Human-Computer Interaction INFR11017

Week 6: Lab Studies

25th October 2023

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Content

About the Course:

- Reps' feedback
- Weekly schedule
- Assessment

HCI "in the world":

- First, something 'new' …
- Weekly examples

Q&A

About the course

Reps’ feedback

- *One of the main concerns was to do with the **quality and amount of content** covered by lectures. Students were not particularly pleased that pre-recorded lecture **videos from 3 years ago** are being used (although they considered some of the content to be good).*

- *One of students' biggest issues was that there **wasn't much content being covered by the videos**, which are predominantly less than an hour of content a week.*

- *There were suggestions that some of the content in the lectures and Q&A would feel more useful if it considered **cutting-edge practices** used in industry currently, which could be achieved through **guest speakers** perhaps (one suggestion named UserTesting as a SaaS company with an office in Edinburgh as a potential source for a guest speaker).*

- *The other primary concern that cropped up was the **lack of labs and tutorials**. Students feel labs would be especially helpful for learning to use tools such as Figma as students feel they have been given no support to learn the software and tools they are meant to be able to use throughout the course. Apparently, tutorials were cut from the course during the pandemic and not reinstated.*

Your feedback

- Please use the padlet below to provide your feedback on the pre-recorded videos and the live sessions.

  Let us know:

  - What you like?
  - What you don't like?
  - What do you suggest to add?

Padlet: https://edin.ac/3MaBV7M

Course overview and status

- **Lectures**
  - Last week (Week 5): Evaluation and Heuristics
  - This week (Week 6): Lab Studies

- **Coursework**
  - This week (Week 6)
    - Finish 2: Assign roles
    - 3: Run the cognitive walkthrough
    - Start 4: Write the reports
  - Deadlines
    - CW2 – group work - 2/10/2023 12 Noon
    - Quiz 2 – individual work – 3/10/2023 12:00 AM - 11:59 PM

HCI “in the world”

First, something ‘new’…

Value Sensitive Design (VSD)

- a way to approach technology that incorporates human values (e.g., welfare, privacy, trust, freedom from bias)
- employs an integrative and iterative tripartite methodology consist of:
  - *Conceptual investigations*
    - direct and indirect stakeholders are identified, followed by an analysis of how these could be harmed by or benefit from a new technology. Additionally, values implicated by the use of technology are identified and defined. As soon as values are identified and discussed, value tensions can emerge
  - *Empirical investigations*
    - qualitative and quantitative methods are employed to evaluate how stakeholders experience a technology with regard to the values they consider important
  - *Technical investigations*
    - combine insights from the other investigations and explore how a technology might be designed to support the values identified
- all three investigations types are interdependent and inform each other
- can be applied when creating any system, as well as evaluating a system

Friedman, B., & Hendry, D. G. (2019). *Value sensitive design: Shaping technology with moral imagination*. Mit Press.

Value Sensitive Design – Case Study

Room with a View: Using Plasma Displays in Interior Offices

Janice is in her office, writing a report. She's trying to conceptualize the report's higher-level structure, but her ideas won't quite take form. Then she looks up from her desk and rests her eyes on the fountain and plaza area outside her building. She notices the water bursting upward, and that a small group of people are gathering by the water's edge. She rests her eyes on the surrounding pool of calm water. Her eyes then lift toward the clouds and the streaking sunshine. Twenty seconds later she returns to her writing task at hand, slightly refreshed, and with an idea taking shape. [1]

(a) "The Watcher" (b) The HDTV Camera (c) "The Watched"

Note: these images are taken from [1, p8]

[1] Friedman, B., Kahn, P. H., Borning, A., & Huldtgren, A. (2013). Value sensitive design and information systems. In *Early engagement and new technologies: Opening up the laboratory*(pp. 55-95). Springer, Dordrecht.

Value Sensitive Design – Case Study

Room with a View: Using Plasma Displays in Interior Offices

Hypothesis: an "augmented window" of nature could render benefits in a work environment in terms of the human values of physical health, emotional well-being, and creativity.

Study - comparing the short-term benefits of working in an office with a view out the window of a beautiful nature scene versus an identical view (in real time) shown on a large video plasma display that covers the window in the same office.

