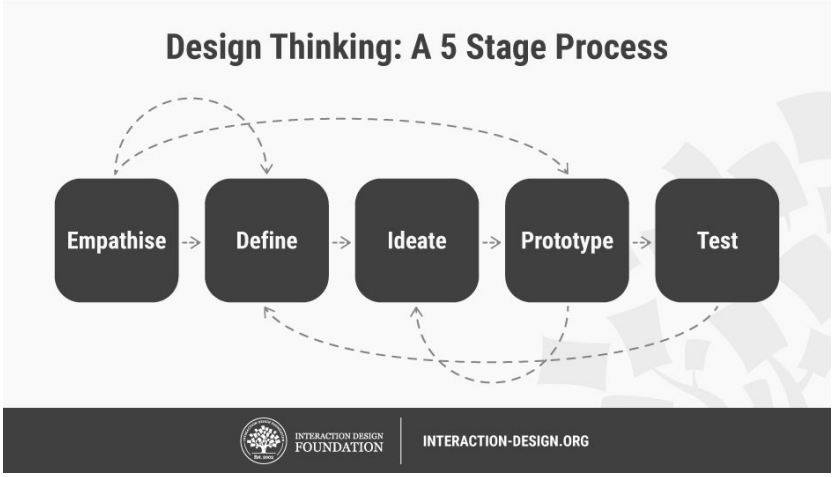
CAL 501 – Course Design Challenge Worksheet

As CAL501 takes up the design thinking process throughout the course, we will have three groups: (1) the designers (you the students in CAL501); (2) the mentors (faculty, guest speakers, literature and course content), and (3) the end users (general public, a specific age group in the general public, Rights Holder or Stake Holders in your organizations) who you will decide in your teams and respectfully name.

> NOTE: People think the design thinking process can be done in an hour but that is just an introduction to the process, that is not design thinking. Design thinking is not a process to rush to solutions. Here in this program, it is a slow, iterative process requiring research, understanding, and iteration over time. For example, the iPad you have in your hand now started as an mp3 player.



https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

The approach for the CAL501 Design Challenge is iterative and recursive, by design. The following table illustrates the process and the proposed outcomes.

Learning Intensive:

Design Thinking Process – Initial Process – Learning Intensive				
Empathize	**Define**	**Ideate**	**Prototype**	**Test**
Design Conversations – Participatory Approach				
• Conversations with designers (CAL501) students using the Design Challenge as a provocation for conversation	• Discussion responses • Grouping ideas & asking Good Questions • Elaborating • Offering examples	• Building on responses • Ideating suggestions (sketches) • Drafting core design principles	not yet	not yet

Online

Design Thinking Process –ongoing throughout the rest of CAL501					
	Empathize	**Define**	**Ideate**	**Prototype**	**Test**
ONLINE	**Design Conversations – Participatory Approach**				
Unit 2	• Revisit conversations with designers (CAL501 students) based on what you each know now	• Discussion responses • Grouping ideas & asking Good Questions • Elaborating • Offering examples	• Building on responses • Ideating suggestions (sketches) • Drafting core design principles	not yet	not yet
Unit 3	• Revisit conversations with designers (CAL501 students) based on what you each know now	• Discussion responses • Grouping ideas & asking Good Questions • Elaborating • Offering examples	• Building on responses • Ideating suggestions (sketches) • Finalize core design principles	• Create initial prototype	not yet
Unit 4	• Revisit conversations with designers (CAL501 students) based on what you each know now	• Discussion responses • Grouping ideas & asking Good Questions • Elaborating • Offering examples	• Revisit ideating suggestions (sketches) • Revisit core design principles	• Revisit prototype based on what you know now	• Test prototype with end users
Unit 5	Gallery walk, presentations, and reflections inform the next iteration				

CAL501 Design Challenge
Context:

Contemporary approaches for climate adaptation leadership are as varied as the sectors involved. As an example, six statements are provided below from your readings:

> "[T]he more scientists understand the significance of the practice and renewal of Indigenous knowledges for Indigenous peoples' own purposes of preparing for climate change and Whyte | 159 protecting their ways of life (sometimes called the governance value of Indigenous knowledges23), the more scientists will grasp richer senses of their responsibilities to work with Indigenous collaborators mutually instead of exploitatively. "(Whyte, 2017)
>
> "We envision an important share of the new generation of scholars on climate change adaptation to be generalists, educated to assist addressing real world problems. But this means that there is also an increasing need for a science *of* adaptation—to provide substantive insights and recommendations to support transdisciplinary research." (Swart et al, 2014)
>
> "Whenever you study a complex system, human being, being part of it, you have to realize that different groups of human beings will have different values, different culture, different ideas, and you have to try to take everything into account...We need to realize that not everybody thinks the same way we think and so whenever we go out to try to understand a complex situation, we need to further realize that we're going to have different voices, we're going to have different groups with different ideas and we have to listen to all of it to be able to get a better picture of what's happening." (Edwin Castellanos, Universidad del Valle de Guatemala. https://www.youtube.com/watch?v=x5xGi9EFCSY)
>
> "Inside the teaching lodge, we engage in a process I've termed relational systems thinking where awareness-based systems change centers mutual benefit, a foundational principle that Uncle Dan shared with me, between all the humans, the non-humans, the unborn generations and our Earth Mother." (Goodchild et al, 2021)
>
> "Given the novelty, complexity and magnitude of the crisis, organisations are forced to think beyond tried-and-tested ways of thinking and doing. Designers "conceive and plan what does not yet exist" (Buchanan, 1992, p. 18), making design thinking a particularly wellsuited way for organisations to address the complex challenges in the broader business environment (Kolko, 2015) and solve wicked problems (von Thienen, Meinel, & Nicolai, 2014)." (Cankurtaran, 2020)
>
> "The interconnections between players in any given system are complex, and poorly designed attempts to make changes can have negative unintended consequences or introduce new failures or inequalities. Supporting transformational adaptation requires the capacity to inquire systematically. This means to inquire into a system of interest, to understand the history of that system (e.g. around sources of control, legitimacy and

knowledge) and challenge the assumptions that underpin existing structures and ways of doing things. Reproducing 'solutions' without assessing what holds the current system in place may result in simply reinforcing existing failures and inequality." (Lonsdale and Turner, 2016)

Design Rationale:

You have already reviewed and analyzed some of the literature concerning issues of climate adaptation, resilience, and Indigenous perspectives to date in the MACAL 501 Learning Intensive. Therefore, you and your team (the designers), are in a powerful position to engage in the design thinking process to answer the following question:

> What are ways we might encourage the public *[businesses, politicians, educational institutions, not for profits, communities]* to use their voice and understanding to become more **actively engaged** in creating and implementing climate adaptation strategies?

Problem Scenario:

You and your team have been selected by your respective organizations to design and develop a prototype of a component of an open educational program designed to empower and engage end users. You are the designers in this problem scenario. You have access to your faculty, guest speakers, and the literature to inform and mentor you along the way. Your design should help end users begin to understand their role, responsibilities, and actions towards climate action, whether you focus on adaptation or mitigation, or co-benefits.

You and your team, the designers, will determine who your end users are. It could be general public, a specific age group in the general public, Rights Holder or Stake Holders in your organizations. Remember, in human centred design, we recognize that the end users hold a portion of any solution. Your prototype should encourage end users to use their voice and understanding to become more actively engaged in inclusive climate adaptation strategies.

Parameters:

- You and your team will go through an adapted design thinking process asynchronously and synchronously. Please use the **CAL 501 Course Design Challenge Worksheet** to guide your work.
- In the Learning Intensive your team will focus on Steps 1 – 3 (Stanford Stages: Empathy & Defining the problem) which leads to Assignment 2. The work you do in these steps will result in **10 min team presentation** with **10 minutes for discussion and Q and A**. See Assignment 2 for a full description of your requirements.
- You will receive instructor feedback on your presentation along with the peer feedback from the session. This feedback will inform the next phase of the design process that you will take up in MACAL 501 Units 2, 3, 4, and 5 (online) which is assessed in Assignments 4 – 7.

