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IMPROVING USER EXPERIENCE IN ENGL 3153

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Abstract

This report examines the usability of the ENGL 3153 curriculum at the University of Oklahoma. I provide an overview of the current curriculum; in addition, I define some key concepts from instructional design and user-centered design that frame my discussion of that curriculum and the usability issues I later outline. Next, I discuss the methods used for my research, including instructor interviews and the coding of student course evaluations. I then share my findings, paying particular attention to the Usability Test unit. I suggest that the issues uncovered in relation to this unit could be solved by decreasing student cognitive load. Finally, I provide a list of suggested solutions to the issues I outline, highlighting especially the need for an introduction to the Usability Test unit which succinctly and efficiently introduces terms and concepts by chunking information effectively.

This research was performed during the Fall of 2020 and Spring of 2021. This report, and an accompanying eLearning module to serve as an introduction to the Usability Test unit, is presented to Dr. Will Kurlinkus, Director of Technical Writing.

Introduction

ENGL 3153, or Technical Writing, consists of five possible units, four of which are taught during a given semester: the Application Packet, the Instruction Set, the Usability Test, the Grant, and the Popular Translation. User-centered design is the through-line of this curriculum. In each unit, students are taught to create documents or other media in a way that "puts human needs, capabilities, and behavior first, then designs to accommodate those needs, capabilities, and ways of behaving" (Norman, 2013). The Application Packet and Usability Test are required, and the Application Packet must be taught as the first unit. Beyond that, instructors can choose and sequence units how they please. A brief sketch of each unit follows.

Curriculum Summary:

- **Application Packet:** Students create CVs, resumes, and cover letters. They learn to use headings and subheadings, to create visual hierarchies, and to keep their documents scannable and therefore more likely to be engaged with by hiring managers.
    - Deliverables: CV, Resume, Cover Letter, Follow-Up Letter.
- **Instruction Set**: Principles of document design are reinforced and expanded, including the proper use of images in technical documents. Students are taught to create step-by-step instructions for how to complete a complex process using a technical tool. Here, they consider exactly who might use these instructions, and design the document for that specific user.
    - Deliverables: Technical Instruction Set.

- **Usability Test**: Students are taught client-facing genres of writing, as they perform a usability test on a small-scale website and write as if presenting the findings to the owner of that website. As they learn to run a usability test, students engage in ethnographic research methods like observation and think-aloud protocol.
    - Deliverables: Redesign Proposal, Protocol Memo, and Usability Report.
- **Grant Proposal**: Responding to a call for proposals, students learn the genre of grant writing as well as the research methods and rhetorical techniques which accompany it. Using a topic they choose or one provided by the instructor, students synthesize their research and write a complete grant proposal.
    - Deliverables: Grant Proposal
- **Popular Translation:** Students learn to communicate technical topics in a way that is comprehensible and *usable* to a lay audience. Students choose a technical topic, rhetorically analyze a popular translation of that topic, and, in some cases, create their own prototype which translates the topic for a popular audience (the design of this unit varies by instructor).
    - Deliverables: Popular Translation Proposal, Rhetorical Analysis of Popular Translation, Prototype of Popular Translation.

My aim in this project is to examine this curriculum and its deployment according to the research methods it teaches, asking how it can better serve its users—both instructors and students. The conceptual frame of usability and user-centered design allows me to conceive of users as "coauthors and codesigners" of the curriculum (Breuch et al., 2001). Because this research is grounded in theory from both instructional design and user-centered design, a brief gloss of some helpful principles from each domain follows.

Instructional Design, ADDIE, and User-Centered Design

Robert Branch and Theodore Kopcha define instructional design as "an iterative process of planning outcomes, selecting effective strategies for teaching and learning, choosing relevant technologies, identifying educational media, and measuring performance" (Branch & Kopcha, 2014). This project then, is one part of that iterative process for ENGL 3153.

Within the field of instructional design, one finds much discussion of differing "models." Models attempt to describe or prescribe the major processes of the design of instruction, to be used as "operational guidelines for managing the people, places, and things that will interact with each other, and to estimate the resources required to complete a project" (Branch & Kopcha, 2014). Much is often made of the pros and cons of differing models—which have become antiquated, and which are best suited for the differing domains of education and industry. However, even the most cursory foray into the literature reveals ADDIE (analysis, design, development, implementation, and evaluation) to be basically omnipresent. Some think of ADDIE as a model, a framework outlining a linear process for designing instruction. However, some have claimed that in reality ADDIE encompasses the "five major activities" that are going to be present in some form and order in every design model. What criticism there is for ADDIE generally comes when it is being conceived of as a prescriptive, linear model; such a lockstep process isn't suited for fast-paced environments that require rapid prototyping and more iterative design processes. For the purposes of this project, ADDIE obtains in this looser sense: as an organizational tool which helps categorize different phases of the project rather than a precise paradigm to be strictly followed. The bulk of this report falls within the analysis phase; in instructional design, this generally means searching for gaps in performance (Branch & Kopcha, 2014). My emphasis on usability expands the focus

to the entire experience of the course for both instructors and learners, including elements like "aesthetics, pleasure, and fun" (Norman, 2013).

Usability "refers to the extent to which a product or its documentation is easy to use by its target audience" (Breuch et al., 2001). It is a core concept—perhaps the core concept—in the curriculum for ENGL 3153. Technical writing programs are highly diverse in terms of curriculum; some focus more on academic science writing, while others take a broader, writing-in-business approach. Usability is a marked shift in focus from either of those, even as it is able to teach those types of writing under its central aim. After one of the first courses in usability was taught in the technical communications program at the University of Minnesota in 1999, both students and instructors of the course reported employment opportunities directly related to their new knowledge of usability, as well as speaking opportunities at conferences and a skillset useful to them in their particular spheres of influence (Breuch et al., 2001). So, while all courses should be created to be usable, those who teach a technical writing course centered on usability have an even greater responsibility to create user-centered courses. In other words, ENGL 3153 should demonstrate the principles it teaches.

Research Questions

My research centers around the following questions:

1) Of the five units in ENGL 3153—Application Packet, Instruction Set, Grant Proposal, Usability Testing, Popular Translation—which contains the most space for intervention? That is, where is improvement most needed? Issues to address could be, for example, readings used, activities run in the classroom, aspects of major assignments, etc. This question is addressed in regard to both in-person and online settings.

2) What is the best way of sequencing these units in order to adhere to instructional principles like scaffolding, broadly conceived here as "the [instructor] 'controlling' those elements of the task that are initially beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (Wood et al., 1976).
3) How can instructors best utilize our LMS (Canvas) to create instruction that is user-centered as well as a learning environment that promotes engagement? Learning management systems are a large part of today's learning environments, whether the course is fully online, in-person, or blended. Thus, many questions regarding usability can be addressed at this level.

Methods

To answer these questions, I employed the following research methods:

1) Instructor interviews: I conducted formal interviews with seven instructors of Technical Writing. These seven were selected to ensure representation from each type of stakeholder within the larger grouping of instructor—graduate students, adjunct instructors, and faculty. Representatives had varying years of experience in the program, utilized differing methods and curricular choices, and had experience with multiple modes of delivery (in-person, online, blended). Each interview lasted about 45 minutes and covered a wide range of topics such as assignment selection, sequencing and scaffolding, and successes and challenges with various units and class activities.

2) In coordination with the Ashley Beardsley, the assistant director of the program, I coded the comments sections of course evaluations. Together we coded evaluations from the Fall of 2010 through the Summer of 2020. Each comment was classified according to one of five codes.
    a. ASSIGN: comments about assignments, including assignment length, number, difficulty, due date, sample assignments, grading time of major assignments, etc.
    b. CLASS: comments related to the class time, in-person vs. online, specific in-class activities like peer review, group work, etc.
    c. INST: comments related to the instructor, including grading time in general
    d. PERCEP: comments that give the overall perception of the course
    e. READ: comments about the readings, including amount of reading[1]

Comments were categorized and given a value of either positive or negative. This method revealed large-scale trends in student experience. The bulk of my concerns were with comments which fell under the ASSIGN code. As a result, I added tags which acted as subcategories for those particular comments. Some of the most important of these tags were those that designated that a comment was referring to one of the major assignments specifically.

The purpose of the coding was largely organizational. That is, coding was not an attempt to convert the qualitative data of course evaluations into large-scale quantitative data. Doing so would strip each comment of its context—who the instructor was for their section, which units were taught, etc. For example, evaluations from the Spring of 2020, when courses were forced

[1] Coding schema and descriptions were provided by Ashley Beardsley, Assistant Director of Technical Writing.

online halfway through the semester, need to be understood in the context of that special situation. Likewise, comments from evaluations in 2017, shortly after the new usability-focused curriculum was launched, are going to read differently than those taking place after the course had time to develop and instructors became more comfortable with the material. So, the entire contents of each individual comment had to be taken into account to see where evaluations corroborated instructor concerns. Coding provided insights into where to look.

Course evaluations are a notoriously unwieldy instrument, and they obviously can't tell the entire story of student experience. They were used in this case to pick up on long-term trends regarding the usability of the curriculum rather than to gauge the teaching effectiveness of individual instructors. Still, evaluations can't tell us the thoughts of the student who refuses to fill out an evaluation. There's also the question of how to handle evaluations demonstrating extreme or hyperbolic comments. In these cases, if an evaluation was brimming with anger and negativity that seemed to stem from a locatable problem—say, a Canvas page that never stopped confusing them—then the emotional tone of the comment was taken into account as an important part of the evaluation. However, evaluations which lacked specific critiques but were characterized by general bitterness about having to take a writing class at all, or about the fact that the English building was too far a walk from the engineering building, were taken with a grain of salt. Extreme care was taken to locate specific critiques within the full context of each evaluation comment.

Nevertheless, a future iteration of this research would benefit from the addition of student interviews as a research method. Given time constraints and the resources available, I found evaluation comments in conjunction with instructor interviews an effective way to triangulate trends in user experience. Student interviews would add more nuance and context to those trends, as well as reveal new areas for intervention.

User Personas

An important aspect of research and analysis in both user-centered design and instructional design is to understand who users are. To this end, using comments from course evaluations in conjunction with OU degree requirements as well as information from my instructor interviews, I constructed the following user personas. User personas are fictional characters created from data, meant to keep user's needs and interests at the forefront during the design process (Harley, 2015). Personas are not meant to stand in for the whole of one's collected data, but to frame that data in "memorable" and "actionable" ways (Roman, 2019). I've included the quotes from which these personas were created, as personas which stray from actual data run the risk of being not only unhelpful, but even harmful (Roman, 2019). That is, personas that aren't based on data are always going to run the risk of bias and stereotyping. So, even after personas are created, interviewing and other user research must continue; this way, understanding of and empathy with the user can grow in nuance, and user personas can be amended and recreated to reflect new findings.[2]

The first three personas represent students, and the last two represent instructors.

[2] The student personas here are created from course evaluations, instructor interviews, and my own experience as a Technical Writing instructor of highly diverse classrooms.

Jeffrey Snyder

Bio: Jeffrey Snyder is a senior mechanical engineering major who is preparing not only to graduate but to enter a competitive job market. He dreads all forms of writing classes and assignments and enters the course with a good deal of annoyance that he is required to be there. He is, however, hesitantly optimistic that improving his writing will help him get a job.

Name: Jeffrey Snyder
College: Engineering
Major: Mechanical Engineering

Goals and Motivations

- Finish his remaining coursework so that he can graduate
- Learn the types of writing he will encounter in industry
- Add something from ENGL 3153 class to his resume or CV
- Obtain a job or internship upon graduating

Skills

- Basic yet vague understanding of science writing genres like lab reports
- Computer programs for engineering like CAD and MATLAB

Pain Points

- Busy work
- Coursework that feels "irrelevant"
- Vague assignment instructions
- Unusable Canvas page

Quotes:

"I think this course is useful for students in STEM majors, in which the assignments are helpful in helping students understand the process of constructing websites and instruction sets that would benefit their future career."

"I think learning how to construct an Engineering Report would be really helpful."

"I would suggest including at least one module more relevant to the engineering students who have to take this class, such as white papers."

"…discussion posts seemed more like busy work than anything else."

"I definitely think this class is important for STEM students because STEM students are paving the innovations of the future, and the one thing they should know how to do is explain their inventions/innovations/technology to people who're not STEM but use their ideas on a day-day basis."

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Figure 1: Student User Persona

Amy Jones

Bio: Amy Jones is a junior Chemical Engineering major whose goals center largely on academics. While she does want to be prepared for a job in industry, she is much more interested in continuing to perform academic research. Whether directly after college or otherwise, graduate school is definitely in her future.

Name: Amy Jones
College: Engineering
Major: Chemical Engineering

Goals and Motivations

- Gain understanding of academic genres of writing
- Receive high grades to stay competitive for grad school
- Learn how to fund research
- Generate solid writing samples and CV for grad school application
- Continue her academic career by attending graduate school
- Graduate with a 4.0

Skills

- Lab research
- Critical thinking

Pain points

- Not knowing her grade
- Busy work
- Group Work
- Long turnarounds for assignment feedback

Quotes:

"Many of our grades were not posted anywhere near where they should have been as set by the syllabus and in our group project, we didn't even get all of our feedback from our instructor before the assignment was due, letting us know what changes were needed."

"Personally, I would rather have done the Grant writing because I feel it would be more useful in my career."

"I didn't really like the meaningless tasks that we were made to do during the week, they didn't really help with the big assignments and felt a lot like busy work."

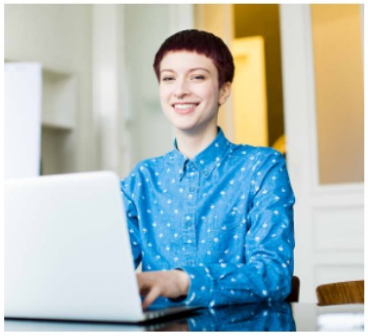
"Having required group work was difficult for me since my groupmates failed to complete certain parts of our projects, lowering the grade when I completed everything I needed to."

"I expected…to learn to put together professional research papers, white papers, and presentations."

ThoughtWorks®

Figure 2: Student User Persona

Kiera Childs



Bio: Kiera is a student with a wide variety of interests who is uncertain about her career path. She is a junior Information Studies major, and she is currently deciding between pursuing a graduate degree in Library and Information Sciences and entering the job market upon graduating. She hopes to learn some skills that will be useful in either of those scenarios.

Name: Kiera Childs
College: Library and Information Studies
Major: Information Studies

Goals and Motivations

- Gain insight into a new field
- Become a better a communicator
- Be more prepared for the job market or grad school applications
- Create a good resume or CV
- Learn a practical skillset that can apply to multiple fields and knowledge domains

Skills

- Data management and analysis
- Statistics
- Quantitative Research
- Learning new tools

Pain points

- Feeling ignored or "less than" in a course
- Unhelpful peer reviews

Quotes:

"The course was flexible for students taking the course outside of the engineering major."

"I did learn things, like the resume unit, that would be practical and useful outside of class."

"Find a way to relate projects and assignments more to people's specific majors, which would allow them to write about things more related to the work they will be doing in the future."

"The use of hands-on application tools is a major plus!"

"This course was mostly geared toward & filled with engineering students. It…didn't feel like we (LIS students) were particularly wanted in there, especially by the engineering students."

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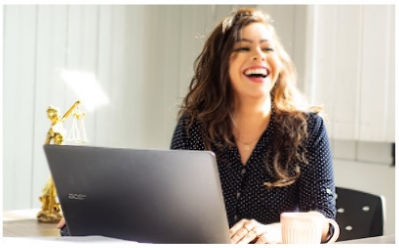
Figure 3: Student User Persona

Sarah Miller



Bio: Sarah Miller is a Ph.D. student at OU. She generally teaches two sections of technical writing each semester. She has a fairly heavy workload, as she is completing coursework and planning her dissertation. She enjoys teaching technical writing, as it offers her a chance to teach new kinds of students, and to learn new skills herself.

