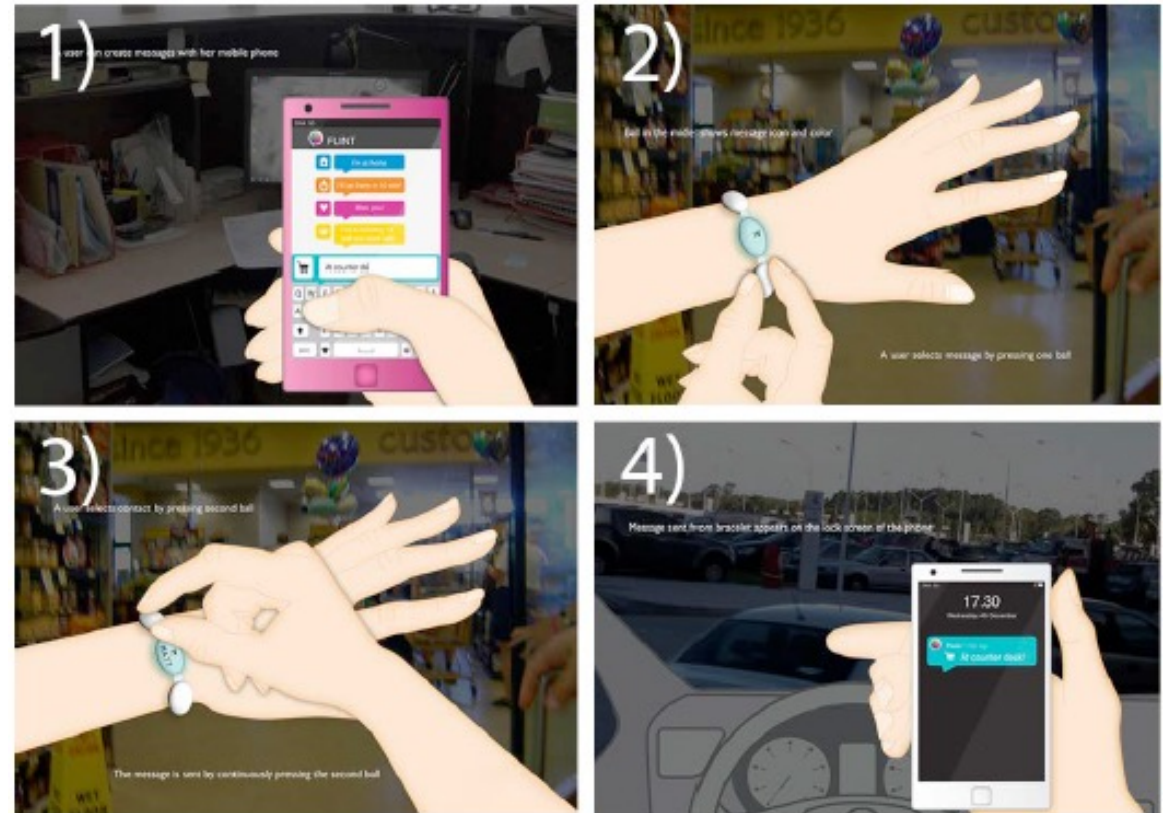
Example from paper 1

Paula and her husband planned in the morning that she will buy groceries, and her husband will collect her from the shop. Hence, now prior leaving from the office, she pre-writes a message on her phone “At the checkout desk!” (1) and assigns it to a turquoise color that she can remember.

When she arrives at the checkout, she uses the bracelet device on her wrist to browse the messages that she has created with the phone (2). She finds the turquoise message (with inner ball) that she created at her office.

Then she selects the receiver, Matt, her husband (with outer ball) and sends it to him (3).

Matt is arriving to the parking lot, when Paula’s message arrives to his phone, he knows that it will only take a few minutes for Paula to come out of the shop, so rather than parking, he drives to waits at the front of the store (4).



VISUAL MATERIALS IN AUX EVALUATIONS

Help user to see over limitations of the prototype by creating a model to show the appearance

- A nice rendering/ visualization of the concept idea in use context held by a human (print/screen)
- A physical unfunctional mock-up (can be hold in hand by the user)
- A set of images + use case story (prints/ Powerpoint slides/video)
- Make sure you show this use case story **before** evaluating the partial and unfinished **appearance** (in this case size, weight, shape, materials), **functionality** (only two types of interactions were compared [interactivity]) or the prototype.
- **Think of what aspects you need to realize as close to the final prototype (physicality as in this case tangible embodiment was almost realistically realized)**



VISUAL MATERIALS IN AUX EVALUATIONS

Example from paper 2

Collect feedback for the further development

- 2 Altered visualizations of possible solutions presented on screenshots taken from the model
- Make sure you show the alternative visualizations **after** evaluating the partial and unfinished prototype
 - **appearance** (no visualizations)
 - **functionality** (only moving was realized in the prototype).
- Think of what aspects you need to realize as close to the final prototype (Appearance and the animations)