Key ideas from the VSD standpoint:

Direct and Indirect Stakeholders - *the watcher and the watched*

Multiple Empirical Methods - *physiological data (heart rate), two types of performance data (on cognitive and creativity tasks), behavioural data (eye gaze), and reasoning data (a social-cognitive interview)*

Coordinated Empirical Investigations - *values that matter for direct stakeholders (physical health, emotional well-being, and creativity) and values for indirect stakeholders (privacy, informed consent, trust, and physical safety)*

Multiplicity of and Potential Conflicts among Human Values - *values of physical health, emotional well-being, and creativity appear to partially conflict with other values of privacy, civil rights, trust, and security*

Technical Investigations - *technological representations of nature can garner some psychological benefits*

- we cannot with psychological impunity digitize nature and display the digitized version as a substitute for the real thing

Lab studies – exercise 1 (3 minutes)

- https://edin.ac/3Q8ru5y

CalmCraft Project

- Ghira, A. (2021). *Toward a Technology to Overcome Anxiety in Children with Autism*. UG4 Dissertation, University of Edinburgh

CalmCraft Project

- **Main purpose:** to investigate how technology can be best designed and developed to help children with ASD overcome social anxiety.

- **Research questions**
  - *RQ1: What are the current strategies being employed to help children with ASD experiencing anxiety?*
  - *RQ2: What are the common aspects of social situations that might provoke anxiety in children with autism?*
  - *RQ3: How can a Minecraft game be designed to present strategies to cope with anxiety in children with autism?*
  - *RQ4: To what extent does the new educational game support children with autism prepare to face anxiety in social situations?*

Methodology

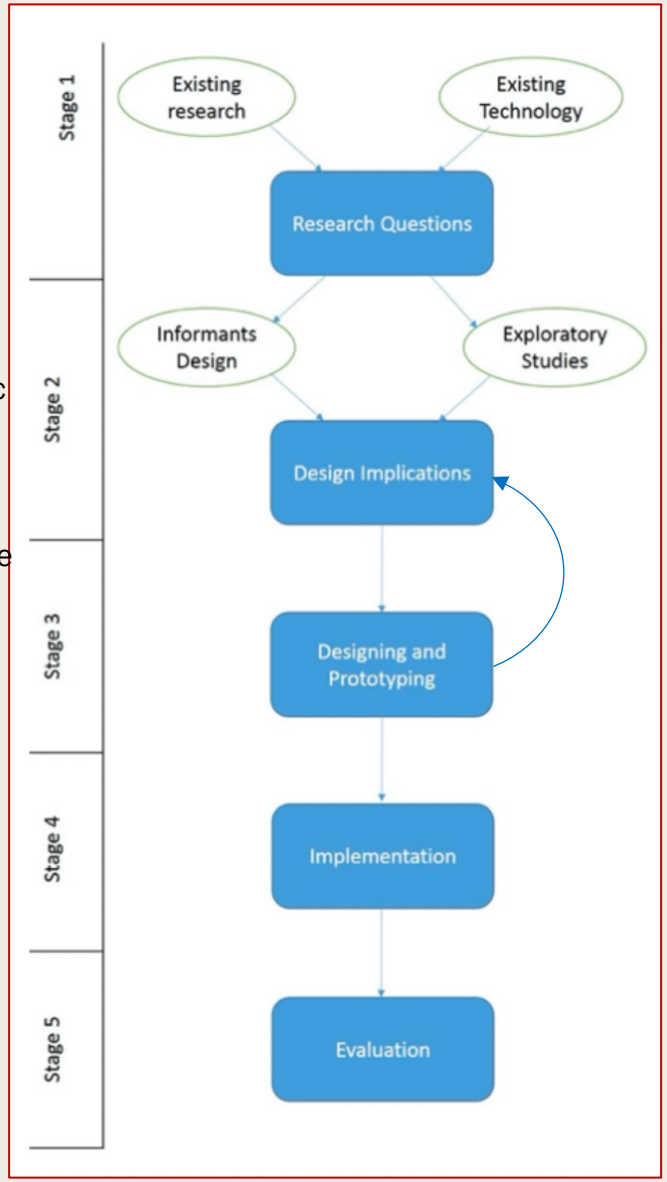
- An adaptation of the “Informant Design” methodology [1]

Online study
5 children (4 TD children, 1 autistic child

Balsamiq prototype
Formative evaluation

Minecraft game prototype

Summative evaluation



[1] Scaife, M., and Rogers, Y. (2001). Informing the design of a virtual environment to support learning in children. *International Journal of human-computer studies*, 55(2):115–143.