Success Determinants: Success will be determined by:

- Alignment to design motto: "design is an optimistic stance."
- Degree to which your prototype addresses the problem posed in the Design Challenge
- Degree to which your prototype aligns with your group's design sketch
- Considerations of the range of openness opportunities evidenced by your prototype
- Evidence of interdisciplinary with your prototype
- Functionality illustrated within your prototype
- Uniqueness

Course Design Challenge Worksheet:

Before you meet with your team, review the CAL 501 Design Challenge below

Review Problem Scenario - Your Task

You and your team have been selected by your respective organizations to design and develop a prototype of a component of an open educational program designed to empower and engage end users. You are the designers in this problem scenario. You have access to your faculty, guest speakers, and the literature to inform and mentor you along the way. Your design should help end users begin to understand their role, responsibilities, and actions towards climate action, whether you focus on adaptation or mitigation, or co-benefits. You and your team, the designers, will determine who your end users are. It could be general public, a specific age group in the general public, Rights Holder or Stake Holders in your organizations. Remember, in human centred design, we recognize that the end users hold a portion of any solution. Your prototype should encourage end users to use their voice and understanding to become more actively engaged in inclusive climate adaptation strategies.

The overarching question you have been asked to answer is:

> What are ways we might encourage the public *[businesses, politicians, educational institutions, not for profits, communities]* to become more **actively engaged** in creating and implementing climate adaptation strategies?

Investigating your personal experiences and perspectives

Consider these questions individually before you start the design process with your partner(s):

- What is a component of your work or practice that might be generalized to inform public engagement strategies?
    - Note: it may help to consider this question from your role as a learner or from any of the theoretical approaches you have read.
- What do the terms intellectual risk-taking and actively engaged mean to you?
- Why might it be important to define the role, responsibilities and actions towards climate action, whether you focus on adaptation or mitigation, or co-benefit

Learning Intensive
Step 1 – Part 1: Gain Empathy – Initial Interview

The 1st step of a human- centered design process is to gain empathy so you can better understand how people understand the problem and what is required to solve it. We gain empathy through conversations with end users.

> Mattelmäki, Vaajakallio, & Koskinen (2014) describe empathic design as "an interpretive approach … [with] its roots in design practices … [It] focuses on everyday life experiences and on individual desires, moods, and emotions in human activities, turning such emotions and experiences into inspiration" (p. 67). Crichton & Carter (2017 state that "Design thinking is a human centered design process that seeks to gain empathy for a situation by developing understanding of the concerns, insights, lived experiences, and/or needs of others. The initial step in design thinking is gaining empathy through interviews. At the heart of good interviews are great questions— questions that are open, engaging and politely probing. It is through open questions that the person who is being interviewed can share what they are comfortable sharing and often be engaged in a conversation that is rich and illuminating to both the interviewer and the interviewee" (p. 34)

Instructions:

- Divide into pairs in your team and stick with that partner until asked to come together as a larger team later in the morning.
- Each person in the pair takes turns interviewing the other for a minimum of 5 minutes.
- Interview your partner(s) to find out about the aspect of the CAL 501 problem scenario as outlined in the design challenge that they find most challenging. Ask lots of questions in order to gain empathy for what their partner knows or thinks about that topic.

Interview tips:

- Write notes or key words
- Ask lots of open questions and why questions
- Encourage stories and examples
- Do not be afraid of silences
- Do not suggest or discuss answers to questions

Learning Intensive
Step 1 – Part 2: Gain Empathy – Detailed Interview

This step digs deeper into your partner(s)' practices, beliefs, and philosophies. Before coming up with integrated solutions, we need to understand the ways our partner(s) think(s) would answer the question.

> Campbell and Schwier (2014) describe the importance of becoming a connoisseur instructional designer, which from their research means we must attend to the nuances of the work, continuing the longstanding focus of creating effective learning resources and environments, [and] appreciating that being effective is a very elusive, very context-based, and very value-laden goal (p. 371).

Instructions:

- In your pairs, take turns interviewing the other but this time, probe for understanding. Using your notes from Step #1 as a guide, interview your partner to dive deeper into what the other person believes, practices or espouses related to the CAL 501 problem statement. Ask for more details, stories, and examples about aspects of the problem statement in the design challenge.

Detailed Interview tips:

- Refer to your notes and key words from Step #1.
- Ask what and how questions for example:
    - What reasons or evidence ….?
    - What is your belief on …?
    - How would you contrast or compare….?
    - What do you suppose would happen if ..?
    - What are the parts or features of …?
    - How is ….. related to ….?
    - What would you do if …?
- Encourage stories and examples
- Do not be afraid of silences
- Do not suggest or discuss your answers to the question when interviewing

Learning Intensive
Step 2: Defining – Individual Reflection

In these two steps combined, you capture your findings from the interviews by taking a stand with a point-of-view. As you frame or bound the problem, you are defining what you see as the problem that you will explore and discover.

