MacChangers: A Guide to Short-Duration Learning

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MACCHANGERS

This project is made possible with funding by the Government of Ontario and through eCampusOntario's support of the Virtual Learning Strategy. To learn more about the Virtual Learning Strategy visit: https://vls.ecampusontario.ca.*"*

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What is MacChangers?

Launched in 2016, the MacChangers program is a co-curricular experiential learning program made possible by the Office of Community Engagement and the Faculty of Engineering at McMaster University in Hamilton, Ontario. Our organization is free and open to McMaster students of all levels and academic disciplines. Our traditional program is 6-months in duration in which students are placed in teams of four and are tasked with creating a solution idea for a problem facing the local community. The problems are identified through a collaborative process with community groups in the Hamilton area. They are intentionally open-ended and ambiguous to support teams in navigating complex problems. Over the course of the school year, MacChangers students develop professional and transferable skills through weekly workshops, which aid in their journey of developing and proposing innovative solutions to their challenge area. They also get the opportunity to consult with community members to integrate their feedback into their designs using the approach of human-centered design. Since 2016, the program has grown from twenty participants to our current size of 140 students. We like to keep the program involved with passionate and enthusiastic students from across the university.

In 2020, MacChangers introduced four theme areas to best describe the nature of the problems facing the local community: 1) Healthy and Safe Cities 2) Clean & Green 3) Economic Prosperity and Growth and 4) Built Environment and Infrastructure. These theme areas are aligned with the City of Hamilton initiative, 'Our Future Hamilton'. In 2020, MacChangers also introduced their first short-duration learning experience called the "Change-a-thon." This was a 5-day iteration of the 6-month program which occurred daily from 9 am to 4 pm, Eastern Standard Time (EST).

The MacChangers team has also been able to participate in a variety of other short-duration learning experiences as co-hosts, guest speakers, guest judges, and group instructors. Our team values accessible, collaborative, and free resource sharing and we are excited to share our experience with anyone looking for inspiration when creating their own short-duration learning events.

The Team

MacChangers is made up of two layers of staff members. Our senior staff includes our Executive Director, Program Instructor, Community Relations Coordinator, and Projects Coordinator. Our junior staff are peers to our participants and are called "mentors." At MacChangers, our mentors are all senior level undergraduate students who have completed the program in prior years and are responsible for supporting the teams week to week. We try to maintain a ratio of one mentor to five teams. During the school year, our student mentors work part time. During our condensed experiential learning terms such as the Change-a-thon, our student mentors work full-time to support the teams. In the summer, we usually have four full-time students to support our preparation for the coming year. We love having students on our team, as we find they offer an excellent perspective on the values and skills of our target participant cohort.

Mentors are essential to the success of short-duration learning programs, providing guidance to students on the direction of their project, as motivators when students become frustrated, and as critics to help students

achieve their full potential. A portion of this book is dedicated to the resources we use to train mentors in preparation for their roles when working with participants. When coordinating a short-duration learning experience, we strongly recommend investing time in creating a mentor role for your participants. Strong mentors can greatly enhance participant program satisfaction and can quickly pick up on the strengths and weaknesses of your program delivery.

Student Teams

Student teams at MacChangers are typically made up of 4 team members of varying levels of study and from a diverse academic background. The teams are divided by theme area. Historically, our program has served between 5 to 10 teams per theme area, for a total of 80 to 160 students per program iteration.

What is the goal of this resource?

This book is a collection of resources created by the MacChangers program at McMaster University in Hamilton, Ontario, Canada. Our goal is to support individuals seeking to create short-duration learning experiences by sharing our materials and resources freely. The content is divided into two categories:

- 1) Guides for planning and preparing a short duration learning experience
- 2) Content we use in our short-duration learning experiences, which is further divided into:
    - Content modules from our 5-day human-centered design event “MacChangers”
    - Training modules for mentors

The guides describe our process when creating a short-duration learning experience. They are meant to aid with the planning and creation phase of creating a short-duration learning experience. Our guides cover the following topics:

- Short Duration Learning 101
- Problem Scoping
- Engaging Stakeholders
- What to do About Timezones
- Technology Guide for Short-Duration Learning
- Program Applications and Group Formation Strategies
- Preparing a Showcase

The second section of this resource is dedicated to sharing our current program content. Part one of this section includes access to our learning lessons and activities, such as our presentations, scripts, and learning activities. These sessions can be delivered in fifteen minutes or less and are foundational to the MacChangers Program. They offer examples of what level of detail our short-duration learning program aims to deliver and might be a useful foundation for other programs. Our content modules cover the following topics:

- Think Global, Act Local
- Human-Centered Design
- Problem Assessment
- Resource Navigation and Research
- Downloading Insights
- Rapid Ideation
- Converging on an Idea
- Prototyping and Financial Viability
- Creating and Refining a Pitch

The second part of our current program content includes the preparatory modules we use to train our mentors. Unlike our content modules, they are not program specific. We have found that when creating short-duration learning experiences, creating training documents for program support assistants is often a short-duration learning planner's last priority. We are hopeful these tools can be used more universally to provide foundational skills for mentors of like programs. Our mentor training modules cover the following topics:

- Accountability
- Group Dynamics
- Roles within the Project Lifecycle
- Starting and Leading Conversations
- Verbal Feedback

Disclaimer: We find links convenient for use and we will reference various technology platforms through this document and at other times throughout this book. We do not control any third-party websites, we do not endorse any third-party websites, and we are not responsible for anything obtained from third-party websites. If you decide to access any third-party websites referenced throughout this document, you do this at your own risk.

Thank you for reading!

We hope that these resources will inspire the creation of other short-duration learning programs, encouraging students to engage in community-informed and experiential learning approaches to understanding and improving local and global challenges facing our communities.

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PART I

BEST PRACTICES GUIDE

1. Why Engage in Short-Duration Learning Programs?

Short-Duration Learning Experiences 101

What are Short-Duration Learning Experiences (SDLE)?

While there are many definitions for short-duration learning experiences (SDLE), all short-duration learning is characterized by brevity.

These may be exemplified through:

- case studies,
- hackathons,
- seminars,
- conferences,
- competitions,
- bootcamps,
- flipped classrooms,
- problem-based learning,
- peer mentoring,
- design thinking,
- team-based learning,
- simulation-based learning,
- active learning,
- experiential learning,
- community engaged-education
- a myriad of other techniques.

Short-Duration Learning experiences cater content for learners to study in bite-sized chunks. This content can be made in many different formats, from text to interactive multimedia, but should always be intended to present information as concisely as possible.

Here are some examples of short-duration learning content:

- Text (phrases, short paragraphs)
- Images (photos, illustrations)
- Videos (short lessons)
- Audio (short snippets of speech or music)
- Games (e.g. simple single-screen challenges)

In this era of busy schedules and short attention spans, short-duration learning experiences are an effective model of teaching and learning, and they may be used for all kinds of training. Examples include skills training, leadership development, effective communication training and ideation.

What Are the Benefits of Short-Duration Learning Experiences?

Shorter Instruction Time

With bite-sized content instructors can have shorter course delivery times. With short-duration learning experiences instructors can create learning experiences with dozens of modules covering individual topics in an hour. This enables instructors to quickly adapt learning material to the needs of the students and new training requirements.

Cost-Effectiveness

Short-duration learning experiences are also very cost-effective to create. It requires fewer resources and needs fewer instructors.

It’s Flexible

As short-duration learning experience courses can cover any subject that regular eLearning courses can; just in a bite-sized way. You can create courses that give a broad overview of a subject or even create ones for complex topics.

Much More Engaging for Learners

Short-duration learning experiences can be a very engaging training delivery method, as they often require hands-on participation from the learners. Generally, in short-duration learning experiences, participants will work together to solve, create or accomplish a task as they learn about the content.

Improved Knowledge Retention

As everyone knows, when you study something repeatedly and revisit it when you are close to forgetting it, you improve your understanding and retention of the knowledge. Such repeated study fits nicely with SDLE units since they are small, self-contained, and easy to return to.

It Gives Learners More Freedom

Conventional training which uses text-heavy content is not the best material for short bursts of learning. Short-duration learning however, allows learners to enjoy casual learning whenever they have some spare time as it can also be self-paced. Furthermore, as training content is small, it's also easy to follow-up and review later on.

Limitations of Short-Duration Learning

Short-duration learning experiences aren't necessarily better or worse than conventional teaching strategies in all scenarios. It all depends on the subject matter.

It's Not Ideal for Complex Concepts

Short-duration units are great for delivering simple information but are not necessarily the best fit for complex concepts. It's still possible but will require more effort. For example, you will need to break down the concept into simple parts. A bite-sized course is a great way to provide a high-level overview of a subject.

Not Recommended for In-Depth Training

If you have a subject that requires in-depth study, short-duration learning experiences may not be the most effective technique.

Best Practices for Short-Duration Learning

Determine if SDLE can be appropriately applied in your situation

If the subject matter you are teaching is complex, requires in-depth study, or calls for in-person training, a short-duration learning experience may not be comprehensive enough for your situation. However, depending on the use case it may still be utilized as an effective teaching technique within your larger course structure.

Focus on the Important Bits

Write short and focused content which emphasizes the important points you want the students to absorb and remember.

Use Multimedia Creatively

Text can be a boring medium for many learners. Adding multimedia components such as videos, photos, illustrations, and animations can help sustain interest. Choose the multimedia carefully. It should add to your subject, not just make it look “pretty”.

Use Gamification to Improve Engagement

Try adding elements of gamification to your content. Gamification can be implemented through points, leaderboards, trivia games, prizes and other techniques. Gamification can be a strong booster of engagement!

Use Mini-Assessments to Gauge Progress

Mini-assessments are a great way to gauge the knowledge retention or output of your short-duration learning experience. Use mini tests, short quizzes or task completion to ensure your learners are progressing with their training goals.

Why We Use Short-Duration Learning at MacChangers

Although short-duration learning experiences are short for the participations, planning a short-duration learning experience still takes a lot of planning. This book covers examples of how to deliver content for short-duration learning experiences, preparatory notes for staff assisting in short-duration learning programs, and guides to some of the lessons we’ve learned while planning short-duration learning.

If you’d like to learn more about offering short duration learning experiences, check out the MacPherson Research Resource Hub at https://mi.mcmaster.ca/resource-hub/

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Maximizing Student Engagement in the World of E-Learning:

Maximizing Student Engagement in the World of E-Learning – MacPherson Institute (mcmaster.ca)

Guide-to-Experiential-and-Community-Engaged-Education-at-McMaster-University-1.pdf

2. Problem Scoping

The Problem Scoping Process

In this guide, we will walk you through the process of considering how to scope a problem for participants of your short-duration learning experience to work through. This process can be generated for students completing a case competition, for students completing a design thinking challenge, or for students completing the experiential learning component of a larger course. Typically, the idea behind this type of short-duration learning experience is to focus on presenting participants with a real-world problem that requires a variety of skills to either fix or improve. Many design-challenge focused short-duration learning experiences try to present students with "wicked" problems (read more about wicked problems here).

Choosing what problem students will focus on is truly an art form; if the problem is too specific, students will feel overly constrained. Many students turn to alternative education styles like short-duration learning experiences to experience more creativity in their learning, and an overly scoped problem can turn away potential participants. On the other hand, if a problem is too large, students will feel frustrated when they discover the problem is "unsolvable." They will complete the program feeling somewhat defeated or they might question their skills. Picking the "sweet spot" of breadth may be challenging but it is well worth the effort.

To create a challenge that is interesting to participants, ensure that there is an interconnectedness between the chosen problem and your participants. Participants need to be able to comprehend and build on the chosen problem set. One way we accomplish this goal at MacChangers is by hiring individuals within our chosen target population and co-collaborating with them to develop topical and relevant problems. We then give our team a theme area relating to one of four topics: Health, Environmental Sustainability, City Planning and Infrastructure, and Supporting Small Businesses. Our team members are then encouraged to look into topics and ideas that have any kind of relationship to their theme area. They gather some data and current news topics and present them to the team. See appendix A for guiding questions our students base their inquiry off of. Based on what is gathered, a subset of topics is chosen through collaboration as a team. This process takes us around 2 weeks; we find it is important to ensure the inclusion of multiple points of view before going ahead with one final choice of challenge. After narrowing down potential challenge candidates, we then connect with key stakeholders and subject-matter experts to further inform our problem. See our guide on connecting with stakeholders for more information about our process.

When brainstorming with stakeholders, quantity over quality is preferred. Topics relevant in the press can be old news to the people engaging in the issue every day; however, they can spark ideas or lead our discussions down new avenues with our subject-matter experts. For this reason, we like to view sessions with stakeholders as brainstorming sessions. We rarely reach a consensus for our chosen problem focus in these meetings. Instead, we usually generate a new list of potential problems that are more expert-informed. We then pose three guiding principles developed by the Delta Lab from the Segal Design Institute at Northwestern University to our improved list of potential problems: questions must be daring, feasible and applicable (Lewis et al., 2015).

Challenges that are daring should have some value within society as a whole and should not just relate to the person or team that are working on scoping a challenge. For example, questions that Lewis et al. pose to decide if their problem is daring include, "Does the problem appear in national news?" and "Are current solutions to the problem lacking in some way?" (2015).

Challenges that are feasible are those which have accessible domains. Questions posed by Lewis et al. to determine the feasibility of a problem include, “Can we access the expertise and tools needed to understand and solve the problem?” (2015).

Thirdly, challenges must also be applicable. One needs to consider not including challenges that are only valid in one context and are difficult to scale (Lewis et al., 2015). Questions to determine the applicability of a problem include “Does the problem affect a significant number of people?” and “Are there multiple places where the problem occurs?” (Lewis et al., 2015).

Questions which are able to pass all three of these guiding principles tend to be successful for finding a balance between being realistic and still intriguing to our participants.

Problem Scoping Timeline

For our longer and more intensive programs, scoping problems takes around four months. We generate 12 scoped problems in this timeframe. For our condensed program, we generate 4 well-scoped problems in a 2-month timeframe.

Example of Problem Scoping Timeframe:

2 weeks: Exploration of Potential problems. Your team will likely want to review a set of potential issues facing your target audience by reading the news, attending webinars or events hosted by institutions related to your chosen topic, and reviewing on-going events in your target community.

1 week: Once a few initial ideas are generated, our team begins to generate a list of potential stakeholders who could speak to our topics and begins to contact them.

6 weeks: We find that once identified, it can take up to three weeks to hear back from stakeholders. Typically, the first person we speak with at one organization will let us know of two to three other individuals who might be a more appropriate fit for our chosen topics. Alternatively, initial stakeholder meetings will lead us to entirely new topics which require research. The process in its entirety takes around a month. When just starting out, this process can take closer to 8 weeks if you do not have an established network. We usually meet with stakeholders at least twice, with the first meeting being broader with an emphasis on brainstorming, and the second being of narrower scope to evaluate the quality of ideas generated through reflecting on the brainstormed ideas.

2 weeks: Consolidate problems into scoped questions through the process listed in this document.

3 weeks: Generate well-researched write-ups regarding the problems, including information derived from research, stakeholder interviews, and defining new vocabulary associated with the topic. We generate challenge guides to introduce topics to participants and we tend to circulate these guides to the stakeholders prior to the program commencement to ensure we’ve accurately articulated the concept. We also check-in with

stakeholders to see if they would like to promote an organization they are affiliated with or if they would like to volunteer more personally. It is very important to know how they would like to be referenced, as often, subject-matter experts can bring many experiences to the table and they may require specific clearance to have their place of work referenced as a collaborator on the project. In those cases, our subject-matter experts prefer to be "free agents," so to speak.

2 weeks: Typically, at least one to two questions require more refinement and processing, so having a buffer of two weeks to the deadline has been helpful to our organization. It is not required.

Creating a Challenge Guide

As an aside, it a good idea to consider how a scoped problem will be presented to participants who engage in your short-duration learning experience. At MacChangers, we create a document called the "Challenge Guide" which participants are invited to review before beginning the program. A link to one our most recent challenge guides can be found here. [Link opens to a new tab, ArcGIS Story Maps, on our Built Environment & Infrastructure 2021-2022 Challenge Guide].

We try to present students with an engaging and inspiring multimedia tool when showcasing the possible projects. Our guides are created using lots of information generated through consultation with stakeholders, current news articles, and any available academic literature. Recently, we've also added Ted Talks or other videos to provide participants with inspirational mechanisms for engaging with the topics. In the future, we hope to record stakeholder interviews to introduce our subject-matter experts earlier into the program.

Appendix A: Questions to Promote Problem Scoping

- Using local news sources, list 5 problems currently facing our community.

- For each problem, answer the following questions:
  - What is the global context of this problem?
  - Who are 3 people you would like to speak with to learn more about this problem?
  - Who are 3 groups of people you believe are impacted by this problem?
  - What are 3 solutions you could imagine being created to solve this problem?

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Lewis, D. R., Gerber, E., & Easterday, M. (2015). *Supporting project scoping: The scoping wheel*. Retrieved December 2, 2021, from https://cpb-us-e1.wpmucdn.com/sites.northwestern.edu/dist/3/3481/files/2015/04/Gerber_Supporting-Project-Scoping-The-Scoping-Wheel-Poster-Rees-Lewis.pdf

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3. Engaging Stakeholders

This guide will be going into detail on how you can identify and engage stakeholders in any project you are hoping to pursue! Stakeholders can range from subject-matter experts to community members you would like to interview. The steps are outlined below, and follow the process of identification, outreach, a stakeholder interview (or some form of contact), and finally how to sustain this stakeholder relationship with short and long-term engagement. At MacChangers, we primarily engage with stakeholders as part of our problem scoping process. Check out our guide on problem scoping for more information.

Step 1: Stakeholder Identification

The first step in engaging stakeholders relies on your ability to accurately identify them. To begin, first, create a "profile" for your ideal stakeholder. This may be difficult in the beginning, especially when you don't know who an ideal stakeholder for your project may be, so alternatively, you may create a guide for different qualities, backgrounds, experiences, and knowledge you hope your stakeholder will have and be able to share with you.

To help with this, lay out a general foundation for your project so that you can not only formulate a list of potential stakeholders to engage with, but so that you can also have guiding materials to propose to your stakeholder during the outreach process. During this process of identification, use any means and networks available to you, your contacts, or even your contact's contacts. These networks can range anywhere from your work and volunteer experiences, colleagues, social media and LinkedIn contacts, and provide for a higher rate of engagement success as you are already being connected. If none of these options yield results for potential stakeholders, begin to look beyond these and be prepared to cold call/email individuals outside your network.

Step 2: Stakeholder Outreach

The stakeholder outreach process is one of the longest and most strenuous ones, as it relies on the stakeholder's response, which could take days, weeks or even months to receive. Depending on who your stakeholder is you should pick a contact method most attuned to them to receive the earliest response. For example, if this stakeholder actively engages within LinkedIn, that may be a good platform to try to reach them through. Since this stakeholder response has an unforeseen time period, it is important to initiate first contact with your stakeholders as soon as possible.

In this initial contact, it is important to keep your message short, concise, direct, and tailored to your stakeholder's interests. If reaching out to more high-profile stakeholders, who comparatively have less time to attend to messages, try to conduct some preliminary research on their work, interests and goals, and attempt to align these with your own project inquiries when requesting an interview. In other words, clearly outline why the project would benefit from the stakeholder's input, and how the completion of the project itself will benefit the stakeholder and *their* aspirations. It is important to make this connection as it allows the stakeholder to see an active need for their support in the work you are proposing.

However, it is also important to keep in mind that the response rate, especially for cold calls/emails, can often be lower than 50%. For this reason, your initial stakeholder outreach should prioritize quantity over quality and simply aim to get the stakeholder involved in some form of conversation with you. To help improve the quantity of your outreach, consider creating a general outline that you can use for each stakeholder email. Make sure

to keep this outline professional and consistent, introduce yourself, your project, your reason for contacting the stakeholder, why you are interested in having an interview with them, and what they will benefit from by getting involved with your project. You can see an example of such an outline in Appendix A.

Step 3: Stakeholder Meeting

During the stakeholder interview, similar to the outreach email, do a recap of yourself, your role and your project. Thank the stakeholder for their time, and give them the opportunity to introduce themselves. Prior to the interview, formulate 7-8 questions to ask them (with some as leading questions, and others as back-ups if the stakeholder does not seem to engage with the others). Also aim to get a notetaker for the interview process, as this allows for someone to be actively recording the responses, allowing you to remain engaged in a conversation with the stakeholder. This method greatly improves the flow of conversation, and gives you the comfort of turning to another person if any technical difficulties arise (in online interviews), or to clarify anything the stakeholders have mentioned and gain a better overview of the interviews' insights.