Name: Sarah Miller
Job: Graduate Student Instructor
Courses: Technical Writing

Goals and Motivations

- Add different kinds of teaching experience to her CV
- Design her own curriculum according to her research interests, ideally providing some content for her dissertation
- Obtain a teaching job after graduating

Skills

- Expertise in digital rhetoric
- Expertise in writing instruction, especially as it relates to digital media and narrative
- Teaching online

Pain Points

- Balancing student workload with instructor responsibilities
- Coordinating group work in online courses
- Grading takes a long time
- Making sure students do reading in online courses

Quotes:

"Tech writing (online) takes a lot of initial investment, but the videos you make stay pretty useful."

"Feedback is super intensive…I don't know how someone could teach more than two sections of this course. I've barely worked on my dissertation since I started grading this last assignment."

"I found during the summer that several students just weren't doing the reading, especially during the usability unit."

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Figure 4: Instructor User Persona

Sam Wallace

Bio: Sam Wallace is an Adjunct Writing Instructor at OU. He teaches four sections a semester, always some combination of Composition 1, Composition 2, and Technical Writing. He also works in the Office of First-Year Composition, helping build curriculum and assisting other instructors.

Name: Sam Wallace
Job: Adjunct Writing Instructor
Courses: Comp 1 & 2, Technical Writing

Goals and Motivations

- Improve the course based on student input
- Teach rhetorical analysis and writing in a way that is useful to his students
- Prepare students to be able to better explain their research to non-technical audiences

Skills

- Expert in curriculum development and pedagogy
- Expert in composition research

Pain Points

- Doing double prep when teaching Comp and Tech Writing at the same time
- Some of the technical elements of the curriculum are outside field of expertise
- Wants more collaboration between tech writing instructors

Quotes:

"I teach tech writing online, but I'm very active. I comment on almost everything they do."

"I do unit surveys and I ask them what they like, what they would change. I make revisions based on trends I see pop up in those surveys."

"I'm the kind of instructor that is very student-focused; I'm all about communication. Where I need work is the tech part."

"The field of tech writing in particular is rapidly changing, so I would like to see more continuing education for instructors."

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Figure 5: Instructor User Persona

Results

Here are five key takeaways drawn from instructor interviews and course evaluations.

Takeaway 1: ***A consistently successful approach to the sequencing of the four major course assignments is to place the most demanding and time-intensive projects as second and third, with workload easing up in the final project.***

With the exception of the first unit which is always the Application Packet, instructors have the freedom to control the course sequence. Of the four options for the remaining three units, only the Usability Test is required. This means instructors choose between the Grant, the Technical Instruction Set, and the Popular Translation for the remaining two units. After various trials with different units and sequences, many instructors note that it has proven successful to run the last unit as a lighter assignment. Here's a comment from one faculty member with several years of experience:

> …the usability is a bigger unit, and for me the pop trans is typically a bigger unit, so usually I'll put those as two and three. I've also done pop trans as unit four; if I'm wanting it to be a little more low key, a celebratory final assignment, it can work there too.

Her reasoning is that "for the student population of tech writing, around finals is just killer for them…for most of their major classes their entire grade is dependent on the lab reports and exams they are taking at the very end of the semester." To have a unit with a heavy workload there just isn't successful. Another instructor says, "I do pop trans last because I've kind of streamlined and done some cuts, because at the end of the semester they need one that is a little less time consuming because they have so much going on at that time." The same instructor notes, "I used to do usability

last, and that was *awful*." These comments are corroborated by similar comments on the course evaluations: "I would prefer to see unit 4 [the grant] earlier in the semester as it is a lot of work to complete when there is a lot of other projects due in other classes at the same time" and "I would have preferred to be crammed for time on Unit 2 or 3."

For many instructors who choose not to run the Grant unit (for reasons mentioned below), a common choice is to run the Usability Test and the Instruction Set as second and third, with a lighter Popular Translation as the last unit. This kind of sequence is a good use of scaffolding, as the design principles explored in the Instruction Set and the research methods practiced during the Usability Test are both necessary for the Popular Translation unit.

Takeaway 2: ***Popular Translation is probably the most popular unit among instructors, in terms of its perceived ability to teach major concepts from the course as well as its ability to be tailored to instructors' own interests and career pursuits.***

The Popular Translation unit asks students to take a topic in which they are an expert and to create a media prototype that explains that topic in a way that is understandable and usable to a lay audience. The prototype has taken many forms, depending on the instructor: podcasts, infographics, videos, even websites. Instructor comments about this unit were overwhelmingly positive. Its purpose, says one experienced faculty member, is to "address the inability of scientists to speak clearly and directly to the public." The instructor goes on to discuss how they once had a student who, after they taught the unit with a focus on infographics, went on to work as a science writer for NASA. A graduate student instructor notes a similar experience of a student who now runs an internal podcast for a big tech company using the skills he learned during his Popular Translation unit.

Students are not the only stakeholder who benefit from this unit. More than one instructor explained that the flexibility of the Popular Translation unit allowed them to gain experience designing curriculum and to do so in a way that was tailored particularly to their career goals. This opinion was more prevalent among graduate students: one instructor noted that the social media emphasis of her version of the unit was chosen because she "wanted to have a chapter in [her] dissertation about using social media to communicate something technical to a general audience" and another mentioned that he switched from the Grant to Popular Translation because "communicating technical ideas to a public audience" aligns with his dissertation research.

Takeaway 3: ***Students notice when Canvas pages are poorly designed and managed, and find it particularly frustrating given the curriculum's focus on usability.***

In the course evaluations, many negative comments categorized under the "Class" code (a category which accounted for digital learning environments as well as the physical classroom) regarded Canvas. Missing or incorrect due dates, modules copied and pasted from previous years without being edited for correctness, clunky layouts and difficult to find assignments—these were prevalent critiques when Canvas was mentioned. I include this takeaway not because these comments showed up at every turn, but because when Canvas *was* mentioned, the comments carried some emotional charge: "The class was about communicating things to non-technical users, but I felt like they did not use their own rules in designing their Canvas page. It was very confusing and made me not have faith in their ability to grade well." Utilizing Canvas is important for any instructor teaching any course, but when it comes to usability, Canvas is the user interface. A poorly designed, unusable build undermines the instruction in usability delivered to students, as

the previous comment demonstrates. So, for a course centered on usability, the interface needs to be usable—enjoyable, even.

Takeaway 4: ***Success with the Grant unit varies widely, and there is a tension between instructors' belief in its importance and the many challenges that come with the decision to teach it.***

One question I asked each instructor was which unit was the most difficult to teach. While it wasn't unanimous, the Grant unit was a prevalent response. A sampling: "Grant writing is the number one unit that poses challenges"; "It is a very hard assignment for students to do well"; "The grant writing unit is *brutal*."

There are several reasons for this. I include the following admittedly long quote simply because it hits on almost all the issues:

> It's the most recent unit. It's the unit instructors choose to teach the least. Because it's difficult to teach. The addition of the grant writing workbook makes it a lot easier to teach I think, but it's the unit for instructors that they're least experienced or comfortable with. This is an entirely new genre for an English major. It's the most technical genre in some ways. All this engagement with scientific research makes it difficult. Topic selection makes it difficult. Do we give them a topic? Do they choose a topic? How much time do they spend researching a new thing? So it's all of the problems and all the learning challenges with a research paper combined with a new genre, combined with the fact that it happens incredibly fast. The other units are well paced…the grant is a little bit harder to do quickly.

For these reasons, many instructors opt out of teaching this unit, as it seems that every way to address each of these issues comes with its own problems. For example, one of the major issues is topic selection. In a unit that lasts four weeks (two during the Summer) whose deliverable is a 12-15 single spaced document, little time can be spared for topic selection. Some instructors attempt to solve this problem by providing the topic as well a large bulk of research material to get students started. This does save a lot of time on the front end. However, some instructors have noted that with this move, the grant ceases to emulate a real-world scenario, as one would likely only write a grant application for something one was an expert in and cared about. While professional grant writers create grant proposals for others based on topics they may be unfamiliar with, the idea behind teaching science students to write grants is not to make them grant writers, but to prepare them for the possibility of funding their own research. Speaking to this issue, a graduate student instructor notes, "the preset [topics], don't necessarily connect with student interests. It is a very hard assignment for a student to do well if they [are] writing about a subject area they don't already know about." Indeed, much of the footwork in writing a grant application is this front-end research. If you bypass it, a central part of grant writing is lost; if you include it, you're asking students to gather an amount of research that in the real world they would have been accumulating over months, even years, of work in a particular field.

One particular graduate student instructor employs a clever solution to the issues of topic selection and time constraints. After students perform a usability test on a website in unit two, they create their own popular translation prototype in unit three to address whatever usability problems they found with the website. They then apply for a grant to fund that project in unit four. One general call for proposals, which the instructor modifies to make more general and applicable to all projects, is used. This accomplishes a number of things: the scope of the project is limited to

something that students could realistically accomplish. The research demands are lower because students have been working with the topic since unit two. This in some ways emulates the actual process of writing a grant, as much of the research would be collected by the time the decision is made to apply for the grant. The Grant unit is in fact so manageable in this iteration that it still adheres to the sequencing recommendation mentioned in the first takeaway. The instructor notes that generally, most of the groups "finish a week early, and don't even need finals week." While this method is unique and laudable, one could argue that it still pares down the research process to unrealistic levels.

A quick sampling of comments from evaluations reveals general agreement from students: "too much material crammed into the last unit – not a fan of grant writing"; "grant writing needs to be worked on"; "feels rushed"; "hardest unit of all them." The majority of the negative comments have to do with the overall heft and speed of the unit; however, there are some positive comments which mention that grant writing felt like a relevant, important skill to learn. In addition, there were a few comments from those who hadn't been taught the Grant unit claiming they wished they had. So, the comments don't suggest a need to do away with the grant, but rather reflect the same tension noted in the instructor interviews: on the one hand, it is an important skill and needs to be taught; on the other, it is incredibly difficult to teach and learn in the short time given for a single unit.

A 2019 study of grant proposal pedagogy in university courses found similar results. The authors note from their discussions with those who have actually written grant applications that it is the non-writing parts of the grant that are the hardest—the "development of a research project…searching for funding, adjacent writing tasks like invention...interpersonal communication skills like networking" (Lawrence et al., 2019). So, in some ways, as noted

previously, there is a disadvantage to bypassing these parts of the process and focusing entirely on the genre of the deliverable or even the audience for which it is prepared. However, the same study also notes the difficulty of attempting to include these aspects in grant writing education: "In the typical university course, the exigence for writing a proposal is an assignment due to the instructor by a specific date. Few students have 1 to 2 years of preliminary research—that is, data collection from an existing project and knowledge of the funding institutions' wants or needs—to leverage" (Lawrence et al., 2019). They conclude by arguing, if hesitantly, for a pedagogy of proposal writing that de-emphasizes the document itself in favor of those other components—searching for funding, research and synthesis, and networking.

Takeaway 5: ***The Usability Test unit can be overwhelming for students and instructors, and students sometimes fail to understand its relevance.***

While the entire course is interested in teaching principles of user-centered design, it is the Usability Test unit where students learn and apply skills most commonly associated with user experience design and its adjacent fields. Students perform a usability test on a website, employ think-aloud protocol, create user personas, and learn the client-facing documents—redesign proposal, protocol memo, and usability report—which would accompany these practices in a corporate setting.

My conversations with instructors revealed two issues regarding this unit. The first issue is that it can be quite overwhelming. One instructor calls it a "tough assignment," as it "has the most moving parts." Another notes that "the heft of it can be problematic in keeping them engaged." Another simply notes that the Usability Test unit is "really challenging."

Course evaluations reveal similar feelings among many students, who find the unit "extremely difficult and time consuming" and "a lot of work." One student quips "the usability unit just killed me."

The second issue is one of student buy-in. Many students fail to see the relevance of the Usability Test unit for their own lives and careers. Instructors note hearing things from students like "I'm an engineer, not a UX designer." Another instructor mentions that "a lot of these students have already had internships, so they know that generally usability testing is contracted out to firms…so in terms of seeing the value, there's a bit of a disconnect." Again, evaluations pick up on this trend, as comments refer to it as "strange…oddly specific to something we will never do," and "kind of a niche application." Students echo instructors almost exactly: "I do not see the point in this if any company I work for will hire someone else to do usability testing."

I think cognitive load theory can help explain both these issues as well as their relation to each other. Cognitive load theory understands learning to be the transfer of information from the working memory to long-term memory. The working memory, though, is limited in its processing capacity. Therefore, the more strain you put on the working memory at once, the more a learner will fail to encode that information into the long-term memory (Sweller, 1988). This is a common concern not only in instructional design, but in usability: Miller's law, which posits that a person can store around seven "bits" of information in the working memory, is a kind of unwritten rule in UX design concerning how best to organize information on websites and other digital media (Indraksh, 2020). One of the primary strategies for decreasing cognitive load is to chunk information (Miller, 1956).

My suggestion is that the tendency for students to become overwhelmed by the Usability Test unit is due to cognitive overload. The three written deliverables make for a heavy workload,

but more important is the fact that "User-Centered Design," to a neophyte, presents as a large, amorphous blob of information; there's a multitude of conceptual content, competing understandings of usability and design by different corporate sectors, and different career fields which all seem to employ principles in different ways. Even understanding the skill of usability testing in its proper context becomes a challenge, much less understanding it as something useful to an engineer. A presentation of this material which draws boundaries on some of the many principles taught, achieved by proper chunking of information, is needed. Such a presentation would help situate the work students do in this unit within the context of their own professional pursuits. I offer some suggestions on how to achieve this in the next section.

Discussion

Before listing my recommendations related to the above takeaways, I want to offer one adjustment that could be made quickly: to change the course description on the OU course catalogue. This is a recommendation based less on any one comment by instructors or students, and more on general principles of user-centered design: an important aspect of a thing or experience being usable is that it does what it says it's going to do. The current description of the course reads "For students of the pure and applied sciences. Focuses on the forms of report writing most frequently encountered in research and industry." While this is not inaccurate, it could benefit greatly from even a small addendum stating, "with a focus on usability and user-centered design." This would be a good way of orienting students towards the material before the course begins, and it would provide them with more accurate expectations concerning course content.

Listed below are four recommendations based on the above findings. Some can be implemented immediately, while others will require more involved, long-term adjustments.

1) ***Sequence the course according to the first key takeaway.***

It has proven successful to sequence the course in a way that sees workload easing up in the final project. Running the fourth unit as a celebratory final assignment—like a pared down Popular Translation where students can be creative—adds an air of enjoyment and pleasure to the course, both for instructors and students. The Instruction Set and the Usability Test are good candidates for units two and three. So, a good rule of thumb is that the Usability Test unit and the Grant unit (excepting the pared down version previously mentioned) *should not be last*. Assignments of this heft are incredibly difficult to do well in unit four, for both instructors and students. Students in particular note exhaustion and a feeling of being overwhelmed in these scenarios; the frustration noted in some evaluations seems to have colored certain students' experiences of the course. Better to end on a note of creativity and enjoyment.

2) ***Implement a Canvas Professional Development Workshop that teaches LMS best practices.***

I recommend implementing a professional development workshop that teaches Learning Management System best practices. This workshop could be integrated into the graduate course ENGL 5133, Teaching Technical Writing. In addition, I recommend that a generic course shell with a usable layout and sample assignments be created and made available to new instructors.

