EDIT 6190e
Design thinking and development tools

Activity and resource reference

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This document is an evolving collection of activities and resources to support your work in this course. Most likely the materials here will also be available in other formats like the eLC, our course Google folder, and so on.

It's my hope we may discover new ideas together as we go and that they find a place here.

Have fun with your project work!

Module: Introduction to creativity

- My message to you about creativity within your project work for this course: https://youtu.be/QGBg1wbt06U
- *David Lynch: Where do ideas come from?* [2:12]): https://youtu.be/Fxr-7O1Bfxg

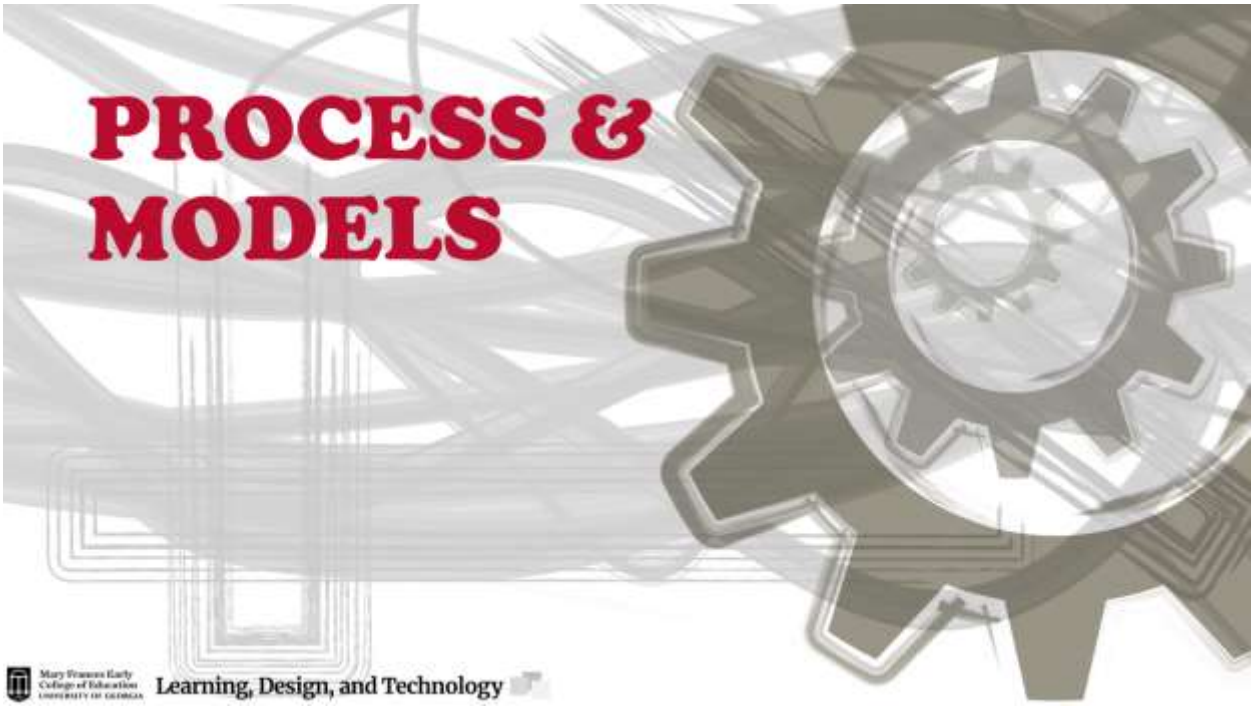
Module: Introduction to design thinking

- My message to you about using design thinking in your project work: : https://youtu.be/IN1PmrOCF88

Here are some excellent resources on the topic of design thinking.

- Brown, T. (2008). Design thinking. *Harvard Business Review*, 86(6), 84.
    - Supplied as PDF, course readings folder
- Video resources
    - *David Kelley on Design Thinking* [7:27]: https://youtu.be/I888UXlens4
    - *IDEO's Tom Kelley is Design Thinking's ultimate disciple, he makes the case as to why*[1:03:33]: https://youtu.be/L1pBhHjGKvI
    - *Design Thinking 101 [3:17]*): https://youtu.be/6lmvCqvmjfE
- Course introduction to design thinking: https://youtu.be/IN1PmrOCF88
    - Video script: Appendix Z