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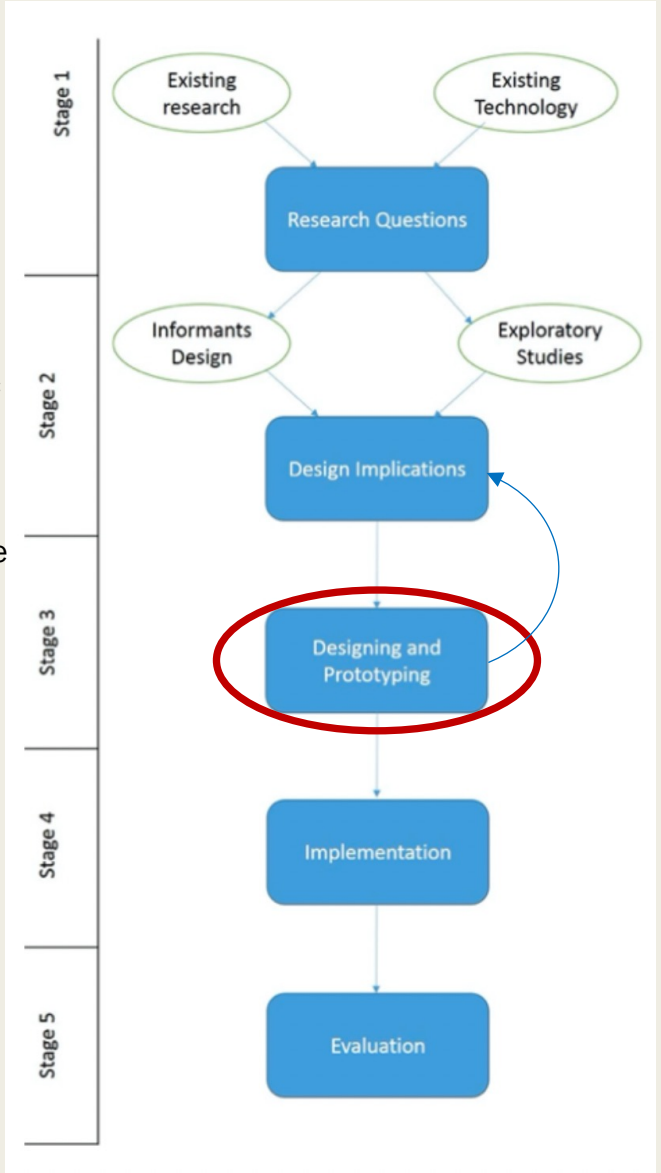

[1] Scaife, M., and Rogers, Y. (2001). Informing the design of a virtual environment to support learning in children. *International Journal of human-computer studies*, 55(2):115–143.

CalmCraft Project – Formative Evaluation

- **RQ3:** *How can a Minecraft game be designed to present strategies to cope with anxiety in children with autism?*

- **Aims:**
  - Evaluate the suitability of the current design for the target population (children with ASD aged 7-11 years old).
  - Identify:
    - *the best way to display instructions in the game.*
    - *the most suitable type of storyline (linear story or stand-alone levels).*
    - *an appropriate reward system.*
    - *the most suitable mechanism of exploring the calming rooms.*

Exercise 2: Think– Pair – Share (10 minutes)

Briefly plan the formative evaluation of the CalmCraft prototype

- **What would be your study plan?**

  Suggestions:

  - start from the study aims

  - think of participants, environment, materials, method(s)

- **What data would you collect and how would you analyse the data?**

  Suggestions:

  - think of qualitative versus quantitative data

CalmCraft Project – Formative Evaluation Plan

- **Participants**
  - *3 experts in HCI, Education and ASD*
- **Environment**
  - *Microsoft Team*
- **Materials**
  - *Information Sheet and Consent Form for Experts, Computer or mobile device to join the Microsoft Teams meeting, Script for the researcher, Notebook for researcher's notes, and playback device for backup*
- **Methods**
  - *Cooperative evaluation (version of Think Aloud), semi-structured interview*
- **Data collection and Analysis**
  - *Qualitative data – audio recordings, researcher's notes*
  - *Thematic Analysis*