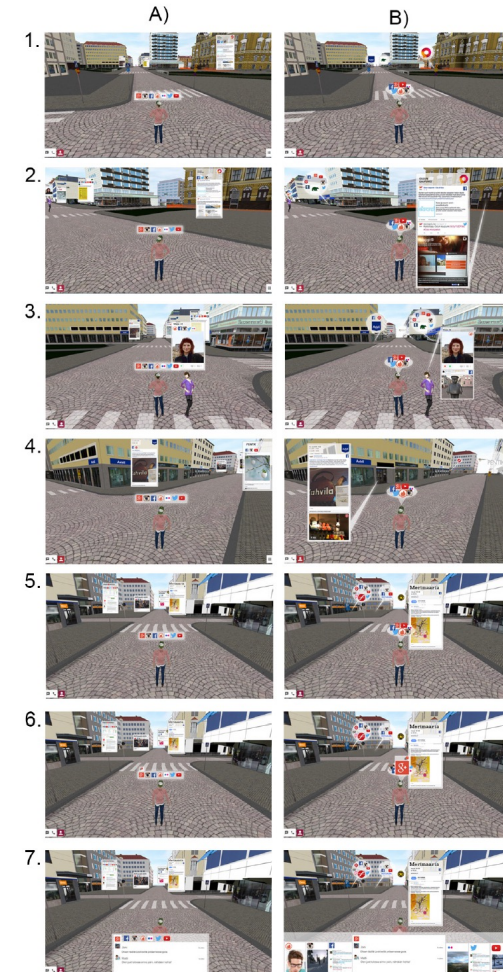


Figure 3. Example visualizations of Concepts A and B.

(Kukka et al. 2017)

VISUAL MATERIALS IN AUX EVALUATIONS

Example from paper 4

Collect feedback for the further development

- One virtual environment with alternative interior and functionalities
- Make sure you let the participants see the alternative visualization **after** evaluating the partial and unfinished prototype
 - **appearance** (no visualizations)
 - **functionality** (only moving was realized in the prototype).
- Think of what aspects you need to realize as close to the final prototype (Appearance, functionalities, and the interactions)





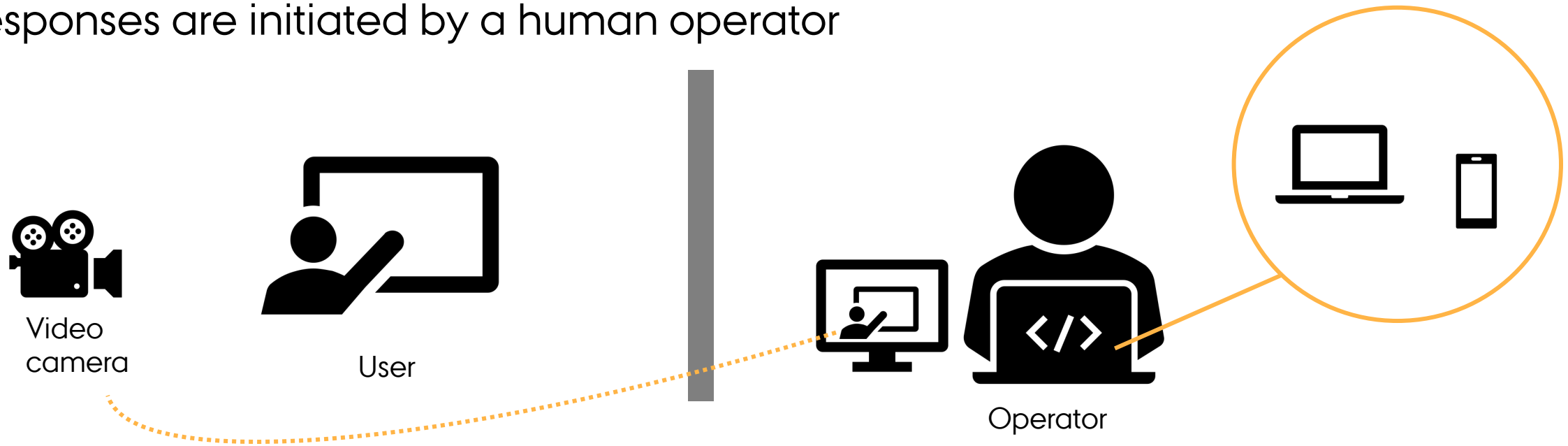
WIZARD OF OZ



WIZARD OF OZ TECHNIQUE

ALLEN MUNRO AND DON NORMAN, 1975

> The Wizard of Oz method is a moderated research method in which a user interacts with an interface that is not really working, but the system responses are initiated by a human operator



<https://www.nngroup.com/articles/wizard-of-oz/#:~:text=Definition%3A%20The%20Wizard%20of%20Oz,Norman%20at%20UC%20San%20Diego.>



WIZARD OF OZ TECHNIQUE

AN EXAMPLE IN LAB SETTING



(Colley et al. 2016)



