Design Thinking Workbook

Whether this is your first design project or your fiftieth, you are taking a brave step to address challenges in your classroom, university or community by designing new solutions that build from people’s needs and desires. This workbook is meant to help you structure your process and capture your thoughts.

Topic:

How can we better support minorities within our department?

1. Empathy
2. Identify Sources of Inspiration

Who are the people involved in your topic? Who might represent extreme behaviors related to your topic? Which experts do you want to meet with to learn more about your topic? List the candidates that you think will provide the most inspiration and circle 3-5 that you want to engage with first.

The people involved in my topic are minorities. Especially in the CS major. Although, people of color are the first group you consider. Women are also considered minorities not only in the CS department but also in STEM. People with language barriers also face a struggle communicating with their teammates.

1. Identify Places of Inspiration

Where can you go to have an inspiring experience related to your challenge? What are analogous settings or extreme experiences where you might witness similar or relevant behaviors and activities in a different context? List as many locations as you can and circle 3-5 that you are most excited to observe first.

Classrooms, workplace, public events, as well as outside in the STC.

1. Select Research Participants

Who specifically do you want to talk to and learn from? Create detailed descriptions for at least 3 different users or sources of inspiration. Be sure to cover a variety of gender, experience, ethnicity, etc.

Shepard interview: Julie Anderson (Teacher for Work Devolpment, Christin (woman of color, student in BYUI), Edgar (Cyber Security Major, International Student), Youan(Computer Programming Major, International Student)

James: friends who are CS majors who are minorities

Spencer: Teachers, people at ACM service project. Adam: Talking to department heads.

1. Build a Research Guide

What do you want to learn to better understand the challenge at hand? What are you hoping to understand about people’s motivations and frustrations? What do you want to learn about their activities?

Start specific. What are some specific questions you can ask to open the conversation?

How can we better show support to minorities in the CS department. Ask instructors if they’ve seen any patterns with minorities in the CS department. With minorities the ones that were successful in class what was the difference with the ones that aren’t. What advice you could give to other woman who are trying to get into these classes? Not just negative things but positive experiences they’ve faced if they have had any? Like what kind of people helped you?

Go broad. What are some questions that can help you start to understand this person’s hopes, fears and ambitions?

Ask for their story. What challenges have you faced as well as what have you been through in this department? Have you seen an representation in this department and how does that make you feel?

Probe deep. What are some ways you might be able to dig deeper in the conversation, to find even more of the perspective this person has?

Have you faced any sort of discrimination while pursuing your major?

Identify things to see. What are some things you want to make sure you observe while you are visiting this place?

Try to see how many minorities there are compared to the majority. An example could be how there are only 2 woman in our technical teamwork class.

Identify things to do. What are some things you can do to gain inspiration in this place?

Asking around for things that could help. Also looking at posters and papers to see if there’s anything that oculd help.

Prepare for fieldwork. Assign responsibilities before going into the field. Who is in charge of confirming the date, time, and location of the research activities? Who is responsible for making sure you have all the necessary equipment? Who will take the lead in interviewing, etc.?

All of us in the project were assigned with the responsibility of reaching out and asking questions.

1. Keep Detailed Notes.

Be sure to record the name of the person interviewed and the location visited. Record your observations including important quotes, memorable stories, or just the way they interacted with their environment.

Shepard:

* Interview with Julie Anderson
  + She hasn’t faced any issues as a woman
  + Feels like being a woman opens doors sometimes since they are few of them
  + She thinks there are few woman in computer studies because it’s mostly a boys club
  + Being the only woman in the room is challenging, leading to woman dropping out
  + There is a mentality that woman can’t be as successful as men in computer studies.