Module: Process and models

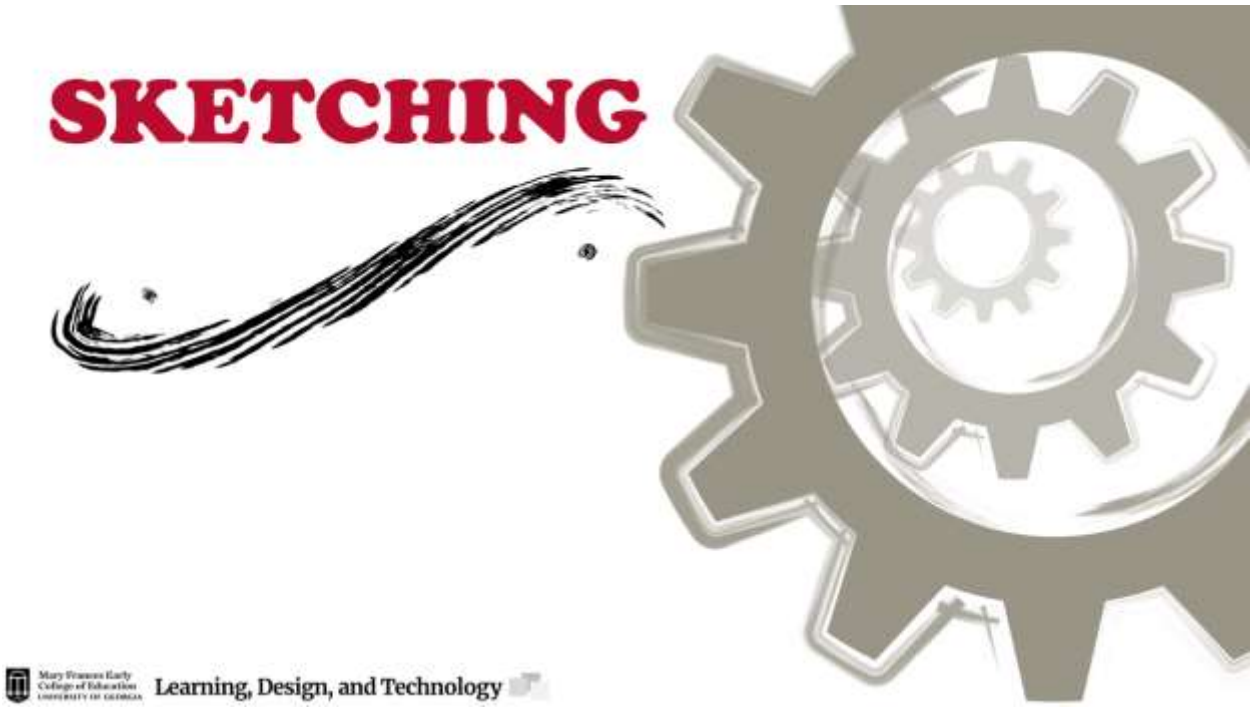


Procedure

1. Think about how you approach a design project of any kind and sketch out the steps, spaces, phases of your process. Use a diagram to represent your personal design process model. Remember this is your model and doesn't need to align with any other model.
2. Limit your personal model to 2 through 10 elements (e.g., steps, phases, spaces, etc.)
3. Create a slide and add your model to it.
4. Make a copy (e.g., take a screenshot or just send a single slide) of your model and send it to one of your classmates (your instructor will give you more information about how to do this, i.e., who to and where to send it.)
5. Once you have one of your peers' personal models, continue through the next slides.
6. Match and annotate each part of the Dick and Carey model with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused." Make copies of this slide as needed.
7. Match and annotate each part of the d.school model with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused."
8. Match and annotate each part of the IDEO model with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused."
9. Match and annotate each part of the Double Diamond model with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused."

10. Match and annotate each part of the Double Diamond model with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused."
11. Match and annotate each part of Wallas' stage model of creative process with the element(s) from your classmate's personal design model that best match. If there's no match at all, set the unused element to the side of the Dick and Carey model and annotate it as "unused."
12. Did you find any of the models useful?
13. Did anything about them intrigue or surprise you?

Module: Sketching

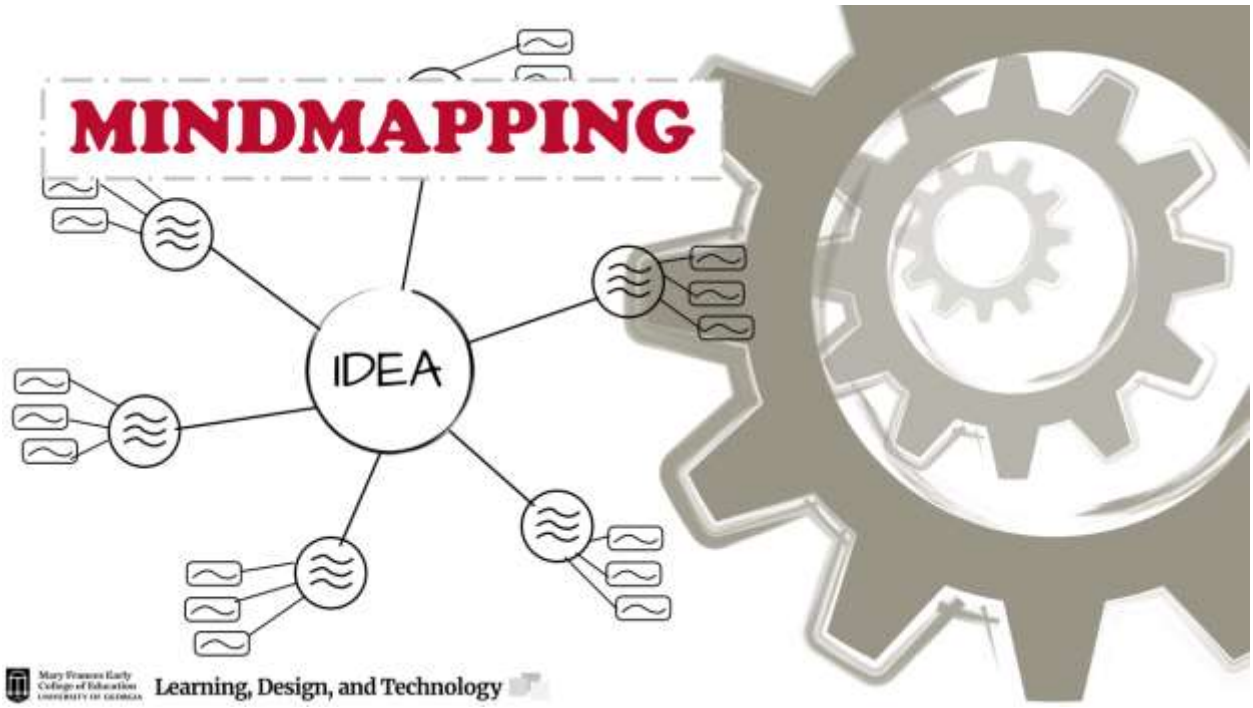


Modeling can be thought of as the overall "language of design", and there are many ways to model ideas! Sketching is one of them. For our purposes, the definition of sketching is expanded to include more than a conventional sketch, but any method that allows designers to capture an idea *immediately*. Although the sketch has a different set of affordances than those of a quickly dictated note, it is the immediacy and ease of capturing ideas that is emphasized here.

Procedure

1. Find a sheet of blank paper and one of your favorite pens or pencils.
2. Without thinking too much, just start sketching out ideas you might have for parts of your learning module.
3. Get out at least a few different ideas and use multiple sheets of paper if you like.
4. Take a picture of your sketches and save them.
5. A good place to save your sketches would be in a design journal. In fact, a good look for a design journal is a mix of sketches and text.

Module: Mindmapping



Mindmapping is a design method. Use it to explore potential project topics using the Who, What, Where, When, Why, How framework (WWWWWH) the activity steps them through the procedure. Adapted from Tomitsch et al., (2018).

Procedure

Think of a project topic. It doesn't need to be the topic you might eventually settle upon; you can just pick one of your potential topics for this exercise.

1. Write your project's topic in the middle of a piece of paper and circle it.
2. Draw six evenly spaced branches radiating out of your topic and label each of them as the following categories 'who', 'what', 'where', 'when', 'why', and 'how'.
3. Add information for each of the sub-categories. To do this ask yourself a series of questions that each start with the keyword of the category.
    - 'Who' is using it?
    - 'What' are its elements and features?
    - 'Where' will they be when they use it? (e.g., geographic location; physical location/structure/environment)
    - 'When' will they use it? (e.g., time of year, week, day; during an activity)
    - 'Why' will they use it?
    - 'How' will they use it? How do they interact with it?