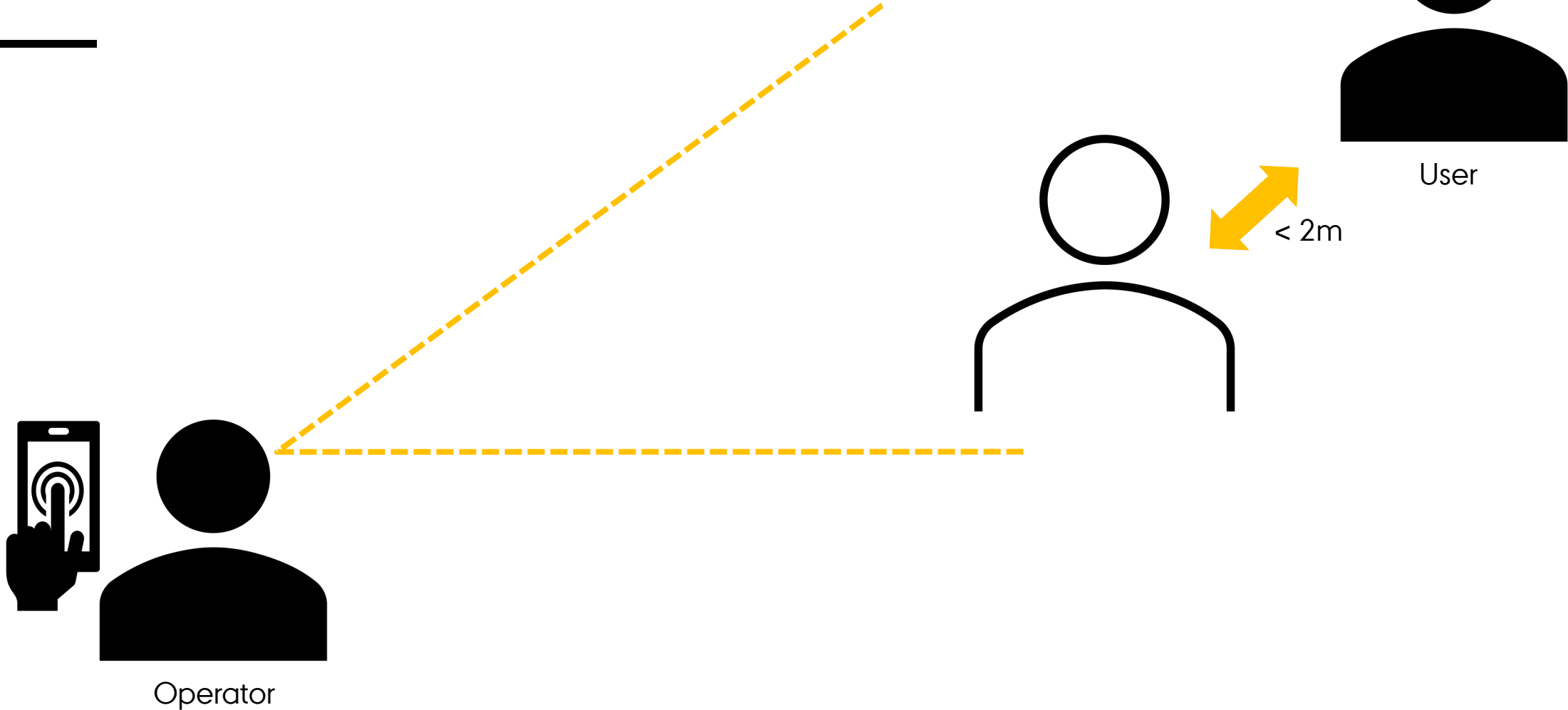
Reporting of the study in your report:

- › What kind of Wizard of OZ evaluation was conducted?
- › How was the Wizard of OZ method described in the paper?

Paper: 3

WIZARD OF OZ TECHNIQUE

MOBILE



PLANNING OF WIZARD OF OZ STUDY

Remember

- › Assign group members to be:
 - 1) Facilitator, introduces the tasks and interviews the participants
 - 2) Operator/"observer" who operates the prototype based on participants input/ other type of input. Make sure there is either direct or indirect (through live video feed) visibility to participants interaction with the prototype with, so that you can operate the prototype well. If the operator is to be in the same space, then say to participants that this person is an observer

- › Do not break the illusion!
 - › Plan the tasks carefully and think all the possibilities what the user could do?
 - If participant does unexpected things, facilitator should say: unfortunately the prototype does not function in that way, can you think any other way how it could work? (and at the end show how to use it).
 - › Make sure the operator have a direct view to the participant and their interaction with the prototype



USER STUDY DATA GATHERING METHODS

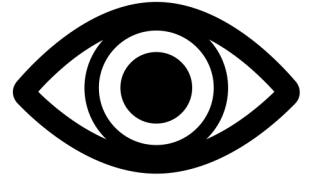
Blandford, Ann, Dominic Furniss, and Stephann Makri. "Qualitative HCI research: going behind the scenes." Synthesis lectures on human-centered informatics 9, no. 1 (2016): 1-115.