3) ***Revamp the Grant unit.***

The Grant unit has proven unwieldy for both students and instructors. There are a few ways this could be addressed, some more instantly pragmatic and others requiring more intensive revision. One option would be to give grant writing double the time it is given now. So, if

an instructor opted to teach the Grant unit, they would be choosing it over two other units, not one. They would only teach, then, the Application Packet, the Usability Test, and the Grant. Giving it eight weeks instead of four would address some of the time and workload issues; students could spend the first two weeks or so developing their project idea, searching for real CFPs, and choosing their topics. Instruction could include things like networking with possible partnering organizations and other tasks that can only be treated peripherally under the current time constraints.

This does have possible disadvantages, however. Students miss out on the Popular Translation or the Instruction Set, two assignments which provide useful skills for those entering the job market. One possible way around this—which, admittedly, would require significant logistical maneuvering—would be to offer two versions of Technical Writing, one that teaches grant writing and one that does not. They could be classified on the enrollment website and course catalogue as Technical Writing (Academic) and Technical Writing (Industry), with the previous teaching the Grant unit. Again, this would require coordination among instructors and the director of the program. It may also require signoff from the College of Arts and Sciences. On the upside though, it would benefit students seeking jobs in industry as well as those pursuing graduate school. It would also address some of the negative comments in course evaluations concerning the personal relevance of the course. It would add student choice to the equation, which is almost always a good thing.

4) ***For the Usability Test, implement a pre-unit e-Learning module aimed at decreasing cognitive load.***

There are several ways to combat cognitive load; one of them is to provide "pre-training, in which learners receive prior instruction concerning the components in the to-be-learned system" (Mayer and Moreno, 2003). So, if we conceive of the system in this case as the network of terms, principles, and skills which make up "User-Centered Design," a pre-training exercise would define those terms, chunking them under larger conceptual headings. My suggestion in this case would be to create an eLearning module with three major chunks:

1) User-Centered Design: this section would review basic design principles and define terms, teaching user-centeredness as a conceptual orientation rather than a skillset.
2) User Experience Design and Research: this section would teach learners about the skills and research methods practiced by professionals in the field of User Experience Design. Usability testing would be taught in this section and introduced as one of those skills. Ethnographic research methods would be defined here, as well as practices like creating user personas and journey maps. This section would be concerned mainly with defining the skills students are going to learn in the unit.
3) Design Thinking: this section would define the process of Design Thinking: inspiration, ideation, and implementation (IDEO). It would emphasize the ways in which this process is employed by professionals outside the field of UX design, including scientists and engineers. The goal of this section would be to teach students, before the unit begins, how the skills they will learn will transfer to their future careers.

My belief is that implementing a pre-unit module of this nature would greatly reduce cognitive load, as students wouldn't have to learn the components of a system and the system itself at the same time (Mayer and Moreno, 2003). In so doing, it would also situate the work students do in this unit into the context of their own careers, answering the relevance critique found in the course evaluations and instructor interviews.

Conclusion

In conjunction with this report, I've presented an eLearning module which I believe achieves the goals mentioned in relation to the Usability Test unit. I believe its implementation, especially in the shorter Summer sections of the course, could improve learning outcomes and overall user enjoyment for both students and instructors.

My goal in this report was to attend to usability issues in the ENGL 3153 curriculum. In doing so, I've drawn on theories and practices from both instructional design and user-centered design. I believe that making the suggested revisions would greatly enhance user experience.

I recommend that in addition to making the recommended adjustments to the course, research of this nature is repeated. In addition, further iterations of this research should ideally include student interviews. Student course evaluations reveal large-scale trends in student experience over time; student interviews would provide more context and nuance to the issues uncovered in this report. For example, an evaluation comment about a difficult to use Canvas page could be further unpacked in an interview, which might reveal that a student with a disability struggled because Canvas pages aren't attending to accessibility issues. Or, perhaps instructors are assuming levels of digital literacy for all students that can't be attributed to students from rural or lower-income high schools. In this way, questions about the Technical Writing program in relation to

positionality could be attended to in ways that are tougher with course evaluations alone. That would be the main goal in the next iteration of this research: to move from a broader understanding of issues uncovered into a more nuanced one, which would in turn allow for more nuanced solutions.

A course which includes graduate student instructors will see frequent instructor turnaround. As seasoned instructors move on from their time at OU, it will be important not only to make new instructors aware of the issues like the ones in this report, but to listen to their stories and heed their concerns. As new solutions are implemented, new ways of improving the course should continually be searched out. In this way, ENGL 3153 can exemplify the iterative, user-centered design at the center of its curriculum.

Appendix: eLearning Module Storyboard

Below are slide images from the Introduction to User-Centered Design eLearning module delivered to Dr. Will Kurlinkus with this report. Where applicable, narration text is included under the image.

Figure 6: Introduction Slide

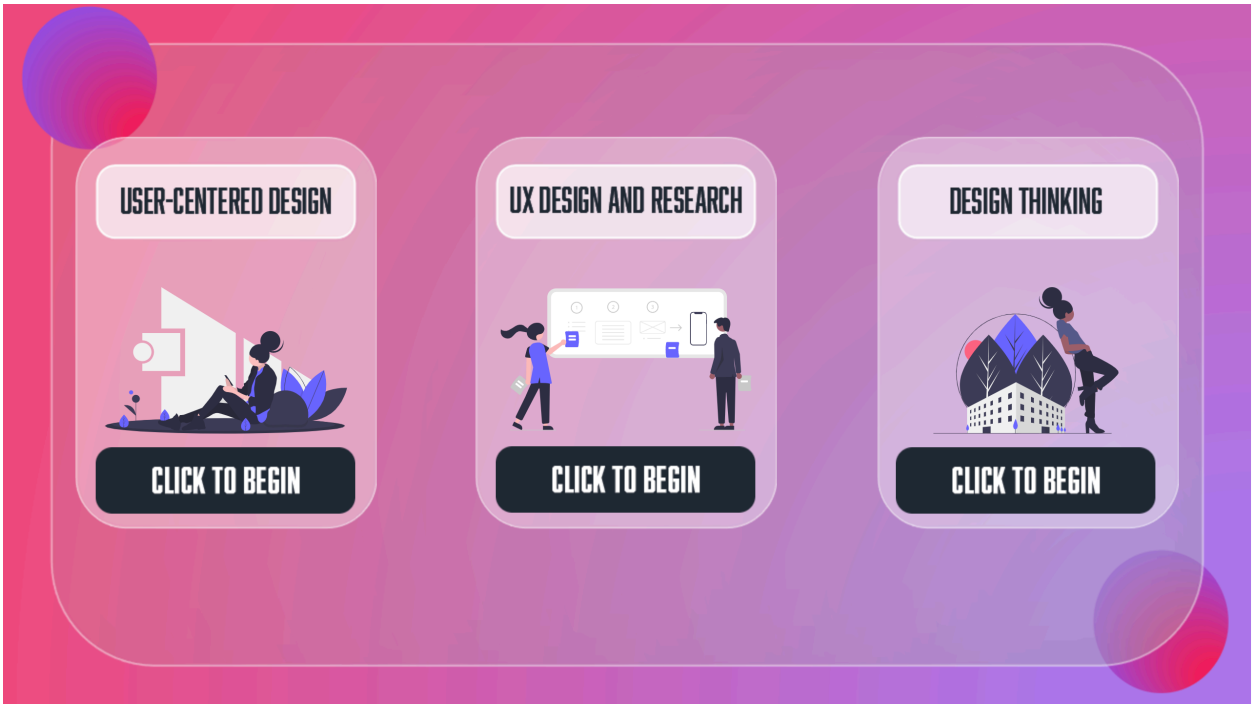

Figure 7: Dashboard Slide

In this introduction to our Usability Unit, we're going to cover three major topics. In the User-Centered Design section, we'll review that broad set of principles which will frame the way we think about the design of everything from documents to household items.

In the User Experience or UX Design and Research section, we'll look at some of the specific skills and practices utilized by those who apply these principles for a living, mostly to on-screen experiences.

In the Design Thinking section, we'll learn about a process that will help you apply the skills you'll learn throughout this unit to any project, no matter what your future career ends up being.

Click the user centered design button to get started.

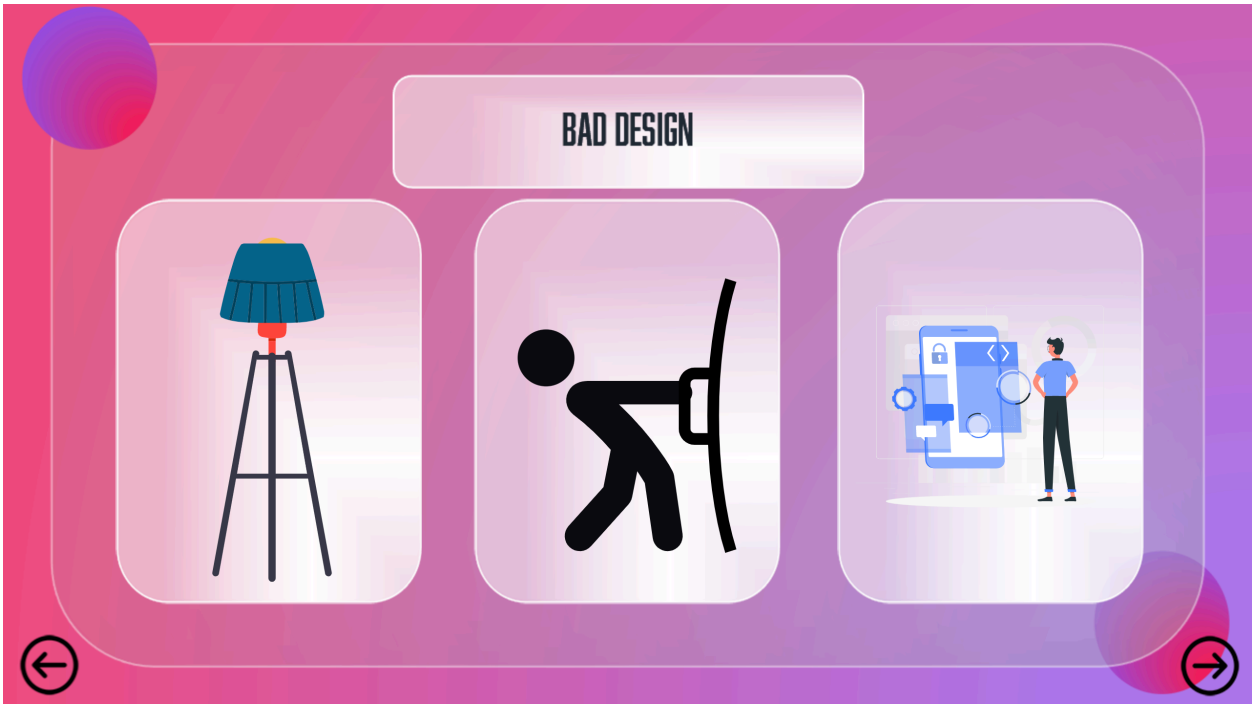

Figure 8: Bad Design

We've all encountered bad design. Maybe it's that lamp that's impossible to turn on because the on/off switch is on the cord behind the couch. Or maybe it's that door you're supposed to push open but has a pull handle on it anyway. Or maybe it's just a really confusing or overwhelming dashboard on a computer.

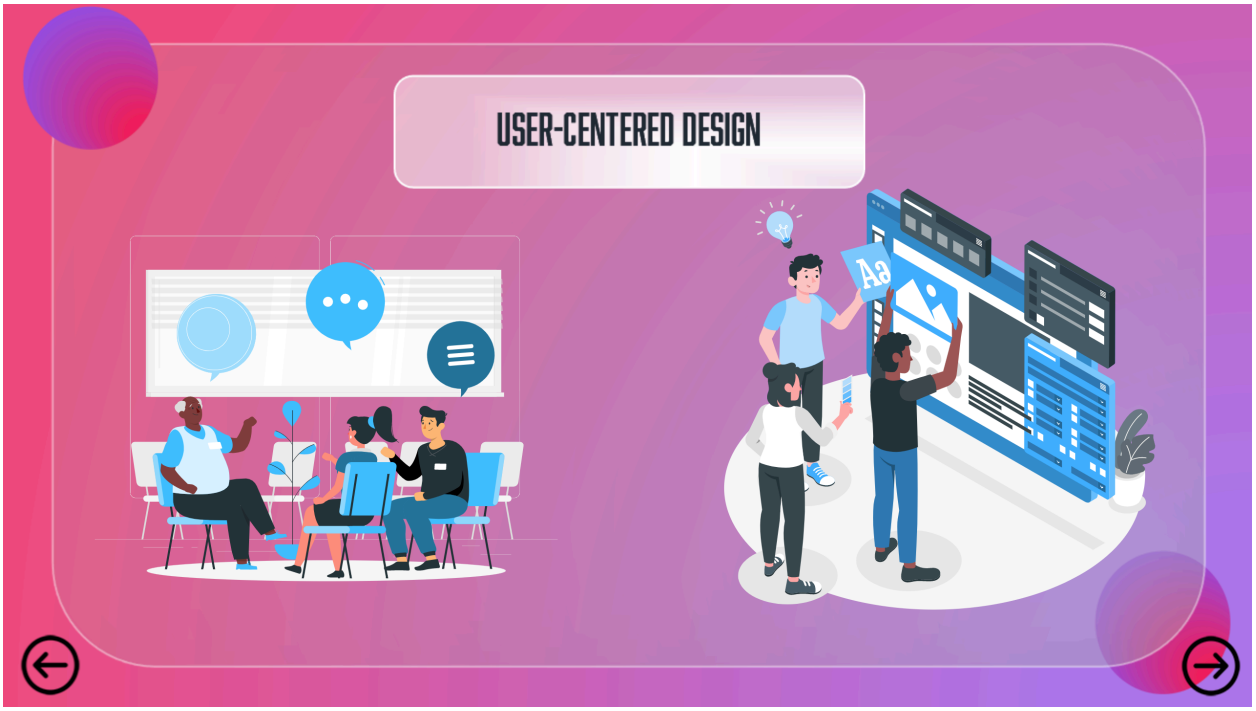

Figure 9: User-Centered Design

The answer to all these issues, as you know, is user-centered design. This is an approach that "puts human needs…first, then designs to accommodate those needs" (Norman, 2013). You learned some basic principles of user-centered design in the introduction to our course. Now, let's learn some new terms which will further enhance our understanding of those principles.