> "Given the novelty, complexity and magnitude of the crisis, organisations are forced to think beyond tried-and-tested ways of thinking and doing. Designers "conceive and plan what does not yet exist" (Buchanan, 1992, p. 18), making design thinking a particularly well-suited way for organisations to address the complex challenges in the broader business environment (Kolko, 2015) and solve wicked problems (von Thienen, Meinel, & Nicolai, 2014)." (Cankurtaran, 2020)

Instructions:

- Individually, Re-read the context, design rationale, and the problem statement in CAL 501 Design Challenge.
- Individually, review your notes to determine what your partners goals and wishes are based on what they have shared with you. What is your partner already trying to do to address some aspect(s) of the problem statement. What is your partner trying to achieve for the end users? What are you trying to achieve for the end users? How are the needs similar? How are they different?
- Create a table, Venn Diagram, or write a statement that describes your stance of the integrated goals and wishes expressed by your partner.
- Consider Insights that the partner(s) have given you. Ask yourself from Steps 1 and 2, What have you learned about your partner(s)' motivations, work, practice, or how they address climate adaptation strategies? Is there anything you note that possibly your partner(s) have not recognized or acknowledged about their practices that you would like to comment on?

Reflection tips:

- Review your notes and look for themes
- Take notes and make annotations
- Record any insights that you have gained, different perspectives that you were unaware of.
- Note if you learned anything new about the problem statement or the design challenge.

Learning Intensive
Step 3 Part 1: Defining & Beginning to Ideate – Individual Visualization

You are now beginning to frame or bound the problem, you are defining what you see as the problem that you will explore and discover.

Instructions:

- Individually, Re-read the context, design rationale, and the problem statement in CAL 501 Design Challenge.
- Individually, review your notes, goals and wishes of your partner (what is your partner trying to do in response to the design challenge based on what they have shared), and your reflections and insights. Did you learn anything new about the problem?
- Sketch 5 possible ideas that based on what you have heard and your own knowledge, you think would help your partner address the problem statement.
- Don't forget to review the design parameters in the CAL501 design challenge.
- Try to use as few words as possible. To sketch, use circles, squares, lines, blobs, triangles to represent your ways to address the problem frame. Then, label each piece to provide some clarity.

Sketching Tips:

- Review your notes and look for themes
- Do not aim for perfection, this is not an art class (smile) - rudimentary sketches to get your ideas down are great
- Aim for less words, more sketches to illustrate your ideas
- Take the time allocated and if you have time left, go back and add in additional details
- Defer judgment
- Go for volume
- One way at a time
- Be visual
- Think in headlines
- Stay on topic – refer to overarching problem statement in the design challenge and your stand on it
- Encourage yourself to think of at least one wild idea

Learning Intensive
Step 3 Part 2: Defining & Beginning to Ideate – Gaining Feedback

In this step, you begin to ideate 5 ways you might choose to address the problem scenario you identified in Step 2. Remember to incorporate your problem scenario.

Instructions:

- Share your problem statement and sketches with your partner taking time to let them ask questions and probe for additional detail as they develop their understanding. Start with your problem statement.
- As you present your sketches, provide context including where you sense this component might have the most impact. By considering context, you start to situate the learning for your partner(s).
- Receive feedback and feedforward responses from your partner (s).
- Record your partner's feedback and suggestions and make note of any other ideas that the conversation caused you to consider.
- Switch roles

Feedback Tips:

- Everyone will be presenting works-in- progress.
- Honour the work the presenter has completed by letting them finish their presentations before you interrupt with feedback and feedforward responses.
- Honour the feedback and feedforward responses by finding possible space and place by either editing your problem statement or your sketches.

Learning Intensive
Step 3 Part 3: Defining & Beginning to Ideate – Redesigning Ideas

In this step, you continue to ideate 5 ways you might choose to address the problem scenario you identified in Step 2. Remember to incorporate your problem scenario.

Instructions:

- Based on the feedback from your partner on your sketches, redesign your idea sketches. You may choose to focus on redesigning one of the 5 sketches, combine all the ideas, create a new idea sketch, or modify an idea sketch based your partner's feedback.
- The redesign should be sketched as much as possible.
- Review the design parameters in the CAL501 design challenge.

Redesign Tips:

- Feedback can apply to all idea sketches or just a few – what happens if you incorporate it across all? Does it spark something new?
- Sketching helps us to visualize what could be free from the limits of words – can you invite yourself to visually articulate the minds vision?

