

Design Requirements Methods

Nicole Meng-Schneider

Many ways to gather design requirements

- Reading background literature
- Surveys
- Diary studies
- Artifact analysis
- AEIOU (UMD #2)*
- Interviews with users and/or experts**
- Contextual Inquiries**
- Personas**
- Focus groups**

*<https://medium.com/the-31-5-guy/the-aeiou-framework-for-design-8b7eff95c796>

** described in separate videos

Literature Review

- Someone might have studied your type of project
- Prior research may have a list of requirements for specific user groups or tasks (e.g. children, autism, visually impaired)
- Review of similar systems that we can learn from
- When to use:
 - Checking prior work is ALWAYS a good idea.

Designing Serious Game Interventions for Individuals with Autism

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Abstract The design of “Serious games” that use game components (e.g., storyline, long-term goals, rewards) to create engaging learning experiences has increased in recent years. We examine the core principles of serious game design and examine the current use of these principles in computer-based interventions for individuals with autism. Participants who undergo these computer-based interventions often show little evidence of the ability to generalize such learning to novel, everyday social communicative interactions. This lack of generalized learning may result, in part, from the limited use of fundamental elements of serious game design that are known to maximize learning. We suggest that future computer-based interventions should consider the full range of serious game design principles that promote generalization of learning.

Keywords Autism · Serious game · Virtual reality · Technology · Computer-based intervention · Cognitive training

Introduction

There is an emerging field of intervention research that is designed to enhance cognitive and social skills, with the ultimate goal of improving psychosocial outcomes in both

mental health and developmental disorders (e.g., Kautz and Kurtz 2013). Some of the best examples of research include interventions that remediate deficits in schizophrenia, which ultimately improve functioning for these patients (e.g., Medalia 2009). Increasingly, researchers are turning to computerized versions of these interventions because of the ease to scale them up and transport them easily, but also because of the ability to employ strategies for increasing motivation and personalizing training, which further enhances learning (Saperstein and Kurtz 2011). In the field of autism research, computer-based interventions are being used to improve emotional and identity recognition abilities (e.g., Tanaka and Sengco 2007; Wainer and Ingersol 2011) as well as language and social skills (e.g., Grynspan et al. 2014). This approach is inspired, in part, by findings that children with autism (who typically develop peers) often engage in computer games in their discretionary time (e.g., Kuo 2011; Kuo et al. 2013). In addition, the computer-based game environment provides a safe and novel context for practicing and acquiring new and complex skills (Kapp 2012). Unfortunately, many of these computer-based interventions for autism have not shown evidence of learning generalization or improved psychosocial outcomes.

Here, we argue that computerized interventions for individuals with autism may be much more effective if motivation can be improved and learning can be enhanced by leveraging principles from another area of research: “serious game design” in educational games (Freitas 2006; Dickey 2006; Habgood and Ainley 2012). To make this argument, we first explain why serious games are and how they are fundamentally different from entertainment games. Second, we show how

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Retrospective Survey

- Ask people about things that have happened to them in the past using a survey format
- When to use:
 - **Critical** events that users are likely to remember well – Describe a negative software update experience.
 - **Recent** events that were somewhat memorable – Where did you have dinner last night?
 - **Rare** events that had a large impact and are memorable – How did your husband propose to you?
- Why not to use:
 - Hard to remember events – How many times did you cross a road last month?

Diary Study

- Ask people to record events as they happen
- When to use:
 - **Rare events** – Some events are rare and cannot be easily observed
 - **Easily forgotten** – People forget that some events even happen
 - **Actual frequency important** – People forget how often they do things. For example, how many glasses of water have you had today?
- When not to use:
 - Study changes behavior – asking people to track their behavior tends to cause them to change their behavior

Diary Study Example # 1

What do students need to know when they start their studies here?

The Informatics front desk is being asked a lot of questions during Welcome Week.



Photo by Dr Kami Vaniea for her slides. All rights reserved.

Informatics front desk FAQs

- Bank accounts – How do I open one? Where is the nearest branch? Where do I get a letter that will allow me to open a bank account?
- Campus Map – most common questions are directions for the Health Centre, Appleton Tower, David Hume Tower, 7 Bristo Square, International Office
- City map
- Buses – shuttle to KB also Lothian Buses, where do I get a bus season ticket?
- Railcards - who can endorse an application?
- Accommodation - Where are Accommodation services?
- Health – register with GP but also emergency stuff eg NHS 24 and A&E services
- Can I get deliveries to the Forum?
- Where is the Fettes police station?
- Where does my post go? (pigeonholes are obviously an alien concept.....)
- Where do I collect my student card?
- Why does my card not work for the Forum?
- Where can I buy a notebook/calculator/University sweatshirt?
- Where is the ITO?
- I have a timetable clash, what do I do about it?
- I've lost access to my timetable online.....
- How do I get a DICE account?
- English classes / English tests. I sometimes get asked where the tests take place and also for suggestions for English classes
- Are there labs/study space/library facilities in the Forum?

Diary Study Example # 2

How do people react to being introduced to smart speakers?

Many people are afraid of smart speakers. We want to see what kind of conversations ensue when they are confronted with.



Photo by [Kelsey Chance](#) on [Unsplash](#)

Diary Examples

Option 1: structured

1. Date and ca. time: _____
2. Who came to visit? _____

3. How is your relationship to them?

4. Did you introduce them? Yes No
5. Have they visited/been introduced before? Yes No
6. How did they react? _____

Option 2: unstructured

Please describe your recent visit.
Include details like who came to visit
and how they reacted to the
introduction.