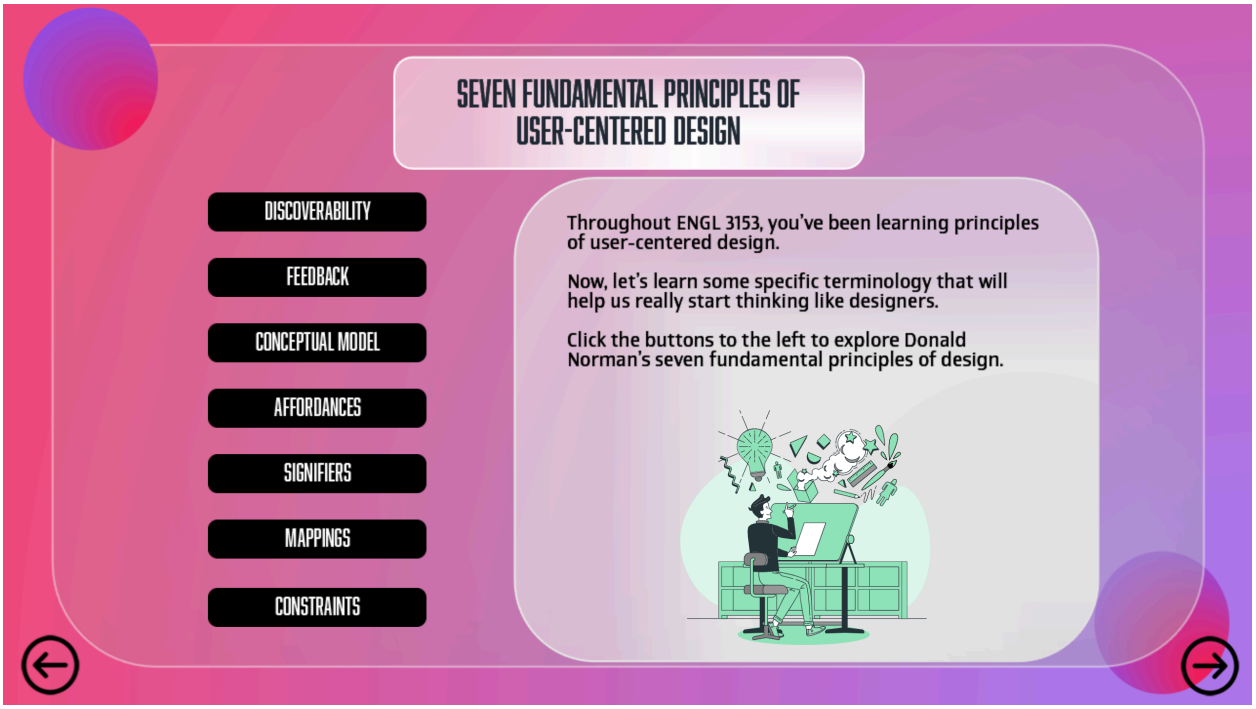

Figure 10: Click to Reveal

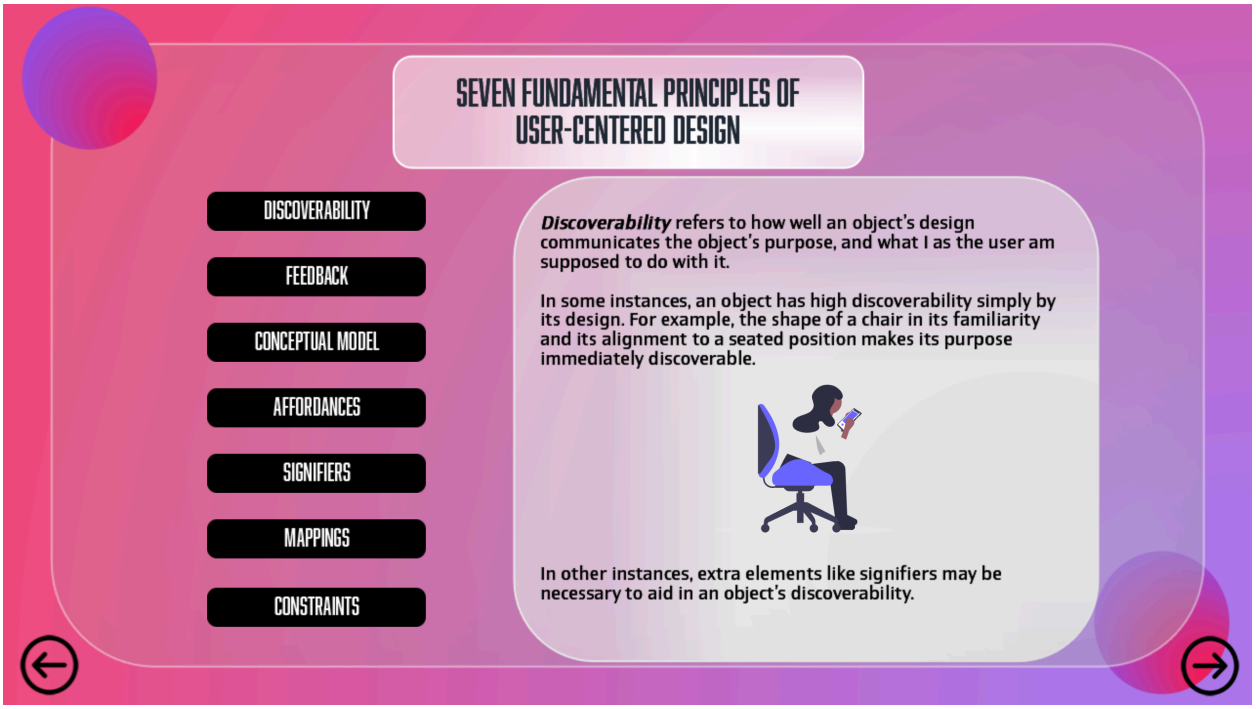

Figure 11: Click to Reveal, Discoverability

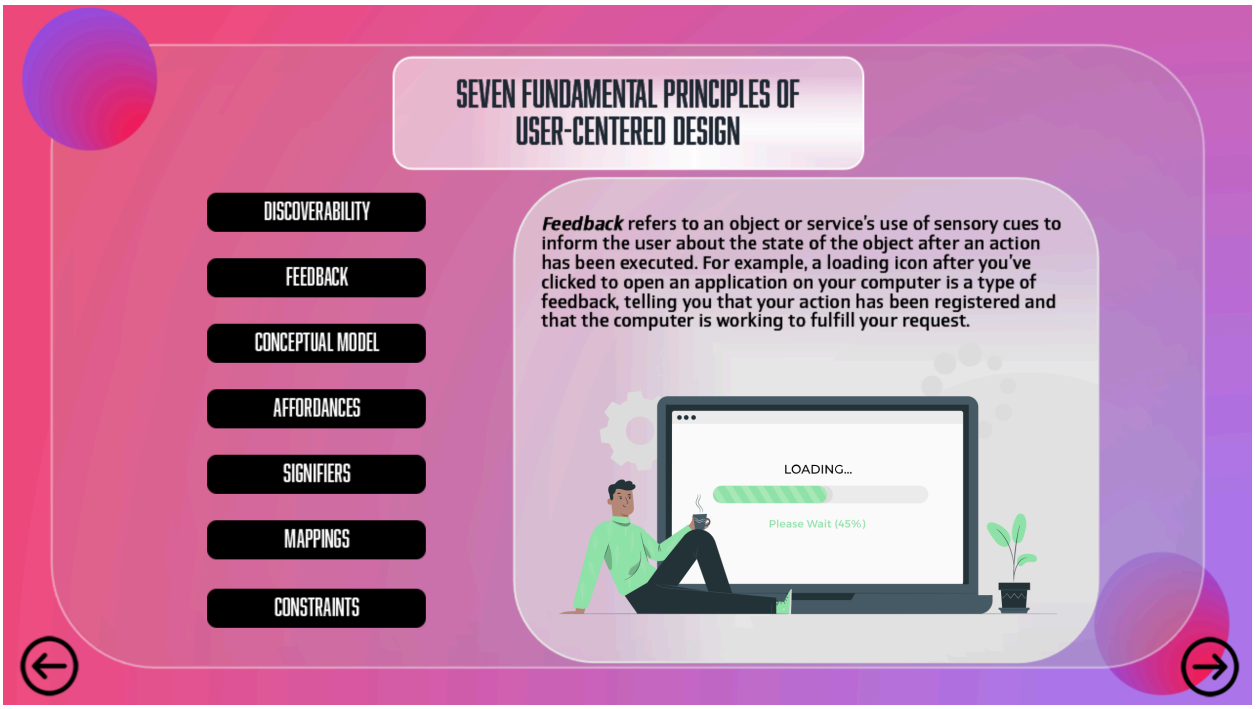

Figure 12: Click to Reveal, Feedback

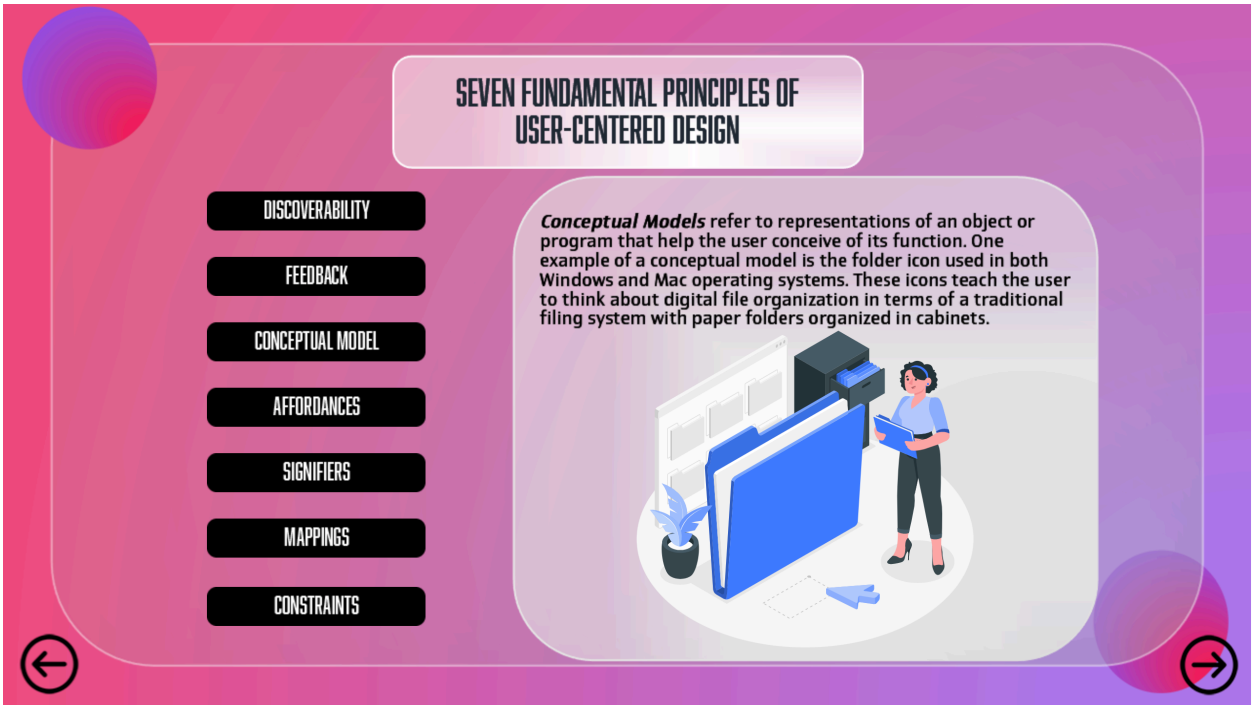

Figure 13: Click to Reveal, Conceptual Model

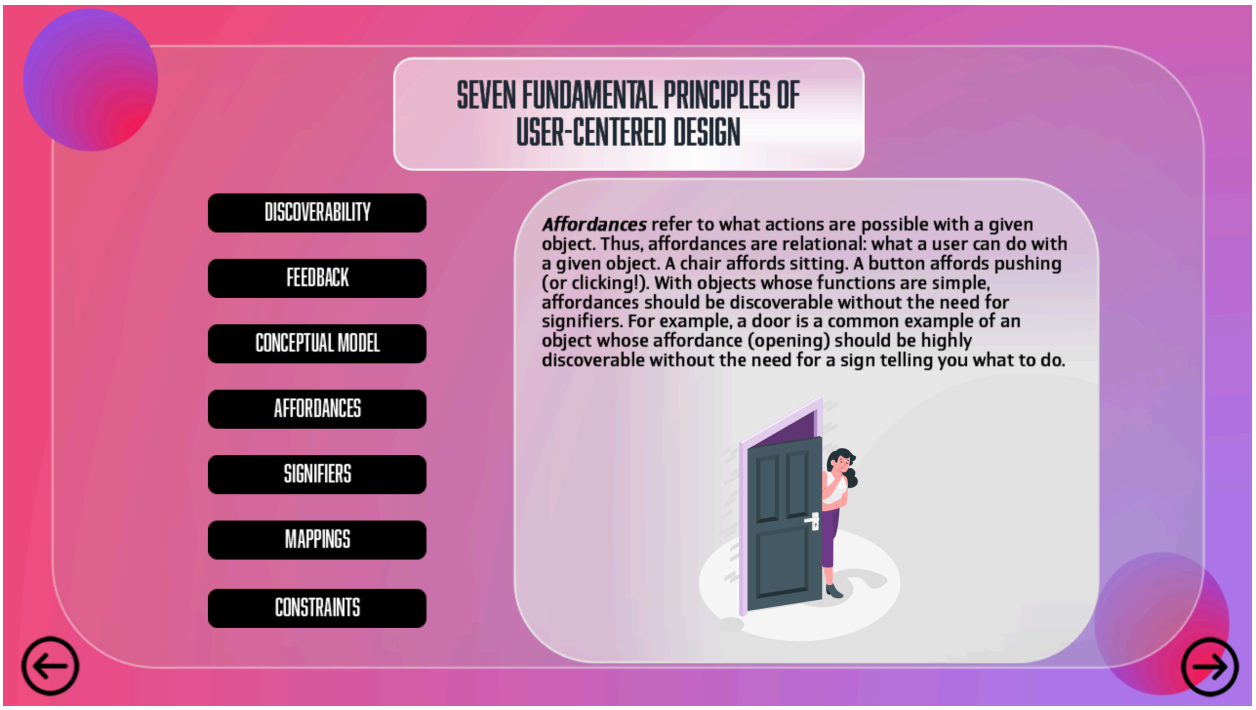

Figure 14: Click to Reveal, Affordances

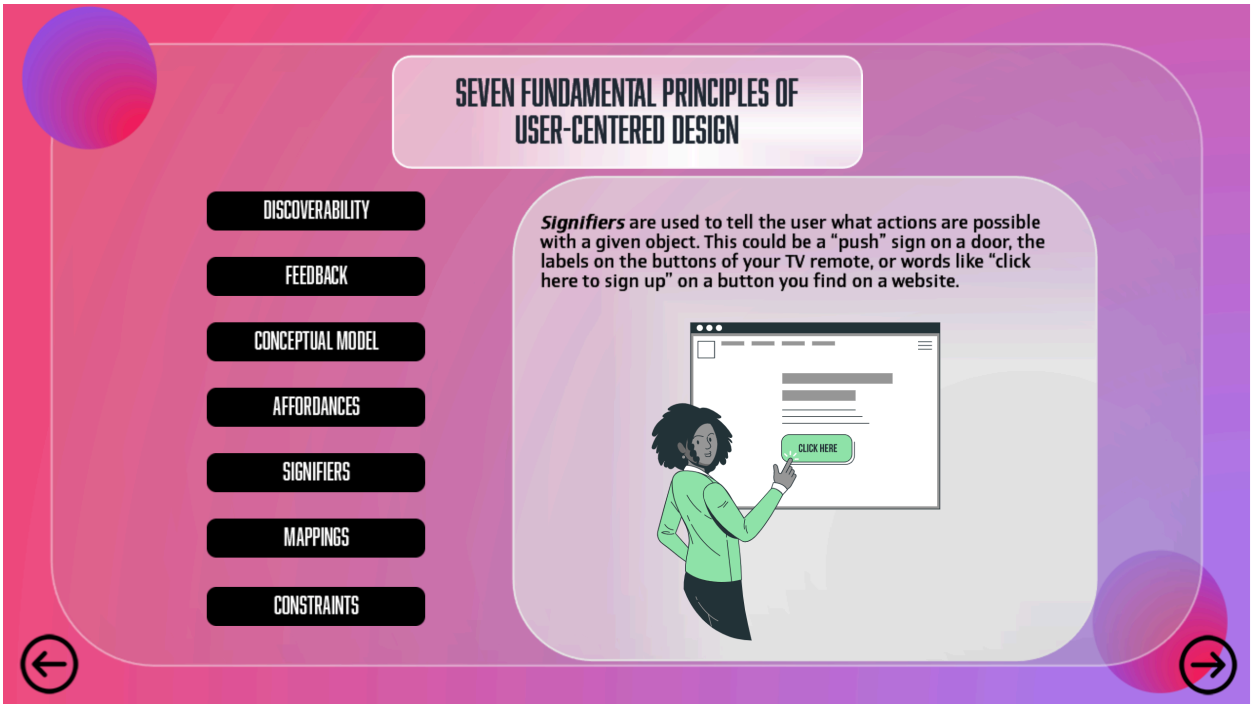

Figure 15: Click to Reveal, Signifiers

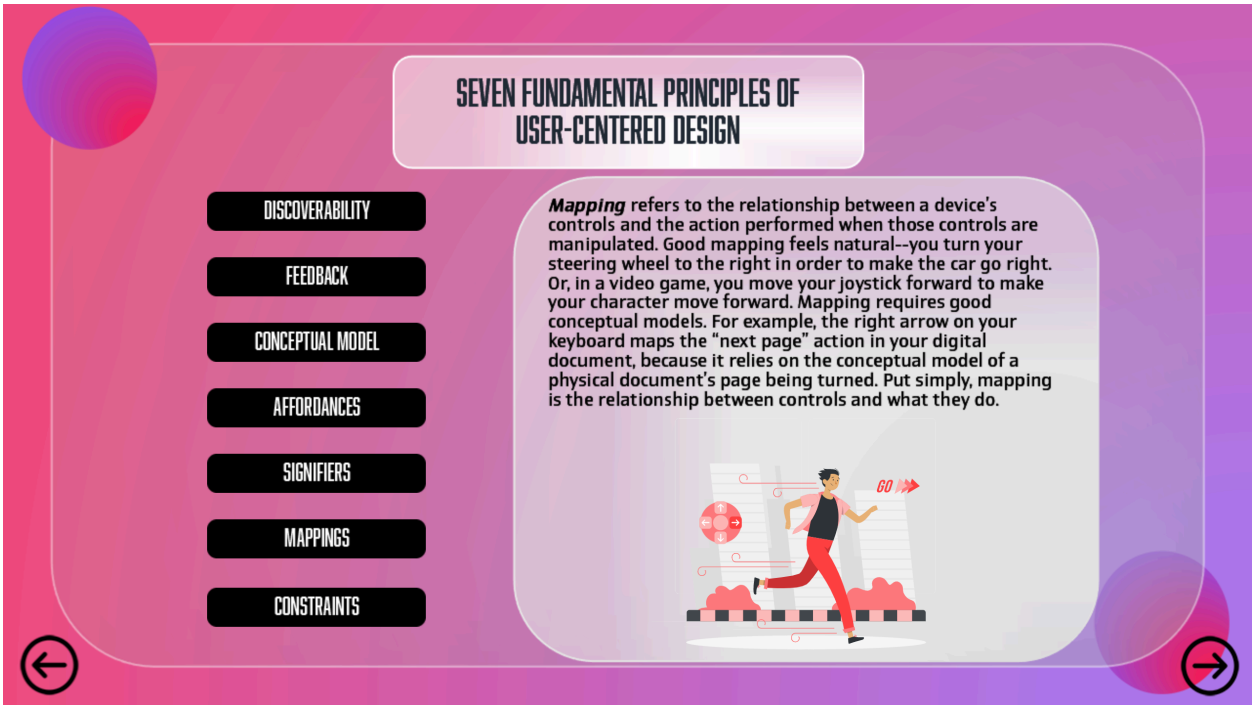

Figure 16: Click to Reveal, Mappings

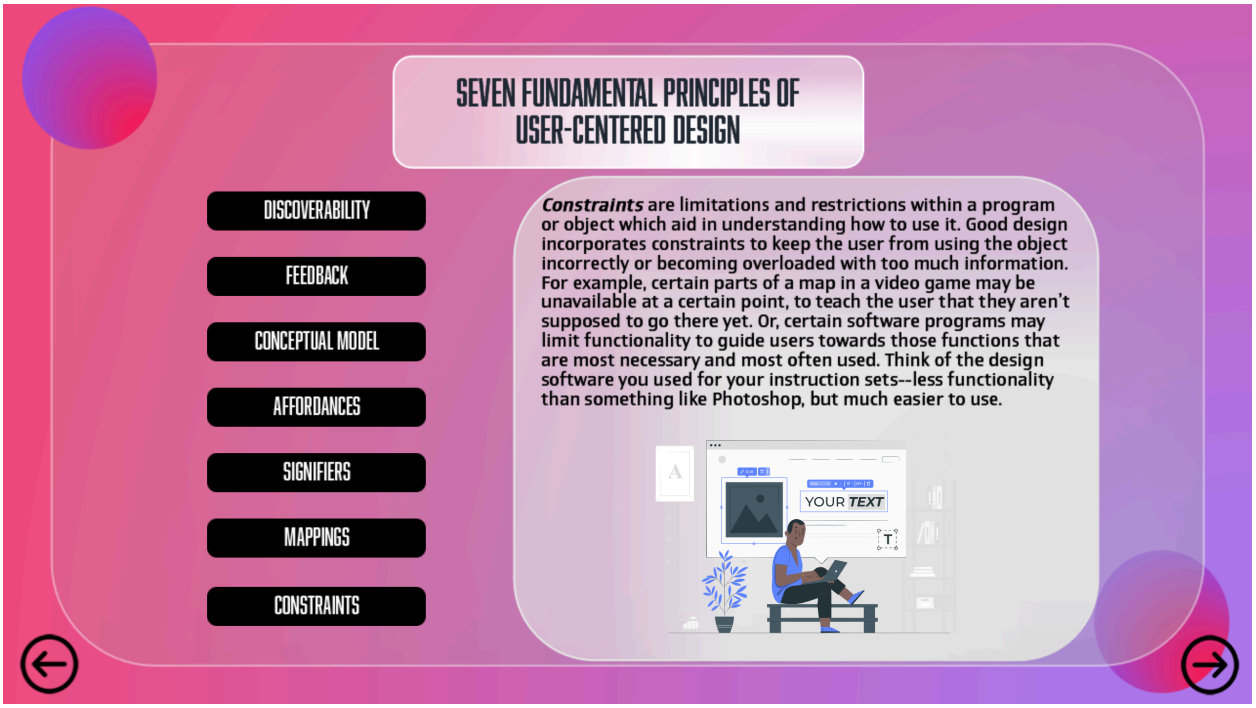

Figure 17: Click to Reveal, Constraints

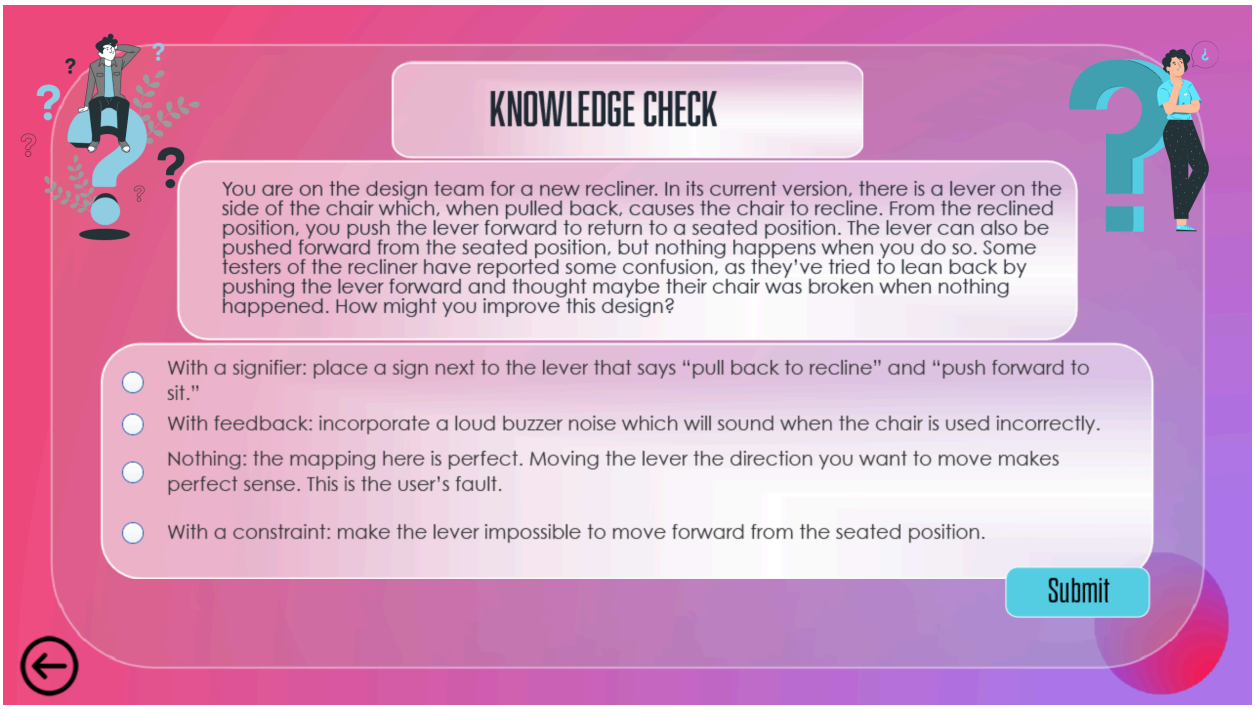

Figure 18: Knowledge Check Slide

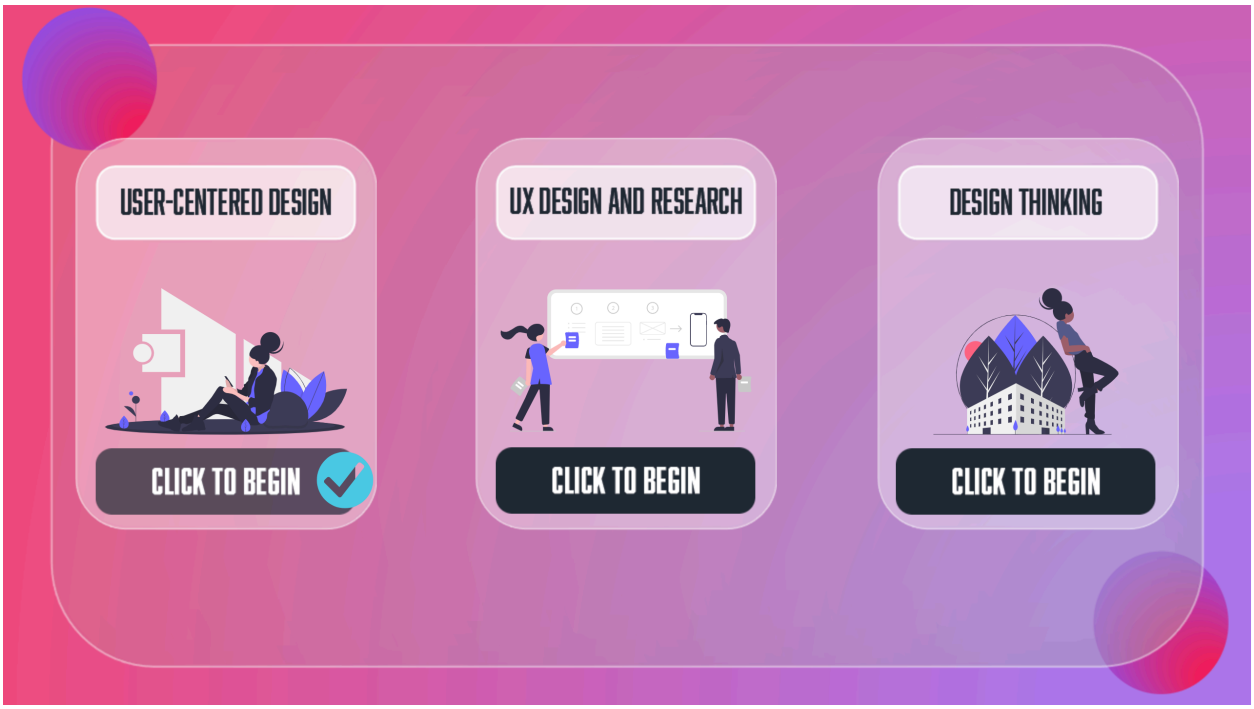