Aim to make the interview short and concise, and respect the stakeholder's time. If you find that the interview is going overtime, ask the stakeholder if they would be willing to do a follow-up interview at a later time. This allows for prolonged stakeholder engagement and more focused conversations. After the interview process, be sure to send a follow-up stakeholder email with recaps of the conversation, a thank you note, as well as any resources and next steps. This keeps the stakeholder in the loop, and informs them about what you will be doing with any knowledge you gleaned from their conversation. This is also an opportunity to possibly send any lingering questions from the interview that you may still have or want resources for to gain further clarification. Finally, the most important thing to keep in mind with stakeholders is not the information you are hoping to receive from one conversation, but how you will connect with them, to allow for long-term engagement. This means finding a point of similarity between yourself and the stakeholder, or any other form of connection between your work, ideologies, interests, etc. It is also a great method to end every stakeholder interview by asking *them* if they have any stakeholders from their contacts/networks in mind that would be interested in further engaging with your project (and if they would be willing to personally introduce you to their contact). By doing so, you can receive access to new stakeholders, and establish new points of communication and collaboration.

Step 4: Stakeholder Engagement

The final step in the stakeholder engagement process involves short and long term engagement.

Short-term

Short-term engagement with your stakeholder can involve the length of time that your ongoing project (which involved their input), is running. In others, their active engagement until the completion of your project. This can be done by actively engaging the stakeholder in conversations/interviews and updating them on the process and progress of your project.

Long-term

Long-term engagement with your stakeholder focuses on how to engage with your stakeholder after the completion of your project. It is important to maintain stakeholder networks/connections even after the end of a pending project, as if these individuals are engaged, they are more likely to remain involved with your organization (or whatever role you are representing), and any future endeavors/projects you take on. This can be done by monthly emails if you are representing an organization, that updates the stakeholder on your current work and how their previous engagement has benefited the project (and future projects). Depending on the type of stakeholder you are engaging with, this method can be altered to suit their needs. Refer to Figure 1 in Appendix B for a comprehensive stakeholder map, that demonstrates the needs of your stakeholders based on their interest and influence.

Appendix A: Email Outline

Request for Stakeholder Interview

Dear _____ ,

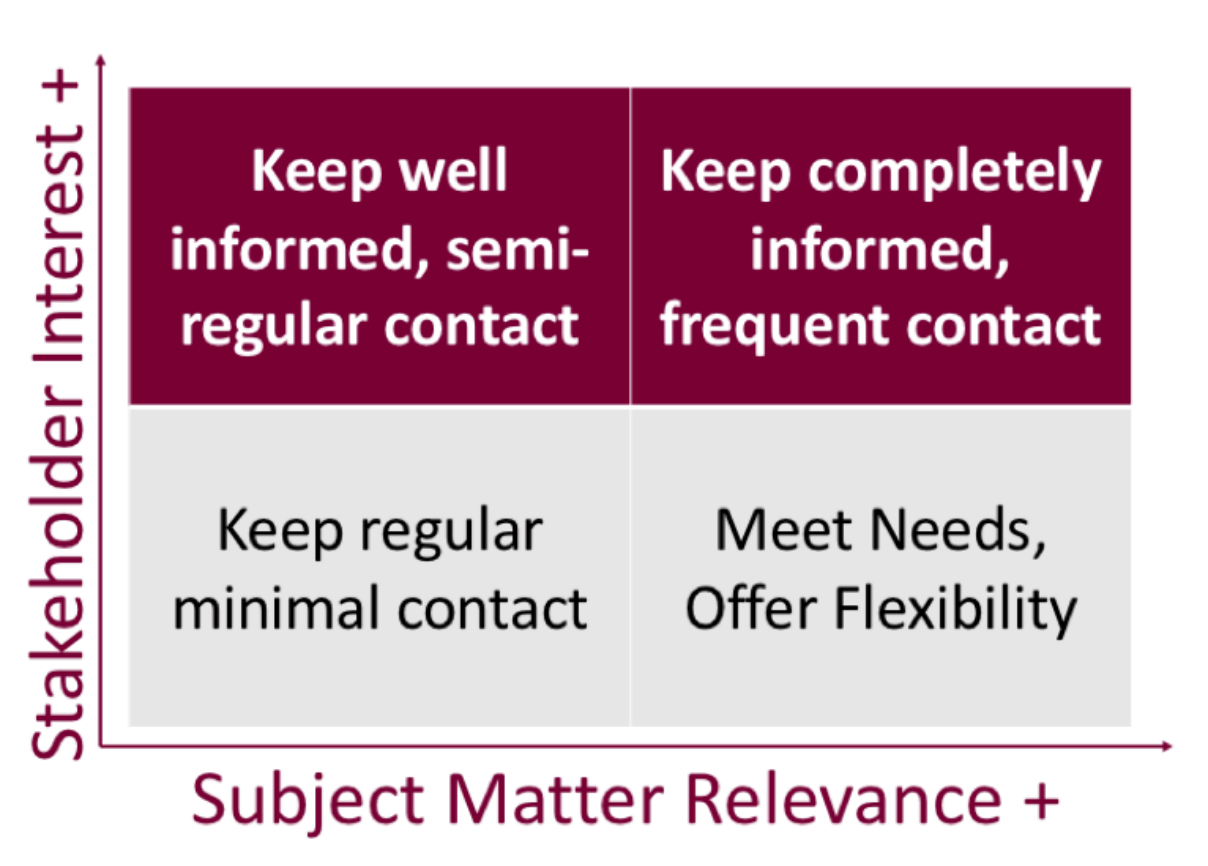
My name is _____ and I am (list program, job, or any other affiliation to give context to your request). In this paragraph provide an overview of anything that may be relevant to your program or position that will help the stakeholder understand how they can support/benefit your project.

Right now, I'm putting together_____. Provide any background information on your specific project. Seeing that you have amazing expertise in____, I would love to capture your insights on your work and how you believe _____. Create a connection between your stakeholder's work and aspirations and your own. In this paragraph, you may also expand on any research/work of theirs that you wish to inquire about in the interview process. I would love to speak to you and get a better understanding of _____. Would you have some time this week or the following week for a short discussion? If you have any questions about _____, please let me know, and I would be happy to discuss specifics with you.

Kind Regards,

_____

Appendix B: Comprehensive Stakeholder Map



Stakeholder Map. Adapted from Open Practice Library (n.d). https://openpracticelibrary.com/practice/stakeholder-map/

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Reports. BSR. Retrieved November 23, 2021, from https://www.bsr.org/en/our-insights/report-view/stakeholder-engagement-five-step-approach-toolkit.

4. What to do About Timezones

One of the most rewarding experiences of higher education is meeting individuals from different backgrounds, disciplines, and industries. When creating virtual events, international participation might be already occurring, whether intentional or not. For example, many international students will continue to attend school while living in a different time zone from their academic institution. Other times, events are created with the specific intention of bringing students together globally. This can present a variety of logistical challenges to short-duration learning experience planning. This guide will cover two considerations short-duration experience planners should make while preparing for a short-duration learning event.

A short-term learning experience that has a global audience will require virtual components. Some of these components will be synchronous, where the teaching team will be delivering content and providing mentorship and some of this time will be asynchronous where the student teams will be working, brainstorming, and researching. Scheduling the synchronous components can be difficult, but it is during these sessions where a sense of community can be built amongst the participants and it is critical to accommodate as many of them as possible. The level of engagement is not solely based upon the timing of the synchronous components but if some participants are regularly asked to join late at night or early in the morning this can limit their engagement and even cause some of them to drop out.

In planning these events, the first step is to consider that there are various time zones that may be at extreme endpoints. What can someone possibly do when it's 8 AM in Toronto, Canada, but it's 5 AM in Kuala Lumpur, Malaysia? Identify where different participants are located in the globe and lay out all the different time zones in comparison to one reference time point. One resource which can support this process is WorldTimeBuddy [Opens in New Tab, Website for Managing Multiple Time Zones]. An example table is below for reference.

City	**Session 1 Times**	**Session 2 Times**
Hamilton, Ontario	9:00 AM	4:00 PM
Montreal, Quebec	9:00 AM	4:00 PM
Melbourne, Australia	1:00 AM **Problem**	8:00 AM **Problem**
Subang Jaya, Malaysia	10:00 PM **Problem**	5:00 AM **Problem**
Rome, Italy	2:00 PM	10:00 PM **Problem**
Los Angeles, California	6:00 AM **Problem**	1:00 PM
London, United Kingdom	3:00 PM	9:00 PM **Problem**

Consideration 1: Creating Realistic Teams

The best solution is to find a time that is suitable, while perhaps not ideal, for most candidates. This can be agreed on collectively. However, as you can see in the table above, this is not always possible. To tackle this issue, alternating time slots can help to keep a project on track while minimizing difficulties for any one group. For instance, meetings can occur at different times every week, so that there isn't one group that is disproportionately disadvantaged.

Another solution one can use is to create teams based on time zones. That is, teams would ideally only have a set time difference between their locations, such as a maximum of a three-hour time difference between all group members. The trade-off to this approach is that it can reduce team heterogeneity. For example, during a global event, this would mean that only North and South American teams would form one time cluster, European and African teams would form another cluster, and Asian and Australian teams would form a final cluster. Logistically, this approach can streamline team formation by using time zone information as a filter during team assignment. On the other hand, this approach reduces within-team heterogeneity.

A third approach to creating realistic teams of varying time zones is to design an education experience which can be handed off between teams. In this case, the idea would be that members of the team would work on different components of a project that could be handed off to fellow team members. Ideally, a branding team could be working asynchronously from a software development team. This approach works best for projects which do not prioritize within-team collaboration.

Consideration 2: Involving Guest Speakers

During the planning phase of a short-duration learning experience, it is important to consider whether subject-matter experts, guest speakers, or esteemed judges will be invited to any part of the event. If your invitees have further conflicting home time zones locations, pre-planning their involvement is the best strategy. Some solutions to maximize guest involvement include asking judges to create a recording rather than live presentations, recording live presentations for participants to watch on their own schedules, or running the same event more than once to include all participants. Failing to consider the involvement of guest speakers ahead of time can lead to frustration for participants and guests alike; as a lack of participation to the speaker can feel like a waste of time, and a guest speaker seeming to favour one time zone can feel unfair to event participants.

5. Applications and Group Formation

Participant Selection and Group Formation

The selection process for your event depends on the desired outcomes of what you are asking participants to do. At MacChangers, part of our goal is for teams to work in multidisciplinary and multilevel groups. This means that groups are made up of students from all levels of study and from all programs at McMaster, including post-graduate degrees. Often, people trained in different fields and at differing stages in their studies have diverging views on topics and problems they may encounter. By allowing for multidisciplinary, multilevel groups to be formed, we feel that students develop unique solutions and learn new skills and abilities from one another.

Team Size

At MacChangers, our ideal group size is four students. Groups of either 4 or 5 allow for varying perspectives and opinions to be expressed while being small enough to maintain unity and cohesion between group members. We also find that teams of 4 or 5 are resilient to a group member leaving the program without putting too large of a burden on the remaining participants, as may happen with groups that begin smaller. As such, by the end of our program teams typically end with 3 or 4 members. On rare occasions, groups of 2 have completed the program.

Forming successful groups is a bit of an art form and as an organization we are continuing to update and change our process year by year. It is important to both try to create a functioning team dynamic, as well as a team that we can logistically put together given our pool of participants. Anecdotally, one way to sink a ship in a collaborative program is to have a dysfunctional team. Below we share our current process for accepting participants and forming teams; however, this is subject to change and an area we are continuously interested in improving.

Applicant Selection Process

Our selection process involves a series of both close-ended and open-ended questions.

Our typical admission form includes the following:

- Asks for name and preferred name, pronouns, contact information, program, and level of study.
- Asks participants to confirm that they understand their time commitment to the program and to confirm they understand the program outcomes.
- Selection of the theme area or topic.
- Determine whether they have entered alone, with a friend, or as a group of four.
- Expression of interest.
- How they heard of our program.

See Appendix A (end of this page) for a copy of our admission form.

Theme selection

In our program, students will each participate in 1 of our 4 theme areas. This is based on interest and space available in the program. Our theme selection process has proven to be very helpful. Applicants fill out a form in which they rank each possible theme or topic into three categories:

1. I am not willing to work on this topic.
2. I am willing to work on this topic if my preferred choice is unavailable.
3. This is my preferred topic.

Applicants are free to rank each topic however they please, with the acknowledgement that students who rank topics in the second or third category have a greater chance of being selected for the program. We've found that students have fewer conflicts when beginning their projects when they are happy with their theme area. We propose that this might help to reduce attrition due to conflict caused by disinterest in their challenge area. That said, we've yet to study this effect formally.

Open-Ended Question

We use the expression of interest to determine the enthusiasm of participants in the program. Using at least two reviewers, we review their understanding of the program goals and their motivation for applying. Applicants with poor responses are rejected while participants with effortful responses are accepted. For example, if an applicant says something that is factually incorrect about the program they will be rejected. Individuals who can speak to personal goals and an accurate understanding of the program are generally accepted. We typically generate a third section of applicants who are neither immediately rejected nor accepted. If the pool is competitive, we typically are unable to take these applicants; however, we keep them on a waitlist should any successful applicants later decline the program offering.

Using open-ended questions for participant selection is not recommended for programs that will be multilingual or accepting applicants from universities from various countries. This question may put those who are not native speakers of the language in which the question is asked at a disadvantage as they may be unable to express themselves appropriately. This question is beneficial when all applicants are level in terms of ability to express themselves in a language.

Use of GPA

You may notice that we do not ask participants their grades or GPA. This is an intentional choice; our program goal is meant to inspire students and to help them feel encouraged with experiences outside of the traditional classroom. Further, our program is co-curricular, and a commitment that students choose to make outside

of their course load. We do not want to make our program feel like it has the same pressure as their already heavy course and assignment schedules. That being said, GPA can be a good tool to use when forming groups. Literature suggests that student groups in which participants are all of moderate ability or GPA are better suited to be more uniformly grouped. However, groups of combined high and low ability or GPA tend to have positive group dynamics and are better in diverse groupings (Chen & Kuo, 2019). GPAs can also be used for cut-off in competitive programs; however, studies do show that GPA variety tends to help as teams will be able to share more diverse knowledge more effectively than if they were all of the same ability level (Webb, 1982; Chen & Kuo, 2019).

Group Formation Process

The group formation process begins by removing students who fail to demonstrate their enthusiasm or understanding from the successful applicant pool. At MacChangers, we pre-determine the number of applicants that will be selected based on the size of our staff. Our program relies on each team being paired with a peer mentor and we try to ensure this number is a ratio of five teams of four students, to one mentor.

Successful applicants are divided into their most preferred theme areas, then sub-divided into their program, program year, and type of response submitted for the situational question. We attempt to diversify the groups as much as possible.

We do allow participants to enter as an existing group of 4 or as a group of 2; however, all participants of the group or duo must be accepted. Pre-formed groups do not work for every program, however, given our program is co-curricular, we try to accommodate students whenever possible. This can defy our goals of creating multi-disciplinary teams and may be removed as an option in the future. An alternative option to remove this issue, is only allowing for pre-formed groups of 2 to join, thus allowing for the rest of their group to be diversified. Familiarity within a group seems to improve the comfort students have in sharing information effectively, however, a group with high familiarity is less likely to have differing knowledge and perspectives (Chen & Kuo, 2019). This means that only allowing pre-formed groups of 2 may improve the balance between familiarity and diversity.

That being said, we are currently undergoing research on project continuity and what allows best for a group to be able to continue with their project. We find that within our program, groups that are pre-formed tend to fare better with the continuity of their projects. It appears that groups with high internal familiarity, who are preformed, will have better group dynamics and want to continue together. So, arguments for and against preformed groups can be made, and the decision may be reliant on your own program's goals.

Current Exploration and Research

It is important for programs to think about how they are forming their groups, and the above can be used as a guide for how we have thus far been successful. The following is a discussion of our ongoing research into ways that we can improve, and potential jumping off points for the future of our program.

A large focus of our research, and of our current method of group formation, is the importance of both heterogeneity and homogeneity. Heterogeneity in a group setting refers to the differences found among groups and the push to make them diverse. Homogeneity in groups refers to the aspects that should be shared

among individuals within or between groups. Studies have identified that the most advantageous groupings are those that are inter-homogenous and intra-heterogeneous, meaning that groups formed are similar to one another to minimize advantages, but internally diverse so that within a group there are varying perspectives and traits (Chen & Kuo, 2019).

Heterogeneous groups are found to outperform homogenous groups on a wider variety of tasks. Moreover, heterogeneous teams outperform student-formed and randomly formed teams as well (Chen & Kuo, 2019). This just provides further reason for minimizing the number of people allowed in a pre-formed group, and the need for a standardized approach to assessing student traits.

As alluded to above, we are reconsidering how we form groups and diversify individuals. We are interested to see if implementing a research-tested system into our existing application process would improve the validity and efficacy of our group formation process, to reduce attrition and increase cohesion within groups. An exciting area in group formation and social networks is the use of algorithms to form groups. However, this is not feasible for the staff and capacity of MacChangers program. While this approach may work for other programs, given our small participant pool, it seems more feasible to utilize a more questionnaire-based approach that can be used to loosely categorize individuals. This could then be used in conjunction with our pre-existing techniques to create diverse groups. The following are approaches being considered for future exploration.

Felder Silverman Model

In this approach learners are distinguished on a basis of 4 dimensions; active or reflective, sensing or intuitive, visual or verbal, and sequential or global. On the first dimension, active learners prefer to really engage with learning material and be able to apply it, while reflective learners prefer to work in smaller groups and to reflect on material. Sensing learners prefer to learn concrete information and facts and they may be more realistic, whereas intuitive learners enjoy abstract information, theories and being creative. On the third dimension, visual learners tend to prefer learning from their observations, while verbal learners gain more from textual representations or speaking. Finally, sequential learners learn in steps that have a linear process, where global learners like to absorb learning material all at once and without finding connections but after learning it all they will make connections within the big picture. (Graf, Viola, Leo, & Kinshuk, 2007)

To find where students lie on these dimensions, Felder and Silverman identified 44 questions, with 11 questions pertaining to each dimension. This test is known as the Index of Learning Styles (ILS). This has been found to be reliable, and the authors of an analysis of this method have compiled a list of only 20 questions that are the most representative (Graf, Viola, Leo, & Kinshuk, 2007). This method would potentially be effective as while 44 questions may be daunting to pose to applicants, 20 is far more reasonable. Questions can even be further reduced by selecting only questions on dimensions that pertain the most to your program.

Where students stand on these dimensions can then be utilized to form diverse or heterogeneous groupings, where for example groups are formed with both visual and verbal learners, as well as both sequential and global learners. This may improve students' abilities to take on projects from a variety of perspectives as well as to learn from one another's differing abilities.

Kolb Questionnaire

The Kolb Learning Style Model defines an individual's learning based on how they perceive and process information. Learners can perceive information as either concrete experience (CE) or abstract conceptualization (AC). CE learners are peer oriented while AC learners are symbol oriented and learn best under the direction of authority. Learners can also process information through either active experimentation (AE) or reflective observation (RO). AE learners prefer to "do" and learn via experimentation, while RO learners must rely on observations to come to conclusions (Lu, Jia, Gong, & Clark, 2007).

An analysis of Kolb Learning Styles and online learning identified 4 groups of learners based on how they perceived and processed information; Divergers (CE & RO), Assimilators (AC & RO), Convergers (AC &AE), and Accommodators (CE & AE). The test utilized here is the Kolb's Learning Style Inventory. This method has been refined to improve validity and can now be considered a useful tool in determining learning styles (Lu, Jia, Gong, & Clark, 2007).

Once again, this method could be used to form groups of 4 composed of at least one individual from each learner group (Diverger, Assimilator, Converger and Accommodator). This may pose an issue as an equal amount of each learner type may not be available in a participant pool, but it is possible that simply aiming for as much heterogeneity as possible would improve group dynamics.