Possible Solutions:

* + - Educate girls about csee from a young age in a fun way
    - Community outreach
    - Science fair, focus on diversity
* Interview with Youan and Edgar and Christine
  + They don’t usually see people who look like them
  + They usually have to pioneer the path

Spencer:

* Interview with Vang Ricky
  + In response to how to show support to minorities in the CS department he replied, “Just treat them how they would treat anyone else. Give the same expectations they’d give anyone else so that minorities may learn equally (if there is a barrier.) look at each other equally, I’d say.
* Interview with Lesliee Cruz:
  + In response to how to show support to minorities in the CS department she replied, “I think it’ would be nice to have some resources in different languages. When you are learning a new topic is always easier to understand the content in your own language. It’d be nice to have a website with different resources in different languages.
* Interview with Tagro Bolou
  + In response to how can we better show support to minorities in the CS department essentially said to find resources to help those who don’t speak English as their first language.
* Interview with Shelton Macamo
  + To the question, “How can we better show support to minorities in the CS department? Not only including POCs but also Woman in the CS major?” He replied, “Encourage the minorities to participate in STEM Majors.”
  + In response to the question, “Have you faced any challenges while pursuing this major (assuming you're majoring in CS)” He responded, “Not really.”
  + In response to the question, “Have you seen any representation and how does that make you feel (whether there has been or lack there of)” He responded, “I haven’t seen any”
  + In response to the question. “Have you faced any sort of discrimination while pursuing you major?” He replied, “Not really”
* Interview with Kari Peck
  + In response to, ”How can we better show support to minorities in the CS department? Not only including POCs but also Woman in the CS major?”, “Have you seen any patterns with minorities in the CS department? For instance with those who have been successful or those who aren't”, “Have you seen any representation and how does that make you feel (whether there has been or lack there of)”, “Have you faced any sort of discrimination?”, and “What kind of advice would you give woman trying to pursue a major in CS”
  + she responded with “I have not faced any sort of discrimination.  I have been treated kindly.  What kind of advice would I give women in our majors...Get involved in societies that are for women so they can have a support group.  Speak up in their classes and be a voice.  There are getting to be more women in our majors so they are helping to pave the way for them.  We have woman in our majors that are excelling and they too can excel and become very successful.  Employers want involved women that have great skills and knowledge so work hard in all your classes and become involved.  This would be my advice.”
* Interview with Brother Grimmett:
  + I asked him these questions:
    - How can we better show support to minorities in the CS department? Not only including POCs but also Woman in the CS major?
    - Have you seen any patterns with minorities in the CS department? For instance with those who have been successful or those who aren't
    - Have you seen any representation and how does that make you feel (whether there has been or lack there of)
  + He responded with:
    - At BYU-Idaho we are about 8% female, and perhaps 25% candidates of diverse cultural backgrounds (this includes Latino students.) We do have a lower representation of Asian students that most Universities, where this population is over-represented. Across the nation female students make up about 20% of those studying engineeringdegrees, and culturally diverse candidates make up about 15% (Asian students make up another 15%).
    - The challenge isn’t necessarily retention, the retention rates of women and minority students are similar to the general population. However, the real challenge is enticing students to enroll in engineering as a major. It appears from looking at the problem for a really long time that there are “women’s” majors, and “men’s” majors. This is particularly demonstrated when we look at Biomedical Engineering, which as a roughly 50/50 split of women students.
    - It appears that women, and POC, choose the “correct” major as early as Junior High School, and this is where much of the intervention is targeted. For example, at the Madison Middle School they have a technology class that teaches programming and robotics.
    - The importance of role models for perspective engineering students is well documented. Many/most of our CompE and EE students report having a parent/relative/person in the church who was able to tell them about Engineering and why it might be important. Additionally, robotics clubs at the High School level are also a good place to discover role models.
    - Once students arrive at BYU-Idaho our department has a very similar retention rate with the rest of the University. We have improved our retention rate significantly in recent years with major changes to our CS program. We have begun to explore how community might effect the retention of our students, but need a clearer understanding of what community means to our students.
    - He also sent a long some useful articles
      * <https://www.nsf.gov/statistics/2017/nsf17310/digest/occupation/overall.cfm>
      * <https://cew.georgetown.edu/cew-reports/engineering/>
      * <https://www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/>

1. Define
2. Find Themes

Look for themes, patterns and connections throughout your research. Create headlines for each category that capture these themes and patterns.