Figure 19: Return to Dashboard

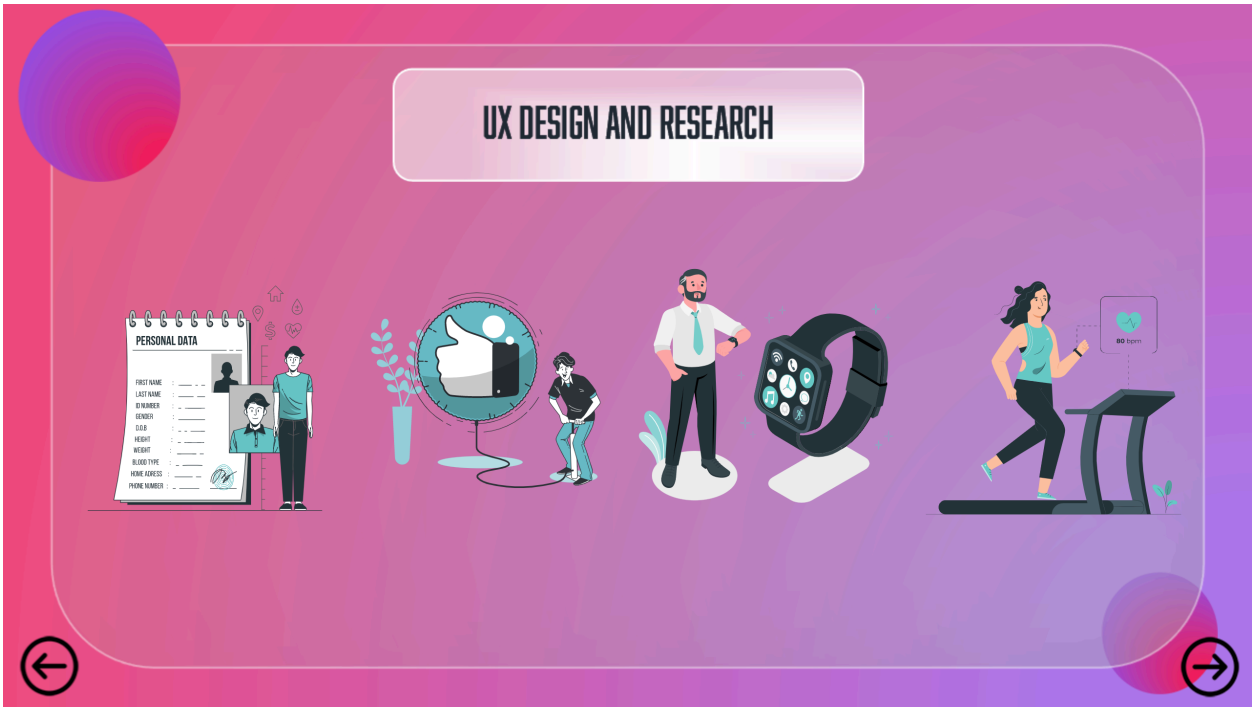

Figure 20: UX Research and Design

All this talk about designing for the user might have you thinking: "How can I design for my user without knowing who they are, what they like, what things they use, and how they use them?" Good question! This is where user-experience research comes in.

We're relying now on the idea of user expertise. As an engineer or designer, you may know how to build something, but the person who uses your design regularly will know it in a unique and singular way. They will hack it and adapt it to better serve their own purposes. Designers who listen to users, then, are able to create truly innovative products.

So, listening is key. How do we do it?