Big 5 Questionnaire

The Big 5 Questionnaire is a method that relies on the Big 5 personality traits: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. If an individual is high in openness, they are intellectually curious and prefer variety, high in conscientiousness is an individual who is disciplined and achievement driven, high extraversion indicates high sociability and assertiveness, high agreeableness is a helpful, cooperative and sympathetic learner, and a highly neurotic individual has anxiety and self-doubt. An analysis of this method identified the importance of personality in conjunction with learning styles, even finding that high openness had correlations to higher GPAs (Komarraju, Karau, Schmeck, & Avdic, 2011).

These traits may be assessed utilizing the Five Factor Inventory (NEO-FFI) which utilized 60 questions. However, a revised version, the NEO-FFI-R was found to be more reliable and consistent (McCrae & Costa Jr, 2004). This test, while revised, is extensive and 60 questions may not be feasible for all programs. It would lend to the ability to create heterogeneously formed groupings of individuals who differ on the 5 traits.

Conclusions

The major findings on group formation are that heterogeneous groups are the most effective in terms of group collaboration, efficacy of knowledge sharing, and success of the group. It is also important to ensure that groups are small enough to feel comfortable sharing with one another. MacChangers is taking steps to increase the diversity within groups, by assessing our choice to allow pre-formed groups, diversifying students based on level and area of study, and by assessing the validity of our current methods. Going forward, best practices seem to rely on the use of a standardized method of assessing participant traits and considering learning styles in how groups are formed to ensure lower levels of attrition and higher rates of group success. The above are guidelines

that can be used and altered for other programs that have been found effective in MacChangers, as well as avenues we are continuing to learn about and explore.

Appendix A: Copy of MacChangers Current Application

This is a copy of our current application form.

Contact Information

Participants are asked for

- First and Last Name
- Preferred Name (if different than listed above)
- McMaster E-Mail
- Phone Number (optional)
- Level of Study
- Faculty

Commitment to the Program

MacChangers is a 6-month program during which you are required to attend a 1-hour weekly workshop or check-in meeting with the teaching team (excluding reading weeks and exam periods). In addition to these sessions, you are expected to dedicate an extra 2 hours per week on your own time to work on your project with your team. Please confirm your commitment to the program.

Theme Area Selection

Please use this section to rank your preference for a challenge area to work on during the 2020-2021 academic year. We will do our best to meet your preference.

Students are asked to rank each theme area as:

1. I am not willing to work on this topic.
2. I am willing to work on this topic if my preferred choice is unavailable.
3. This is my preferred topic.

Are students entering as a pre-formed group?

Students are asked to choose that they are applying.

- By Myself
- With Friends (pre-formed group)

Expression of Interest

In 3-4 sentences, tell us why you would like to participate in MacChangers. The MacChangers Teaching Team will evaluate your submission on the basis that it aligns with the goals of the program.

How they heard of our program?

Ask students where they heard about MacChangers to better understand effective marketing techniques. This is an optional question.

References

Chen, C.-M., & Kuo, C.-H. (2019). An optimized group formation scheme to promote collaborative problem-based learning. *Computers & Education*, 94-115.

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6. Using Technology in Short-Term Experiential Activities

Disclaimer: We find links convenient for use and we will reference various technology platforms through this document and at other times throughout this book. We do not control any third-party websites, we do not endorse any third-party websites, and we are not responsible for anything obtained from third-party websites. If you decide to access any third-party websites referenced throughout this document, you do this at your own risk.

There are several stages in the execution of the experiential activity where technology can become a primary enabler for the organizing team as well as participants. These can include aspects such as communication, team formation, collaboration, and project submission.

There are many complex aspects and features of the experiential activity, which may include:

1. Online/Offline Participant registration forms
2. Promotion and Marketing of the event and promotional content
3. Team formation: can participants find partners and form teams inside the platform?
4. Community and team messaging functionality
5. Livestream: does the platform provide a built-in livestream tool?
6. 1:1 support: Is there dedicated support available to address participant concerns?
7. Project showcase

One of the initial decisions the organizing team may have to make is to choose a platform to host the activity. While many events can be conducted purely through Microsoft Teams or Zoom, there is greater event cohesion if team members, stakeholders and mentors can collaborate, communicate and engage with each other directly through the platform in an end-to-end experience. Some organizations also have strict rules about which platforms are approved for participant use for privacy reasons. It is therefore important to collaborate invited stakeholders or subject-matter experts when selecting event technology.

Let's start with the first component of the experiential activity workflow; creating the event.

Planning an Experiential Activity

Every experiential activity, such as a hackathon or design sprint, is centered around a common theme upon which the experiential activities focus the design challenges. For example, a hackathon based on the theme of workplace inclusivity and accessibility, may focus on design challenges focussed on assistive technology, attitudinal bias, workplace flexibility and accommodation. Based on the design theme you identify, you may need different technological tools to enable your participants to fulfill the above mentioned aspects. Below we will discuss some of the existing tools which can help with each aspect.

Participant Registration Forms

Google Forms is a free, user-friendly and general-purpose online form generator. All of the participant responses are stored in a Google Spreadsheet in the creator's Google Drive. It is generally well-suited for ad-hoc purposes such as original research, customer satisfaction surveys, and participant registration. Google Forms can also automatically provide rudimentary analytics from participant responses.

TypeForm has excellent aesthetics and a polished professional presentation style. While they're mainly used for surveys and market research, you can use them for lead generation or information collection on a website as well.

Gravity Forms is the most used WordPress form tool, although it requires slightly more technical knowledge as compared to the other options we discussed. This is a great tool to utilize if your website or organization already uses WordPress and you want a more customizable form.

Eventbrite is an event management and ticketing website. It allows users to browse, create, and promote local events. The service charges a fee from event organizers for allowing online ticketing and registration services. However, if the event is free there are no fees.

Promotion and Marketing of the event and promotional content

Here are a few technology tips you can use to increase your event's promotion and marketing.

Create and use an event hashtag.

Across social media posts as well as other marketing channels and any printed material, reinforcing the hashtag helps remind people of your event.

If your organization has dedicated social media accounts for your event, include the hashtags in the account bios as well. The following social media channels support hashtags: Facebook, Twitter, Instagram, Pinterest, and Google+. Utilizing a hashtag on these social media channels allows faster and better targeted outreach of your promotional content.

Furthermore, engage your event participants, including guest speakers and performers by suggesting that they use it when referring to the event. This helps you reach a larger following of people who may be interested in the same content.

Optimize your SEO for better outreach.

Search Engine Optimization (SEO) doesn't require much technical expertise. It can be simplified to two basic concepts:

1. Knowing what words people use to search for events similar or related to yours
2. Optimising your content for those keywords

Use effective Social Media marketing.

In general, here's how you can use the different social channels:

Facebook: This is often a popular platform to market all of your event related content. You can share detailed updates about the event and also answer any questions through the comments and messages.

Twitter: Great for quick, real-time updates both before and during the event. One of the best places to use your hashtag.

LinkedIn: If your event is focused on a professional audience, this is a great place to reach them! Through LinkedIn you can also find communities of people interested in specific topics.

Instagram and Pinterest: These very visual channels are perfect for sharing some teaser images and stories of your event, along with photos from past attendees.

Be sure to obtain consent from any individual you would like to showcase on any media platform associated with your organization.

Team formation

In any experiential activity one of the first obstacles participants encounter is finding group members and forming a team. There are multiple ways to form teams in an experiential activity. These include:

- Allowing participants to register with their own pre-formed teams
- Allowing participants to form their own teams after conducting ice-breaker exercises to enable students to learn about each other at the event
- Matching team members based on complementary skillsets or personality styles
- Assigning team members based on their preference

If you decide to allow participants to form their own teams, you can simply request them to list the names of their team members in the registration form. If they are forming teams explicitly at the event, they can simply list the names of the group members in their project submission.

If you decide instead to organize teams yourself based complementary skillsets, personality styles or group member preferences, you may have to include additional survey questions within your registration form to learn about the qualities of your participants. In either case, you can either notify the team members of their groups via email and allow them to coordinate their own meetings, or explicitly introduce team members to each other at an orientation session of your event.

Community & Team Messaging

Your event will need to enable participants to communicate with each other, as well as give the organizers the ability to communicate with all of the participants for mass announcements.

Here are the different types of technological communications you may want to consider:

- Messaging from Organizer to All Participants for Mass Announcements
- Participant to Participant Direct Messaging
- Participant to Group Messaging

- Document Sharing
- Screen Sharing
- Webcam and Video

These features are provided by various platforms including:

Virtual Meeting Software: Zoom, Microsoft Teams Meetings and Webex.

Advantage: Extremely easy to setup and use. Very convenient for mini events. Most users are already familiar with the software.

Voice Over IP (VoIP) Instant Messaging and Digital Platform: Discord and Slack

Advantage: Allows long term communication. Participants can upload and share files. Groups can set up their own private chats.

Online Event Platforms: Dotslive and VFairs

Advantage: Very customizable to the unique virtual experience you want to create for your participants.

Livestreaming

Livestreaming involves streaming media simultaneously recorded and broadcast in real-time over the internet. Platforms which enable users to stream in real-time or "livestream" include Facebook, Youtube, Twitch, Zoom, Hopin, and LinkedIn. User interaction via chat rooms are an important element of livestream interaction. These platforms also include features enabling the ability to speak with the broadcaster and participate in conversations in the chat. Livestreaming is a popular way to generate marketing promotion and online engagement.

1:1 support: Is there dedicated support available to address participant concerns?

Often participants and team members may require direct support from a Mentor, Organizer, Judge or Moderator at the event. It can be helpful to enable direct 1:1 support. These can be facilitated through an open Voice Channel dedicated to answering questions, assigning specific Mentors to each team through email, or scheduling a Question-Answer session at the event.

Project Showcase

As an event organizer you will also need to decide whether participants can deliver and showcase their projects at the event through the virtual platform. For example, Devpost is a platform that enables people to participate in hackathons, design and software competitions. Participants create an account and submit their design or solutions through the platform for judging. However, at the end all of the submissions are showcased on the event page. This allows users to create a consistent portfolio of hackathons, which they can show on their devpost account. Similar platforms include Kaggle, HackerRank and LeetCode. If you are hosting a website, it may be useful to showcase some of the past competition submissions on your website. Project submissions can be in the form of short video presentations, demos and/or a report.

Conclusion

These are just some of the many different areas in which technology can be used to enhance your event experience. Always remember, using technology can only add to what your event is about, it can't become the center of focus. It has to be seamless, intuitive to use and effective at creating better engagement – otherwise it is not necessary to incorporate it. Furthermore, it is best to reduce the overall number of platforms being used. If one platform can do the job of two others, opt for the simplicity of fewer platforms rather than more platforms. Finally, at MacChangers we like to do a simple check for platform simplicity. One member of our team is technology avoidant. If that team member can navigate new technology we would like to introduce to our event, we feel more confident in the platform ease of use.

7. Showcase Planning

Many short-duration learning experiences close with a final ceremony or event where participants can demonstrate the learning they have completed during your initiative.

It's important to note that showcase planning starts at the very beginning of short-duration learning planning. Organizers must begin with the end in mind when planning an experiential activity, because the way the event concludes will characterize the next steps, learnings, and outcomes of the initiative. Below we will share some of the key considerations in planning your showcase.

Organizers are often surprised by the number of moving parts associated with showcase planning. Thus, although we've emphasized that showcase planning starts when the short-duration activity is planned, some decisions may have to be made closer to the event date. Aim to have as many of these decisions as possible made ahead of time.

Submission Evaluation Methods

If you are planning on evaluating the submissions, you will need to develop a judging process. You will need to decide who the evaluators will be, what the judging criteria will be, when the evaluation will take place, and how the results will be shared.

Another key consideration you must make is deciding whether to share the evaluation criteria with the participants beforehand. There are advantages and disadvantages with either option. We have listed some of these considerations for you below:

Sharing criteria with participants

- **Pro:** Provides better direction for participants to develop solutions and create a more cohesive presentation.
- **Pro:** Can enable participants to clearly meet expectations
- **Pro:** Best when teaching and evaluating a specific skillset
- **Con:** Depending on the criteria focus, sometimes teams can perform extremely well on the criteria without embodying the spirit of the rest of the event. For example, in a final showcase scenario, some teams can woo the audience with a well-pitched but poorly constructed idea. Try to consider whether this might be possible with the criteria you put together.

Not providing judgement criteria with participants

- **Pro:** Greater variety in the style and type of presentations; when participants do not feel there is a tight set of expectations, they may be more willing to engage in risk-taking.
- **Con:** Without a consistent rubric it may be difficult to compare submissions as there is less uniformity in the style.

We strongly recommend sharing final presentation criteria with participants if their final projects will be evaluated or ranked. Even if presentations are ranked through a People's Choice Award, it is still extremely helpful to give participants specific knowledge about their strengths and weaknesses. For mentors, providing participants with direction can feel worrisome without knowing what criteria is being used by the judges. Furthermore, participants can best understand their learning goals when they have an idea for what is valued by the administrators. We have found that participants who complete an evaluated showcase who are not able to see the criteria ahead of time feel that the experience is less fair and confusing compared with participants who are able to see the criteria for evaluation ahead of time.

For any experiential learning program, we also recommend a note about recognizing and redefining failure. Many participants fear failure and as a result, are not willing to take risks. Short duration learning experiences are a fantastic opportunity for participants to try something new without major consequences. (Mayhew et al., 2019). Encouraging participants that there are benefits to risk-taking even if they "fail" at the beginning of the program can lead to participants trying new and exciting ideas throughout the program.

Showcase Styles

We have listed a few showcase formats below. This is not an exhaustive list and is considered for events of approximately 150 participants and additional attendees.

Live and Virtual

General Idea	Schedule/Format	Advantages	Disadvantages
• Participants prepare 3-minute videos for showcase. Videos are on display in a virtual showcase page. • Participants are on standby in breakout rooms. • Invite attendees to view videos on the showcase page and chat with participants in breakout rooms.	Example Timing: 15:30-15:40: opening remarks 15:40-17:15: attendees view videos and talk with participants 17:15-17:30: closing remarks and thanks	• Pre-recorded videos are easier to coordinate than live presentations • Attendees can view videos at own pace • Lends well to attendees having flexibility to when they attend since they can view presentations on their own time; this might increase the overall number of attendees.	• Attendees tend to chat with the participants whose presentations are the most visible; this leads to an uneven distribution of attendees visiting participants. • Not very engaging for participants in rooms with fewer attendees. • Attendees need to flip between the showcase page and participants rooms. This can be technologically demanding.
• 4 separate rooms exist for each theme area • 3-minute videos are presented in real time by moderator in each of the 4 rooms • There is a live Q & A period following each video for attendees to pose questions and interact with participants.	Example Timing: 15:30-15:40: opening remarks in 1 room 15:45-16:35: In 4 rooms, divided by theme area. The first 5 teams present 3-minute presentations, 5 minutes for questions, 2 minutes for transitions between presentations. 16:35-16:45 Intermission 16:45 – 17:45 In 4 rooms, divided by theme area. The last 5 teams present 3-minute presentations, 5 minutes for questions, 2 minutes for transitions between presentations. 17:45 – 18:00 Closing remarks and thanks	• Transitioning between videos is faster and more reliable than live transitions. • Possibly better watchability due to shorter presentations • Videos can be shared ahead of time with attendees, more emphasis on Q&A during the actual event (more engaging) • Participants might take a more creative approach to creating a video rather than presenting live	• Audience might be split between 4 rooms unevenly • More risk for logistics or technological issues (e.g., moderator internet stability would pose as a significant risk as they would be solely responsible for broadcasting all videos) • Participants with time conflicts during the event would be absent for the Q & A • Watching a video together is not necessarily more engaging than watching a live presentation (depends on quality of video)

• Virtual poster showcase: participants have a one-page written description for their project and pitch their solutions to attendees when they arrive in their virtual room. Optional screen sharing of a poster slide.	15:30-15:40: opening remarks 15:40-17:15: attendees view videos and talk with participants 17:15-17:30: closing remarks and thanks.	• Logistically easier to manage than having synchronous virtual viewings • Feels more organic due to conversational nature rather than formal presentations • Participants focus on one-pager rather than formal presentation or video; overall quality of their project might be greater but the pitch skills may be diminished.	• Attendees chatting with participants is very hit or miss • Least engaging option for participants in rooms with fewer attendees • Participants don't get formal presentation experience, which can be an important skill.

Live and In-Person

General Idea	Schedule	Advantages	Disadvantages
• Presentations are given in clusters according to theme on a main stage, time for questions is permitted, social breaks in between. • Poster presentation room occurs simultaneously separate to a main stage. This is a more flexible atmosphere. Participants use a virtual screen to showcase work to date in more detail.	**8:00 – 9:00:** Registration/ Light Breakfast **9:00-9:15:** Opening Remarks **9:30 – 11:00:** First 10 teams present **11:00- 11:15:** Break **11:15-12:45:** Next 10 teams present **12:45-13:30 :** Lunch **13:30-15:00 :** Next 10 teams present **15:00-15:15:** Break **15:15-16:30:** Final 10 teams present **16:30-17:00 :** Closing remarks and thanks.	• Interactive day, allowing participants to follow up with interested attendees in detail • Skill building for both formal presentation skills and networking skills • Attendees can attend formal presentations or can pop-in to see final team ideas.	• Heavy logistical planning; must share location and parking details with participants and attendees • Expensive: costs for event space and food • Might face capacity restrictions requiring attendee restriction. • Difficult for attendees to pop-in during work day as compared to a virtual event.

On-line and Asynchronous

Can accommodate any number of participants

General Idea	Schedule/Format	Advantages	Disadvantages
• Participants create a video presentation of their final project which is uploaded to a single viewing platform. • The viewing platform is shared on-line with any spectators; participants are encouraged to share on their networks.	• For a day/week/month, presentations are viewable on this platform. • Possibly an online voting tool could be made available to collect feedback from viewers.	• Most straight-forward logistically, allows for lots of viewer flexibility. • Encourages participants to share work through their network, promoting event.	• Can be difficult to maintain engagement and enthusiasm without a final event together.

Some Other Things to Think About

Are any privacy laws regarding stakeholder concerns being violated?

- You require consent from the stakeholders to reference their work or to share their logos.
- If you want to acquire promotion materials, participant and attendee consent is necessary.

Who will be your audience and are their schedules clear?

- We recommend notifying esteemed personnel at least 2 or 3-months in advance of the showcase date to ensure their attendance.
- Participants should be made aware of the final showcase date when entering the program so that conflicts can be made aware to staff as early as possible.
- If it's a virtual event with participants tuning in from around the world, will the showcase time align with the time zones of the participants and the judges or other attendees? There is typically a "golden window" during which the showcase is at a reasonable time for all attendees; however, this time needs to be determined immediately and the rest of the event should be planned around concluding at this time. This is especially true if the event is planned to last between 2 to 3 days; the "golden window" could occur early on the final day, reducing the overall event time by a significant number of hours.

Is this event accessible?

- McMaster University offers information for designing accessible events at https://accessibility.mcmaster.ca/.
- Event accessibility must be considered whether in-person or on-line.

Closing Ceremony

As part of the closing ceremony for the initiative, be sure to thank all the participants, mentors, organizers and stakeholder organizations. This is a good opportunity to promote your sponsors and create material for future promotion by taking photos. The closing ceremony should reinforce the theme of the event, and also allow participants to learn how they can pursue next steps for their projects and their learnings.