OBSERVATION

Observer observes

- › "Fly on the wall" (Blandford et al. 2016)
- › What do people do and how do they do it?
 - › Difficulties or errors with the interaction?
 - › What do they get enthusiastic about?
 - › How do they operate the system?
- › Are their actions supporting what they say?
 - › e.g., if they seem to have problems and they claim it is easy to use



PLANNING OBSERVATION

Pay attention to

- › Select setting(s)
- › It is not possible to observe everything, so decide what is to be documented in each observation.
- › Plan an observation form for collecting observations for each task
- › When a participant does something very interesting, you can mark down the time, which helps finding that incident from the video or audio recording.



THINK ALOUD



- › Technique can be used in usability testing, user experience evaluation, and even in field studies
 - › Start by explaining to the participant how to think aloud
 - › It is not about what they do, but what they think while doing it
 - › The tasks: chosen by participants (naturalistic) or defined by you
 - › Thinking aloud does not come naturally to all
 - › You can prompt silent participant by asking: “What are you thinking”
 - › You should politely steer too chatty participant back to the tasks
- › UX and usability studies have different rules
 - › Intervention in minimum (usability) | UX interventions for seeking clarifications



INTERVIEW

> allows understanding people's perceptions and experiences

> **Different types**

> **Unstructured**

> not directed by a script (ethnographic)

> **Structured**

> tightly scripted, almost like a questionnaire

> **Semi-structured (most used)**

> guided by a script, interesting issues explored in more depth by asking for further details



INTERVIEWING

The interviewer interviews the participant/s

- › Form the topics and questions: open, broad & narrow
 - › Next slide what to avoid when forming questions
- › Opening the conversation
 - › assure your interest in participants' replies as an expert in the topic
 - › Ask the question and wait that the person gives a reply
 - › Ask for clarifications if a person's reply is not complete or if it is just yes or no/ good/bad
 - › *You said that it is good, in what way/s it is good/ what features make it good?*
 - › *You wished the information on the screen was clearer, in which way?*



INTERVIEW QUESTIONS

When creating questions avoid:

- › Long questions
 - › Compound sentences - split them into two
- › Jargon and language that the interviewee may not understand
 - › *What did you think of this AR feature? ->the feature where you can see items appearing on this real space we are in?*
- › Leading questions that make assumptions
 - › *Isn't this feature good in...*
- › Unconscious biases e.g., gender/age... stereotypes
 - › *As a/n elderly/woman/child you probably found this as complicated...*

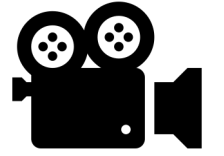




DATA RECORDING



VIDEO RECORDING



Pros and cons

- > A rich way to capture interaction in the context + user comments are automatically in sync with user interaction
- > Video recording can make participant anxious
 - > Placing the video camera in a more discrete location usually helps users to forget it



AUDIO RECORDING



When and why

- › In some of the interviews it is fine to record audio only
 - If you do not have any prototypes or visual materials, an audio recording is more discrete than a video.

- › It is good to also record audio when you use video recording as sometimes it is hard to hear from the video what the user is saying especially if the camera is located far away from the user



PHOTOGRAPHS



Records the moment

› Capture moments as they happened. They help in reporting results and important moments in the interaction for example in project reports and publications



OBSERVATION NOTES



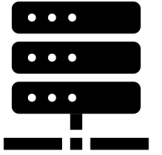
Fast in situ note taking

- › Observation notes are a good way of getting the most important things marked down, you can even mark the time when a user did or said something that was unexpected or interesting in some other way

- › Notes can be used also as the basis of analysis (i.e., themes)



LOG DATA



Recording user interaction on the device

- › records user actions in the device log

- › You can find errors and quantify your results easily with log data, but remember that you need the before-mentioned methods to understand why people made mistakes or did things in certain ways



UX EVALUATION AND DATA CAPTURING METHODS

<https://experienceresearchsociety.org/ux/evaluation-methods/>

The screenshot displays the 'UX Evaluation Methods' page on the Experience Research Society website. The page features a navigation bar with links for EVENTS, COMMUNITY, RESOURCES, ABOUT, CONTACT, MY ACCOUNT, and JOIN EXPRESSO. A prominent banner for 'User Experience' includes a breadcrumb trail: UX HOME | UX DEFINITIONS | UX EVALUATION METHODS | UX WHITE PAPER (PDF). Below the banner is a search bar with the placeholder text 'What are you looking for?' and a search icon. The main content area is titled 'UX Evaluation Methods' and includes a 'METHOD FILTERS' section on the left. This section has three categories: 'Study type' (with 'Lab studies' selected), 'Development phase' (with 'Early prototypes' selected), and 'Studied period of experience' (with 'Before usage' selected). The 'Evaluator / Info provider' category is also present. On the right, the search results are displayed, showing 'Showing results for: Lab studies, Early prototypes, Qualitative'. Two method cards are visible: 'Emocards', which provides a non-verbal method for self-reporting emotions, and 'Group-based expert walkthrough', which is a scenario-based usability inspection method. Each card includes a 'READ MORE' button.