Artefact Analysis

- Look at the “things” people leave around in the world to understand a problem
- When to use:
 - **Physical spaces** – Workflows tend to generate physical artifacts which say a lot about how people work
 - **Tasks involve artifacts** – Goal task involves artifact creation. I.e. Microsoft Word
 - **Interactions generate artifacts** – For example, emails, social media posts, etc.
- When not to use:
 - There are no meaningful artifacts
 - It is faster to learn the information another way – artifact analysis can take some time

Artefact Analysis Example

Where could we find artifacts from confused, new students?

The screenshot shows a Facebook page for the 'Informatics - Class of 2018 - University of Edinburgh'. The page is a closed group within Edinburgh. The header features the University of Edinburgh logo and the text 'THE UNIVERSITY of EDINBURGH informatics'. The left sidebar lists shortcuts to 'MSU Hackathon' and 'IFIP Summer School...'. The main content area includes a 'School Email Required' section with a 'Join Community' button, a section titled 'A Place for All Your School Stuff' with a description, and two community posts: 'Free & For Sale' (0 friends, 1,479 members) and 'Housing' (0 friends, 889 members). The right sidebar shows 'GROUPS WITHIN EDINBURGH' with links to 'English Literature' (184 members) and 'Dick Vet Class of 2018' (132 members), along with a photo of a person in a suit.

Artefact Analysis Example

FAQ-M 01	Bank accounts – How do I open one? Where is the nearest branch? Where do I get a letter that will allow me to open a bank account?	FAQ-FB 23	Do I have to choose one of the suggested university specialist areas for my other courses?
FAQ-M 02	Campus Map – most common questions are directions for the Health Centre, Appleton Tower, David Hume Tower, 7 Bristo Square, International Office	FAQ-FB 24	Is it possible for me to change my master's programme after the academic year begins?
FAQ-M 03	City map	FAQ-FB 25	Deadline for ielts?
FAQ-M 04	Buses – shuttle to KB also Lothian Buses, where do I get a bus season ticket?	FAQ-FB 26	In my first year can I take outside courses that aren't within Informatics if I'm doing a joint degree?
FAQ-M 05	Railcards, who can endorse an application?	FAQ-FB 27	Can I obtain my driver's licence on a student visa?

Artefact Analysis Example

Sorted posts into topics

- Admissions
- Social
- Studying
 - Lectures and Teaching, Campus, Courses and Programs
- Accommodation
- Transportation
- Finance
 - Bank account, loans, fees
- Visiting and international student issues

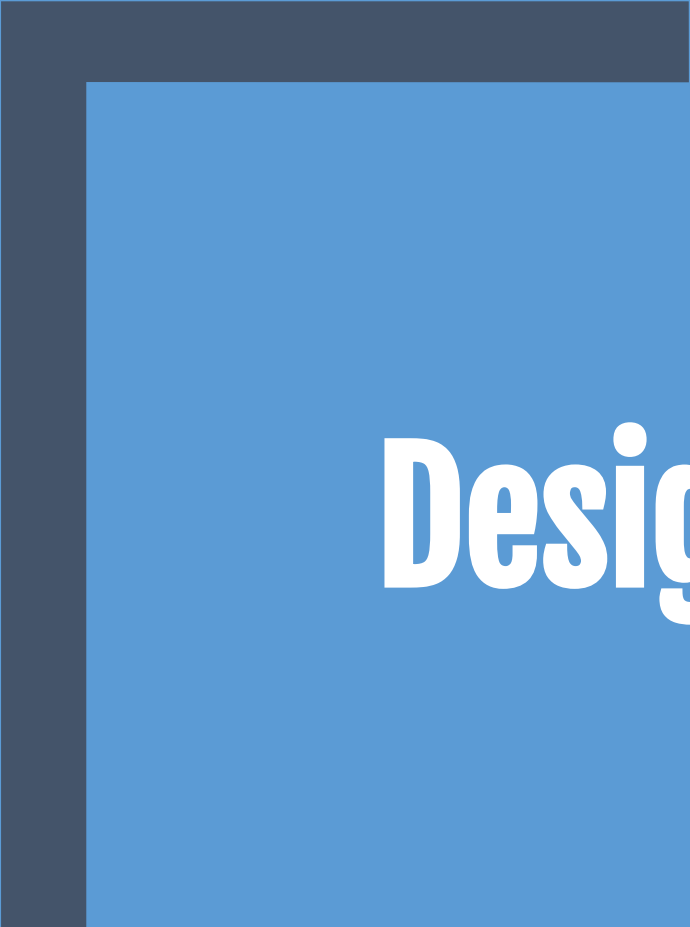


AEIOU (UMD #2)

- Design Thinking Framework to “structure all observations you make on the field during user research”*
- When to use:
 - documenting observations e.g. contextual inquiry
- When not to use:
 - conflicting methods like interviews

A	E	I	O	U
-ORDERING FOOD <	-EVENING -OUTSIDE -CROWDED -STADIUM LIGHTS	-CASHIER GIVES RECEIPT TO WORKER -WORKER PREPARES FOOD -CASHIER CALLS OUT ORDER # -FOOD GETS TRANSFERRED -CUSTOMER PAYS CASHIER -PEOPLE TALK IN LINE	-MONEY	>

*<https://medium.com/the-31-5-guy/the-aeiou-framework-for-design-8b7eff95c796>
image from <https://openpracticelibrary.com/practice/aeiou-observation-framework/>



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