PART II

CONTENT MODULES

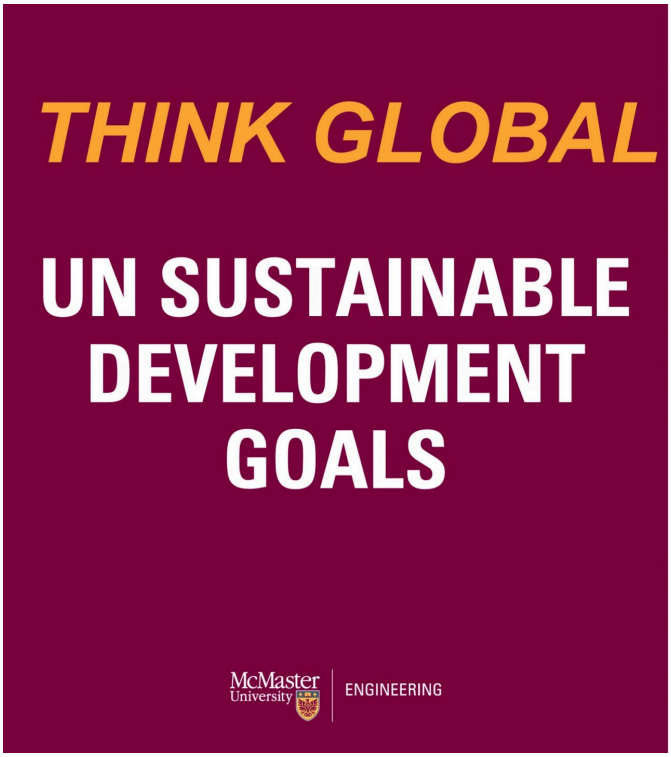
8. Module 1- Think Global, Act Local

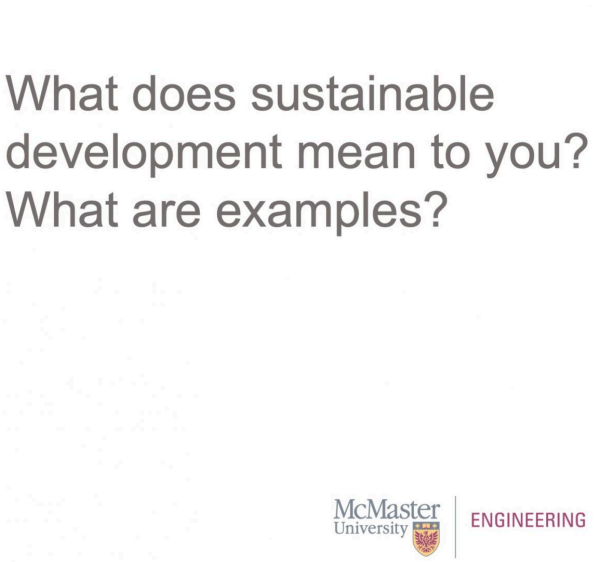
Welcome to the first module in our community-informed experiential short-duration learning experience! Today we will be discussing the global implications of your local problem solving.

Learning Objectives

By the end of this session you should be able to...

- Navigate and identify applications of the UN SDGs
- Identify and describe McMaster's Principles of Community Engagement"





Take a moment to reflect on what the words sustainable development mean to you. Can you think of any examples where you see sustainable development in your neighbourhood? At your place of work or study? Are there any practices you engage that are unsustainable?

SUSTAINABLE DEVELOPMENT

SDGs are supposed to guide the future course of economic and social development on the planet

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SDGs are goals that were established by the United Nations to be completed by countries and institutions by 2030. The SDGs are supposed to guide the future course of economic and social development on the planet and they encompass a wide range of different goals from ending poverty to encouraging healthy living to building sustainable urban infrastructure and engaging in responsible technological advancement.

SDG

Goals

- 17 calls to action for all countries
- To meet the 2030 Agenda for Sustainable Development

Targets

- Vary for each goal
- How to achieve this goal

Indicators

- Statistics that will prove if targets have been completed

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In total, there are 17 Sustainable Development Goals, often referred to as the SDGs, and these goals are calls to action for all countries. Under each goal there are specific targets. These are more specific, measurable objectives that countries can strive to meet in order to meet the overarching goal. Finally, SDG indicators are essentially accountability measures that can mark national and collective progress towards achieving these goals.

For example, SDG Goal #10 is “Reduced Inequalities.” Target 10.1 states, “By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average.” The indicator for target 10.1 is “growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population.”

MISCONCEPTIONS WITH GAPMINDER

Gapminder Misconceptions Quiz

Complete the Gapminder UN goal misconceptions quiz

When you are finished…

How many out of 18 did you get right?

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Now that you understand more about the Sustainable Development Goals, we invite to complete this quiz by Gapminder: Gapminder Misconceptions Quiz.

Completing this quiz will demonstrate to you that while many of the problems associated with the Sustainable Development Goals are well-known to the general public, the details of these problems are actually not well-known at all. The Gapminder Quiz is a great resource for reminding ourselves to consider our biases.

WHY DO WE NEED THE SGDS?

Strive to contribute to the **global sustainable development** and **development of Hamilton** with your solutions by tying them to the SDGs.

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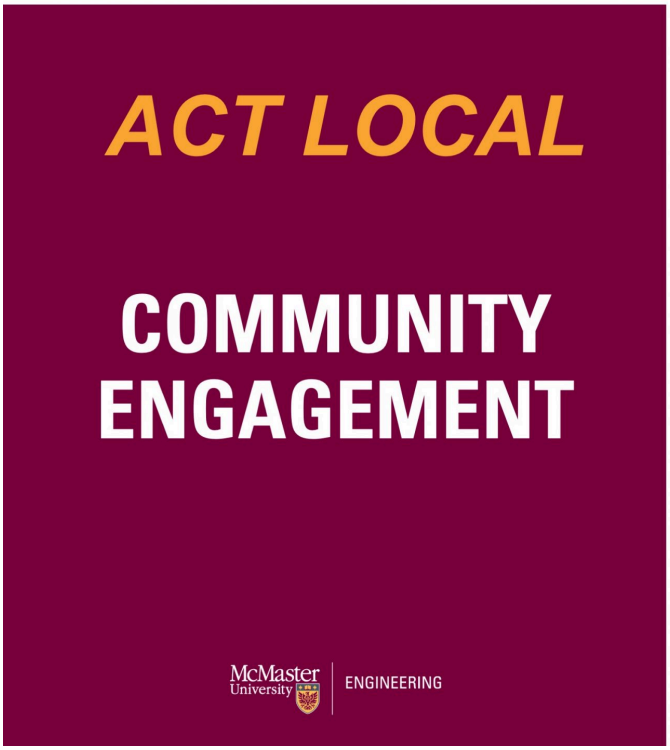
As you work through the challenges you are posed throughout this program, tie them back to the UN SDGs. Consider what opportunities you have to contribute to the global effort surrounding the SDGs. Alternatively, you can use the SDGs as a jumping off point to see what opportunities for improvement could be implemented in your community. Aligning your ideas to the SDGs means being part of a larger movement of like-minded individuals, and an idea you create wherever you are right now could end up being shared globally one day.

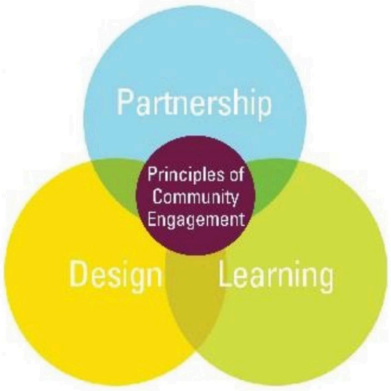


Now that we gotten a taste for the global community trying to solve international challenges, we need to turn our attention to learning how to support our local community. Before we begin, consider what community engagement means to you. What prior community engagement experiences have you had? What interests you about getting involved with your community?

THE FOUNDATIONAL PRINCIPLE

RESPECTFUL RELATIONSHIPS

Community is built upon the foundation of respectful relationships. These respectful relationships are based upon trust and integrity.



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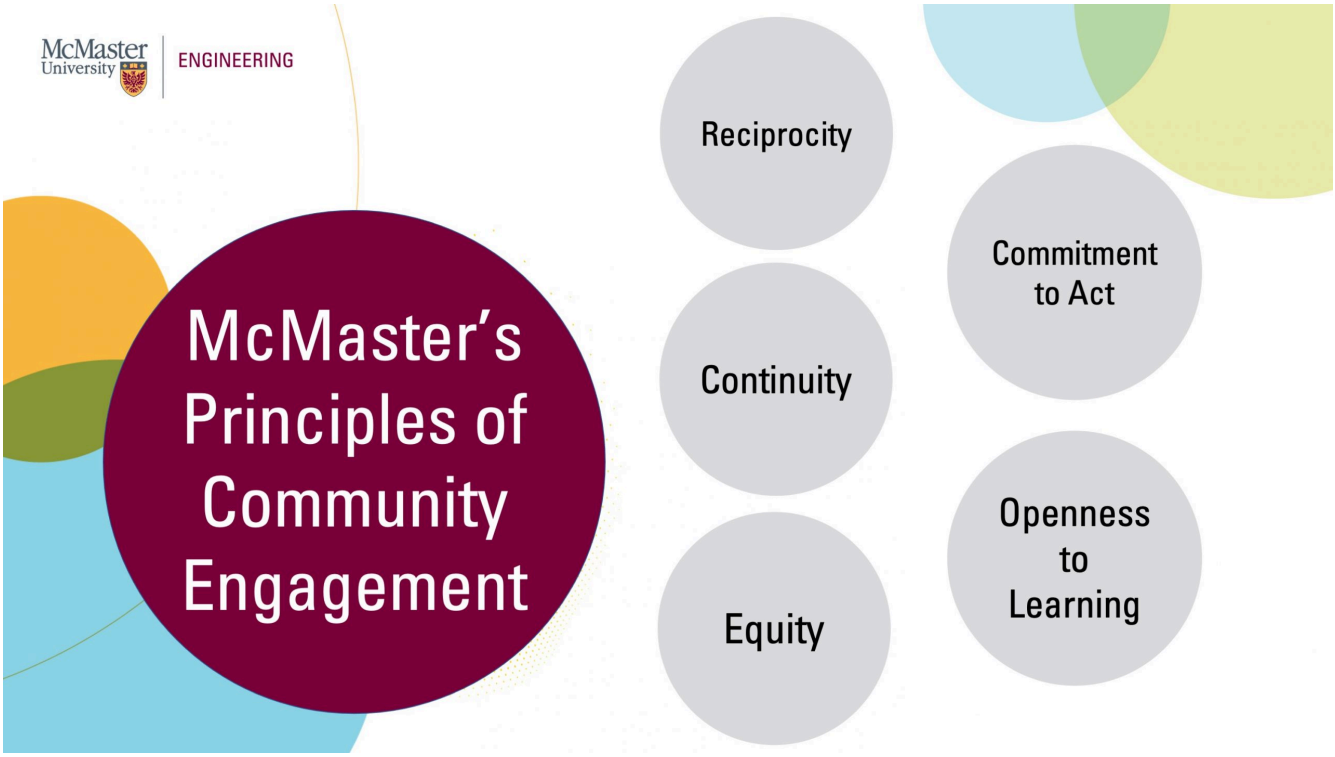
When you start to become involved with the community, or really when it comes to building any sort of relationship, you need to build trust. A respectful relationship is built upon trust and integrity. We will soon be discussing principles of community engagement, but underlying every principle is the understanding that community engagement is relationship building, and relationship building is based on trust.



So, what are McMasters principles of community engagement? McMaster focuses on five main principles. And these are reciprocity, continuity, equity, commitment to act, openness to learn.

RECIPROCITY

Through collaboration and consultation with community organizations we focus on meeting shared goals.

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McMaster Community Engagement Principle 1: Reciprocity.

RECIPROCITY

Example:

While working on a transportation project, students **supported City-staff objectives** by sharing a new software program while **learning about City priorities**

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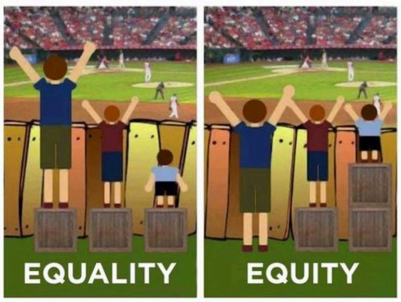
In this example of reciprocity, the students gains experience and exposure to real life work, the city gained a new software and the new optimized version to do a certain process. Both parties benefit from this interaction. If you are going to attempt community engagement, consider what you can offer and consider what your motivation is to get involved.

EQUITY

We must be conscious of the **historical and structural inequities** that exist in society and strive to reduce these barriers



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McMaster Community Engagement Principle 2: Equity.

Note that there is a difference between equality and equity. As you can see, in the image above, there are three people watching a baseball game. These three people are of different heights and they are all watching the game behind a fence. In an equitable approach, all three people are given a box to stand on in order to see over the fence. However, this box is not necessary to give the tallest person, who's view was never obstructed. The box is also of insufficient height to help the shortest person, whose view is still obstructed. The medium-height individual benefits appropriately from receiving the box and can now see over the fence. This image is meant to demonstrate that offering an equal approach to these three we're equal between all of them, they still might, it still might not lead to the desired outcome from everyone involved.

Equity, on the other hand, focuses on creating equal opportunity and inclusion, even if the resources offered vary for each individual. In this scenario, the goal is for everyone to watch the game, which means offering the shortest person two boxes while the first individual does not receive a box. Everyone is able to watch the game.

EQUITY

Example:

To reduce barriers, a community engaged project focused on gaining free bus passes to families on weekends to attend public events through consultations with a public transport agency.

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An example of equity that exists in Hamilton, Ontario is in regards to our public transit. Through free tickets, people are able to attend events in the city as the city will de-monetize public transit to certain events. As a bonus, this initiative encourages community building and encourages people to choose the more environmentally sustainable option to attend local events.

CONTINUITY

Acknowledging that different communities work on different timelines and schedules, we strive to consider both the **short and long-term implications** of our work together

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McMaster Community Engagement Principle 3: Continuity. An example of continuity within a project might be passing along a community-focused project from one class to another in order to maintain a commitment to the community members involved.

OPENNESS TO LEARNING

Commit to **continually** learn from and **evaluate** our work together, reflecting on and sharing both our successes and failures to grow as individuals, partnerships and communities.

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McMaster Community Engagement Principle 4, “Openness to Learning”.

OPENNESS TO LEARNING

Example:

A team had to change direction after presenting to their community consultant who did not like their idea!

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An example of openness to learning is entering situations with stakeholders with a willingness to be wrong or need to change tracks. Entering conversations with a mindset of learning and growth will allow you to hear the needs of the individuals with lived experience and expertise more freely.

COMMITMENT TO ACT

We aspire to make a positive difference in our community by **sharing** and **acting on our knowledge** to contribute to the greater social good.

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The fifth and final McMaster Principle of Community Engagement is a Commitment to Act.

COMMITMENT TO ACT

Example:

Through consultation and collaboration with their community partner, students co-developed and proposed a policy recommendation to city council.

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This example is of a well-scoped project that is carried through to completion. Commitment to act means creating feasible goals that benefit both parties, and then being accountable to that commitment during the entirety of your relationship together. As mentioned above, relationships are built on trust, and a commitment to act is one way that trust is built.

YOUR TURN

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Read the following Problem & Solution:

Problem:

How might we improve sustainable drinking water access in Hamilton?

Solution:

Students designed a system of public water fountains for reusable water bottles that can withstand cold, as well as collect and filter rainwater.

Find at least 2 SDGs with 1 target each that align with this problem and solution.

Thank you for completing the first module in our MacChangers series. To practice your understanding of the UN SDG targets, give the above challenge a try!

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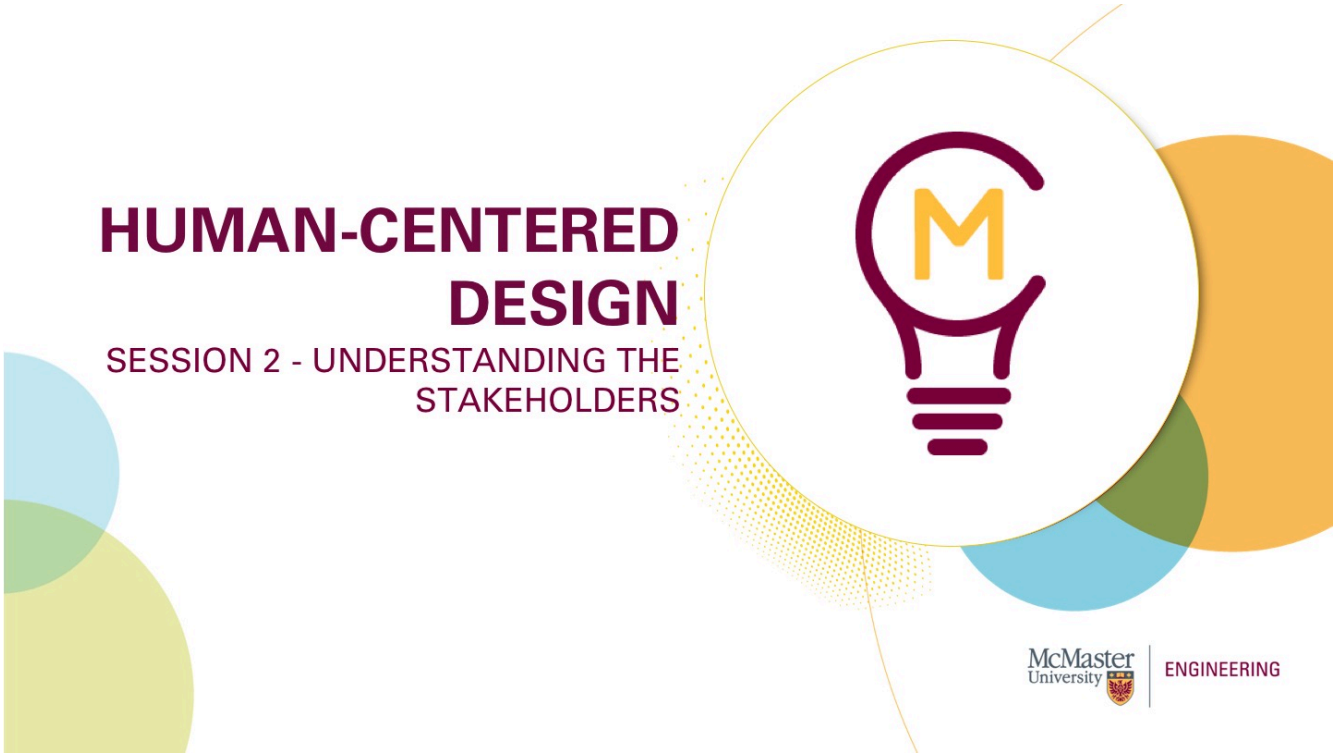
United Nations. (2022). The 17 Goals. https://sdgs.un.org/goals

9. Module 2 - Human-Centered Design



Welcome to module 2, human-centered design! In today's module, we will be discussing a model of design thinking that places people as the main priority.

Learning Objectives

- Explain how curricular problem-solving differs from problem-solving in the real world
- Define Human-Centered Design

- Apply Empathy, the first stage in Human-Centered Design in understanding a problem

THE NATURE OF PROBLEMS

VS

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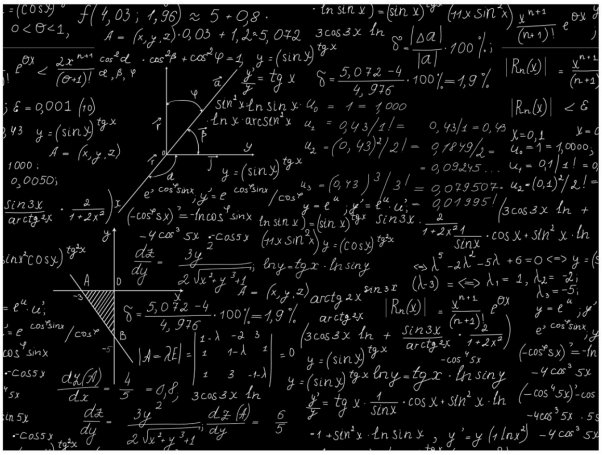
Before we delve into human centered design, it is first important to understand the nature of problems. Real-world problems are significantly different than what we see in our classrooms, and this can be explained through understanding the nature of problems itself.

THE NATURE OF PROBLEMS

Structure and **Complexity** are core elements of problems:

- Complexity increases with the number of variables involved
- Structure increases with coherence of the variables



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When we look at the nature of problems, there are two main elements, including Structure and Complexity. The complexity of a problem is related to the number of variables involved. For example, if you are in a STEM field, then you are used to solving problems in which there is one unknown variable, and you use everything you know to find that variable. But with complex problems, you are working with many unknown variables and so it becomes a lot harder to pin down a 'solution'. Essentially, the less that is known, and the more variables there are, the more complex and difficult the problems become.

The second core element of a problem is structure. You can measure structure with the coherence of the variables. So what do I mean by that? If you and a friend and working on a problem, the problem would be well-structured if you can both look at the information provided and agree on the interpretation of the information and what needs to be done to arrive at a solution. The problem would be ill-structured however, if you disagree on the interpretation of the information, the goals, what the next steps would be and even the constraints.

Let's dive into some examples.