Learning Intensive
Step 3 Part 4: Defining and Ideating– Deciding on the final team idea sketch

Now in your team, with a larger group, you are beginning to frame or bound the problem, you are defining what you see as the problem that you will explore and discover and ideate a possible way forward.

Instructions:

- Connect back with your larger team.
- Each team member will present their revised 5 idea sketches and receive feedback and feedforward from the rest of the team members.
- Once all members have shared their idea sketches, the team will reflect, discuss and decide which one will be used by the team to move forward into the next phases of the design process. This may involve redesigning one of the team members sketches, combine all the ideas to create a new idea sketch or modifying an idea sketch.
- All team members must agree on the final sketch.
- Ensure that the design parameters are met and don't forget to review the success determinants.

Deciding on the Final Idea Sketch Tips:

- How is your practice reflected in your solution? (Answers from Before You Start)
- How are the needs of your partners reflected in your solution? (Problem Statement)
- How have you honored the feedback and feedforward responses?
- If you described your solution to trusted work colleagues, how might they respond?

To complete as part of Unit 2 (online)
Step 4 & 5: Revisiting Defining and Ideation – Deciding on the renewed final team idea sketch

Now you are your team are revisiting how you framed and bounded the CAL501 design challenge during the Learning Intensive based on all that you know and have experienced since then that you can bring to bear on how you as a group might approach it moving forward.

Instructions:

- Individually review the final sketch that your team agreed on in Step 3 presented during the Learning Intensive. Based on what you now know given the course and the content you have examined since the Learning Intensive, revise the sketch.
- Connect back with your team and share the revised sketches.
- Meet with your team to discuss the revised sketches and learnings of the team members and decide which sketch will be used by the team in the next phases of the design process. This may involve redesigning one of the team members sketches, combine all the ideas to create a new idea sketch or modifying an idea sketch.
- All team members **must agree** on the final sketch.
- Ensure the design parameters are met.
- Share your final sketch with the larger class for comment and ideation.

Deciding on the Final Idea Sketch Tips:

- How is your practice reflected in your solution? (Answers from Before You Start)
- How are the needs of your partners reflected in your solution? (Problem Statement)
- How have you honored the feedback and feedforward responses?
- If you described your solution to trusted work colleagues, how might they respond?

Connecting to the literature – Open Educational Resources:

> Karunanayaka and Naidu (2015, p. 340) discuss the impact of the 4R Framework of Open Educational Resources (OER) on Open Educational Practices (OEP). According to the 4R Framework of OER – Reuse; Revise; Remix and Redistribute (Wiley & Green, 2012) users are permitted not only free use of materials, but also the ability for re-purposing them through improvement and creation of new materials, as well as innovative teaching practices using OER. This focus on OER extends beyond mere 'access' to engagement in 'innovative open educational practices' (OEP), with different degrees of openness in the usage and creation of
> OER, ranging from "no usage" or "OER (re-) usage" to "OER (re-) usage and creation" of (see OPAL, 2009).

Question to consider: How does the above literature connection and the course work done to date impact your team's final sketch and approach? What might it invite you to add/remove/edit/investigate as you move forward?

To complete as part of Unit 3 (online)
Step 6 & 7: Prototyping

In this step, you begin to rapidly prototype 3 to 5 ways you and your partners might choose to address the problem frame you identified in Step 3 and revised in Steps 4 & 5. Remember to incorporate your problem statement. This is the hands on making of things based on your design.

Instructions:

- As a team, review your problem statement and final sketch coming out of Unit 2 based on what you now know since Unit 2.
- Discuss what may need to change or additional information that is required in order to move the final sketch into the rapid prototyping phase. Check your definition, check if you need to ideate further the final sketch.
- Consider the context of the CAL501 design challenge including where your problem statement and final sketch might have the most impact for all stakeholders.
- In your discussions remember that everyone will be speaking about the final sketch/problem solution as a works-in- progress. Honour the work the presenter has completed by letting them finish their presentations before you interrupt with feedback and feedforward responses. Taking a moment to have folks sketch their edits might be a useful way to balance this.
- Honour the feedback and feedforward responses from all by finding possible space and place by either editing your problem statement or your sketch that you will prototype.
- Develop a plan to create your prototype
- Work on your prototype – due prior to Unit 4 online

Connection to the Literature: Design

Thomas (2010) describes rapid prototyping as an instructional design solution including "a set of concurrent, overlapping four-level parallel process that will help both to speed up the process and to overcome many limitations of the traditional instructional design models [such as ADDIE] …"(p. 191 – 192).