As with the divergent thinking exercise, don't be concerned if your ideas make sense or if they are organized. The purpose of this method is to generate ideas—evaluation of them can come later. Keep your answers brief and limited to short phrases and keywords. Give yourself around 15 minutes for this exercise.

Mindmapping is another ideation tool and helps you explore our topic and expand your ideas. Keep your map or take a picture of it. Refer to it during your project work, make changes to it, or repeat the exercise for a different topic.

Module: Personas

Description

Building and using personas is a design method. Data about potential users is gathered and synthesized to create relatable personas. Personas can help to improve design conversation within teams because the user is no longer abstract, and personas can be used as elements within storyboards.

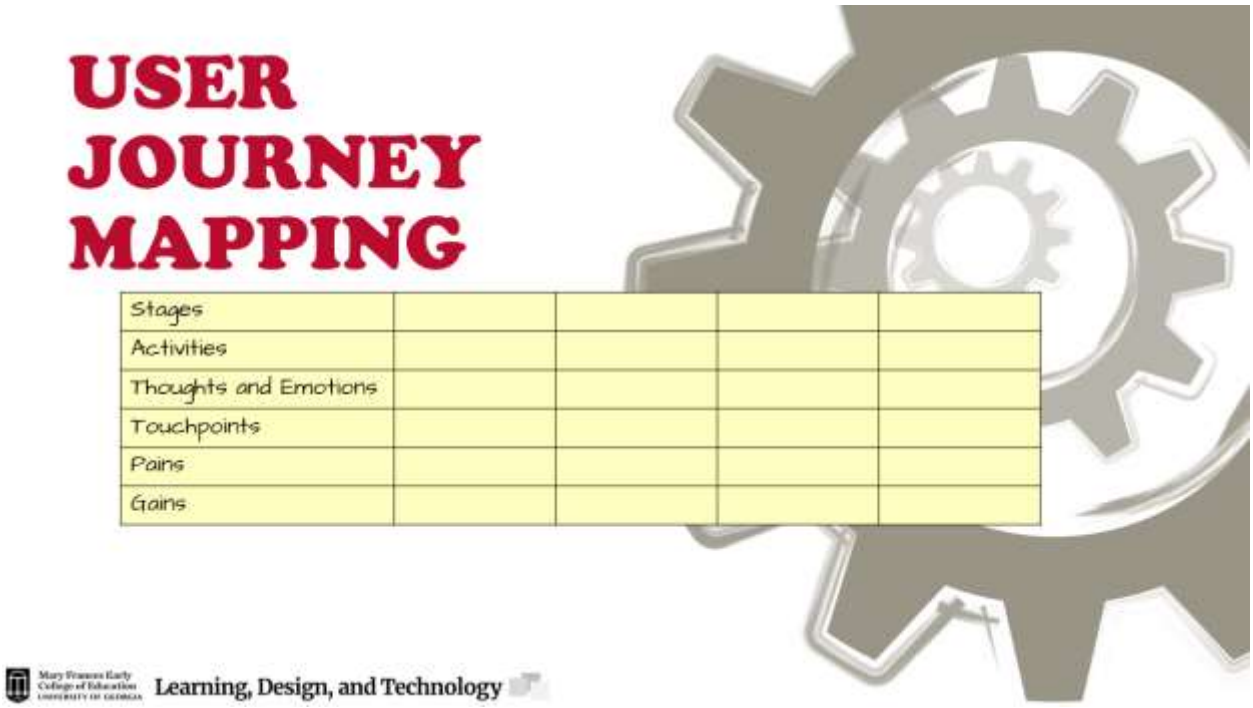
Personas can be used for other design methods like user journey mapping, scenarios, storyboarding, wireframing, and so on. And of course, personas can be very effective as part of your final project.

Procedure

1. Read through your research data (this can be interviews with potential users, collected information about potential users from online sources, collected information from conversations with potential users, and so on.) You might consider including demographic data (e.g., age, gender, educational attainment level, location), behavioral variables (e.g., experience with your topic's content), and altitudinal variables (e.g., likes/dislikes, trusts/distrusts, open/closed mindsets, and so on.)
2. Synthesize patterns in the data by looking for patterns or clusters across all the variables in your data. This will manifest as similar behavior across multiple people who share other characteristics. E.g., data might reveal that learners who speak English as a second language tend to spend more time studying that native speakers of English language.
3. Amalgamate patterns in the data to form a single but coherent 'persona'. You may have found that people who are interested in gardening are also interested in healthy lifestyle factors. Make the personal believable and engaging by using storytelling: provide a name and a backstory.

4. Review and refine. Review your persona by getting feedback from someone else and checking your interview data. Ask yourself the following questions: (a) How realistic, convincing, and coherent is the persona? (b) Are the goals specific to the design problem?
5. Use your persona. Brainstorm ideas to help that persona achieve their goal, create a scenario for the persona or use a persona-based walkthrough exercise to evaluate a prototype or product

Module: User Journey Mapping



Procedure

1. Choose whose journey it is. You will need to already have collected enough data about your potential users to have a good idea of their general characteristics. If you have already made a persona then use that persona for this journey map. Once you've selected a user, or a representative of potential users, then you'll define what it is the user is trying to accomplish. For example, if you were designing a module about gardening you might set the users' goal to be preparing the materials needed for a gardening project (e.g., gardening tools, soil, containers, seeds, and so on.)
2. Plot out the main stages of the experience. At this point you'll need to create a layout for plotting the journey map. You can use paper, a spreadsheet, a word doc, or whatever you like for this. This involves creating a timeline, based on stages, to map the users' experience in achieving whatever goal you set. The rows in the grid should be "Stages", "Activities", "Thoughts and Emotions", "Touchpoints", and "pains and gains." Something like this:

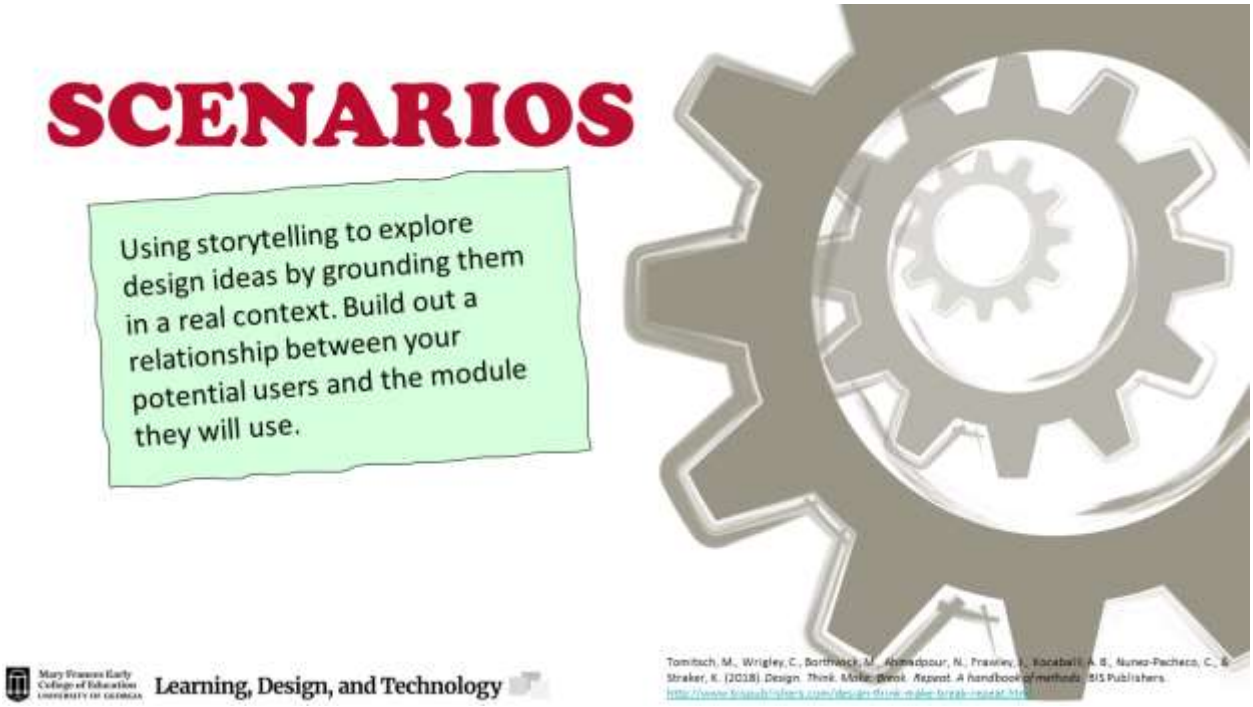
Stages					
Activities					
Thoughts and Emotions					
Touchpoints					
Pains					
Gains					

The experience may begin earlier than you think; usually there is some planning activity on the part o the user. In our gardening example, people might need to learn what time of year is best for growing

certain plants, what kind of soil is best, what kind of light is best, and so on. Write one main phrase in each column.

3. Write down the activities carried out during each of the main stages you identified, in the second row of your map. E.g., researching the best light, soil, and planting time for a desired plant.
4. Devote the next row to the users' emotions and note how the user is thinking and feeling during the different stages and activities.
5. Use the next row to record the touchpoints required to complete these activities—where do each of these things happen? E.g., an internet search, the local nursery, a garden club, and so on.
6. Write down all the pains (what is negative) and the gains (what is positive) about the experience across the selected pages. This provides a focus for potential future redesigns—your user journey map can be used as a tool to analyze where the current experience can be improved.

Module: Scenarios



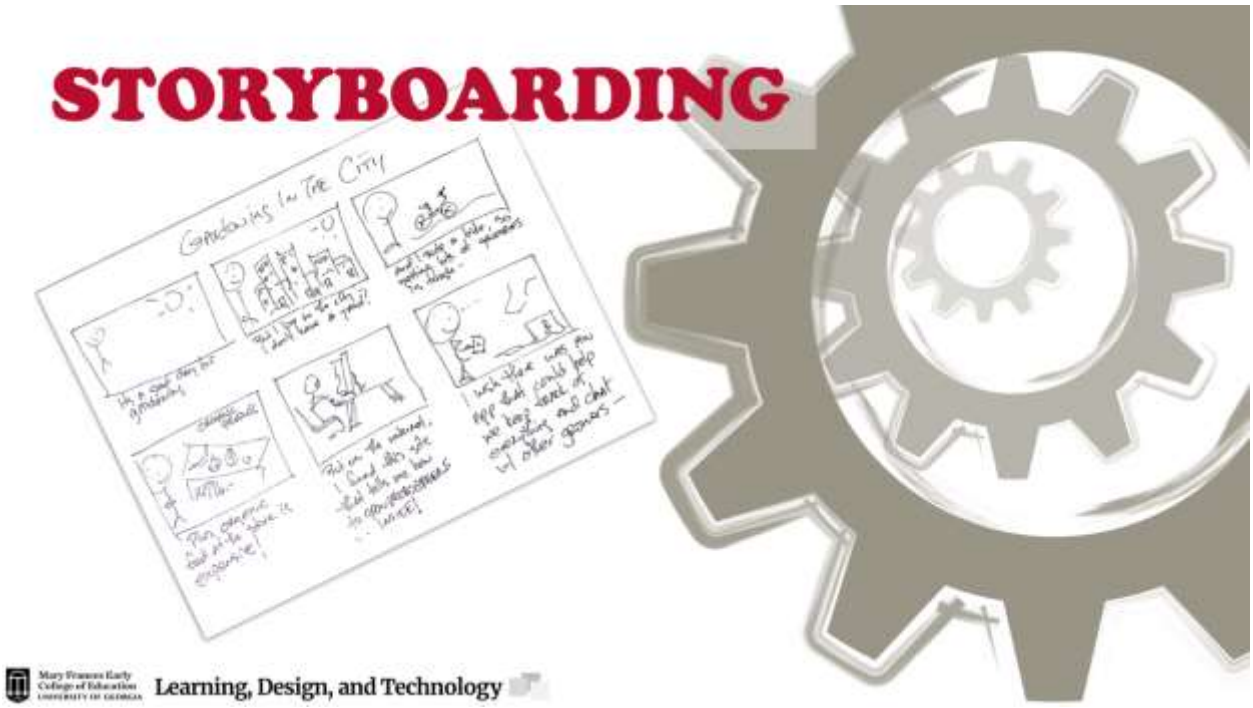
Description

Scenarios take advantage of storytelling to communicate design ideas as they are situated in authentic contexts. The scenarios can be used both as an ideation tool and/or a part of your final e-learning module.