THE NATURE OF PROBLEMS

More Complex

Less Complex

$$T_f = \frac{9}{5}T_c + 32$$

Solving a Rubik's Cube	Start a small business
Converting temperature from Celsius to Fahrenheit	Explain what justice looks like

Well-Structured **Poorly-Structured**

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An example of a well-structured and less complex problem would be simply converting temperature from Celsius to Fahrenheit. It is less complex because there only one unknown variable, Fahrenheit, and it is well-structured because the process to convert degrees Celsius to Fahrenheit is a known equation.

Moving up, a well-structured but more complex problem is solving a Rubiks cube. It's structured because you can all agree on what the objective of the game is, but what makes it complex is that you cant change any single tile without changing at least seven others.

Moving down to the right, a poorly structured but less complex problem is attempting to explain what justice looks like. What makes this less complex is that it's only referring to one variable, and that is Justice. But, to now explain what Justice looks like, depending on your background, values, morals, justice can look very different. You could probably go in the dictionary to DEFINE justice, but to explain what it LOOKS like can be a downright contentious topic to discuss, making it a very ill-structured problem in that there may very well be differing ideas of the how to arrive at an 'answer' and even what the 'answer' would be.

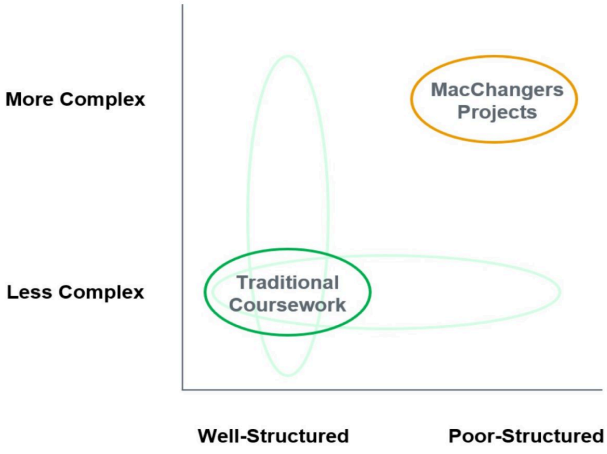
Finally, the hardest challenge here, is starting a small business. What makes this a very complex problem is that there are so many variables involved to do so. From financing, base location,

logistics, to marketing, and more. And what makes this a poorly-structured challenge is that there is no hard and fast rule to starting a new business. Typically with starting a business there is no 'right way' to do so, just a better or a worse way to do.

By now, I hope these examples have helped break down the nature of problems as it relates to complexity and structure.

So now what? Why are we seeking to understand this?

THE NATURE OF PROBLEMS



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Traditional coursework in university or in higher education in general tend to fall within the less complex and well-structured domain. This means that the problems you are typically exposed to have a right or wrong answer, or right or wrong process.

Sometimes, especially in your final years, you may delve into more complex problems OR poorly

structure problems, but almost never both at the same time, unless you are in graduate or final year thesis or capstone projects.

Well, real-world problems, or MacChangers challenges, sit in the poorly-structured and more complex domain. And in fact, this where we operate post graduation and in the professional world. Almost everything we do in the professional world is poorly structured and very complex. The reality is, there are no formulas to real-world problems.

So, how do we start tackling big problems?

WHAT IS HUMAN-CENTERED DESIGN?

An approach to problem-solving that centers on the experience of the people at the heart of the challenges we tackle.

Human-centered design invokes creativity, confidence, open-mindedness, and the ability to pivot.

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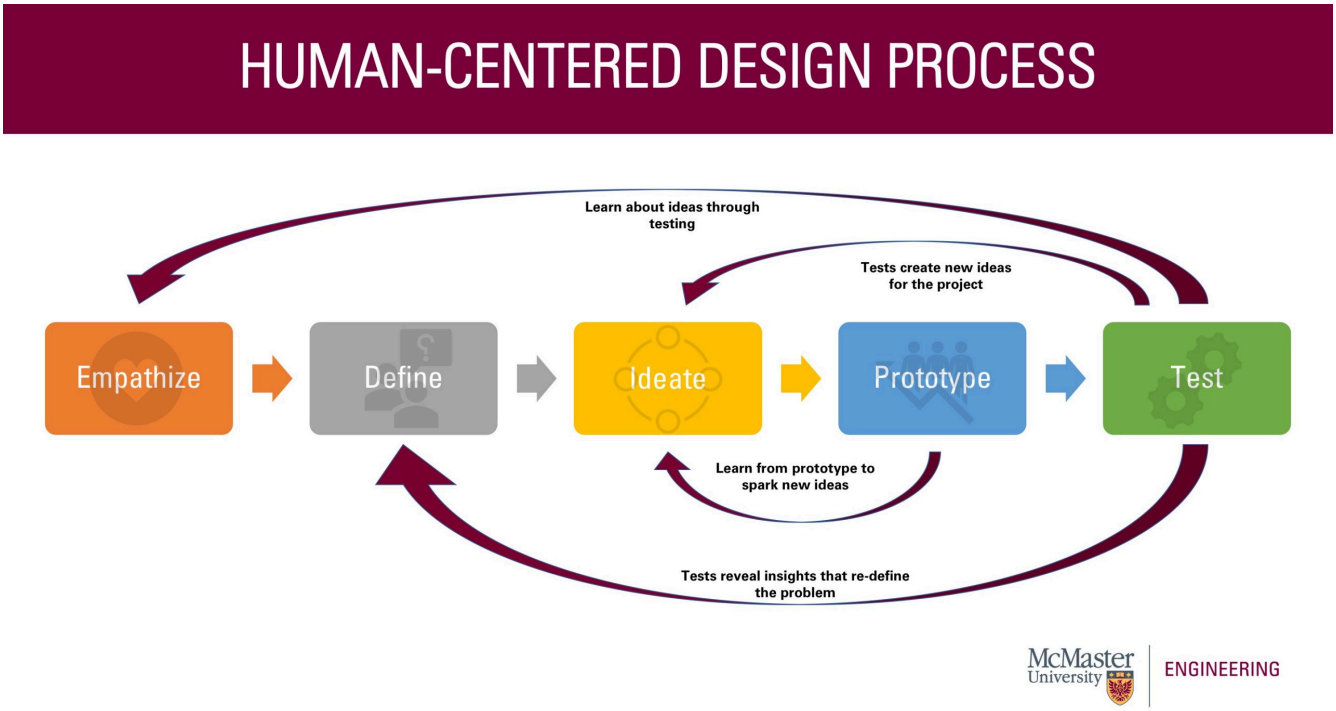
We can start with a human-centered approach. Human centered design is a creative approach to complex and ill-structured problem solving. It's a process that starts with empathizing with the people experiencing the problem and ends with new solutions that are tailor made to suit their needs. Instead of looking at the technological feasibility or the financial viability of a possible solution, we start with the people who have a vested interest in solving this problem, who we will refer to as stakeholders.

Throughout this entire process, as in the name 'Human Centered' makes explicit, it is important to remember that there is a human behind every challenge and so empathy with the user is the guiding strategy to developing meaningful solutions.



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Human centered design follows a 5-stage process, and if you haven't already guessed it, the entire MacChangers program follows these stages: Starting with empathizing with stakeholders, re-defining the problem, ideating, prototyping, and finally testing.

It is also important to note that this process is iterative in nature in that failure is expected, followed by re-ideating, re-prototyping, and re-defining to bring you closer to a better solution.

HUMAN-CENTERED DESIGN
EMPATHY

Understanding the experience of stakeholders allows us to re-define a problem by humanizing it

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Why do we empathize? We empathize because understanding the experience of stakeholders allows us to re-define a potentially vague or big problem through humanizing it.

HUMAN-CENTERED DESIGN
IKEA CASE STUDY

- "A few years back, IKEA was facing a problem with the shortage of manpower for their stores. Being a low-cost furniture manufacturer, they had their own limitations."
- "Customers were frustrated waiting to get the ordered furniture from the warehouse."

Source: https://medium.com/@shahmm/the-beauty-of-reframing-the-problem-to-create-impact-solutions-c776e3e2e8fb

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Let's take a look at a real-world example.

A few years back, IKEA was facing a problem with the shortage of manpower for their stores. Being a low-cost furniture manufacturer, they had their own limitations. Customers were frustrated, waiting to get ordered furniture from the warehouse. So this is a typical employee shortage of employees, shortage of manpower and trying to service the requests and the demands from the consumer.

Being a low cost furniture manufacturer, they had their own limitations. Customers were frustrated, waiting to get ordered furniture from the warehouse. So this is a typical employee shortage of employees, shortage of manpower and trying to service the requests and the demands from the consumer.

HUMAN-CENTERED DESIGN
IKEA CASE STUDY

Ikea	Customers
•Want to keep prices low for customers •To keep prices low, can't hire additional employees •Want customers to have a pleasant shopping experience	•Want affordable product •Want to receive their product in a timely manner

Source: https://medium.com/@shahmm/the-beauty-of-reframing-the-problem-to-create-impact-solutions-c776e3e2e8fb

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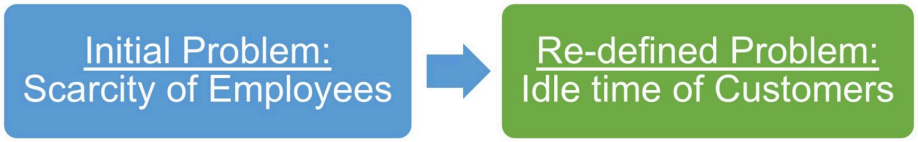
Let's take a look at the two stakeholders in this situation.

The first stakeholder we'll talk about is IKEA themselves. IKEA is very interested in keeping prices low for customers to improve customer satisfaction. However, to keep prices low, they can't hire additional employees because in order to pay them, you need to charge more for your product. Finally, IKEA would like customers to have a pleasant shopping experience because that will increase the chances of them coming back.

From the customer perspective, customers want an affordable product, and they want to receive their product in a timely manner. If you were to solve this problem on pen and paper, your instinct might be for IKEA to hire more employees. But as was just mentioned, hiring more employees means that you need to charge more for your product and charging more for your product likely means that you will start to lose customers somewhere along the way. When working with stakeholders and when working with actual real people as opposed to pen and paper. It's these kind of ripple effects that you'll need to keep in mind as you design your solution. So what did IKEA do?

HUMAN-CENTERED DESIGN
IKEA CASE STUDY



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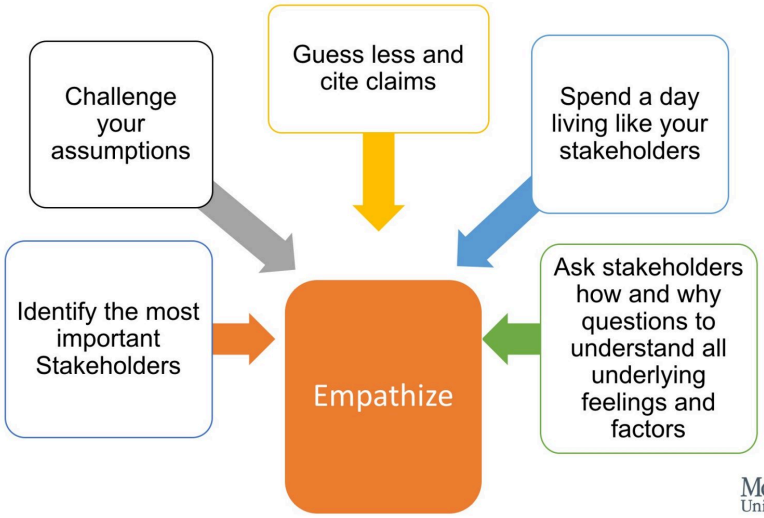
IKEA changed the problem from scarcity of employees to idle time of customers. Customers were frustrated. They were waiting and idle. Can we engage them? How might we engage them? Radio? Magazines? Or, could we ask them to go and pick up the furniture themselves from the warehouse? And thus, IKEA's legendary business model of customer self-pickup was born in reframing the question itself. IKEA was actually able to capitalize on the idle time of customers in order to solve the very problem that they were copying through the process of human centered design, IKEA was able to put themselves into the shoes of the various stakeholders and find a solution that was very effective in solving the problem at hand.

HUMAN-CENTERED DESIGN
EMPATHY



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So let's break down the first stage, empathize. How do we empathize and with who?

We start with the people who have a vested interest in solving this problem, who we will refer to as stakeholders moving forward. When considering stakeholders, there actually tend to be many more than we initially think. It's best to begin with the interests of and the barriers faced by the three most relevant groups of stakeholders in order to better understand this.

Now that we've understood the WHO, let's unpack HOW to empathize.

To truly empathize with a stakeholder, we need to start with challenging our assumptions about stakeholders because if we have pre-conceived notions about the stakeholders, it can inhibit us from truly empathizing with them. For example, a group of MacChangers students in the past were working on a challenge around people experiencing homelessness. They made the assumption, which is reasonable, that if spots were open in a homeless shelter, then people facing homelessness would occupy these spots. But that wasn't true. There are high levels of abuse and violence within homeless shelters and so often people will choose not to go into them. Once again, while it was a reasonable assumption, it was not backed up by anything. It was simply a guess. It's very easy for us to think from our own lived experiences about other people's experiences. So it is critical to back-up any claims with citations.

Another way to empathize with stakeholders is to spend a day living like your stakeholder. There is no better way than to put yourself in the shoes of others. If your challenge is to reduce the impact of heat related illnesses in our urban core, take a walk in the city for more than hour on a hot, sunny weekend. Look around you, what does the built environment look like? What kinds of people are out and about? How are people mostly travelling? Are they walking, biking, cycling etc? How do you feel? Are you thirsty or uncomfortable? Imagine if you experienced precarious housing. How would you navigate yourself or where would you flock to?

Finally, whenever possible ask stakeholders how and why questions to understand all underlying feelings and factors.

DESIGN THE IDEAL WALLET

Tools:

- Paper & Pen or digital writing device
- Miro

Expectations:

- Be creative and ready to engage
- You are encouraged to share video and audio in the break-out room

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Activity adapted from https://dschool.stanford.edu/resources/the-gift-giving-project

Now let's put this into practice. For the next few minutes, you will be designing the ideal wallet for a stakeholder. The tools you will need include a piece of paper and a pen, or your digital writing device. In this design challenge, we expect you to be extremely creative and ready to engage with the 'stakeholder.' If you are completing this module in an-online setting, we recommend using Miro to collaborate as a group.

Note for Facilitators: This activity can be found under a creative commons license offered by the Standford d.school, https://dschool.stanford.edu/resources/the-gift-giving-project.

DESIGN THE IDEAL WALLET - TAKEAWAYS

- What do you notice between your first and second iteration?
- Was it easy or difficult to generate ideas after interviewing the stakeholder?
- Do the second set of ideas feel like they are more tailored to meet the needs of the person you talked to?

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Activity adapted from https://dschool.stanford.edu/resources/the-gift-giving-project

What do you notice between your first and second iteration? Were your ideas the second time around more interesting, funny, or even innovative? Or did you find it challenging to be creative? Was it easier to generate ideas and did they feel less contrived?

DESIGN THE IDEAL WALLET - TAKEAWAYS

Designing a product with insights from user observation is a much more productive process than starting from scratch

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Do the second set of ideas feel like they are more tailored to meet the needs of the person you talked to? If so, you have experienced the power of empathy in action. With any luck you still got to see how designing a product with insights from user observation is a much more productive process than starting from scratch.

THE CHALLENGE GUIDES

- Provide plenty of information from articles and community consultations to get you started on collecting information
- Critical in following the process of human-centered design (HCD)

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So where do you start? As you may know the challenge guides are available through avenue via webpage links. Within these guides, you will be exposed to the context of the issue. By no means, however, is everything in the challenge guide whole encompassing. In a future session you will be doing more research to understand the problem. We recommend you bookmark your challenge guide, so it is easily accessible to you. It is critical that you read, watch, and familiarize yourself with these guides as they provide you with the relevant information to help you understand community derived issues as well as to kickstart empathizing with your stakeholders.

References

Da Silva, T.,Filipe Pereira, & Marques, J. P. C. (2020). Human-centered design for collaborative innovation in knowledge-based economies. *Technology Innovation Management Review, 10*(9), 5-15. Retrieved from http://libaccess.mcmaster.ca/login?url=https://www.proquest.com/scholarly-journals/human-centered-design-collaborative-innovation/docview/2450654229/se-2

Nandan, M., Jaskyte, K., & Mandayam, G. (2020). Human Centered Design as a New Approach to Creative Problem Solving: Its Usefulness and Applicability for Social Work Practice. *Human Service Organizations: Management, Leadership & Governance, 44*(4), 310–316. https://doi.org/10.1080/23303131.2020.1737294

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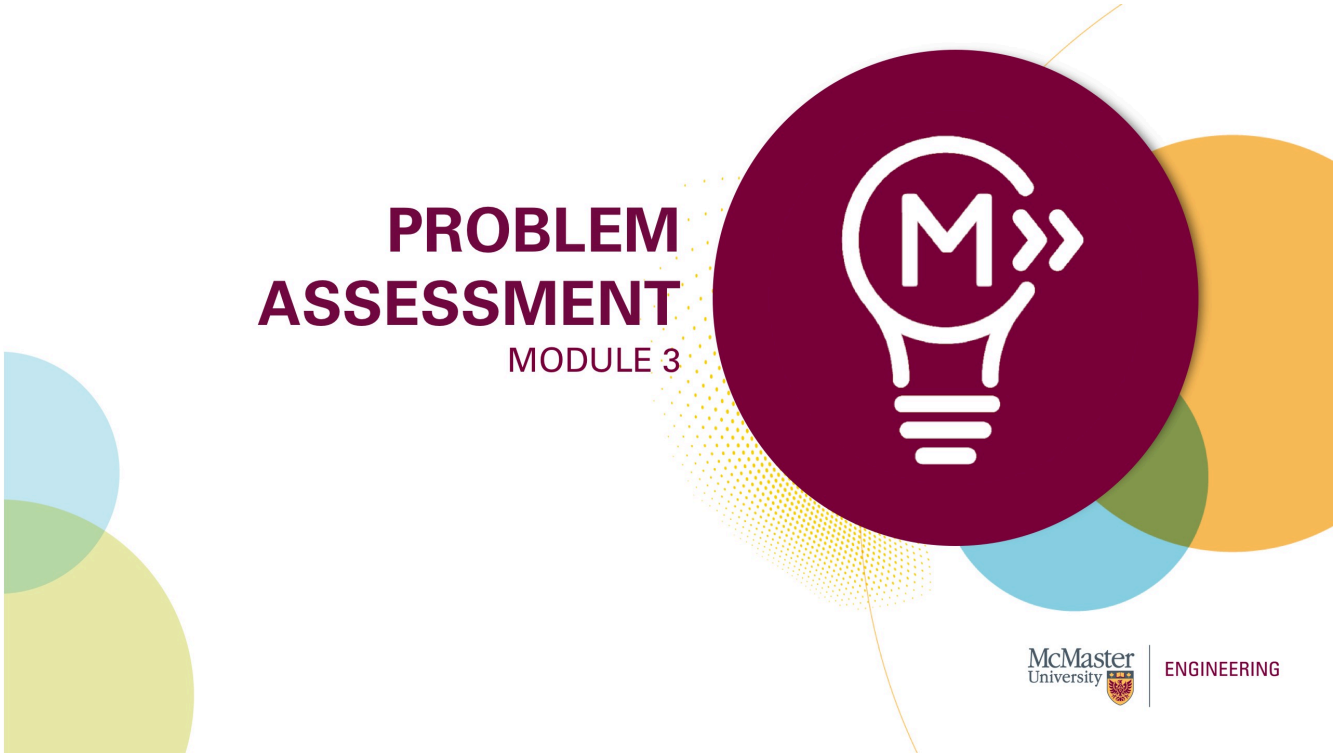
10. Module 3 - Problem Assessment



Learning Objectives

– Generate questions to address assumptions

– Identify the larger context of the problem

SCUM RIVER BRIDGE CASE STUDY

This is the scum river bridge in Astoria neighborhood (Queens, NYC). A leaky pipe submerged a heavily trafficked sidewalk with a cesspool of water. Not only is this unhygienic but it can also prove to be dangerous during the winter when the water freezes over the sidewalk. To solve the issue, citizens built this bridge with recycled wood to create a safe passageway for folks in the community. Did it solve the problem? No this is not an acceptable solution. Take a moment to think about the user experience in using this bridge.