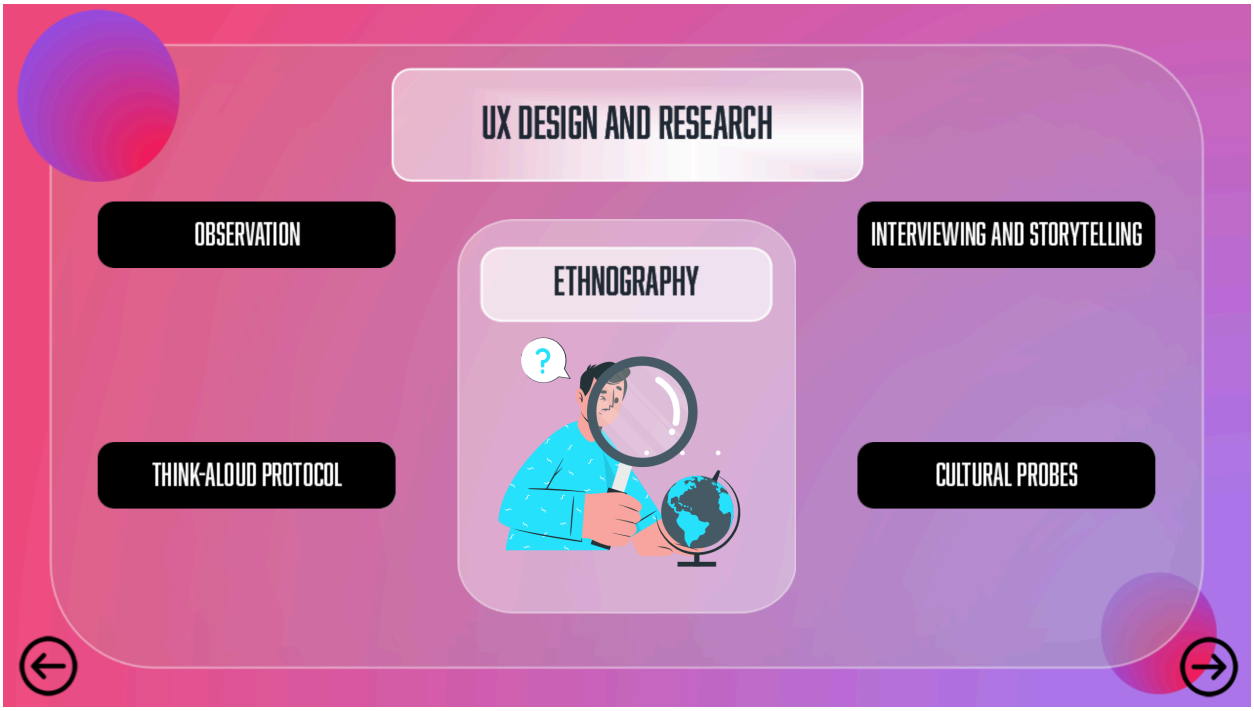

Figure 21: Ethnography

Much of the research that UX researchers and designers do is called ethnography: the study of a person or culture with the goal of uncovering codes, expertise, and vernacular literacies. Put simply, ethnographers doing UX research want to understand why and how people act, talk, interact with one another, and most significantly—how they use things.

Ethnographers gather this information using several methods. We're going to talk about four: Observation, Think-Aloud Protocol, Interviewing and Storytelling, and Cultural Probes.

Click on each icon to learn more.

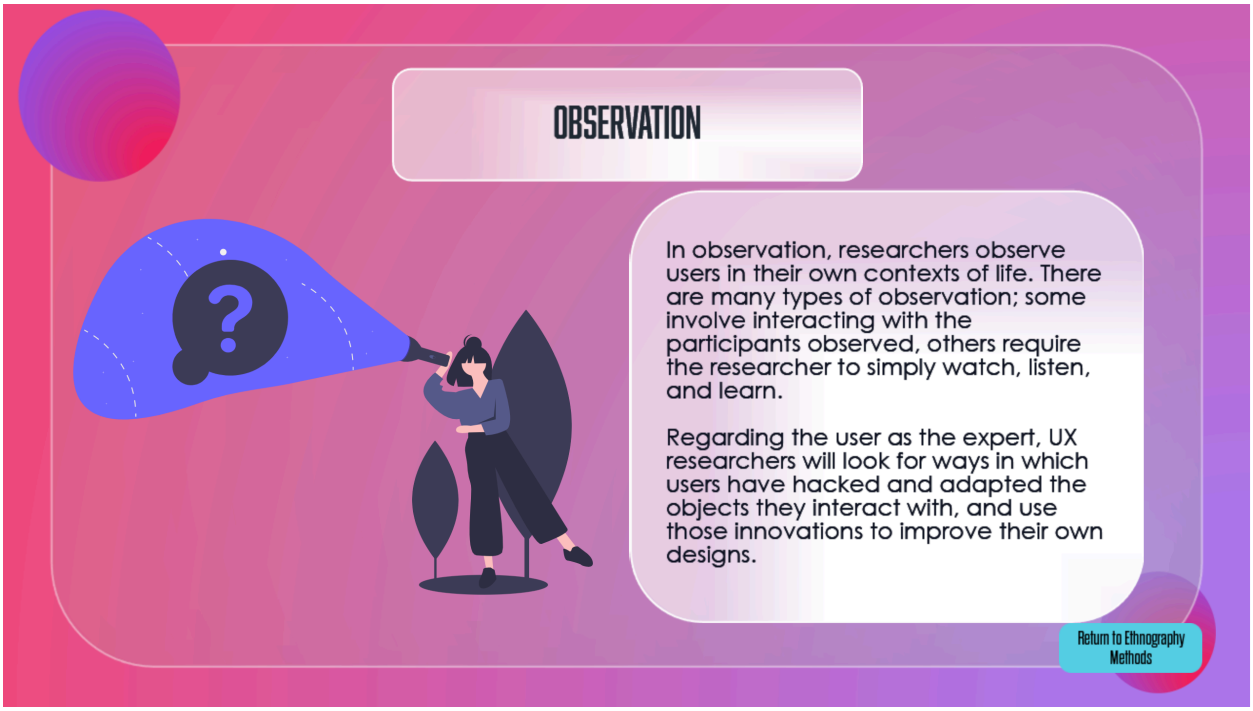

Figure 22: Observation

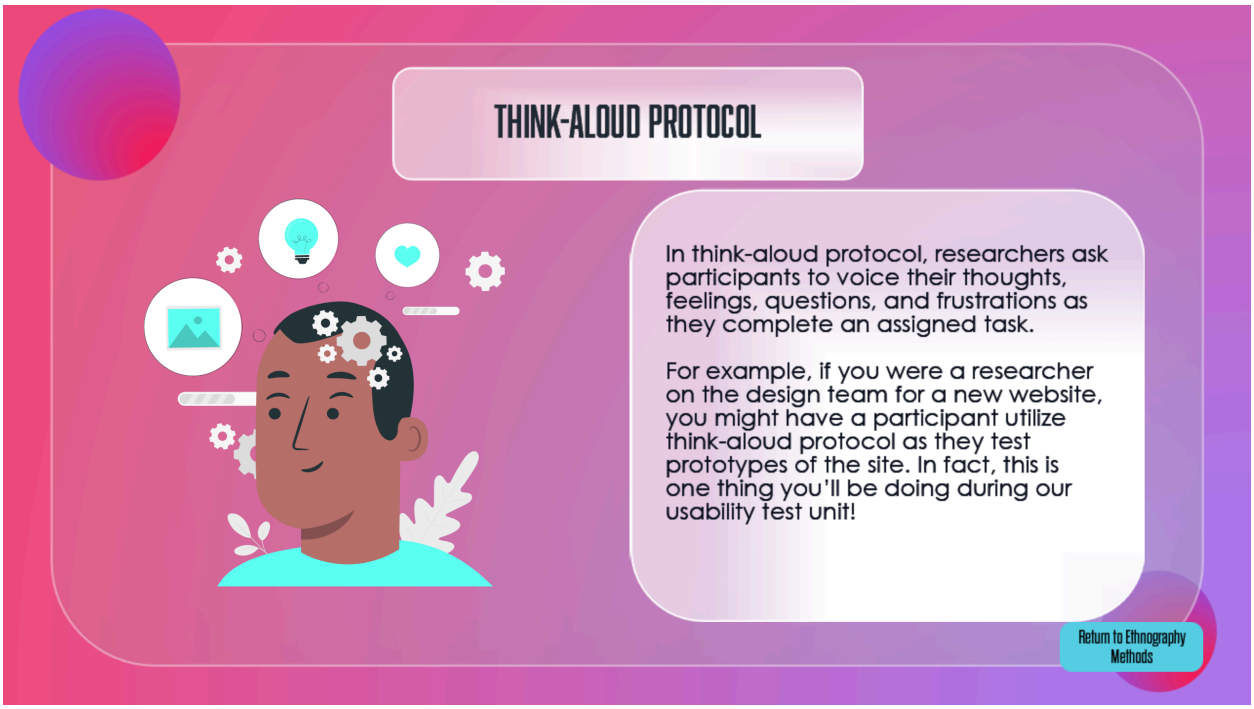

Figure 23: Think-Aloud Protocol

Figure 24: Interviewing and Storytelling

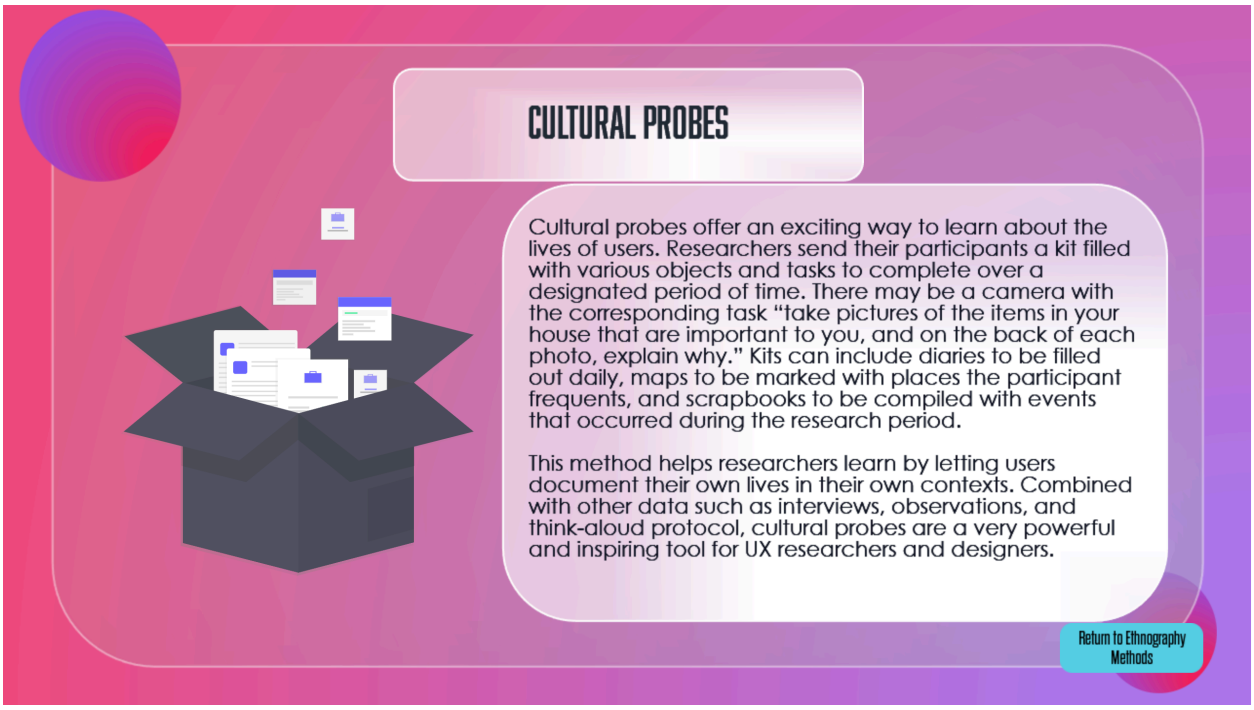

Figure 25: Cultural Probes

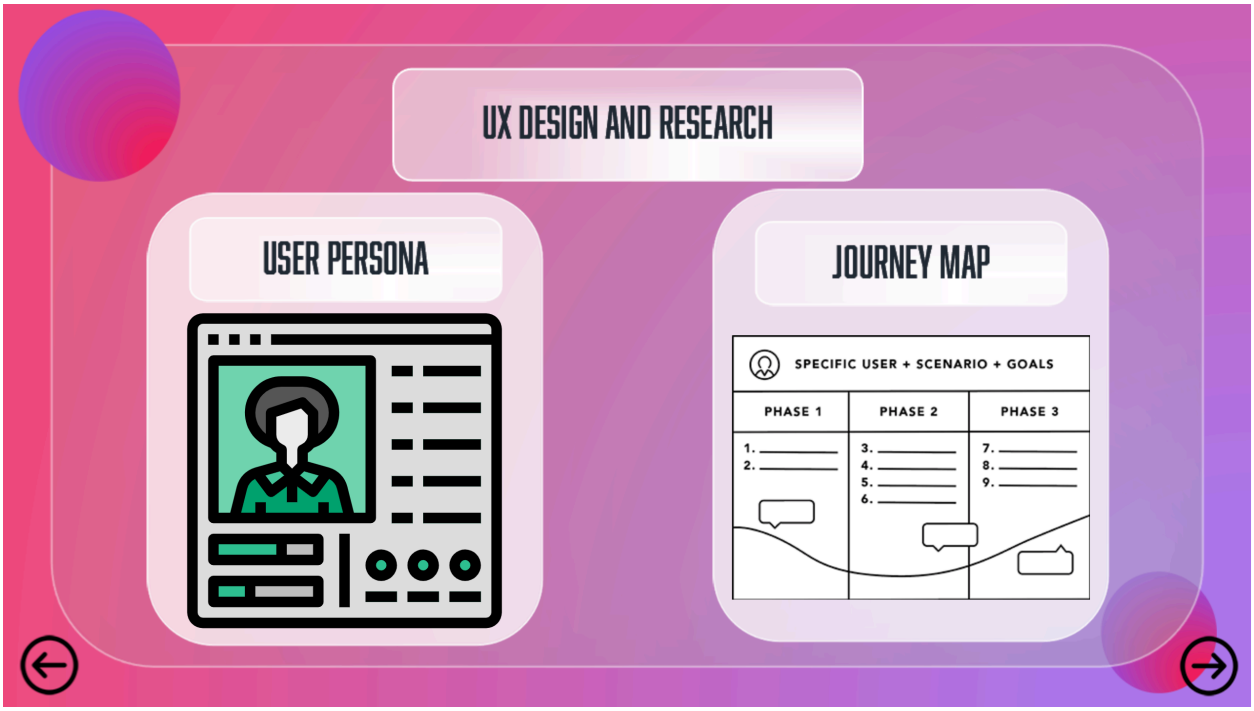

Figure 26: User Personas and Journey Maps

So, what do you do with all that data? That is, how do you take what you've learned from your research and use it during the design process? There are several ways to do this; two common ones that you'll be practicing in this class are the User Persona—a fictional character created from your research that represents a type of user you're designing for, and the Journey Map—the imagined experience you see that persona having with your design from start to finish.

