Lesson 3: User Centered Design Define and Prepare

Overview

Question of the Day: How can we design for people other than ourselves?

This is the first part of a two-day lesson where students are guided through an abbreviated version of the design process they will be seeing throughout this unit. This lesson focuses on the Define and Prepare steps of the process. Students first brainstorm a list of potential users of smart clothing. As a class, they then group these ideas into broad categories and each group will choose one category of user. Groups repeat this process to brainstorm needs or concerns of their user, eventually categorizing these needs and choosing one to focus on. In the next lesson, students will complete the Try and Reflect steps of the design process.

Purpose

This micro activity is the first of three design projects in this unit. It is a fast-paced introduction to the user-centered design process, intended to give students an experience with user-centered design that they can build on in later projects. In this lesson the primary goal is to establish that design decisions will be made with the user's needs in mind. The practice of categorizing lots of disparate ideas to help make decisions will also reappear later in the unit.

The activity in this lesson is an adaptation of the **Design Charrette from the University of Washington**.

Assessment Opportunities

1. **Generate multiple strategies for meeting user needs.**

   Activity Guide, Page 2: At the top of the page, students should have have generated multiple relevant ideas for meeting the user's needs.

2. **Organize ideas and strategies into meaningful categories.**

   Circulate the room as students group their ideas into categories. There should be multiple related ideas in each category, with multiple categories for each group.

Objectives

Students will be able to:

- Generate multiple strategies for meeting user needs.
- Organize ideas and strategies into meaningful categories.

Preparation

- Ensure you have plenty of sticky notes, pens and large poster paper for students to work on
- Set up groups with preferably 3 students each

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the teachers

- **CSD Unit 4 - The Design Process** - Slides

For the students

- **The Design Thinking Process** - Video
- **User Centered Design (Define & Prepare) 2021** - Activity Guide

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

- **CS** - Computing Systems
- **IC** - Impacts of Computing

Agenda

Warm Up (5 minutes)
- **Journal**

Activity (35 minutes)
- **Introduce Design Thinking**
- **Introduce the Activity**
- **Define**
- **Prepare**

Wrap Up (5 minutes)
- **Journal**

Teaching Guide

Warm Up (5 minutes)

Journal

Prompt: In the last two lessons we've seen that products are designed with a purpose and that different designs are more useful or pleasing to different people. Since different people have different needs or interests, what might be some of the challenges if you're trying to design a product for someone else?

Discuss: Have students think silently before having them share with their tables and then the class as a whole.

Discussion Goal

Goal: This should be a very quick introduction to the lesson. You are looking to call out that designing for other people requires you to consider their needs instead of your own, which can often be challenging. This discussion will lead into the video introduced just after the warm up.

Remarks

> Designing for other people can be challenging for a lot of reasons, but one of the most important is that it challenges us to consider what another person values, likes, or is concerned about. In other words we need to have empathy for someone else. Today we're going to do a mini design activity to help us practice the entire process ourselves.

Question of the Day: How can we design for people other than ourselves?

Activity (35 minutes)

Introduce Design Thinking

Video: Watch the Design Thinking Process video with students. Stop the video after Step 5 (around 3:10).

Teaching Tip

Design Thinking: Today's activity, as well as this entire unit, are heavily influenced by Design Thinking. This is a very open-ended, creative process that may be hard to visualize if you've never participated in a design thinking activity yourself. The resources below can help you imagine what your classroom will look like during these design thinking activities.

- **What is Design Thinking? A Handy Guide for Educators**.
- **Design Thinking: Lessons for the Classroom**
- **Design Thinking Teacher Training (Video)**

Some of these resources are framed around science classrooms or physical prototypes, which is different from this unit which ultimately focuses on creating apps. Regardless, they should offer some clarity on what the entire process looks like from start-to-finish and what your classroom may look-and-sound like during these activities.

Display: Display the steps from the Design Thinking Process. As you talk about this process, click the animation on the slide to have these steps fade out and the Problem Solving Process fade in.

Remarks

> The Design Thinking Process is very similar to our Problem Solving Process - both are centered around empathy, and both have a similar cycle for defining, preparing, trying, and reflecting. Over the next few weeks, we're going to practice this process so we can design products and apps for people in our communities and around the world. Today and tomorrow, we're going to practice a shorter version of this process by brainstorming different groups of people and their needs, then designing smart clothing products to meet those needs.

Introduce the Activity

Group: Students should be in teams of 3 to 5.

Distribute: Hand out the activity guide to each student, as well as markers, sticky notes, and poster paper for each group.

Teaching Tip

Reducing Printed Materials

Online Option: The Activity Guide can be completed online. For the drawing, students can either draw their product online or submit a paper version of their product separately.

Journal Option: This activity can be completed as a journal entry. Students can use a digital version of the Activity Guide as a prompt, copying the headers or prompts into their journals.