SCUM RIVER BRIDGE CASE STUDY

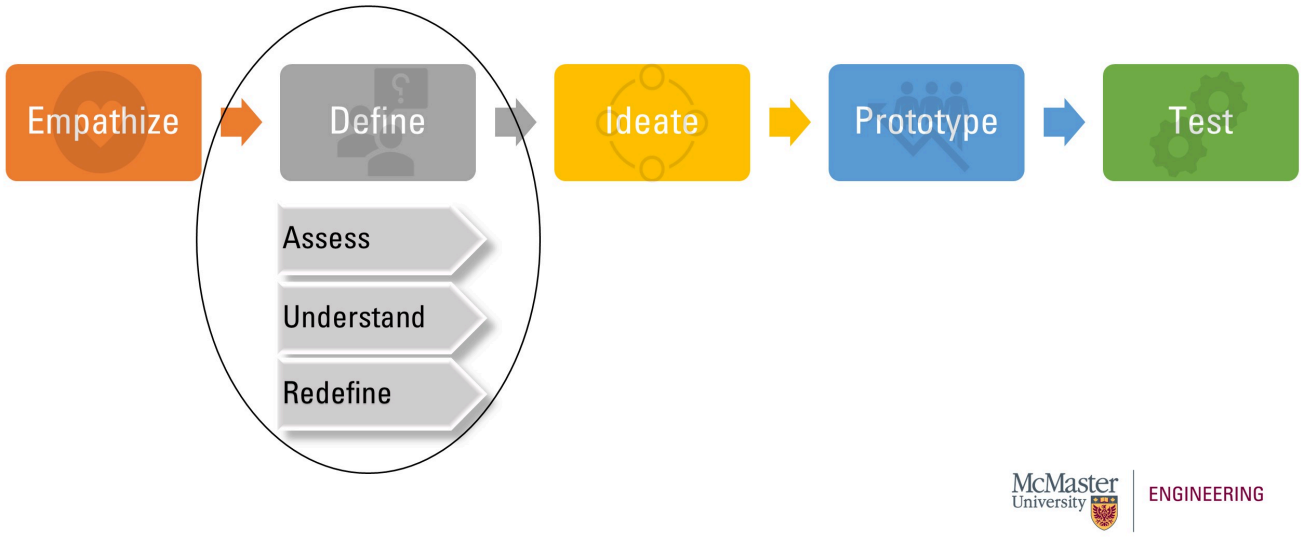
Yes, it created a passageway. But how might a person who is visually impaired use it? How will it survive for a long time with constant exposure to moisture and other weather? The solution is not viable or sustainable. Furthermore, we haven't solved the actual problem yet.

SCUM RIVER BRIDGE CASE STUDY

You might be thinking that all we need to do is plug the pipe and stop the leak. That's still not the real issue at hand. If we re-phrase the problem from "How might we fix the leaky pipe" to the real problem at hand, the question becomes, "How might we create a space where people can cross the street safely and cleanly?" A solution needs to be able to target that.

Let's zoom out then and understand the context of this issue to see where we can start tackling the issue. This leaky pipe is a symptom of a much larger problem. The street where the leak is situated is beneath Hell Gate Bridge. Portions of the bridge structure are falling apart leading to leaking. If this leak is fixed, it is likely another leak will spring shortly after. In that case, would plugging this leak be the most ideal solution? Probably not! Changing all the infrastructure is the most ideal solution – but it is expensive and improbable. That might not be feasible given time constraints to solution generation.

HUMAN-CENTERED DESIGN - DEFINE



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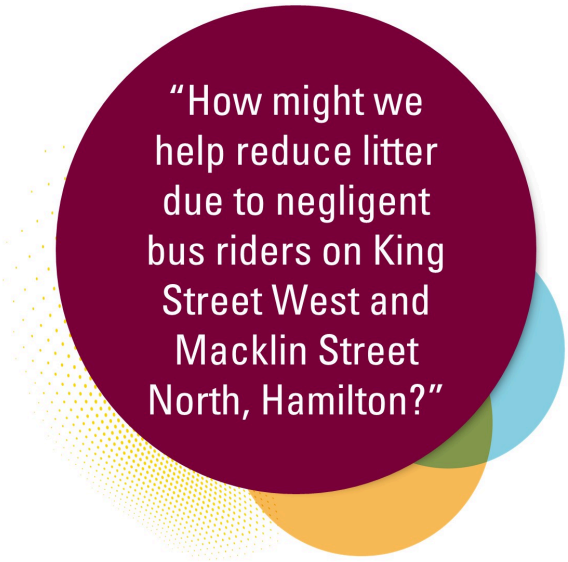
Assessing the problem allows us to challenge our assumptions and dig deep into why the problem exists. Furthermore, understanding the problem allows us to redefine it in a human-centric

way and produce more tailored and feasible solutions.

ZOOM OUT OF THE PROBLEM



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We will use this sample problem for the rest of this module to demonstrate how we are going to zoom out of a given problem: "How might we help reduce litter due to negligent bus riders on King Street West and Macklin Street North in Hamilton, Ontario, Canada?"

ZOOM OUT OF THE PROBLEM

Where is King Street West and Macklin Street?

What is the historical context of littering in Hamilton?

Why are bus riders littering?

What does the built environment look like?

What are current initiatives in the city? How effective are they?

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How do we zoom out of the problem? You can start by asking questions about the context of the problem. Questions can range from small to large. For instance, you need to know where Macklin street is located! Other questions might be much larger, such as inquiring about the history of litter problems in the city of Hamilton or asking about assumptions embedded in the question. Are the bus riders negligent or could their behavior be explained for a different reason? You could also ask about the current infrastructure and how effective are existing solutions if there are any. You will also find how one question can lead to another, allowing you to identify where you need to go next. Generating questions, ranging from who, what, where, when about what you need to know in order to understand the problem is crucial.

ZOOM OUT OF THE PROBLEM

Next, clump the questions you generated into themes. This will give you an idea of what major areas you and your team have to focus on to get the context of the question.

- In your own group session, you will be generating follow-up questions to your chosen challenge(s)
- By the end of your work period, you should have a list of questions that seek to understand the context of your chosen challenge(s), organized by sub-theme

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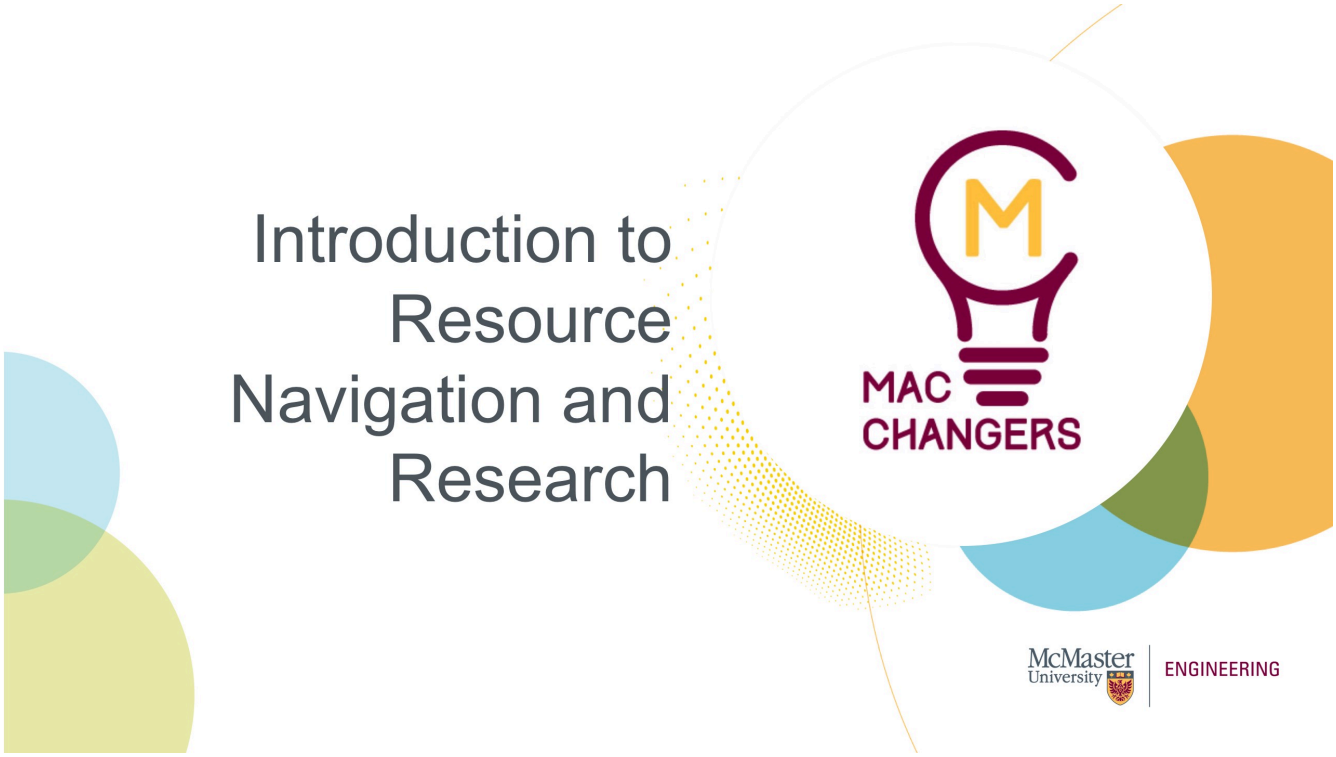
- In your own group session, you will be generating follow-up questions to your chosen challenge(s)
- By the end of your work period, you should have a list of questions that seek to understand the context of your chosen challenge(s), organized by sub-theme

References

dschool. Getting started with design thinking. (2022). https://dschool.stanford.edu/resources/getting-started-with-design-thinking

11. Module 4- Introduction to Resource Navigation and Research



Welcome to the introduction to resource navigation and research module!

Learning Objectives

By the end of this module you should be able to...

- Understand a general research process
- Navigate Google Scholar
- Navigate UN Databases

"How might we help reduce litter due to negligent bus riders on King Street West and Macklin Street North, Hamilton?"

Sub-question: Has the City of Hamilton attempted to reduce littering in this area previously, and if so, what did they try?"

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As a first step to finding answers to the larger and more complicated questions, we must break them down into smaller questions. Consider the question from last session: " How might we help reduce litter due to negligent bus riders on King Street West and Macklin Street North, Hamilton?" In order to tackle this questions we should try asking smaller scale questions such as " has the City of Hamilton attempted to reduce littering in this area previously, and if so, what did they try?" Go ahead and try doing this with your own questions.

"How might we help reduce litter due to negligent bus riders on King Street West and Macklin Street North, Hamilton?"

Sub-question: Has the City of Hamilton attempted to reduce littering in this area previously, and if so, what did they try?"

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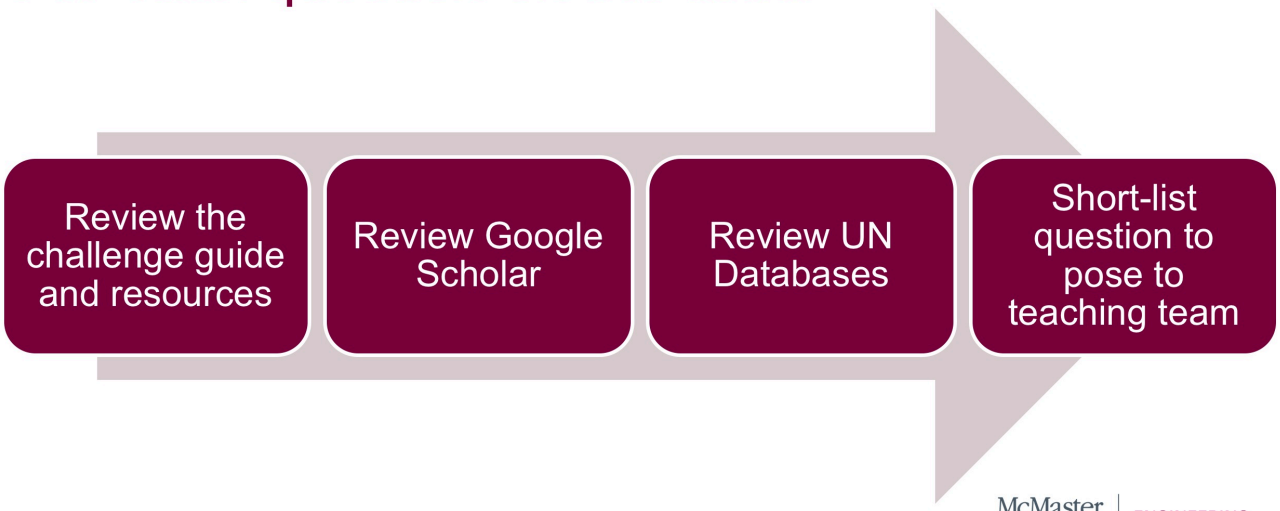
The questions that you ask may go in many different directions. For example, in this scenario we are trying to address the problem of littering in Hamilton, so the first question to ask can be to inquire into what strategies have already been in place by the City and other authorities to address the issue.

For each question on the list…



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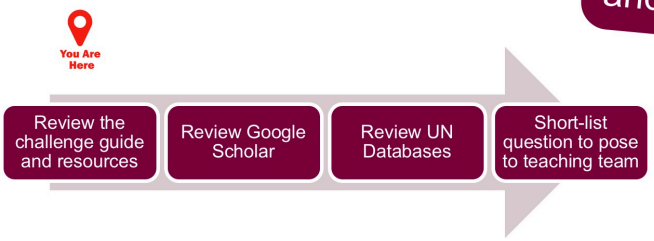
Once you have created your list of questions, use this strategy to start working your way through your questions:

- Start with reviewing any materials provided to you by our organization when you first learned about the topic. In this case, you would want to review our Challenge Guide (a link to an example challenge guide can be found in the "Problem Scoping Best-Practice Guide").
- If you can't find the answer there, go to Google Scholar or any other academic journal you feel comfortable using.
- If you can't find the answer on Google Scholar, review the UN databases for information.
- Finally, if you really can't find anything related to your question, short-list the question as a potential candidate to pose to your subject-matter experts. By the end of this work-period, you will be able to submit some questions to the stakeholders.

Let's get started!

Has the City of Hamilton attempted to reduce littering in this area previously, and if so, what did they try?"



- After scouring the Challenge guide we've discovered…
  - the Macklin by King Street bus stop is in Ward 1
  - Residents in the area are disgruntled because there are two coffee shops in the area who produce large volumes of single-use plastics and waste
  - King Street is a high-traffic area

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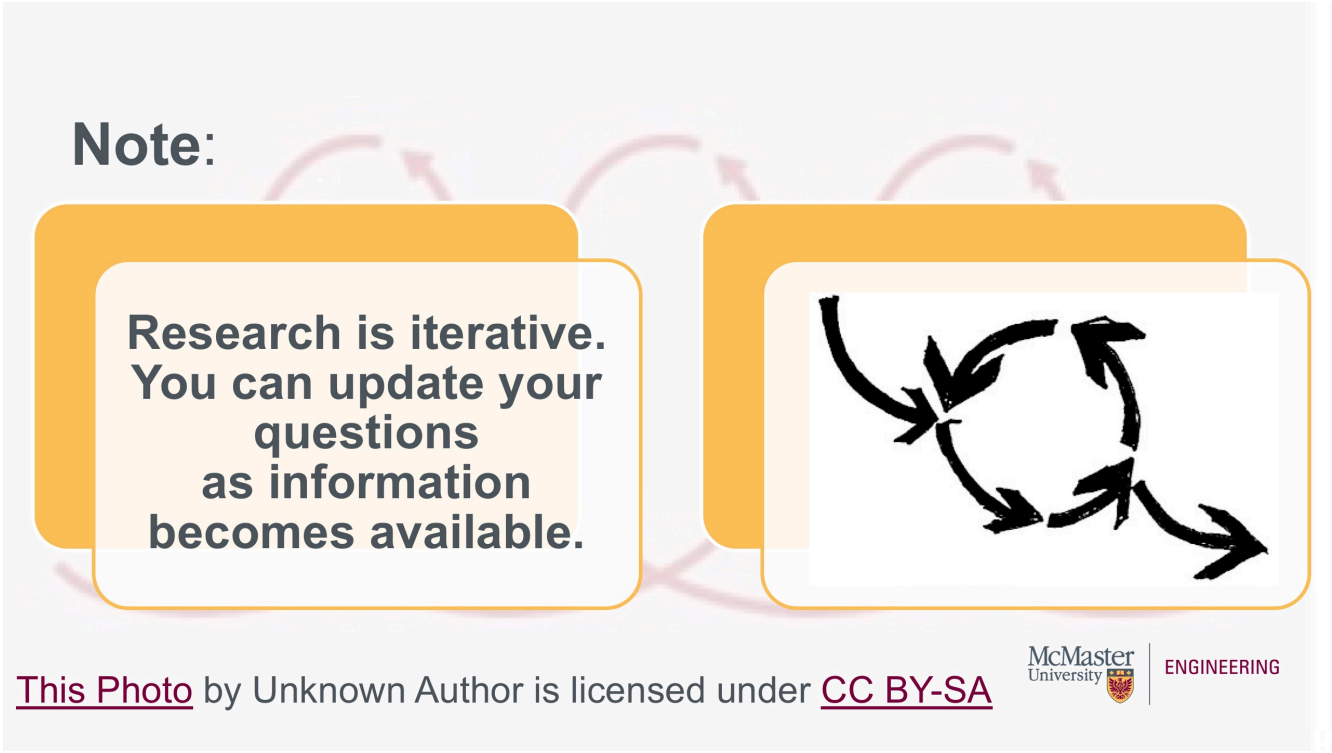
Lets take a closer look at the steps that we have listed above. Let's pretend that looking at the challenge guides has given us some useful information such as the fact that the Macklin by King Street bus stop is in Ward one. We also learned that the residents in the area are disgruntled because two local coffee shops in the area produce large amounts of plastic. Finally, we learned that Kind Street is a high traffic area.



Note! Research is an iterative process. Feel free to update your questions as information becomes available. For example – **Maybe you started by thinking the target population was middle aged, to discover it primarily concerning adolescents; that's fine! Update as you go.**

"How might we help reduce litter due to negligent bus riders on King Street West and Macklin Street North, Hamilton?"

Sub-question: Has the City of Hamilton attempted to reduce **single-use plastic** littering in **Ward 1** previously, and if so, what did they try?"

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Here is an example of how you might update an existing question. For this challenge question, litter is huge and can refer to all manner of materials. Specifying single-use plastic in this ward can further scope the question and make it easier to tackle.