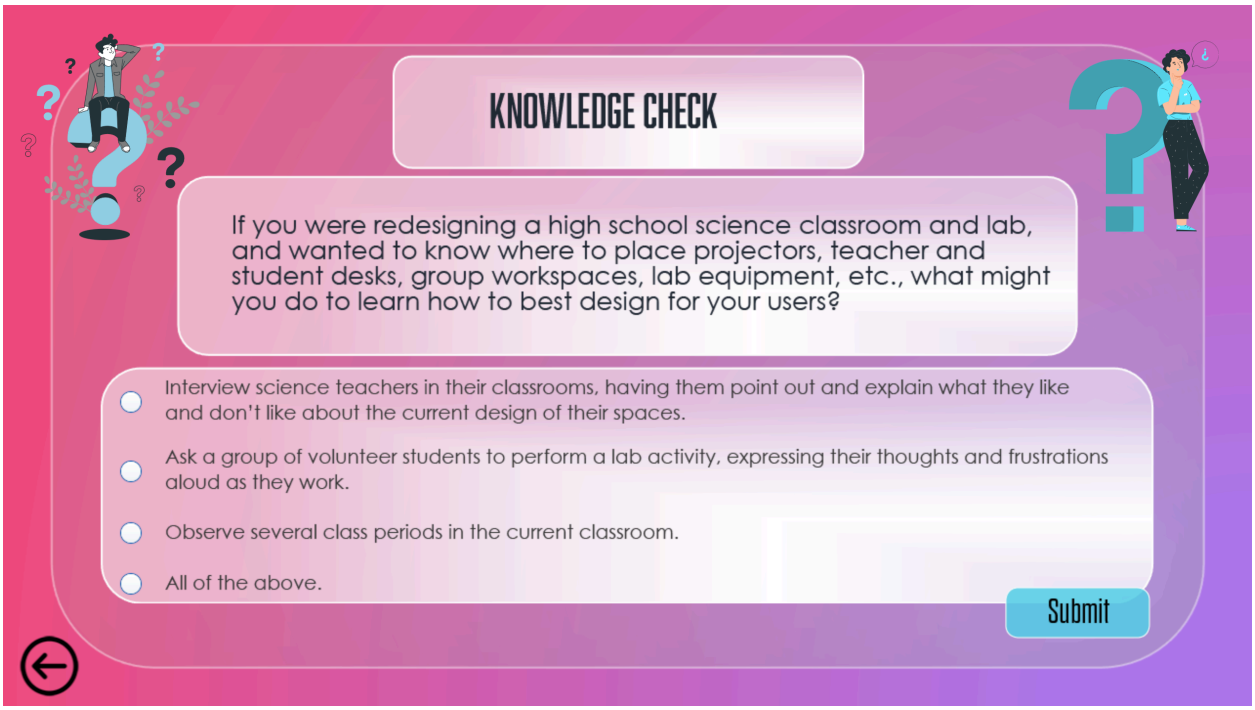

Figure 27: Knowledge Check Slide

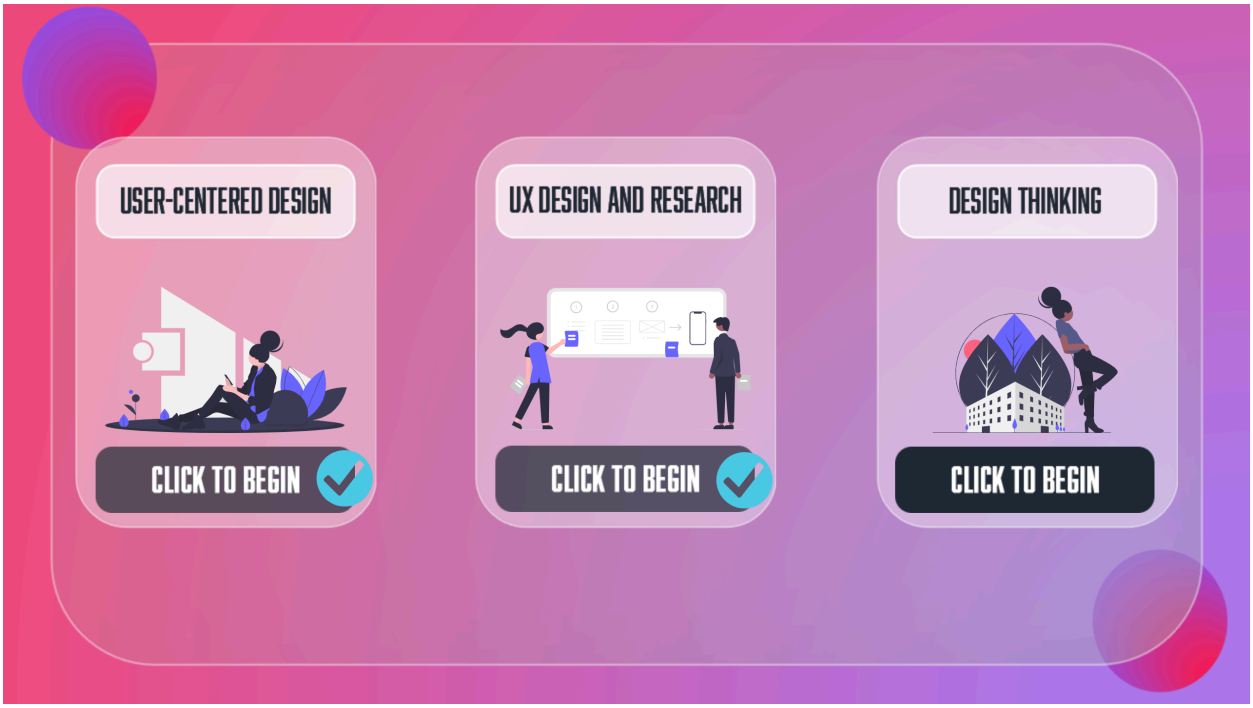

Figure 28: Return to Dashboard

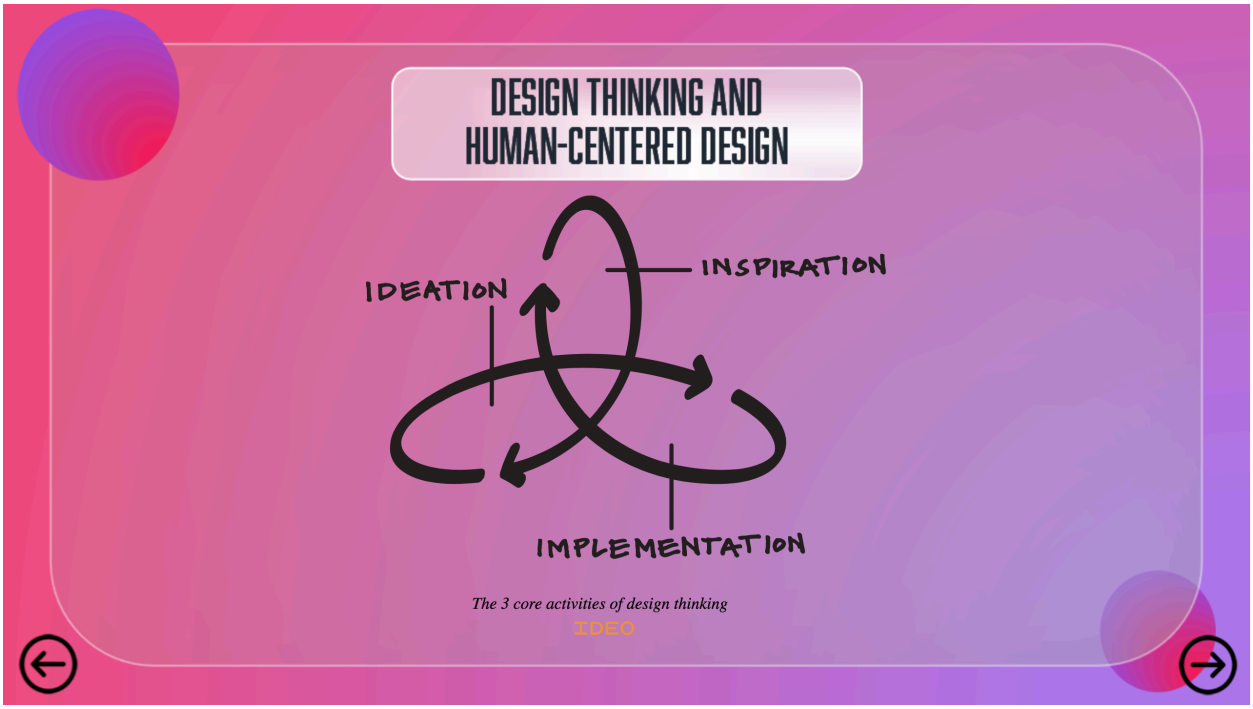

Figure 29: Design Thinking

In this class, we're going to practice the UX research and design skills we've been discussing by looking at websites and other digital designs. But, odds are, most of you aren't trying to become UX designers. That's where Design Thinking comes in. This process will help you transfer the skills you'll learn in this unit to whatever career you end up having—from engineering to environmental science.

So, Design Thinking is a process. Inspiration includes those research methods we learned about in the UX research section, but it also means cultivating a mindset where you are *always* learning about your users and developing empathy towards those whose lives you are trying to improve. Ideation is where you come up with solutions based on your research, prototype those solutions, and have your users test them to see if they work. Implementation is where you put your designs out into the world (IDEO).

Notice, this process isn't linear, but iterative. Ideation and implementation always lead back to the user, who you continue to empathize with and become inspired by, which continually leads to new and innovative designs.