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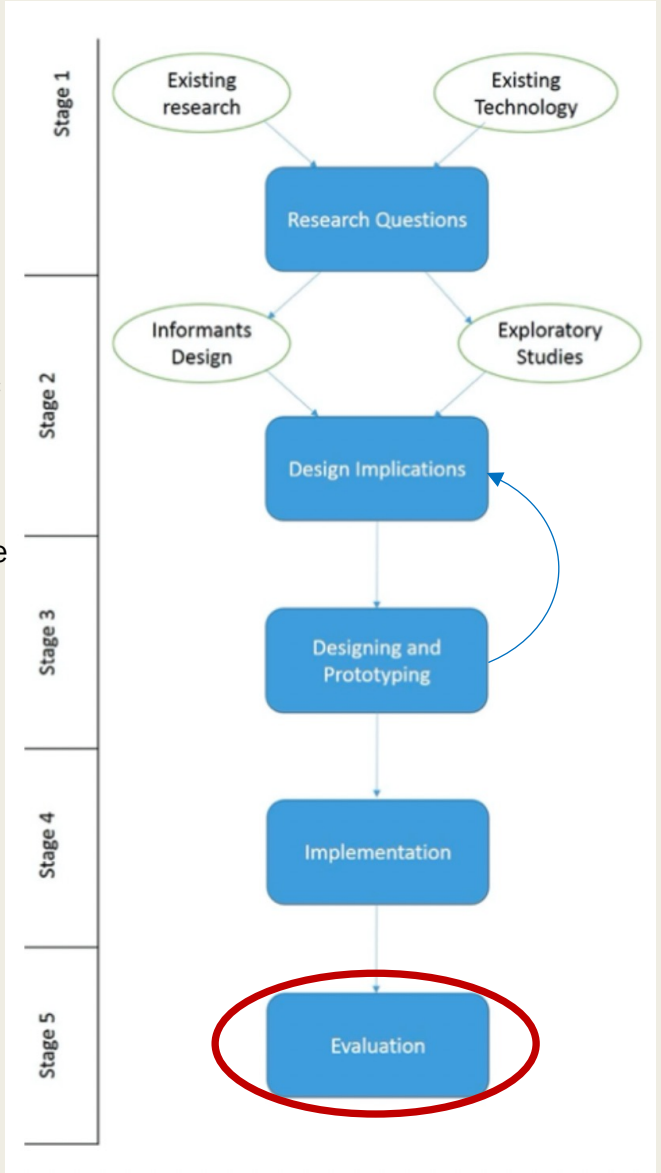

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CalmCraft Project – Summative Evaluation

- **RQ4:** *To what extent does the new educational game support children with autism prepare to face anxiety in social situations?*

- **Aims:**

The main aims were to evaluate

A1. the usability of the game (user satisfaction, ease of use)

A2. how engaging and enjoyable the game is – as perceived by the target group

A3. the effectiveness of the game in supporting children in real situations

Besides, the main researcher collected new suggestions for improvement

Exercise 3: Think– Pair – Share (10 minutes)

Briefly plan the summative evaluation of the CalmCraft prototype

- **What would be your study plan?**

  Suggestions:

  - start from the study aims

  - think of participants, environment, materials, method(s)

- **What data would you collect and how would you analyse the data?**

  Suggestions:

  - think of qualitative versus quantitative data

CalmCraft Project – Summative Evaluation Plan

- **3 stages:**
  - ***Usability study with Informatics students (A1)***
    - Quantitative research
  - ***Evaluation with children (A1-A3)***
    - Qualitative and quantitative
  - ***Evaluation with experts (A1-A3)***
    - Qualitative research

CalmCraft Project – Summative Evaluation Stage 1: Usability study with Informatics students

- **Participants**
  - *6 Informatics students*
- **Environment**
  - *GatherTown*
- **Materials**
  - *an online questionnaire in Google Forms, pre-recorded demo video of the whole game played by the researcher, script for the researcher, presentation poster of the project*
- **Methods**
  - *System Usability Scale (SUS) questionnaire*
- **Data collection and Analysis**
  - *Quantitative data – results of SUS*

CalmCraft Project – Summative Evaluation Stage 2: Evaluation with children

- **Participants**
  - *3 TD children (2 of them participated in the design workshop)*
- **Environment**
  - *Microsoft Teams*
- **Materials**
  - *computer with Minecraft Java Edition 1.16.5 installed, script for the researcher, back-up audio-recording device, notebook for taking field notes*
- **Methods**
  - *Task-based evaluation, observations, questionnaire (including 5-point Likert scale questions)*
- **Data collection and Analysis**
  - *Qualitative and quantitative data*

CalmCraft Project – Summative Evaluation Stage 2: Evaluation with experts

- **Participants**
  - *4 experts in HCI, Education and ASD*
- **Environment**
  - *Microsoft Teams*
- **Materials**
  - *computer with Minecraft Java Edition 1.16.5 installed, back-up audio- recording device, notebook for taking notes during the sessions*
- **Methods**
  - *Task-based evaluation, interviews*
- **Data collection and Analysis**
  - *Qualitative data*

Triangulation

- The convergence of multiple methods on the same research question, to corroborate evidence from several different angles
- Ensures accuracy of the information
- Four different triangulation forms:
  - *Data – data gathered across a variety of time, contexts, people*
  - *Methodological – multiple methods (e.g., questionnaire, interviews, observations)*
  - *Investigator – multiple researchers to collect and interpret data*
  - *Theoretical – multiple theoretical positions in interpreting data*

Any questions..

- Post to the Piazza
- Ask the TA during the TA open hour
- Aurora Constantin: aurora.constantin@ed.ac.uk
- John Vines: john.vines@ed.ac.uk