- We want to know the details of previous litter reduction strategies.
- Google scholar is a search engine for scholarly literature available on the internet; it spans all disciplines, and will return only journal articles, editorials, and case presentations for the most part.
- Let's review google scholar: https://scholar.google.ca/

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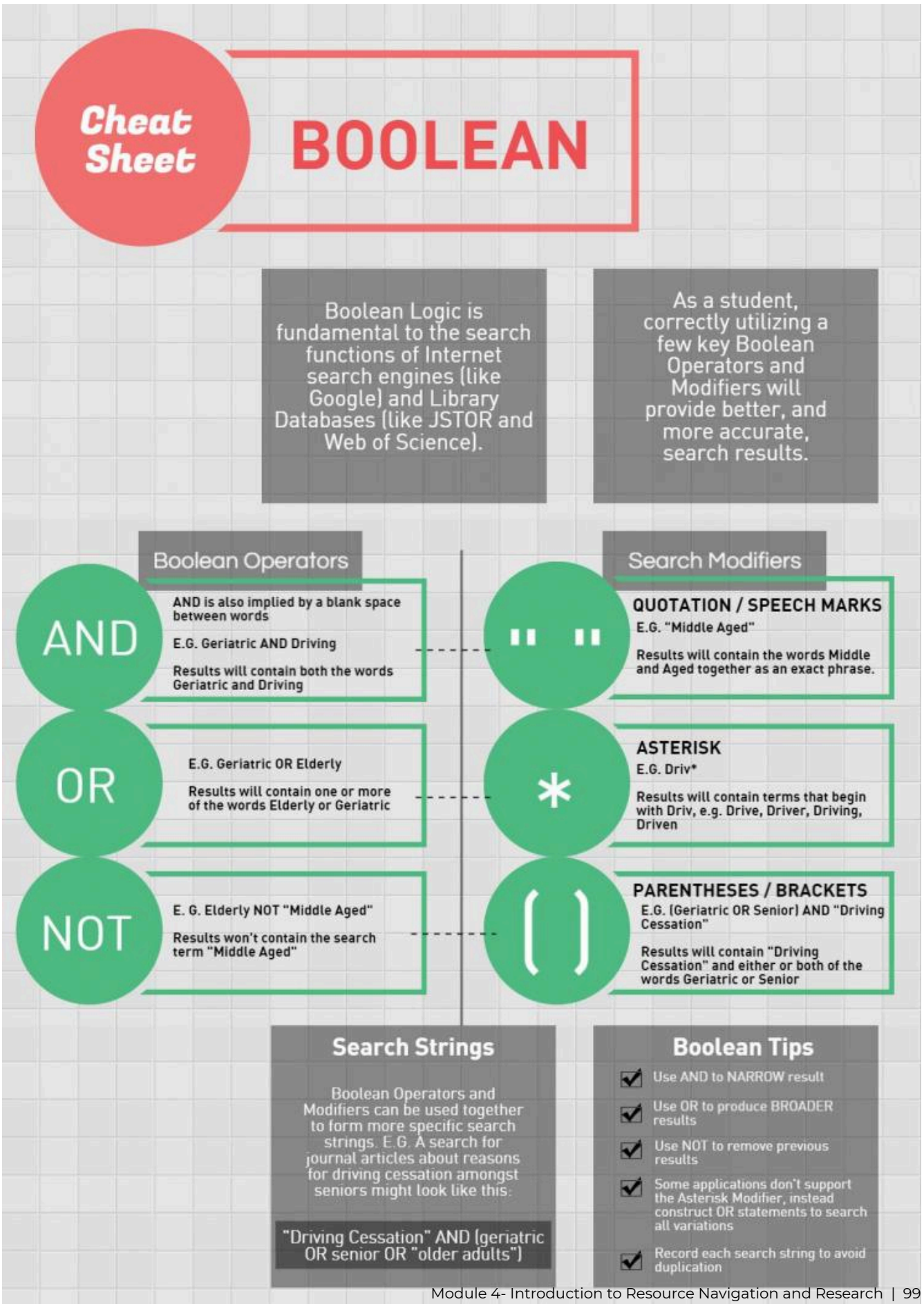
So, even after looking through the challenge guide, we couldn't find the information we wanted, so let's move to google scholar.

Google scholar is a search engine that contains scholarly material which spans across all disciplines. It is a reliable source for seeking academic information and is open to the general public to use. Note that a lot of content on Google Scholar is blocked by pall-walls. If you are not associated with an organization that pays for this content, you might not want to use Google Scholar. On the other hand, Google Scholar is more accessible than other scholarly databases which can require log-in prior to searching.

Here's an activity to help you refine your search:

- Try going to google scholar now. [New tab will open to the google scholar launch page].
- Type in "Hamilton waste management strategies ward 1"

You might be overwhelmed by the number of returns! How could we refine this a bit? One mechanism is through something called Boolean Operators. These are database-specific terms that help you refine your search by more explicitly telling the database software what you are looking for.


Cheat Sheet
BOOLEAN
Boolean Logic is fundamental to the search functions of Internet search engines (like Google) and Library Databases (like JSTOR and Web of Science).
As a student, correctly utilizing a few key Boolean Operators and Modifiers will provide better, and more accurate, search results.
Boolean Operators
AND
AND is also implied by a blank space between words
E.G. Geriatric AND Driving
Results will contain both the words Geriatric and Driving
OR
E.G. Geriatric OR Elderly
Results will contain one or more of the words Elderly or Geriatric
NOT
E. G. Elderly NOT "Middle Aged"
Results won't contain the search term "Middle Aged"
Search Modifiers
" "
QUOTATION / SPEECH MARKS
E.G. "Middle Aged"
Results will contain the words Middle and Aged together as an exact phrase.
*
ASTERISK
E.G. Driv*
Results will contain terms that begin with Driv, e.g. Drive, Driver, Driving, Driven
( )
PARENTHESES / BRACKETS
E.G. (Geriatric OR Senior) AND "Driving Cessation"
Results will contain "Driving Cessation" and either or both of the words Geriatric or Senior
Search Strings
Boolean Operators and Modifiers can be used together to form more specific search strings. E.G. A search for journal articles about reasons for driving cessation amongst seniors might look like this:
"Driving Cessation" AND (geriatric OR senior OR "older adults")
Boolean Tips
Use AND to NARROW result
Use OR to produce BROADER results
Use NOT to remove previous results
Some applications don't support the Asterisk Modifier, instead construct OR statements to search all variations
Record each search string to avoid duplication
McMaster University Library

Navigate to https://library.mcmaster.ca/research/how-library-stuff-works for more information about Boolean Operators and for transcripts of this content.

Based on the chart above, try typing: "Hamilton Ontario" AND (garbage OR litter) AND strategy. We are using four Boolean Operators here:

- "AND" will narrow search results by only allowing for resources that contain both search terms
- "OR" will broaden results by allowing resources that contain synonyms or similar content
- "" will contain exact phrasing, as written between quotation marks
- () helps to differentiate between Boolean Operators for different terms

Other ways to refine your search results include reducing resources by year, and by looking at the number of times a resource was cited. Most importantly, you want to see if the topic fits well with your question.

From Google scholar, we learned…

- People felt they lacked control over having a clean neighbourhood. They also felt strongly that neighbourhood cleanliness and health were intercorrelated.
- There seem to be strategies in place to combat the waste management system, but little information on neighbourhood waste management

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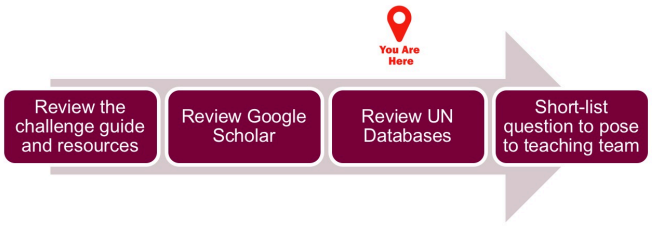
From our search on Google Scholar we learned that people don't feel that they have control over having a clean neighborhood, and that they felt that there existed a connection between neighborhood cleanliness and health. Although there seem to be strategies in place to combat the waste management system, little information on neighborhood waste management is available.

Has the City of Hamilton attempted to reduce single-use plastic littering in Ward 1 previously, and if so, what did they try?"



- We might also want to look at other databases to see a wider range of solutions.
- The United Nations offers a tool to access a collection of databases that can be useful to researchers.
- Let's review the UN Databases: https://www.un.org/en/library/page/databases

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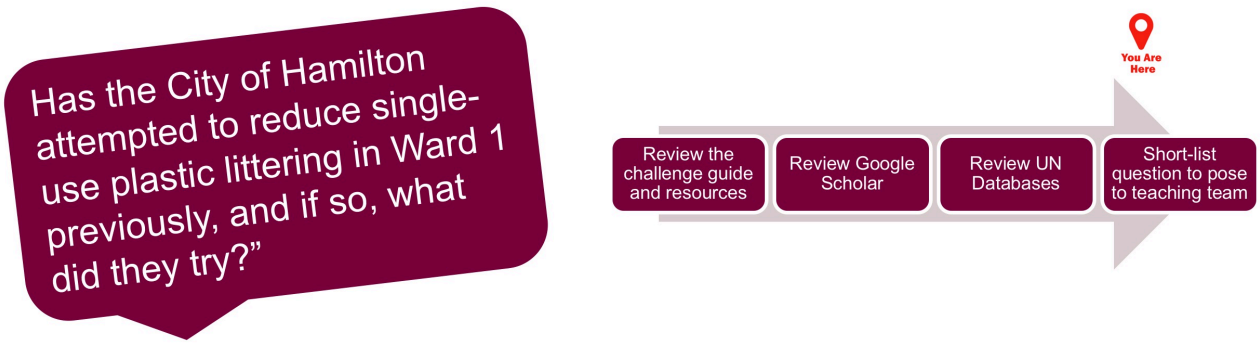
Once we have exhausted our search on Google Scholar, we want to turn to other databases. We recommend trying the UN Database, https://www.un.org/en/library/page/databases. For this example, you could try typing in "waste management strategies."

In this database, we are specifically trying to look at what other places have done to tackle this very issue. If you have access to other newspaper articles, that can be another great way to learn this information. This will give us room to brainstorm ideas that can be directly or indirectly relevant to our topic. We are trying to look at what other places have done to tackle this very issue. This will give us room to brainstorm ideas that can be directly or indirectly relevant to our topic. The UN databases include topics that relate to development, economy and finance, international law, international

relations, social affairs and more! The best part about the UN databases is that they are accessible without a pay-wall to anyone seeking information.



As one of our 2 to 3 questions, we may want to pose to the teaching team the question, "Has the City of Hamilton attempted to reduce single-use plastic littering Ward 1, and if so, what did they try?"

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Moving on from this step we might want to ask the teaching team if the City of Hamilton Has attempted to reduce single-use plastics in Ward 1, and if so, what did they try?" Please note that we are using the "teaching team" to refer to mentors, subject-matter experts, and stakeholders. In order to reduce the number of words on the slide, we are referring to this group as "the teaching team."

As you can see, the process that we followed not only helped us gain a better understanding of the issue that we are looking at, but also helped us formulate more specific questions that will help provide context for our solution.

NOW IT'S YOUR TURN

In your own group session, use the flow chart to answer the questions generated by your group for each Challenge Question.

By the end of the work period, you should have answers to most of your questions, and you should have identified potential questions to pose to the teaching team.

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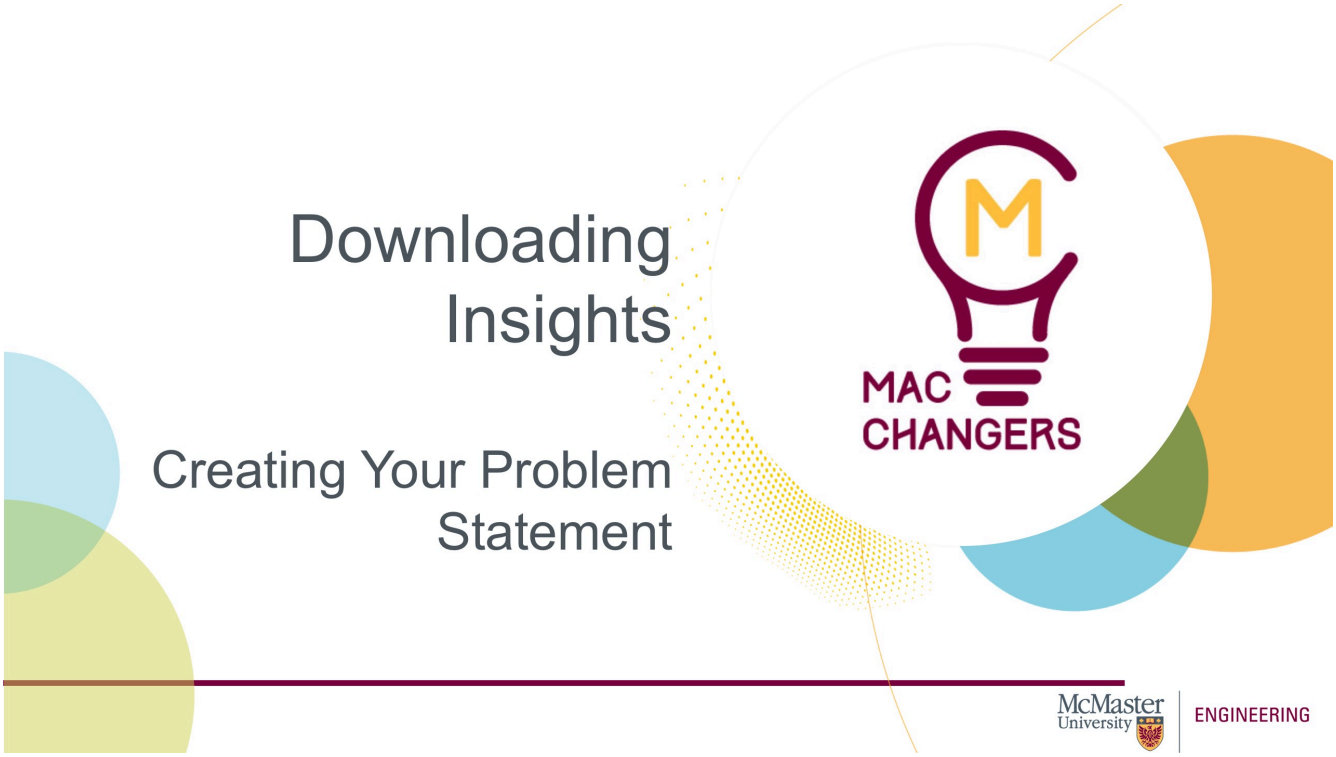
Now, its your turn! Use the process above to generate questions about your chosen challenge area and complete some preliminary research on your issue.

12. Module 5 - Downloading Insights



Hello, and welcome to this session titled Downloading Insights: Creating Your Problem Statement.

WHAT SPECIFIC CHALLENGE WILL WE BE SOLVING?

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By the end of this module, you should have a better sense of how you'll go about identifying the specific challenge that you'll be solving. So far, through extensive research and conversations with real people, you should now have a lot of information regarding real challenges that are present in the community.

Introduction: The Road So Far

Through extensive research and conversations with real people, you should now have a lot of information regarding real challenges that are present in the Hamilton community.

This session will describe a process that helps you focus everything you've learned down to the first draft of your Problem Statement.

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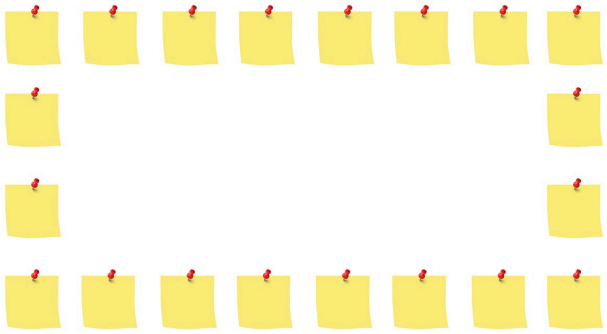
This session will describe a process that helps you focus everything you've learned, down to the first draft of your problem statement. After this module it is important that we all take a look at these steps together, as well as go through some examples from what we mean for some of the more complicated steps.

Downloading Insights

Step One: Share your Stories



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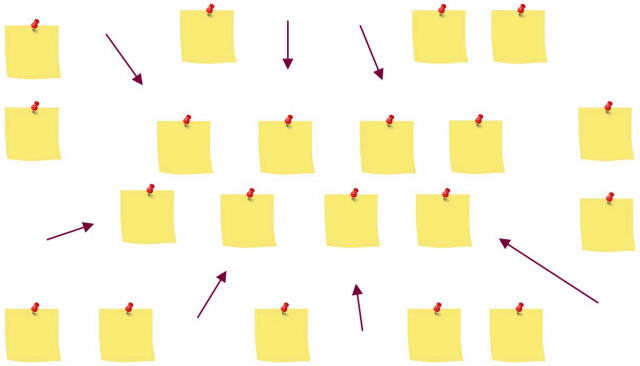
The first thing that you'll want to do is to share your stories for each member of your team. Write down as much information as you can regarding what research you found, or what you heard from the conversations with the community partners. It is important to write down as many pieces of information as you can remember, and normally when we would do this session in person, you would be given Post-it notes to do this. For this program, you'll have to use Microsoft Word or some joint collaborative document writer in order to take the down your notes. We recommend Miro!

Downloading Insights

Step Two: Key Ideas



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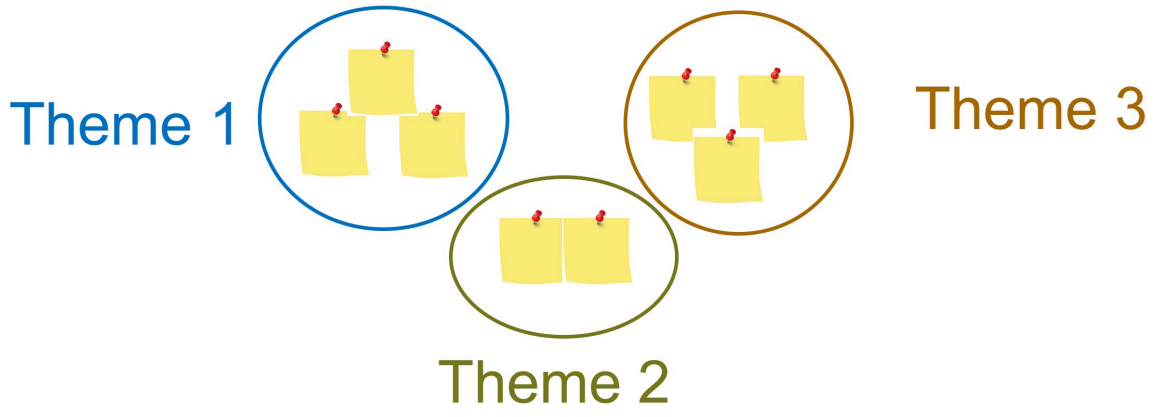
Once you've written everything down, the next step is to identify the key ideas that speak to you most. Highlight or bold these ideas, as we will use them later. This step is all about identifying the most important pieces of information.

Downloading Insights

Step Three: Find themes



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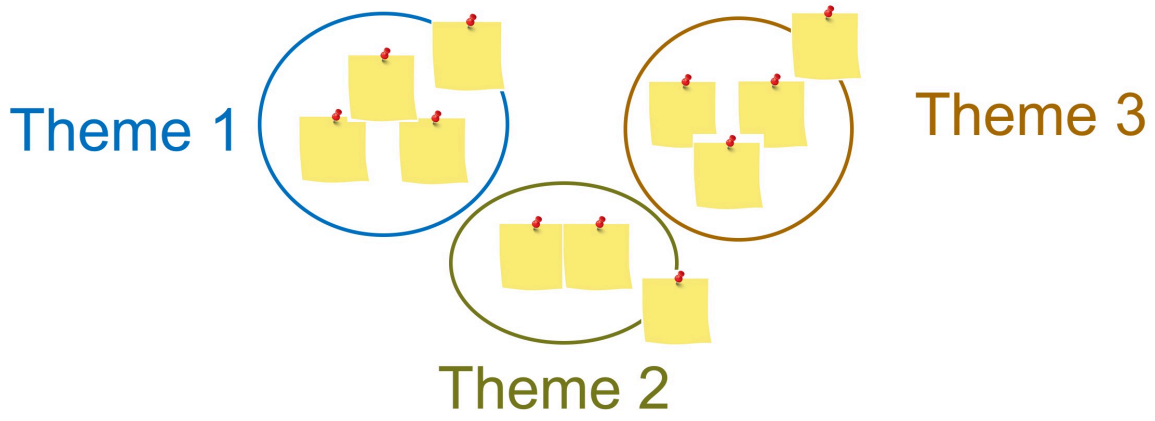
Next, you'll want to group pieces of key information together in the form of themes. While all information regarding a challenge area is connected, some pieces of information are more directly connected to each other. If you're in the mobility challenge area, you might notice themes arising regarding the experience of being on a public transit bus during COVID-19. Similarly, you might notice pieces of information that are more related to the experience of waiting for a bus on a limited bus schedule during COVID-19. These are just some examples of what these themes might look like.