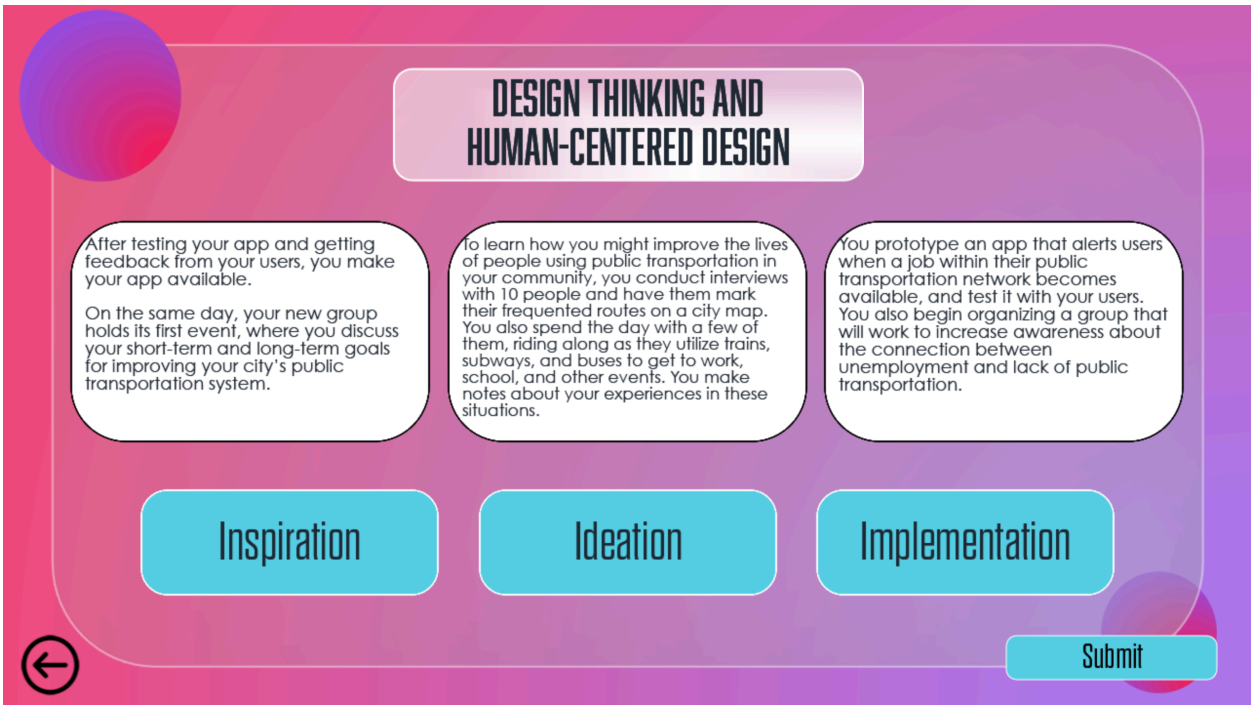

Figure 30: Design Thinking Drag and Drop

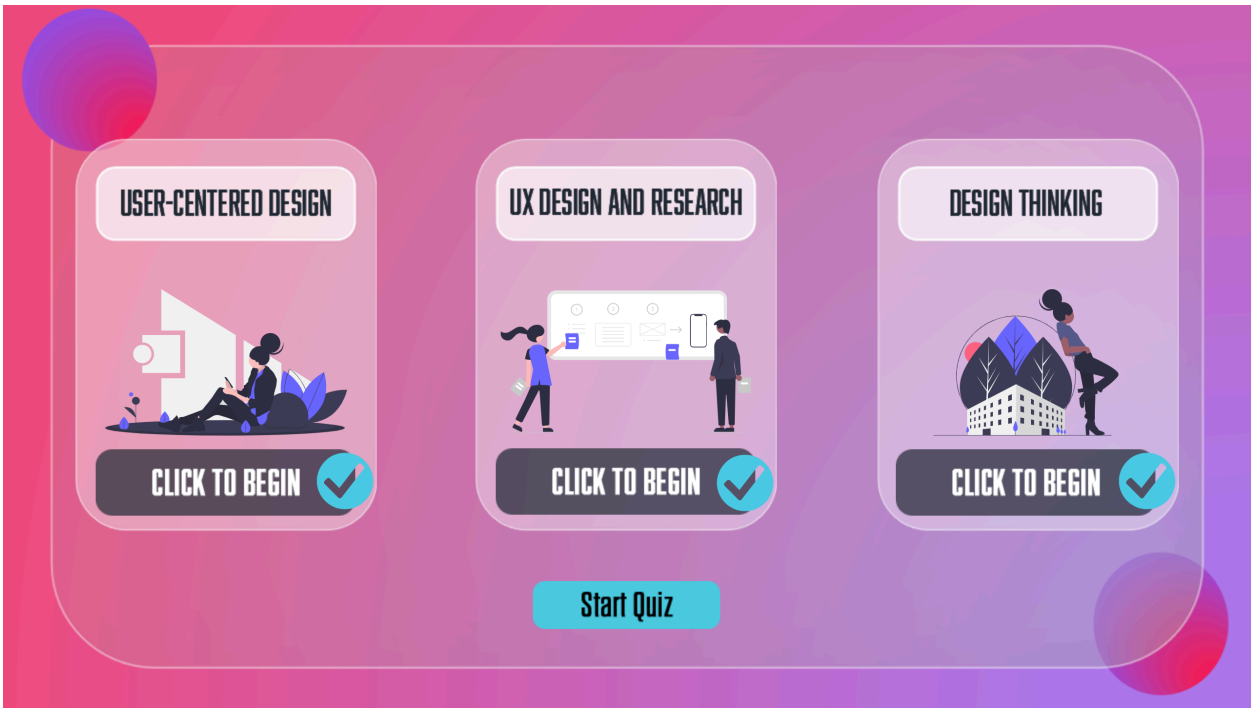

Figure 31: Dashboard Complete, Start Quiz

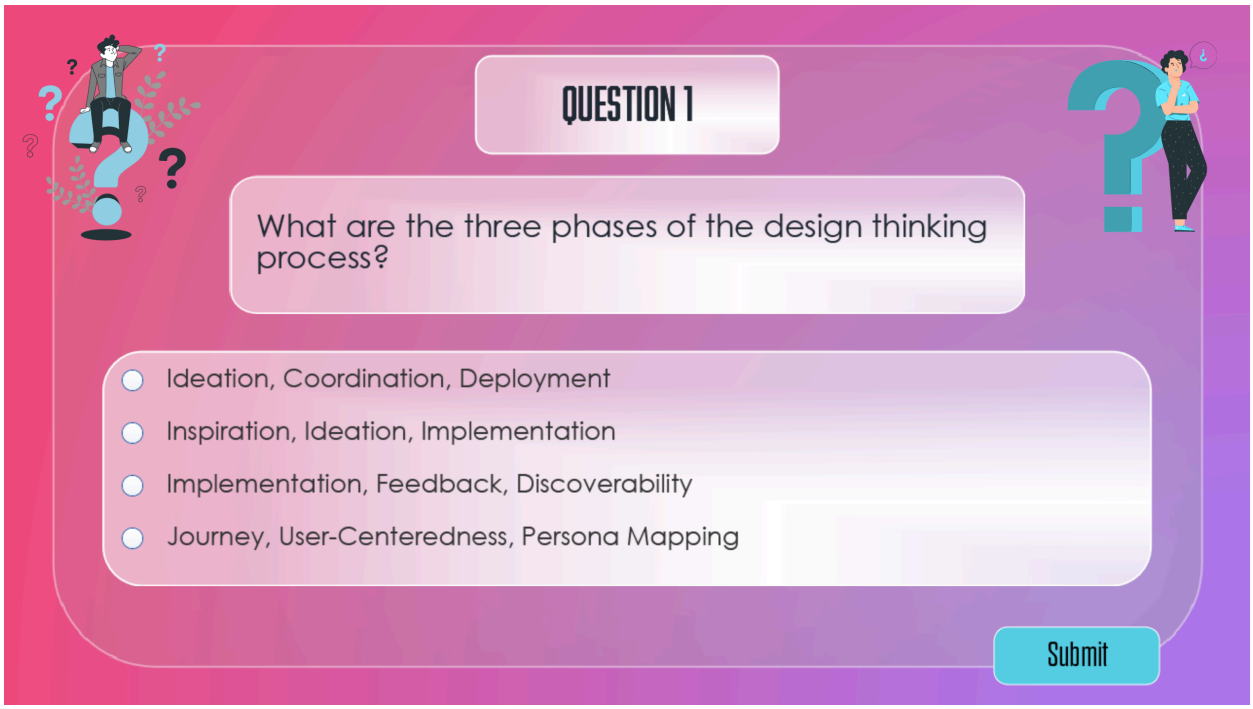

Figure 32: Question 1

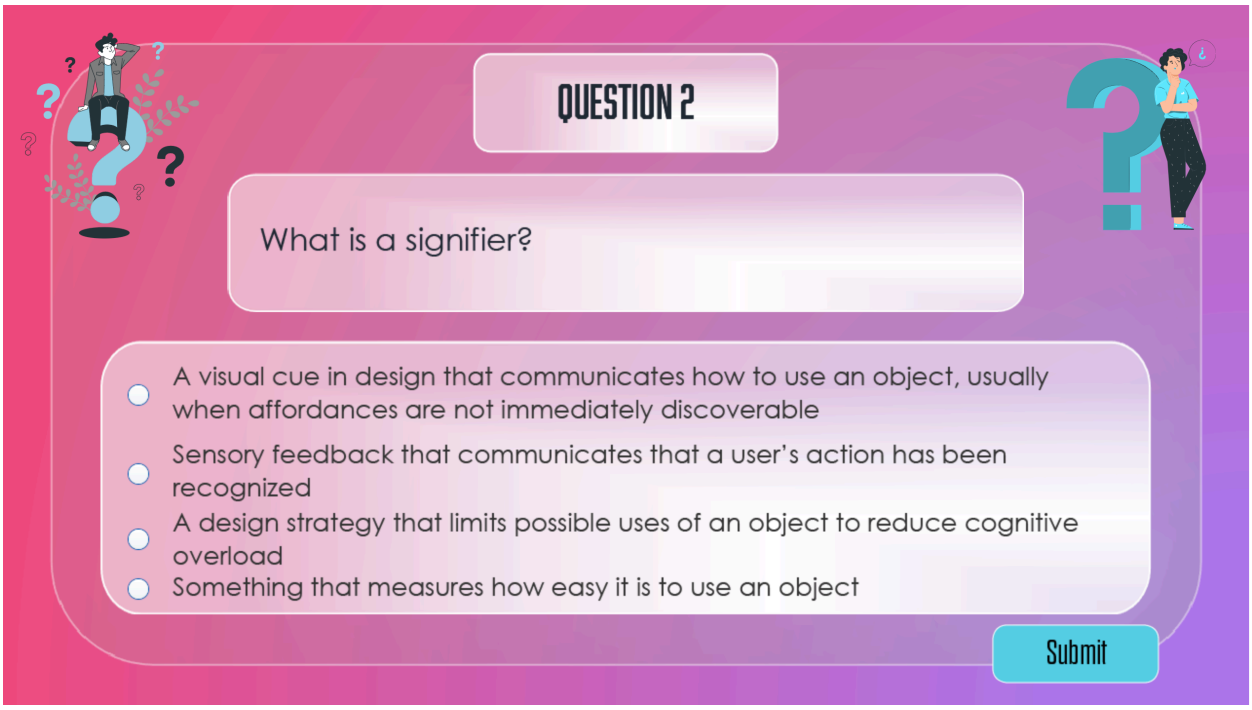

Figure 33: Question 2

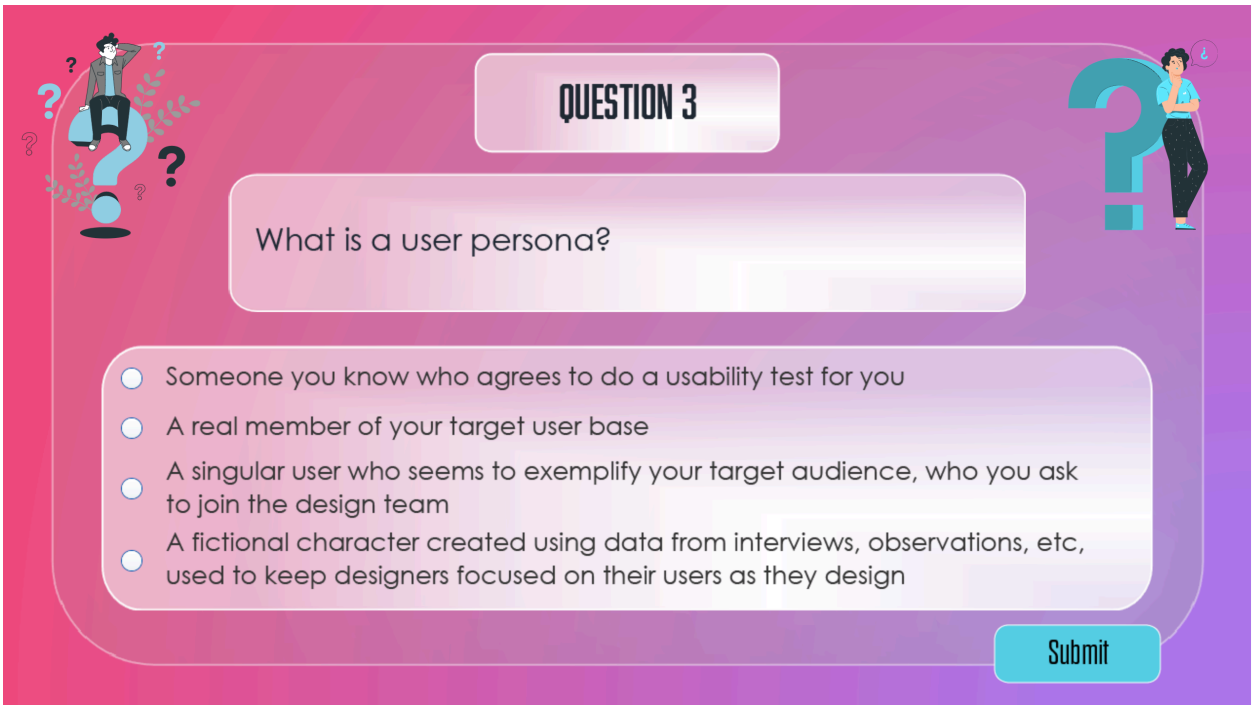

Figure 34: Question 3

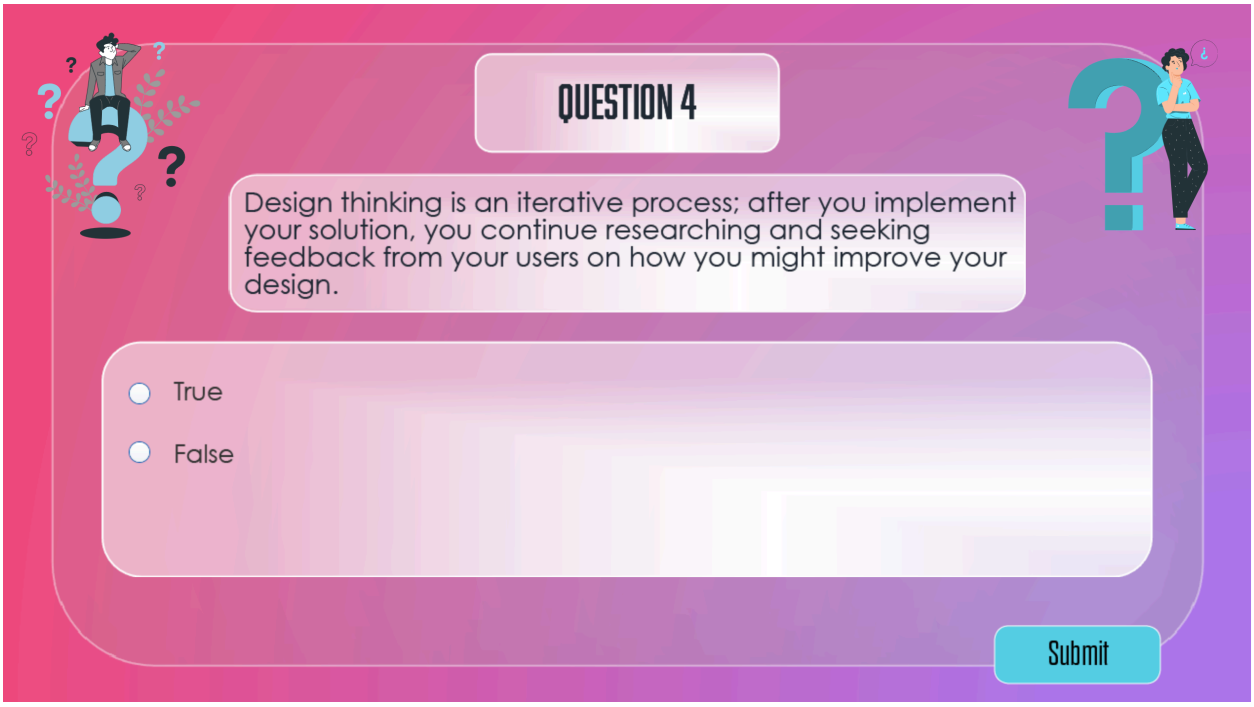

Figure 35: Question 4

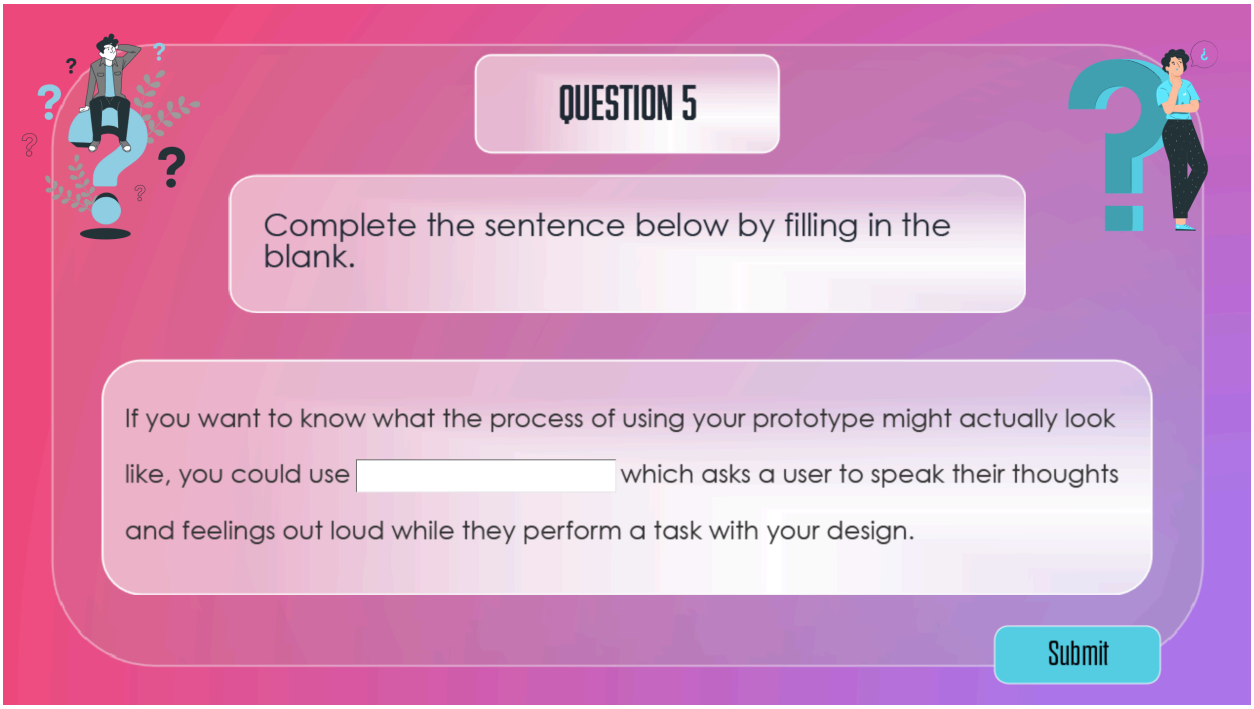

Figure 36: Question 5

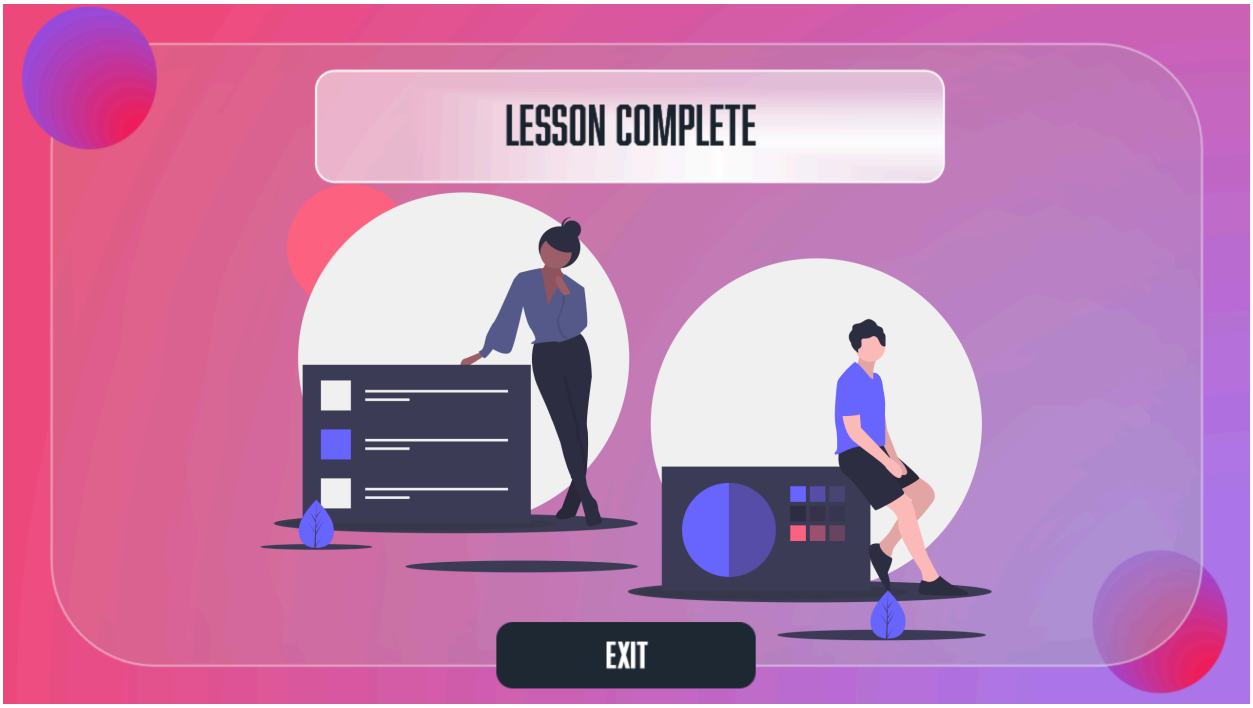

Figure 37: Exit Slide

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