EXPERIENCE RESEARCH SOCIETY

EVENTS COMMUNITY RESOURCES ABOUT CONTACT MY ACCOUNT JOIN EXPRESSO

User Experience

UX HOME | UX DEFINITIONS | UX EVALUATION METHODS | UX WHITE PAPER (PDF)

UX Evaluation Methods

What are you looking for?

METHOD FILTERS

Study type

- Online studies
- Questionnaire
- Field studies
- Lab studies

Development phase

- Concepts
- Early prototypes
- Functional prototypes
- Products on market

Studied period of experience

- Before usage
- Snapshots
- An episode
- Long-term UX

Evaluator / Info provider

Showing results for: Lab studies, Early prototypes, Qualitative ^x

Emocards

Emocards provide a non-verbal method for users to self-report their emotions. Flash cards or single sheet of a paper.

[READ MORE](#)

Group-based expert walkthrough

It is a scenario based usability inspection method, aiming to identify usability-problems, possible design improvements and successful/good design solutions in a given user interface. The evaluations are conducted as group usability inspections and require no previous training of the evaluators. Thus the method supports evaluators not accustomed to usability inspections. The group-based expert walkthrough is particularly suited for early evaluations of applications specific to a particular work



Reporting of the study in your report:

- › **What kind of data collection and recording methods were used?**
- › **Were there some methods that were not described here?**



EVALUATION PLANNING

TASKS, PROCEDURE, & INTERVIEW QUESTIONS



PLANNING

1. **Prepare procedure** – steps, tasks...”script of the evaluation”
2. **Prepare interview (+questionnaires) questions** – background, task related, end
3. **Pilot study** – try out your procedure, tasks, forms, questions & how long the evaluation will be
4. **Iterate your procedure** – if something needs to be changed
5. **2nd Pilot** – test if changes work better
6. **Recruit participants** – amount depends of the study, from 6-14-30-..., set also times for the studies and let them know the estimated duration
7. **Prepare for the evaluation** – cameras, video cameras, tripods, audio recording, print forms, get gifts for the participants, book rooms...
8. **Conduct your study**- follow your procedure, record the data and store it for analysis, remember to thank your participants after the evaluation!





PROCEDURE

Applied from Leena Arhippainen, UX researcher and Minna's Phd supervisor



PROCEDURE

1. **Consent from filling**- participant agrees on the study (See L3: GDPR)
2. **Intro to the study**- who, why and what
3. **Background info of the users**- questionnaire or interview
4. **Ice breaking task** – easy task to get user familiar with the prototype
5. **Actual task(s) with the prototype** – design the task so that you are able to get feedback on right things
6. **Post questionnaires**- preferences and quantitative data
7. **Semi-structured interview** – get more detailed understanding how user felt using your prototype and what s/he thought about the design idea in general



PROCEDURE

Example of procedure:

- Everything is explained so it is easy to follow in the actual evaluation

1. Consent & background questionnaire form filling
2. Who are we and explanation of the purpose of the study (even if explained in the consent form in detail)
3. Actual tasks are written down so that each participant is instructed in a similar way
4. Questionnaire fillings are marked in the procedure
5. Interview questions for post-interview (can also be on different paper)
6. Thank and reward the participants

PROCEDURE

-Consent form and pre-questionnaire filling.

-Explain the purpose of the evaluation for the participants:

The prototype that you are going to try and evaluate is still works-in-progress and therefore we value all the feedback that we can get from you, so do not hesitate to comment your thoughts about the use, interaction, and/ or experience being those either negative or positive. We have not developed the system, but are just conducting the evaluation, so you can give your honest feedback for us. The prototype is developed for enabling telepresence, which means that both participants of collaborative task can be located in different places in reality, but this technology allows them to collaborate within one virtual environment.

Tasks

1. **Ice breaking:** (simple talking and orientation)
 - c. Participants will greet each other
 - d. Participants will ask each other to locate some notable objects
2. **Task 1:** Participant 1: Find a hidden virtual key by visual and oral instructions given by another user, Participant 2: guide another participant to hidden key by providing oral and visual guide for him/her.
 - o After participants complete the task, ask them to fill co-presence questionnaire: 6 statements (remember to mark which condition VRM/VRG/ARM/ARG was used first and participant ID on the form)
3. **Post UX interview,** users' feelings and comments of the use and interaction in both conditions:
 - o Describe your experiences with the system?
 - o What kind of feelings this kind of interaction with remote user brought up in you?
 - o What did you think about using this kind of technology for remote collaboration?
 - o How the communication/ interaction between users went?
 - o What was easy/natural and what was difficult/unnatural in the interaction?
 - o Were there any critical moments in the interaction, if yes describe it/them?
 - o How aware were you of events occurring in the real world around you?
 - o What do you think of VR and AR avatars appearance? (show pictures)
 - o Can you come up use case/s where this kind of system could be used?
 - o If this kind of system would be available for you, how willing you would be for using it, select a number between 1-10 and what would you use it for?