Procedure

1. Write a scenario where a specific user interacts with your module. It's best if you've already developed a persona so that you can use it in the scenario(s) you make.
   [5 minutes]
2. Consider the user in your scenario. Who are they? What do they care about? Why might they need to use your module? [5 minutes]
3. Make a list of features of your module design that you want to showcase. These lists contain details that you should include in your scenario. [5 minutes]
4. Story structure: Draft the main narrative of your scenario (PPT provides template)
5. Narrative writing: work on your story
6. Key Qualities: Identify three key qualities for your design concept that emerged from the story. You can take this exercise a step further by creating a storyboard.

Module: Storyboarding



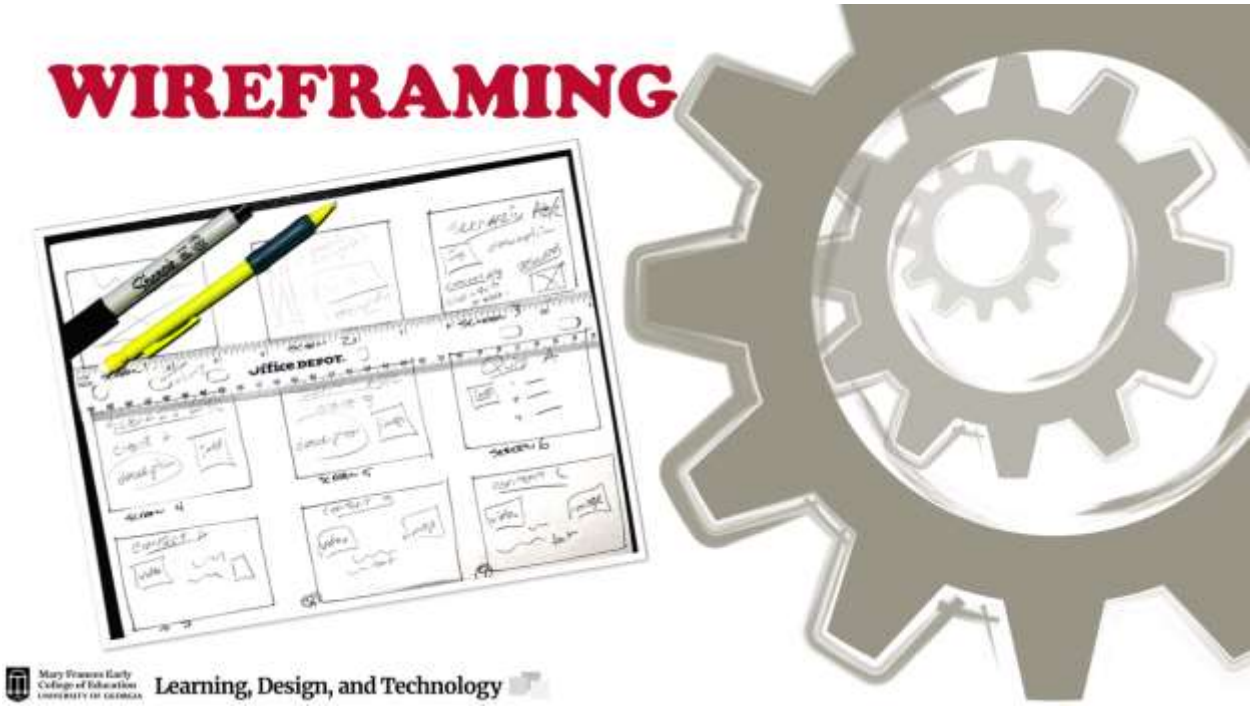
Description

Storyboarding is a design method. Like personas, user journey mapping, and scenarios—storyboards take their inspiration from human experience. Emphasis is placed on low-fidelity construction of brief storyboards.

Procedure

1. Reflect on the user, or learner, who will use your e-learning module.
2. Write down three to five key steps that the user would go through when interacting with your module, or the topic for your module.
3. Think about how to frame those key steps in your storyboard. You might consider different kinds of 'shots.' [PPT provides a description of shot types]
4. Draw your storyboard in the template or make your own. Consider beginning with a 'wide shot' to establish an impression of where the story begins and to introduce the objects or people that are important.
5. For each remaining step illustrate what the person would do. You can just use simple symbols and stick figures. Use a variety of shots to show relevant parts of the environment and the interactions between the person and the evaluated product or service.
6. Add short captions to describe each step. Ideally, every panel should show a single action accompanied by a sentence explaining the action. To improve your storyboard, try the following:
    a. Use bold outlines or highlight colors to draw attention to important parts.
    b. Use arrows to indicate important directions of movement.

