Design Thinking Workbook

Team #: **B2**

Contributing team members:

**Myungwon Lee, James Emerick, Taisei Goto, Dallin Williams, Austin Jesperson**

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 support minorities in the CSEE 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.

* People involved in our topic include minorities in the CSEE department as well as CSEE leadership (department leaders, professors, etc). Potential candidates that may help inspire are as follows:
* Introductory programming professors
* Students of foreign origin
* Anyone who speaks english as a second language
* Students in their senior year / graduated

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.

* Tutoring Labs
* Intro courses
* Advanced/ upper level courses

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.

* Individuals of priority include (but are not limited to) Students of foreign origin and/ or anyone who speaks English as a second language, Professors that teach introductory CSEE courses, as well as female CSEE students.

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?

* Which resources they are using to make a better transition to learning in English
* What they think might be helpful to them.

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

* How long have you been a student?
* Has language affected you in learning at school?
* Where are you from?

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

* What has been the most challenging for you in being a student in this department?
* What have been the most useful resources when you have struggled?
* What degree are you working towards?
* Rate your inclusion level on a scale of 1-10. (how well your needs have been met in class)

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?

* How do these challenges compare to prior challenges you may have had? Are they similar or different?
* Have you found any sources that might be helpful for you, or have you tried to find any sources?
* What do you think can be helpful for you to better learn?(Either they can be something already exists or doesn’t exist)

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

* A larger percentage of the visitors is in the minority group.
* If language is a major difficulty for this group in particular.
* Interviewers address similar difficulties or struggles.
* They can’t mingle with other students in class.

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

* Be more observant to the individuals of the minority group and the group they are in.
* Ask the Lab tutors if they seem to struggle more than others in communication or learning.
* Surveying professors on how their interactions have been with minority groups.

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.?

With the power of online surveys, we can reach out and get many perspectives from our target audience without expending the resources required for in person interviews. Surveys can be taken at any time and location. With automatic updates to our survey, we can update the questions in real time.

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.

Survey Results:

12 Participants, 0% Native English speakers.

Year of college varied with a high percentage in 1st-2nd year and a few with more experience.

Language needs: Hard split between believing needs are met while many others expressed the opposite.

Of the courses expressed to be difficult, the majority had common ties of upper-level language use as well as complicated vocabulary. However, almost half of those surveyed expressed no challenges with upper-level courses.

Of the resources mentioned in the final question, (an open-answer question asking about what resources they feel could be / have been helpful) the majority involved tutors, with various other responses. Some of the answers included more office hours, offering a vocabulary guide, easier dictionary access during class, with tutoring being mentioned in 7 of the responses.

**2. Define**

1. **Find Themes**

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

Difficult Upper-Level Classes

While responses were polarized, the general consensus of survey takers expressed the difficulty of upper level classes instead of introductory ones.

Suggested Solutions and Aides

58% of responses included the suggestion of more tutoring support for coursework. Other suggestions include extended professor and TA office hours and a vocabulary guide for each class.

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?

The conclusions from the survey suggest that there may be a lack of or an altogether inadequate tutoring support structure for all students in the CSEE program.

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

It is our conclusion that while there are certainly challenges that minority groups within the CSEE program face, a big one is also the same one that the majority of CSEE students face; the inadequacy of tutoring support for the bulk of students and classes.

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

We’re excited to understand the intricacies of structuring a volunteer tutoring

organization, and what the changes that will have the largest positive effects will be, and the challenges associated with implementing our proposed strategy.

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*.

CSEE program students + Better/more tutoring access and professor hours + an introductory class targeting EaSL students = In order to succeed in classes, mostly upper level courses, there needs to be more availability and structure in the tutoring for CSEE students, along with extended professor and TA hours, or perhaps an optional introductory class targeting EaSL students.

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.

How can we construct a model for a course that fulfills all of the needs of our survey group while also being an attractive option for the university to implement and support?

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.

* February 10th, 7:00PM

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 other's ideas and record them. For example, use a whiteboard and take pictures or something else.

* We hold Zoom meetings, as time doesn’t allow everyone to meet in person. We share our ideas via screen sharing and the built-in chat of the Zoom call.