And when participants are ready, take the forms and store them in binder, and give movie tickets to them and say: "Thank you for participating and providing a lot of interesting feedback for the developers, here is a movie ticket for you."



PROCEDURE

2. Introduction to the study

- Who are we
- Short description of the study aim
- Tell the user once more that **they can withdraw** from the study whenever they feel like it
- Ask the user to **think aloud** during the tasks (+how to do it)
- In Usability evaluation: explain if you will not help the participant during the tasks
- Ask if the user has **any questions**



EXAMPLE

2. Introduction to the study

PROCEDURE

-Concent form and pre-questionnaire filling.

-Explain the purpose of the evaluation for the participants:

The prototype that you are going to try and evaluate is still works-in-progress and therefore we value all the feedback that we can get from you, so do not hesitate to comment your thoughts about the use, interaction, and/ or experience being those either negative or positive. We have not developed the system, but are just conducting the evaluation, so you can give your honest feedback for us. The prototype is developed for enabling telepresence, which means that both participants of collaborative task can be located in different places in reality, but this technology allows them to collaborate within one virtual environment.

Tasks

1. **Ice breaking:** (simple talking and orientation)



Reporting of the study in your report:

> Was there differences in the example procedure that was given to your group?

PROCEDURE

3. Background information

- What do you need to know about your user?
 - Age
 - Gender: male/female/nonbinary
 - Educational background/ profession
 - Prior experience with similar technology that you are evaluating
 - Prior experience with the use context (e.g., fab labs, pottery, chemical lab, etc.) of your system



EXAMPLE

3. Background questionnaire

Note that you do not necessarily need this, especially if you have only a few things to ask. The questions can also be interviewed in the beginning or at the end of the evaluation!

Background questionnaire

ID: _____

Your age: _____ Sex: Female male other

Your highest carried out school degree:

- Comprehensive School
- Vocational School
- High School
- Lower academic degree (Bachelor)
- Higher academic degree (Master)
- Licentiate degree
- Doctoral degree

Your Field of study: _____

What do you do for work: _____

Technical devices:

Smart phone manufacturer: _____ Model: _____

Do you own a tablet device? Yes No |

Manufacturer: _____ Model: _____

Do you have previous experience on 3D technologies, services, or applications? Choose one or more of the following options:

- I have watched 3D-movies
- I have played 3D-games, where 3D capabilities have been implemented
- I have played games controlled by hands or body movement (e.g. Nintendo Wii, Kinect)
- I have used devices where 3D dimension is seen **with** 3D glasses (e.g. Oculus Rift)
- I have used Oculus Rift with its hand controllers
- I have used HTC Vive with its hand controllers
- I have used devices where 3D dimension is seen **with** 3D glasses and
- I have used devices where 3D dimension is seen **without** 3D glasses (e.g. Stereoscopic devices)
- I have used 3D-virtual worlds (e.g. Second Life)
- I have worked developing 3D-virtual worlds/ environments
- I have used 3D-modeling software

Other 3D-experience, what?



Reporting of the study in your report:

- > How the participants were described in the paper, and what kind of information was given about them?**
- > What way the description was written?**

PROCEDURE

4. Icebreaking task

- Idea is to familiarize your user with the thing under evaluation
- Easy and short task
- Reduces nervousness of the participant



EXAMPLE

4. Icebreaking task

- Explore the prototype freely for a while

1. Familiarization with the current 3D City model

1. Familiarize yourselves with the 3D City model simply by looking at it and giving your initial thoughts before interacting with it.
2. Now you can start interacting with the model by controlling an avatar (WASD and arrows) and explore the model freely. While exploring the 3D model, please think aloud and comment on anything that caught your attention.



PROCEDURE

5. Actual task(s)

- The idea is to plan tasks that the user can do and by doing the tasks you will learn if your product is understandable for the user or how they do experience the prototype
 - Try to keep them short and not too complicated to conduct
 - Test how your core use case activities are working



EXAMPLE

5. Tasks

1st task:

1. First you want your handbag to match with these red shoes over here, what would you do?
2. Next you can try to make the bag imitate the fabric and color of this of this scarf here.
3. And then this shirt here.

Questions after the tasks are completed

What did you think of this idea?

Would it be useful for you?

 Is the idea fun?