The advantages of the rapid prototyping are the utilization of the design with active participation of potential learners, which leads to participatory design; a design environment which makes it practical to synthesize and modify instructional artefacts quickly, which also leads to increase in creativity; an accelerated development, which built on sound footing by the earlier detection of the errors by the quick iterations (Tripp and Bichelmeyer, 1990; Wilson, Jonassen, and Cole, 1993).

Crichton & Carter (2017), state that "Tinkering or prototyping is done once the initial design has been sketched and negotiated. We recommend that students work within their groups
to refine their sketches and add essential details and descriptions. As they do that, they begin to think aloud about the ideas and find different sources of the initial problem. Thinking aloud basically allows them to talk through the design process. When students

> engage in thinking aloud within a group, their classmates can engage with them as critical friends and offer timing supports, ideas, and modifications. Thinking aloud forms a link between tinkering and thinkering in the design thinking cycle as it bridges initial ideas with more iterated, developed plans (p. 40).

Question to consider: How does the above literature connection and the course work done to date impact how your team will move forward in the prototype? What might it invite you to add/remove/edit/investigate while prototyping?

To complete as part of Unit 4 (online)
Step 8 & 9: Testing

In this step, you will reflect on the entire process thus far and determine how that might influence your prototype as you test it. This is the phase where you are thinking critically to analyze your solution and in the context of the problem statement by testing and making (Crichton & Carter, 2017).

Instructions:

- Based on the team reflection and discussion, determine how you will test your prototype and the ways in which is addresses the problem statement, and refine it based on feedback.
- Test your prototype with sample stakeholders.
- Discuss as a team how your prototype from addresses the following questions:
    - How is your practice reflected in your solution? (Answers from Before You Start)
    - How are the needs of your partners reflected in your solution? (Problem Statement)
    - How have you honored the feedback and feedforward responses?
    - If you described your solution to trusted work colleagues, how might they respond?
- Edit and revise the prototype as needed in preparation for Unit 5 Design Showcase.

Connections to the Literature: Asking Good Questions:

> "We value the use of the revised Bloom's taxonomy questions as a way to introduce the types of questions that open conversations and encourage iteration. Learning to ask good question is an essential outcome of design thinking. People working in the fields of coaching and leadership (Whitworth, Kimsey-House & Sandahl, 1998; Payne & Hagge, 2009) suggest that powerful questions support open discussion and sustained dialogue" (Crichton & Carter, 2017, p. 40)

Questions to consider:

How do the questions raised within your team as you test your prototype help you to evolve it?

To complete as part of Unit 5 (online)
Design Showcase - Final gallery tour of the end result.

You are now at a point where you can move to the next phase of testing of your prototype by sharing it with a larger audience for comment and feedback. Reflecting on the feedback received and the various iterations that it will inform is critical in the design thinking cycle as it informs continuous improvement of the design.

> "Reflection helps to make thinking visible (Eisner, 1998) and [helps the design team] consider what they have learned…. And provide thinking time to consider what was done and why, what were the contributions , what could be better for next time etc. Reflection is essential for iteration because it helps to inform what could be done next … how to make the design better" (Crichton, & Carter, 2017, p. 41)

Instructions:

- Your team will create and present a 10 min team presentation (live in our synch session in Unit 5 & pre-recorded) and the link to which is shared openly for comment by a broad audience on your blogs – see Assignment 7 description (also below).
- Reflect on the process and include that as part of your follow up blog post. As you reflect, consider the following:
    - What aspects of your solution were well-received by your peers? Did your peers provide any suggestions for improvement?
    - What do you think is most important to making your idea a success? Do you have ideas for further refining your solution based upon the feedback you received?
    - What was the most surprising thing you learned through the design thinking process?
    - Which part of the process was most rewarding? Why?
    - Which part of the process was most difficult or frustrating? Why?
    - What parts of the design thinking process are particularly useful or insightful for tackling challenges in your own organizational context?
    - What would you do differently next time?
- Comment on other CAL501 team presentations by asking insightful and respectful questions on their blogs. This is the opportunity for sharing, iteration and professional learning.
- Adjust the prototype based on the feedback received and discussion as required and share openly via CC licensing on your blog and the MACAL website.