1. **Facilitate Brainstorming**

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

* Would it be helpful to open an optional introductory-level class or workshop for non-native English speaking students to improve English-based CSEE literacy and logic?
* What is the biggest struggle for the students whose first language is not English? if related to language, where do they have the hardest time (ex. understanding in class, making friends, getting jobs, etc.)?
* Where or who do they go to for helpful resources?

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. Improve upon the tutoring structure already in place. I.e., incentivized tutoring programs and consequently more tutors and hours, more TAs for higher level classes, smaller class sizes to allow for more professor office hours available to the individual student.
2. An optional introductory-level class or workshop for non-native English speaking students to improve English-based CSEE literacy and logic.
3. **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?

The most important aspect of our proposal is the academic support of minority groups and all students in the CSEE program by providing sufficient tutoring resources for lower and upper classmen. CSEE students have voiced their need for more tutors, extended TA and professor office hours, and relevant dictionary and vocabulary libraries for each class.

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?

We foresee the main opposition to the expansion of the tutoring resources for CSEE students being the implementation of such improvements. To offer more tutoring hours in more subjects, we need more tutors. As of now, tutors are students who volunteer their time and energy. The university could provide monetary or academic incentives to attract more tutors, but that would perhaps necessitate a screening process to ensure quality tutors

1. **Summarize Your Idea**

Concept name:

Intro. to Comp. Lit. for EaSL Students

One sentence concept description:

Design a workshop or introductory course to help EaSL CSEE students improve their English-based computer literacy, and will provide them with access to relevant libraries of computer vocabulary and definitions.

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 and describe the roles and responsibilities along with a timeline.

We can delegate specific topics to each team, have them collaborate on one section of the course, and put it together in sequence to form a complete course or workshop structure. While under construction, it would be beneficial to continue to receive criticism from professors, EaSL students, and CSEE majors in order to make any improvements or adjustments while in the prototyping phase. To that end, we should elect a student-professor liaison and have a team formulate and administer surveys on course content ideas.

Developing university courses, even and perhaps especially introductory courses, is a time and labor intensive project. We should have the outline of the course completed in two weeks from initiation, each section team should fill their section with material and resources after four weeks, and the survey team and liaisons should provide gathered criticism on the materials after five weeks. Adjustments should be made until the end of the semester until presentable.

Your work during this part of the project will be graded mainly according to the following rubric, with variation depending on the quality of your work.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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. |

**Proposal Summary** – See the whole picture and prepare for the proposal presentation.

Problem & Solution Overview (**the problem you identified** that your proposal will address & why your awesome idea addresses/solves the problem):

It would be beneficial to EaSL students in the CSEE program to have the option to participate in a introductory class or workshop that

Research:

Our research suggests that minority groups are struggling with some classes in their CSEE program because of the language difference between their native language and the English-based coding languages and programs.

Ideate/Brainstorm (an example or two of other ideas you had):

* Incentivize tutoring programs to attract more tutors.

Minimum Viable Product:

Draw official university attention to the struggle of EaSL students in the CSEE program, and the importance of an introductory class as described above.

Timeline:

We should have the outline of the course completed in two weeks from initiation, each section team should fill their section with material and resources after four weeks, and the survey team and liaisons should provide gathered criticism on the materials after five weeks. Adjustments should be made until the end of the semester until presentable.

Resources & Costs:

During the prototyping phase, no monetary support is required. Section, survey, and liaison teams should have adequate resources and skills to effectively construct the framework of the course, which should be enough to pitch as a viable option to the school.

Maintainability:

If the school decides to adopt and continue to develop the course, it should improve upon itself as time goes on by conducting surveys on course material. The ultimate test of effectiveness and viability will be the attendance record of the course if fielded.

Roles & Responsibilities:

Team leads (2-3 people) will provide supervision, ensure access to relevant resources, keep the project on schedule, and work on transitioning between sections as necessary.

Section teams (2-5 people each team) will research and form the framework of their assigned course section topic.

Survey team (2-3 people) will formulate, administer, and study surveys on the course material for the proposed course material. Target audiences include EaSL students, professors, and upperclassmen.

Student-Professor liaison (1-2 people) will, because of the valuable experience of professors, work directly with them as a resource for section team members to access through them.