PROCEDURE

6. post questionnaire

- Sometimes you might need user feedback on different designs so you can use certain questionnaires to help assess different things.
- The attractiveness of the product: Attrakdiff
<https://www.attrakdiff.de/index-en.html> (online service was discontinued from January 2025 😞)
 - Can be used for
 - Single evaluation
 - Comparison
 - Before-after



EXAMPLE

6. Post questionnaire With Attrakdiff questionnaire

	3	2	1	0	1	2	3	
Captivating								Dull
Inventive								Conventional
Pleasant								Unpleasant
cumbersome								Straightforward
Creative								Unimaginative
Predictable								Unpredictable
Practical								Impractical
Novel								Ordinary
Simple								Complicated
Appealing								Repelling

End questionnaire

ID: _____

What do you think of the overall concept idea? Following, are pairs of words to assist you in your evaluation. Each pair represents extreme contrasts. The possibilities between the extremes enable you to describe the intensity of the quality you choose. Mark suitable option between extreme word pairs.

	3	2	1	0	1	2	3	
Captivating								Dull
Inventive								Conventional
Pleasant								Unpleasant
cumbersome								Straightforward
Creative								Unimaginative
Predictable								Unpredictable
Practical								Impractical
Novel								Ordinary
Simple								Complicated
Appealing								Repelling

Now think all the ideas that you have seen, rank them based on how pleasurable you find them. Mark from 1-6 after the following options based on how pleasurable that concept idea is: 1 is most pleasurable idea and 6 least pleasurable idea.

- a) matching hand bag with your clothes _____
- b) bag disappearing on its background (chameleon) _____
- c) showing content of the bag _____
- d) Showing personal opinions/badges _____
- e) Showing shopping list _____
- f) Showing your current status _____

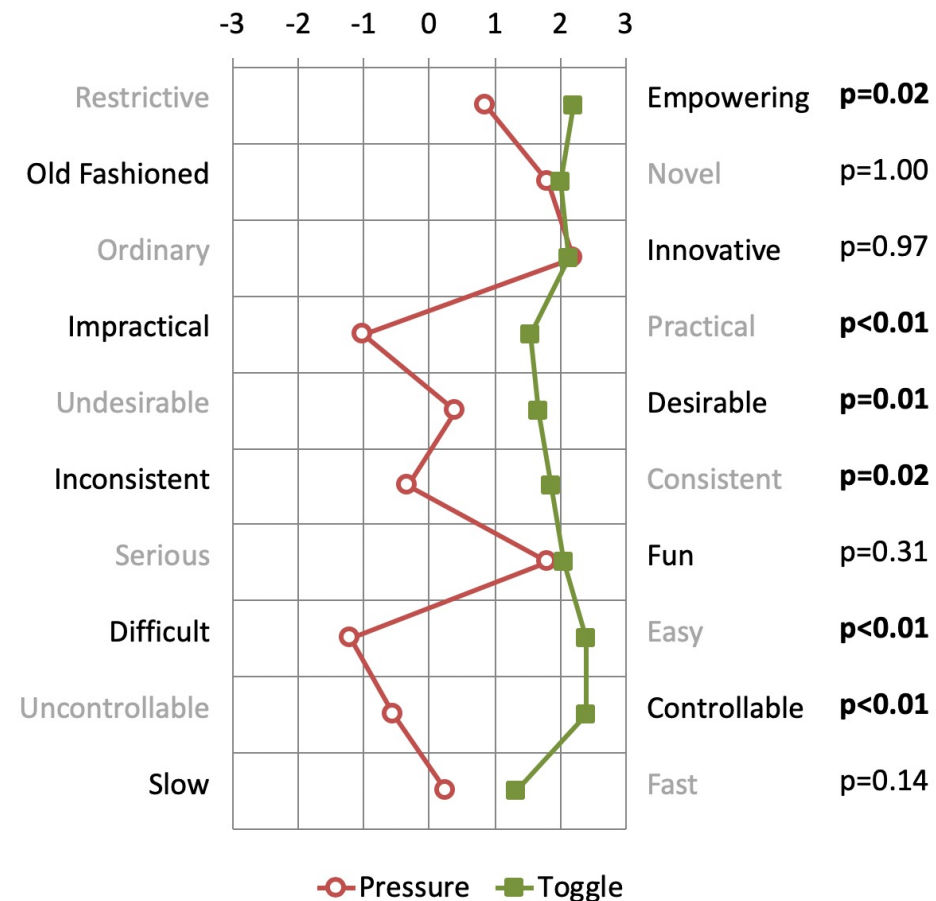
What would you like to display on the bag?

What would be the best virtual hand bag?



EXAMPLE

> Visual presentation of Attrakdiff findings in the report



(Pakanen et al. 2014)



PROCEDURE

7. Semi-structured interview

- The last part of the evaluation is for asking questions from the user to find out their thoughts about the prototype and the interaction with it
 - What is good/bad in the design idea and the prototype?
 - What was difficult?
 - What would make it easier to use?
 - What would you like to change in it to make it more interesting to you?
- Try to avoid questions that can be replied to just with yes or no!



EXAMPLE

7. Post-interview questions

- *Describe your experiences with the system.*
- *What do you think of using this kind of technology for remote collaboration?*
- *What was easy/natural and what was difficult/unnatural in the interaction?*
- *Were there any critical moments in the interaction? If yes, describe it/them.*



HOW DO YOU DESCRIBE YOUR STUDY IN THE REPORT?