Module: Wireframing

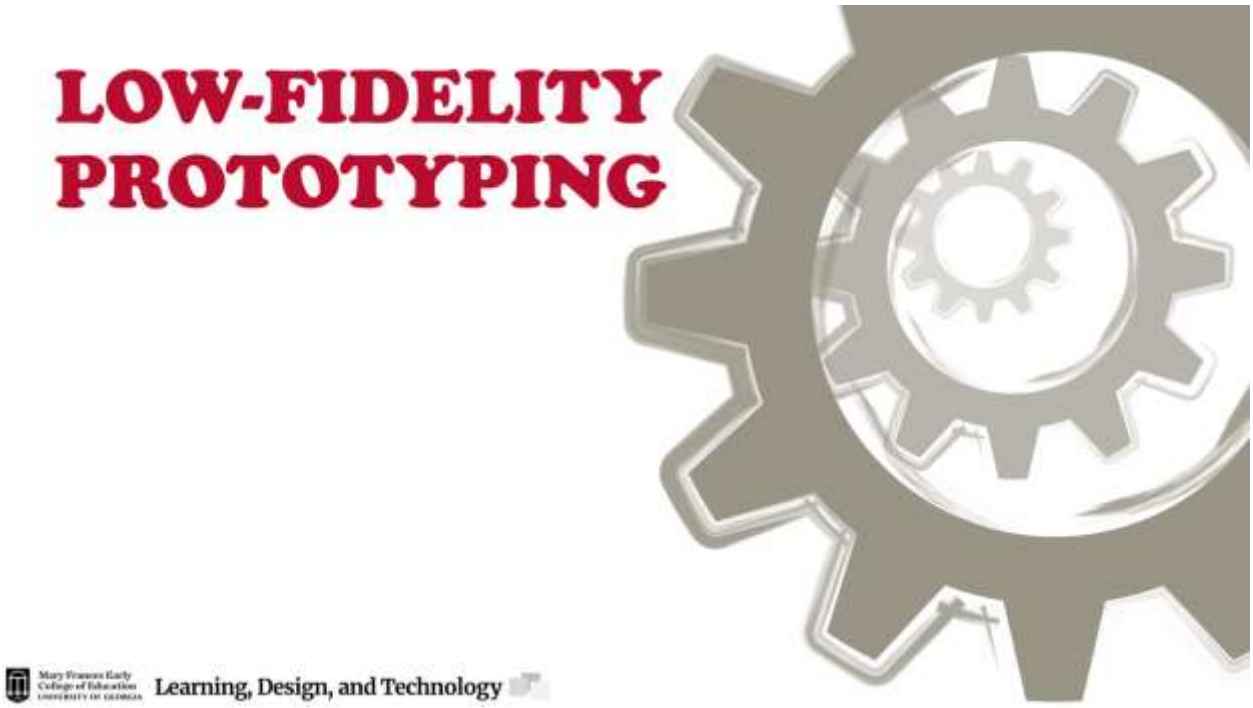


Procedure

1. Brainstorm a solution for the chosen problem or situation.
2. Sketch the parts of your module that you want to represent in your design. For example, if you were creating a module on gardening you might choose a specific scenario (e.g., What to do if I don't have a yard for gardening?)
3. Prepare a canvas for every screen that you need—this is a rectangle with the same proportions as the screen's display format. Use the articulate resources to approximate the proportions.
4. Draft your navigation and functions for each screen. Wireframes don't need to be pretty: quick line drawings that show careful thought about the module's functionality are better that perfectly drawn illustrations. Do not be shy about using existing design conventions for screen components and consider the usability, or user-friendliness, of your design.
5. Present your screens in a linear format so that they can be viewed in sequence. Add annotations to explain important functions. You can use color to highlight the key features of each wireframe, but it should not be used as a visual design element.
6. Discuss and evaluate your wireframes with your partner.
7. Annotate or make notes about the design changes you are considering.

Extend this activity by sharing your wireframe and requesting feedback.

Module: Low-fidelity prototyping



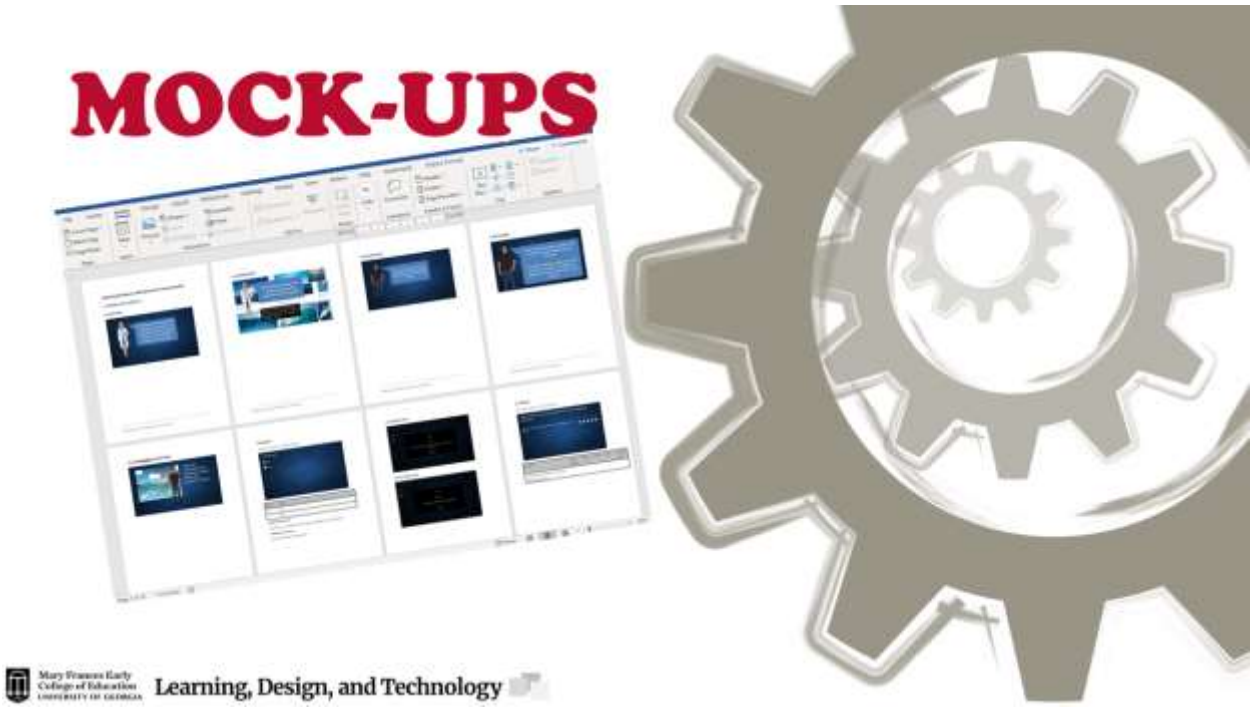
Description

Low-fidelity prototypes add accurate scale representation and content to wireframe designs, but they withhold the finishing process in terms of style. The addition of style information is added with mock-ups. Finally, fully functional prototypes come last and allow for beta testing. Fully functional prototypes can also be used to just test specific parts of a design. For example, if a design has sections that are static and sections that are interactive, it may be reasonable to test only the interactive part(s).

Procedure

1. Sketch the part of your module that you want to represent.
2. Create wireframes. These increase the fidelity of the sketches and clearly show the key elements of each screen.
3. Create a physical prototype. This can be a simple printout of the different screens or elements on the screens that you developed in your wireframe.
4. You can increase the fidelity by including an example of the module you're thinking about. This way your peers can use it a little bit, and give you feedback that helps you make it better.
5. A good rule of thumb is to make the prototype only as elaborate as it needs to be to get the kind of feedback you need.
6. Add real content. Up until now your modeling has focused on the various components of your design. Now add in some real content. It doesn't need to be the full content at all, just enough to specifically communicate the content that will be housed in each component.

Module: Mock-ups



Description

The design method of mock-ups is introduced. This time, the examples are provided within the context of Articulate Storyline, as this is the first time in this sequence of modules where it makes sense to use Articulate as a design tool. However, this activity would work equally well within other presentation software, such as MS PPT. Articulate is chosen simply because it is the design tool learners in the course are asked to learn to use.