1. Make Sense of Findings

Take a closer look at your themes and find overlaps, patterns and tensions as they relate to each other. Can you group several related themes in larger categories?

Did you find any contradictions? Did you have any unexpected learnings or find something that felt surprising? Why?

After having discussed with your team, what are you excited to dig deeper into?

1. Define Insights

Insights are a concise expression of what you have learned from your research and inspiration. They are the “aha” moments and unexpected learnings. Sometimes, it can be helpful to write an insight in the form of a Point-of-View (POV) statement which makes an insight specific to a user or user group. A simpler way to create a POV is through the POV equation or *user + need + interesting learning = POV*.

1. Make Insights Actionable

Actionable and successful ideas start with the right question. Try creating questions that begin with the words, “How might we”. Ask yourself, is the question broad enough to inform new ideas? Is the question narrow enough to feel manageable? Is the question focused on responding to your insights? You can also create more than one “how might we” question if you need to.

1. Create a Visual Reminder

Frameworks, diagrams, and illustrations are great tools for communicating insights or complex information. You might try mapping out the network of connections between people, actions, objects, interactions using a relationship map, ven diagram or another visual technique. You might also try illustrating activity or information flow using a simple flow chart.

1. Ideate
2. Prepare for Brainstorming

A successful brainstorm session requires planning. The small details matter. Make sure you select a time when the whole team can be present. Write the date and time down.

Write down where you will conduct the meeting and any other notes about how you will arrange the room to facilitate your brainstorming. Make sure you have a way to see each others ideas and record them. For example, use a whiteboard and take pictures or something else.

1. Facilitate Brainstorming

Create some warm-up brainstorm questions people in the right mood.

1. Select Promising Ideas

After you brainstorm, cluster any related ideas and have the team pick their 3 favorite ones.

Write them down. Include the sketches if applicable. Which ideas received the most votes?

1. Do a Reality Check

What is at the core of your idea: what gets you excited about it? What is the most important value for your audience? What is the real need this is addressing?

Make a list of all the challenges and barriers you are facing with your idea. What are you missing? Who would oppose the idea? What will be most difficult to overcome?

1. Summarize Your Idea

Create a concept description for the idea that you would like to prototype.

Concept name:

One sentence concept description:

Who will execute the prototype? What are their specific roles and responsibilities? For example, you will most likely need people to participate in management, development, marketing, and procurement. You may also need people to participate in other areas depending on your proposal.

It’s important to remember the whole class will work together to execute your proposal. Think carefully about how they will all contribute or be involved.

How does it work?

Your work during this part of the project will be graded according to the following rubric.

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| --- | --- | --- | --- | --- | --- |
| **Content** | **8 pts**  **Mastery**  Meets Proficient criteria plus all sections demonstrate  depth and complexity in their answers. | **6 pts**  **Proficient**  Meets Developing criteria plus *ideate* section of workbook is complete. | **4 pts**  **Developing**  Meets Beginning Criteria plus *define* section of workbook is complete. | **2 pts**  **Beginning**  E*mpathy* section of workbook is complete. | **0 pts**  **Missing, Incomplete or Incorrect**  Design Thinking workbook not submitted. |
| **Style** | **4 pts**  **Mastery**  Meets Proficient criteria plus workbook is well formatted and easy to understand. | **3 pts**  **Proficient**  Meets Developing criteria plus grammar is correct. | **2 pts**  **Developing**  Meets Beginning criteria plus punctuation and capitalization are correct. | **1 pts**  **Beginning**  Spelling is correct. | **0 pts**  **Missing, Incomplete or Incorrect**  Design Thinking workbook not submitted. |