How procedure is reported in the paper?

> How is the procedure description in the paper differentiating from the study procedure, or is it doing that at all?



Reporting of the study in your report:

- > How the procedure is reported in the paper?**
- > Is the procedure description in the paper differentiating from the study procedure, if so, how?**



ROLES IN THE EVALUATION



ROLES IN THE EVALUATION

1. Facilitator/interviewer

- Facilitates the study, gives tasks, interviews, handles questionnaires

2. Observer

- Stays behind and observes what user does
- Takes notes on each task-can also write down user comments

3. Documenter (can be also facilitator)

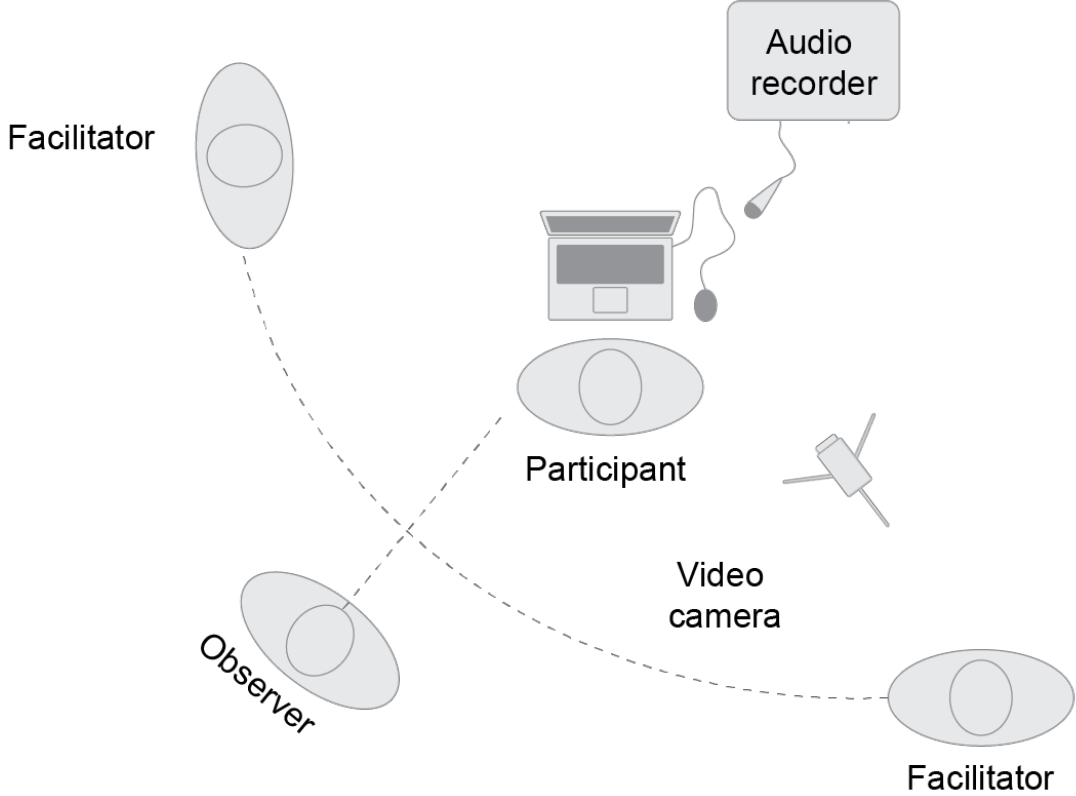
- Videos/photos/audio recording

Pick a role that fits best for you!



ROLES IN THE EVALUATION

An example



QUALITATIVE DATA ANALYSIS

Thematic Analysis

Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57–71). American Psychological Association. <https://doi.org/10.1037/13620-004>



PLEASE REVISIT MY SLIDES FROM L5

> <https://brightspace.au.dk/d2l/le/lessons/202542/topics/2569495>

> There is detailed explanation how to conduct thematic analysis!



Reporting of the data analysis in your report:

> How the qualitative data analysis was reported in the papers?

Reporting of the findings in your report:

- › **Check the example papers for tips how to report qualitative findings in your report**
- › **How participants were identified?**
- › **How participants quotes were written?**

- › **Pay attention to the story!**



PLANNING YOUR OWN EVALUATION TA SESSION FROM 13:15-> TODAY!



TASK FOR TA

Start planning your evaluation

- Who are your participants? You need 5 participants
- Think of your research question
- Think what kind of tasks and questions would help you to answer to your research question
- Make an early draft of your procedure
- Think about the roles: facilitator, observer, video recorder...



WHEN THE PROTOTYPE IS “READY”

Conduct a pilot evaluation

- Get participant/s from the other group/s
- Follow your procedure rigorously
- Act like you do not know your participant beforehand
- After the pilot you have an understanding whether your tasks are easy to understand or too complicated to pass and if your questions can reveal knowledge you were hoping for
 - > Iterate your procedure, tasks and questions, do another pilot study before you go to the actual evaluations!



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