In this exercise, you will create a series of mock-up screens for a digital solution. Start with existing wireframes, either from your own work or a design brief if supplied by your instructor. The wireframes provide the structure. Content comes from your project topic (or a supplied design brief/scenario.) Functions come from the features available to you within Articulate. E.g. trigger actions on slides, embedded video, surveys, quizzes, and so on

Procedure

Mock-ups are scale or full-size models or products and the features (e.g., your module and its components.) They are useful for testing ideas and getting buy-in from external stakeholders, before spending time on building functional prototypes.

Mock-ups focus on visual aspects, such as style and color, whereas wireframes focus on structure and functionality. When designing e-learning modules, they are used for creating high-fidelity representations of the visual design. Which include actual content, font type, color scheme, and so on. The design of a mock-up should resemble as closely as possible the final visual representation of the module.

Mock-ups don't allow for user interaction as they aren't functional. Nonetheless, mock-ups can be used for preliminary user testing of certain features of a module and even to simulate user interaction and flow. When testing digital mock-ups with participants, it can be useful to use print outs of the mock-up screens. Presentation software, such as MS PPT, Google Slides, or Apple Keynote are all good choices for building mock-ups. Articulate can import PPT presentations, something to keep in mind.

1. Select three wireframes that depict a use scenario for a digital solution, either from one of your projects or the templates in Articulate.

2. Establish style and color. Make sure that these match your topic and are consistent throughout your module. If you introduce specific graphical details, establish rules for when and where these will be used. E.g. rounded corners on all buttons

3. Decide on one or two font types and sizes and use those consistently throughout your mock-up. The same style should be used for the same purposes on each screen E.g. bold 12pt Helvetica for menu titles, 10pt regular Helvetica for body text

4. Establish the content. You can make up the content, both text and images, but you need to ensure that it looks as realistic as possible. For example, use photos of real people from stock images, not cartoons or silhouette representations.

5. Apply style, color and content to all three wireframes, creating your own mock-ups in Articulate or your graphics tool of choice. Start with one screen and iterate on style and color until you are happy with the result. Only then should you start working on the other two screens.

6. Try out your mock-ups. They can be used to present your design ideas in a design critique session or for usability testing. If you have trouble making choices about specific features, you can also make two alternative versions and perform an A/B test to see which one produces the better result.

Module: Design Critiques

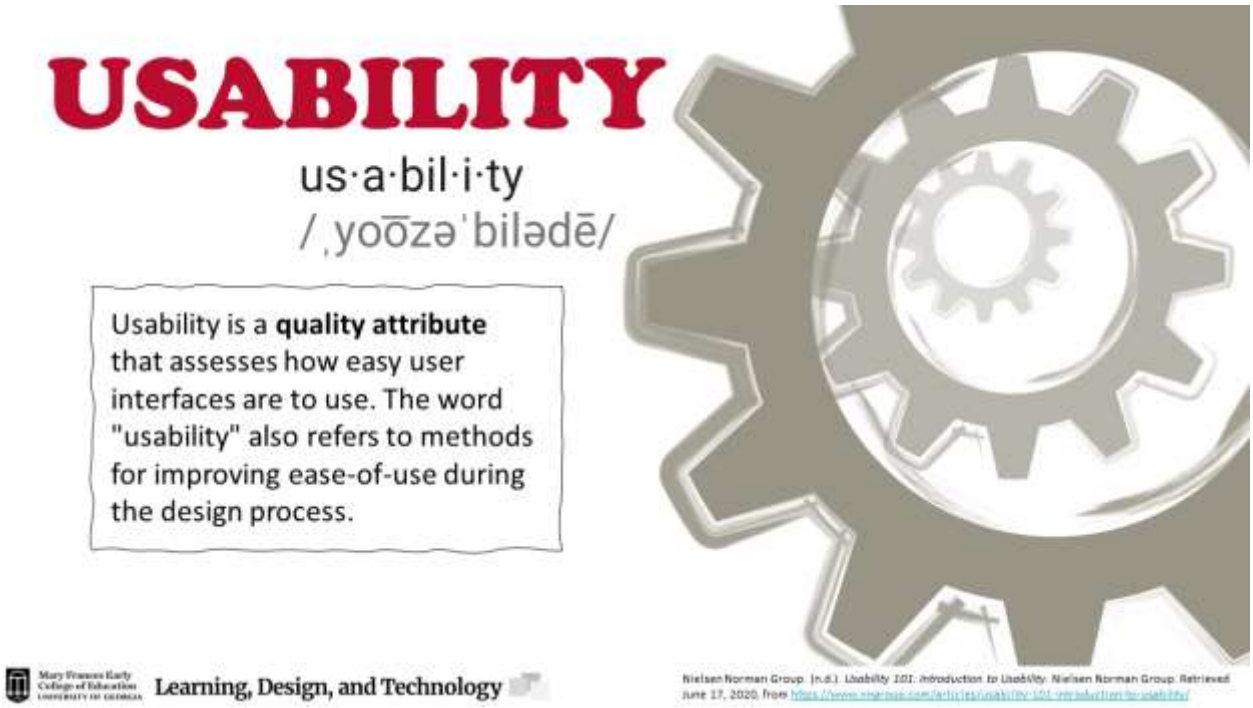
Description

Desk ~~critiques~~ consults are introduced as a design method. General advice is provided for conducting design ~~critiques~~ consults. Adapted from (Tomitsch et al., 2018)

Materials

- Appendix B – Design Consult Template

Module: Usability



Description

Usability is introduced as a design method (evaluation templates are provided) and quality attribute.

Materials

- Appendix C – Design Consult Usability Evaluation Template
- Video resource (*1:1 with Google UX Designer (formerly at Etsy, Fab.com* [10:32]): https://youtu.be/Bj9S6SQN8fo
- Video resource (*User Testing: Why & How (Jakob Nielsen)* [3:13]): https://youtu.be/v8JJrDvQDF4

Module: Using design software, roundtripping

Description

This module presents some advice for using design software. The focus is on workflow and tools use. One video is from Aaron Draplin, a professional graphic designer. He discusses his workflow with Adobe Illustrator, and what he says can be applied across a wide range of digital tools.

The other videos were created by me. One video shows a roundtrip process in Articulate Storyline and a the other shows the tools and general workflow used for this project.