User-Centered Design

Overview: As a class read through the "Overview" section to make sure groups understand the goal of the activity.

Teaching Tip

Why Smart Clothes?: This type of product was chosen because there are broad applications for combining computing technology with clothing that could benefit many types of users. An additional benefit is that the field is not yet well-defined and so it provides students more leeway to develop ideas for how to solve people's problems rather than rely on more established solutions.

Define

Brainstorm User Groups: Ask students to list on their activity guides as many different potential user groups of smart clothing as they can think of. The video gave an example of elderly people, but students can come up with different groups of people. Give students a couple of minutes to brainstorm independently. Once they're done, ask each student to create a post-it for the two or three user groups they think are most interesting.

Teaching Tip

Brainstorming User Groups: In this first brainstorming activity, try to model this process carefully. Encourage students to consider different identifying factors when brainstorming users - for example, identifying users by age or occupation or living situation. These should be broad, one or two word responses that identify large groups of people in the population. Some examples may include: young students, military, doctors, pet owners, live on a farm, etc.

Encourage students to draw from people they know in their lives to help generalize to a certain type of user. Emphasize the fact that there are no right or wrong ideas, and students will have a chance to narrow down their choices later.

Categorize Users: Have students group together post-its of their users into similar categories on their poster board, such as by age or occupation. It is okay if some post-its don't fit into any similar groups and are left by themselves.

Teaching Tip

Categorizing Users: The larger goal is for students to notice any patterns or similarities between the groups that each person brainstormed independently. The categories may continue to generalize user groups - for example, post-its like "police" and "firefighter" and "EMTs" might get grouped together because they are all "first responders".

When creating categories, emphasize that again there are no "right" categories - instead, remind students that the goal here is to Define the problem they will try to solve and this process is a useful way to begin focusing on a specific problem.

Choose Specific User: Ask groups to pick one of the user categories they've created. Do your best to ensure a good mix of categories in the classroom but it's not a problem if some groups choose similar user categories.

Brainstorm & Categorize Needs: Students will repeat the brainstorming process to identify a list of potential concerns, interests, and needs of the user they picked. Begin by brainstorming on the activity guide, then creating post-its for two or three of their ideas to share on the poster board. Encourage students to think carefully about what might be important to those people.

Circulate: Students should repeat the same process of creating scraps of paper for each need, interest,

or concern of their user and then grouping them. Students can use the markers and poster paper to do this step if you have provided those materials.

Assessment Opportunity

As you circulate the room, check that students are grouping ideas into meaningful categories. Categories should be broad enough that several related ideas fall into them, but not so broad that there are only one or two categories for the entire group.

Choose Specific Need: Ask groups to pick the specific need for their user that they want to address. They should try to pick a need they think could be addressed by smart clothing so in some cases they may need to be a little creative in thinking about these needs.

Share Out: By this point, each group should have settled on a specific user group and a need or interest that group has. Ask groups to share their user group and need with the rest of the class.

Prepare

Brainstorm Solutions: Ask students to brainstorm potential ways smart clothing could be used to address the problem they've decided to solve. Record their thoughts on the second page of their activity guide.

Discuss Pros and Cons: Once students have brainstormed solutions individually, have students share their ideas with their group and discuss the pros and cons of each solution. Encourage students to use the discussion to build on each other's ideas, possibly generating even more potential solutions.

Teaching Tip

Discussing Pros and Cons: Students should speak from the standpoint of their user, imagining any intended or unintended benefits and harms for each proposed solution. They are not judging ideas as “good” or “bad”, but instead discussing whether or not the solution addresses the needs & interests of their user. Some useful phrases during the discussion are saying “Yes, and...” when they hear a pro, and saying “No, but...” when they hear a con.

Choose Specific Solution: Have the group choose a specific solution they will focus on. They may decide to combine solutions from their discussion or use a brand new solution that developed during the discussion. This decision will guide the product they create in tomorrow's activity.

Remarks

> Today we’ve completed the Define and Prepare stages of our design process - we’ve determined our users and brainstormed their needs, and are now ready to design a solution using smart clothing. Tomorrow we’ll complete the Try and Reflect stages, where you’ll create your own smart clothing design and share your ideas with the class.

Collect: Either collect the activity guides from each student or ask them to store them in a safe place - they will be used in tomorrow's activity.

Wrap Up (5 minutes)

Journal

Prompt: Today's activity involved a lot of brainstorming with your group. What is one example from

today where a group member had an idea that you hadn't considered before? How did that idea affect some of the decisions you made?

Discuss: Allow students a minute to think silently before having them share with their tables and then the class as a whole.

Discussion Goal

Goal: Students should reflect on how different voices helped elevate the ideas the group had and may have contributed to the product they will begin designing tomorrow. This attention to teamwork and valuing others ideas will be important throughout the unit as students work together to develop apps for others.