Materials

Video example: Aaron Draplin, a professional graphic designer. He discusses his workflow with Adobe Illustrator, and what he says can be applied across a wide range of digital tools.

- Aaron Draplin on Working Efficiently in Illustrator with Free Vectors
  - https://youtu.be/g9lBlD04sDs

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APPENDIX A – Design Consult Guidelines

Giving and receiving feedback on design ideas and prototypes is an essential part of the prototyping process. There are methods for guiding the process that can improve the outcomes of your design critiques.

Try out these guiding questions when reviewing your peers' design presentations

'I didn't know that…'

- Something you learned from the presentation
- E.g. I didn't know there are over 40 countries in Asia.

'Tell me more about…'

- Something in the presentation material you want to know more about
- E.g. tell me more about the different languages used in Asia.

'Have you thought about…'

- Something you think is missing in the work or might be useful
- E.g. have you thought about showing images of native language speakers?
-

General recommendations for giving and receiving feedback

Feedback should focus on how or why a design does or does not satisfy a user need

- Use language like “It might be better if…” and “Have you thought about…”

Focus your analysis on the presentation.

- Avoid problem-solving and suggesting other approaches.
- Provide helpful feedback that relates directly to the proposal

Resist the urge to explain your design to the reviewer.

- Present your design without qualifications. If the reviewer is confused, that is helpful data that will help your revision work.

Take notes when receiving feedback. Feedback is valuable data. Respond to the feedback in your design document or journal.

- What was the suggestion?
- How will you respond to it and why?
- What changes will you consider implementing?
- Note the version of you design at the time of feedback.
- Take a screenshot and add it to you design document or journal.

Encouraging creative expression in design conversations – ideas and techniques

- Remain open to others’ creative expression
- A person’s creative ideas are always valid.
- A person’s creative ideas are neither right nor wrong.
- Your reactions and responses to creative expression are always subjective
    - It is fine to dislike or disagree with creative design ideas, but that doesn’t make them “incorrect” or “wrong”
    - Take care to frame your responses so that others recognize your respect of their creative design ideas, even if you disagree with them. Avoid value judgements (e.g., ‘That’s wrong;’ ‘You are wrong.’) This approach makes for more productive design conversations.
    - These attitudes and techniques support creative work environments.

APPENDIX B – Design Consult Template

Design Critique Usability Form	
Use this form to organize your feedback for desk critique activities.	
Reviewer information	
Please provide your name and the name of the person's whose design you are reviewing. If possible, include the link to the module or reviewed artifact.	
Your name:	Name of the designer:
Tile and/or description of the artifact under review:	
Link to artifact (or n/a)	
Design Critique	
Try to keep your feedback focused design artifact as it's presented to you and avoid problem-solving and suggesting other approaches. When you make a comment or suggestion be sure to include specific a specific example. Use the following guiding prompts to guide your feedback. If one of the prompts doesn't seem to apply, it's okay to skip past it.	
I didn't know that...	
Tell me more about...	
Have you thought about...	
It might be better if...	

APPENDIX C – Design Consult Usability Evaluation Template

Usability heuristic	Status	
	OK	*Possible revision (location + suggestion)*
Visibility of system status: The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.		
Match between system and the real world: The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.		
User control and freedom: Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.		
Consistency and standards: Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.		
Error prevention: Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.		

Recognition rather than recall: Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.		
Flexibility and efficiency of use: Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.		
Aesthetic and minimalist design: Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.		
Help users recognize, diagnose, and recover from errors: Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.		
Help and documentation: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.		

APPENDIX D – Software tools and other links

Name/type	Link	Category
software		
krita	https://krita.org/en/	graphic design
photopea	https://www.photopea.com/	graphic design
inkscape	https://inkscape.org/	graphic design
canva	https://www.canva.com/	graphic design
Colorblender	https://meyerweb.com/eric/tools/color-blend/#:::hex	graphic design
Color Safe (WCAG aderence)	http://colorsafe.co/	graphic design
Color contrast checker (WCAD adherence)	https://webaim.org/resources/contrastchecker/	graphic design
SketchUp	https://www.sketchup.com/	3D software
OBS	https://obsproject.com/	video recording and streaming
Storyboarder	https://wonderunit.com/storyboarder/	storyboarding software
Marvelapp	https://marvelapp.com/	prototyping software
Figma	https://www.figma.com/	prototyping software
Trello	https://trello.com/en-US	project management software
online communities		
storyboarding	https://www.reddit.com/r/Storyboarding/	design method
data visualization	https://www.reddit.com/r/dataisbeautiful/	data visualization
design critiques	https://www.reddit.com/r/design_critiques/	design method
user interface design	https://www.reddit.com/r/UI_Design/	UI design
user experience	https://www.reddit.com/r/userexperience/	UX design
web design	https://www.reddit.com/r/web_design/	web design
sites		
Nielsen Norman Group	https://www.nngroup.com/	usability and user testing
w3schools.com	https://www.w3schools.com/	web technologies reference and tutorials
W3C web accesibility initiative (WAI)	https://www.w3.org/WAI/fundamentals/	web accessibility
IDEO - design thinking	https://designthinking.ideo.com/	design thinking resources
Stanford - d.school design questions library	https://dschool.stanford.edu/resources/design-questions-library	design thinking resources
University of Sydney	http://designthinkmakebreakrepeat.com/	design thinking resources

APPENDIX E – Video resources links

Title	Time	Link	Topic
David Lynch: Where do ideas come from?	2:12	https://youtu.be/Fxr-7O1Bfxg	Creativity
David Kelley on Design Thinking	7:27	https://youtu.be/I888UXlens4	Design thinking
IDEO's Tom Kelley is Design Thinking's ultimate disciple, he makes the case as to why	1:03:33	https://youtu.be/L1pBhHjGKvI	Design thinking
Design Thinking 101	3:17	https://youtu.be/6lmvCqvmjfE	Design thinking
User Testing: Why & How (Jakob Nielsen)	3:13	https://youtu.be/v8JJrDvQDF4	User testing
1:1 with Google UX Designer	10:32	https://youtu.be/Bj9S6SQN8fo	User experience designer job example
excerpt from the documentary Alive Inside		https://youtu.be/fyZQf0p73QM	Empathy and human-centered design
Aaron Draplin on Working Efficiently in Illustrator with Free Vectors	7:32	https://youtu.be/g9lBlD04sDs	Tool use