Downloading Insights

Step Four: Revisit Ideas



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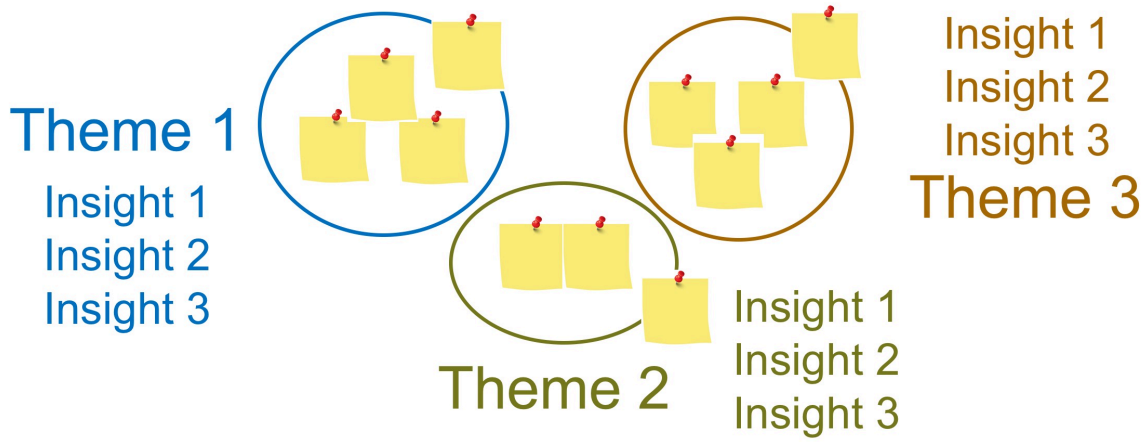
Once you've identified some themes, you'll want to revisit the ideas that you put to the side earlier, and see if they can fit into any of these themes.

Downloading Insights

Step Four: Revisit Ideas



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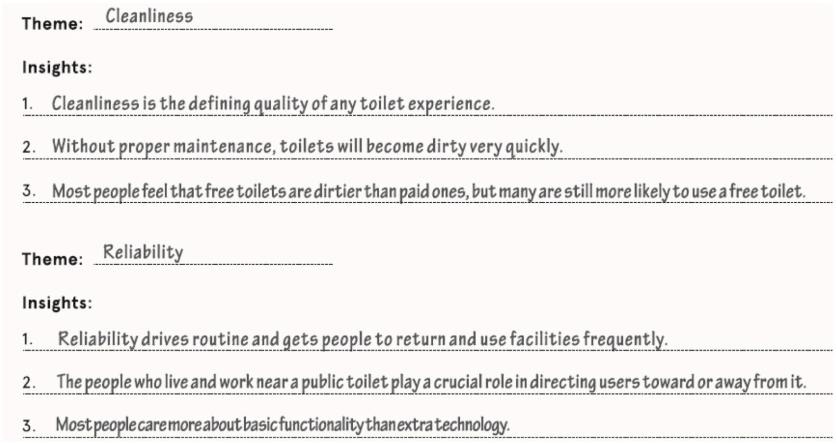
Once most of ideas have been categorized into one of these themes, you'll want to write at least three insight statements that summarize or draw conclusions from the information that you've identified. What do these insights look like?

Downloading Insights

Step Five: Create Insights



Theme: Cleanliness

Insights:

1. Cleanliness is the defining quality of any toilet experience.
2. Without proper maintenance, toilets will become dirty very quickly.
3. Most people feel that free toilets are dirtier than paid ones, but many are still more likely to use a free toilet.

Theme: Reliability

Insights:

1. Reliability drives routine and gets people to return and use facilities frequently.
2. The people who live and work near a public toilet play a crucial role in directing users toward or away from it.
3. Most people care more about basic functionality than extra technology.

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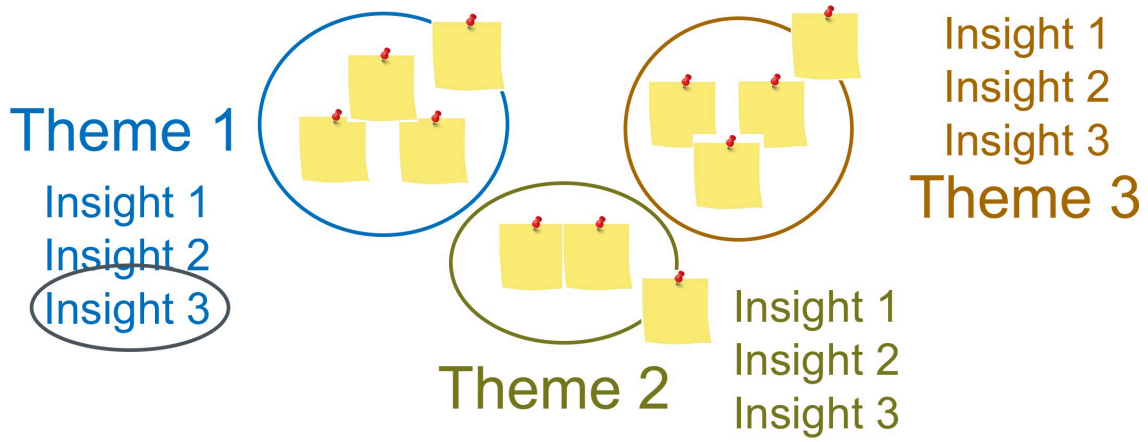
Let's take a look at an example. Here are two themes that were drawn from research done on public restrooms. The first theme is cleanliness. Three insights that were drawn from this theme include cleanliness being the defining quality of any toilet experience, and the need for proper maintenance, otherwise, toilets will become dirty very quickly, and this idea that most people feel that free toilets are dirtier than paid ones, but would still be more likely to use a free restroom. The second theme is the reliability of public restrooms. Insights include that reliability drives routine and gets people to return and use facilities frequently. The people who live and work near a public toilet, play a crucial role in directing users toward or away from it. Also, most people care more about basic functionality of a public restroom, than extra technology. These are just some examples of insights that you can draw from your research.

Downloading Insights

Step Six: Choose the Insight that resonates the strongest with you



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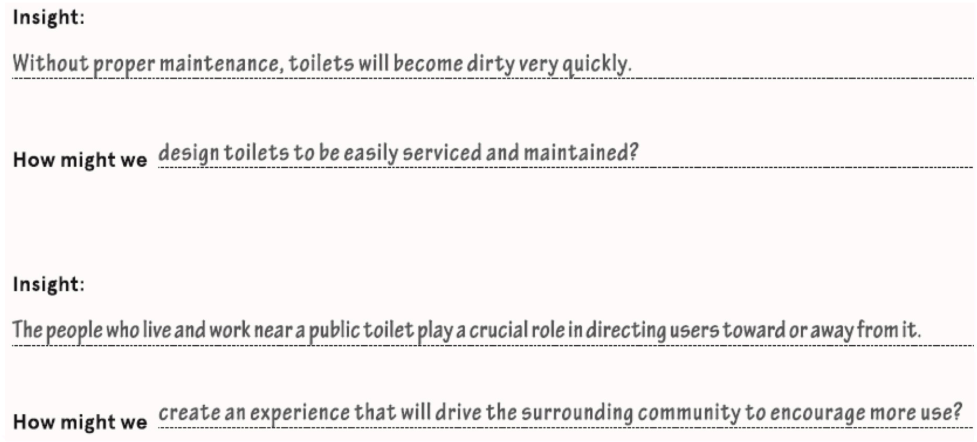
Once you've identified three insights from each of your themes, you'll want to come together and choose one insight that resonates the strongest with you. It might resonate with you because it's an important topic to you, and might resonate because it plays to your strengths. Or, it might resonate with you because it presents a really good opportunity for a solution.

Downloading Insights

Step Seven: Turn that Insight into a ‘How Might We?’ question



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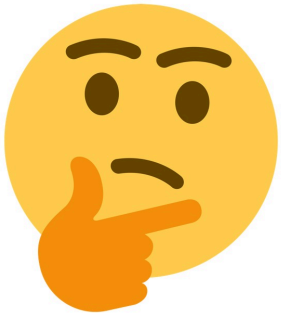
Finally, you’ll want to turn that insight into a How-Might-We question. Revisiting the two themes from before, we’ve pulled one insight from each of those themes and turned them each into a How-Might-We question. The first is the insight that without proper maintenance toilets will become dirty very quickly. This has been positioned into a How-Might-We question of: “How might we design toilets to be easily serviced and maintained?” The second insight is that people who live and work near a public toilet play a crucial role in directing users toward, or away from it. This was positioned as the question of: “How do we create an experience that will drive the surrounding community to encourage more use?” It is from this How-Might-We question that we can start to generate our problem statement.

Writing a Problem Statement

Framing the Challenge That You Will Be Solving

Now that you have a **How Might We?** question that is informed by **Insights** you've gained from your **Research**, it's time to frame the specific challenge that you will be proposing a solution to.

An effective Problem Statement is up to 150 words and describes the problem, identifies the impacted group(s), mentions relevant statistics, and discusses previous attempts to solve the problem.



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Now that you have a How-Might-We question that is informed by insights you've gained from your research, it's time to frame the specific challenge that you will be proposing a solution to. An effective problem statement is up to 150 words and describes the problem, identifies the impacted groups, mentions relevant statistics, and discusses previous attempts to solve the problem. It's important to note that a good How-Might-We question is scaled down quite extensively. It's important to remember that a problem statement is an evolving document. While you will generate the first iteration of your problem statement, problem statements tend to change as you learn new information. Also, as you go through the design process, it's very possible that the problem statement you create today is not the same problem statement that you end up solving on the final day of this program. But it's important to take that first step.

NOW IT'S YOUR TURN!

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- In your own group Session, you will attempt to download your insights as a group to identify the scoped challenge you wish to work on.
- By the end of this work period, you should be able to generate a How Might We? question and draft the first iteration of your Problem Statement.

Now it's your turn. In your own group session, you will attempt to download your insights as a group to identify the scope challenge you wish to work on. By the end of this work period, you should be able to generate a how might we question and draft the first iteration of your problem statement.

References

Innovation Champions. (n.d) HMW Statements. Denstu Innovation Council. https://innovationchampions.com.au/toolkit/hmw-statements

d.School. (2022) "How Might We" Questions. Standford University. https://dschool.stanford.edu/resources/how-might-we-questions

13. Module 6 - Rapid Ideation

Hello and welcome to this module titled Rapid Ideation: Innovative Thinking. By the end of this module you should be better equipped to help answer the question of: “how might we start thinking of solutions?”

Introduction

"The Honey Pot" by Elaine Camper

- Back in the 80's a power company (PP&L) was having trouble with snow building up on their power lines.
- After seeing a black bear near one of their towers, they joked about using honey to get bears to climb the towers and shake off the snow.

I want to start by sharing the story titled *The Honeypot* by Alain Camper. Back in the 80s, a power company named PP was having trouble with snow building up on their power lines. If too much snow builds up on the power lines, they have a risk of tearing or collapsing. After seeing a black bear near one of their towers, they joked about using honey to get bears to climb the towers and shake off the snow.

Introduction

"The Honey Pot" by Elaine Camper

- They talked about using helicopters to place pots of honey at the top of the towers to lure the bears.
- They then realized that the downward force of a helicopter would likely be enough to quickly clear snow from the power lines.

They further explored this idea and talked about using helicopters to place pots of money at the top of the towers to lure the bears. Jokes aside, they then realized that the downward force of a helicopter would likely be enough to quickly clear snow from the power lines. This method of using a helicopter to clear snow from power lines is used by people to this day. Notice that it all started with this absurd story of using bears to clear snow!

Rapid Ideation

What can we learn from the Honey Pot?

- Innovative ideas come from where you may least expect them.
- It's perfectly okay to start with bizarre and infeasible ideas during the brainstorming process, because those ideas lead to innovative thinking.

What can we learn from *The Honeypot*? The lesson here is not that if you think hard enough about a bad idea, it will become good, but that innovative ideas come from where you may least expect them. Sometimes it's perfectly okay to start with bizarre and infeasible ideas during the brainstorming process because those ideas lead to innovative thinking.

Rapid Ideation

Principles in Idea Generation

- Write down every idea
- Build on the ideas of others, and look for opportunities
- Resist the urge to discuss feasibility of ideas (at first)
- Ensure everyone is participating

While there are no direct strategies that will result in a successful innovative idea, there are some principles that we can practice. First, you'll want to write down every idea, and I mean, every idea, even the really out-of-the-box crazy ones. Next, you'll want to build on the ideas of others and look for opportunities. Don't discuss the feasibility of using bears to knock snow off the power lines. Talk a little bit about what you would have to do to get a bear to do that. You'll want to resist the urge to discuss the feasibility of ideas at first, during the initial brainstorming so you can go wild with your ideas. Finally, you'll want to ensure that everyone is participating. You don't want to let anybody feel singled out and you want to let people feel encouraged about their brainstorming.

Rapid Ideation

Strategy in Idea Generation

- One strategy is to brainstorm collectively in three, 20-minute rounds
  - First 5 minutes: each team member brainstorms as may ideas as possible
  - Remaining 15 minutes: share ideas together and group similar ideas together
- Ideas get better with quantity

One idea generation strategy is to brainstorm collectively in three 20 minute rounds. The first five minutes of each round is dedicated to each member individually brainstorming as many ideas as possible on their own. They don't have to be great ideas, but just the first things that come to mind. Write down as many ideas as you have. For the remaining 15 minutes of that 20 minute round, you will to share the ideas together and group similar ideas. Once you do this over three rounds, you'll notice that the ideas tend to get better as you start to collectively realize that you know where you're going as a group with these ideas. This is just one strategy. You don't have to use it, but it worth trying!

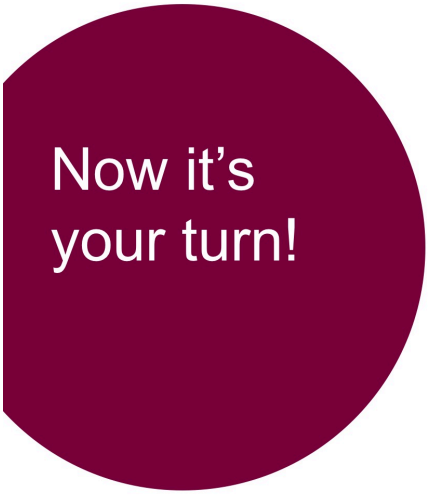
Rapid Ideation

Selecting the Best Ideas

Some things to consider when choosing your best ideas:

- What advantages does your solution offer?
- Qualities that make this solution unique
- What benefits does your solution offer the public?
- Can this solution be implemented widely?

At the end of the session, you will have to narrow down your brainstorming to your three top ideas. Some things to consider when choosing your best ideas include: What advantages does your solution offer? If there are existing solutions, then what is yours offering that the others don't? What makes it unique? What is it doing that others can't do? What benefits does your solution offer the public? Why would the public want this? Finally, can this solution be implemented widely? The more areas, or situations, or contexts that you can apply a solution, the better that solution is.



- In your own group Session, you will rapidly brainstorm solution ideas
- Your goal is to develop three possible solutions to your Problem Statement, no matter how unrealistic they might be!

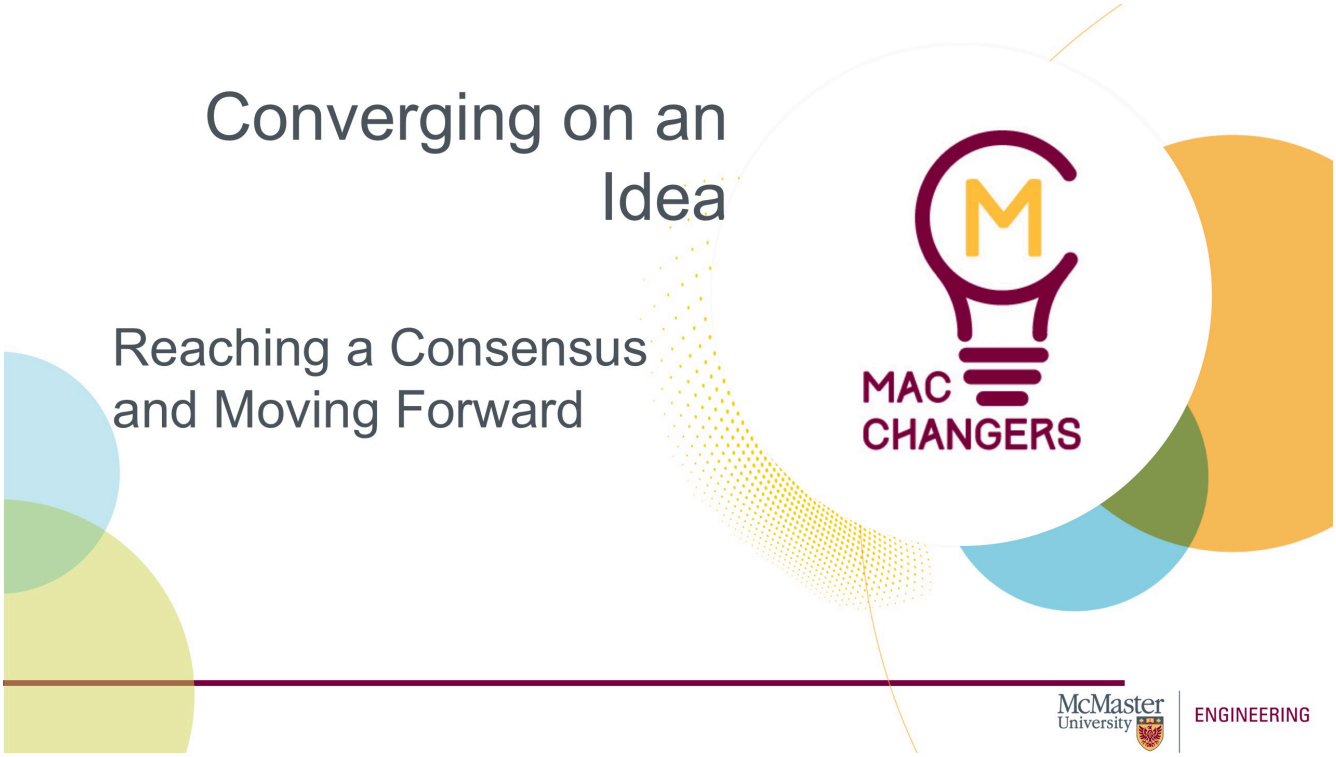
Now it's your turn. In your own group session, you will rapidly brainstorm solution ideas. By the end of your session, you should have three possible solutions to your problem statement.

References

Camper, E. (1993). The Honey Pot
A Lesson in Creativity & Diversity. https://www.insulators.info/articles/ppl.htm

Innovation Champions. (n.d) Rapid Ideation. https://innovationchampions.com.au/toolkit/rapid-ideation

14. Module 7 - Converging on an Idea



Welcome to Module 7 where we will be covering how to come to a consensus and converge on an idea in order to move forward with your project.

Reaching an agreement on how to proceed can be a troublesome experience

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When working in a team, it is important to understand that every individual comes to the team with their own lived experiences and opinions. From one perspective these differences make it challenging to come up with a census, but these differences also allow for the team to gain a much more rounded understanding of the topic. Luckily, there exist many strategies of coming to a consensus within a team and we will uncover some in this module.

Converging on an Idea

Guidelines for Consensus

- **Puts the interests of the group and of the problem ahead of your own.**
- If you are misunderstanding something, trust your team to help you in clarifying.
- Be clear, precise, and honest in your viewpoint.
- Think before you speak and listen before you object.
- Minor disagreements will make your ideas better.

Source: https://www.seedsforchange.org.uk/shortconsensus

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First of all, it is important to place the interests of the team and project before your own; you can't expect others to do so without showing that you place the team first yourself. Secondly, don't be afraid to clarify something that you do not understand as this will help keep everyone on the same page and help avoid conflicts in the future. Thirdly, be honest with your feelings and opinions, as this will not only make your own experience more enjoyable, but will also help the team be more understanding of your position. Next, be sure to not just listen, but hear what everyone has to say. Listening is a skill that requires mastery, so be mindful of what you say and how you react to others. Finally, don't be afraid to disagree, truth is often uncovered through discussion!

Converging on an Idea

Exercising Skills in Reaching Consensus

By conversing with your team, you will develop your skills in:

- Active Listening
- Summarizing
- Synthesis

Source: https://www.seedsforchange.org.uk/shortconsensus

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Through conversation you will develop three main communication skills:

- **Active Listening:** When we actively listen we suspend our own thought processes and give the speaker our full attention. We make a deliberate effort to understand someone's position and their needs, concerns and emotions.

- **Summarizing:** A succinct and accurate summary of what's been said so far can really help a group move towards a decision. Outline the emerging common ground as well as the unresolved differences: "It seems like we've almost reached agreement on that bit of the proposal, but we need to explore this part further to address everyone's concerns." Check with everyone that you've got it right.

- **Synthesis:** Find the common ground and any connections between seemingly competing ideas and weave them together to form proposals. Focus on solutions that address the fundamental needs and key concerns that people within the group have.

NOW IT'S YOUR TURN!

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In your own group Session, you will take your newfound insights and agree upon an idea to move forward with.

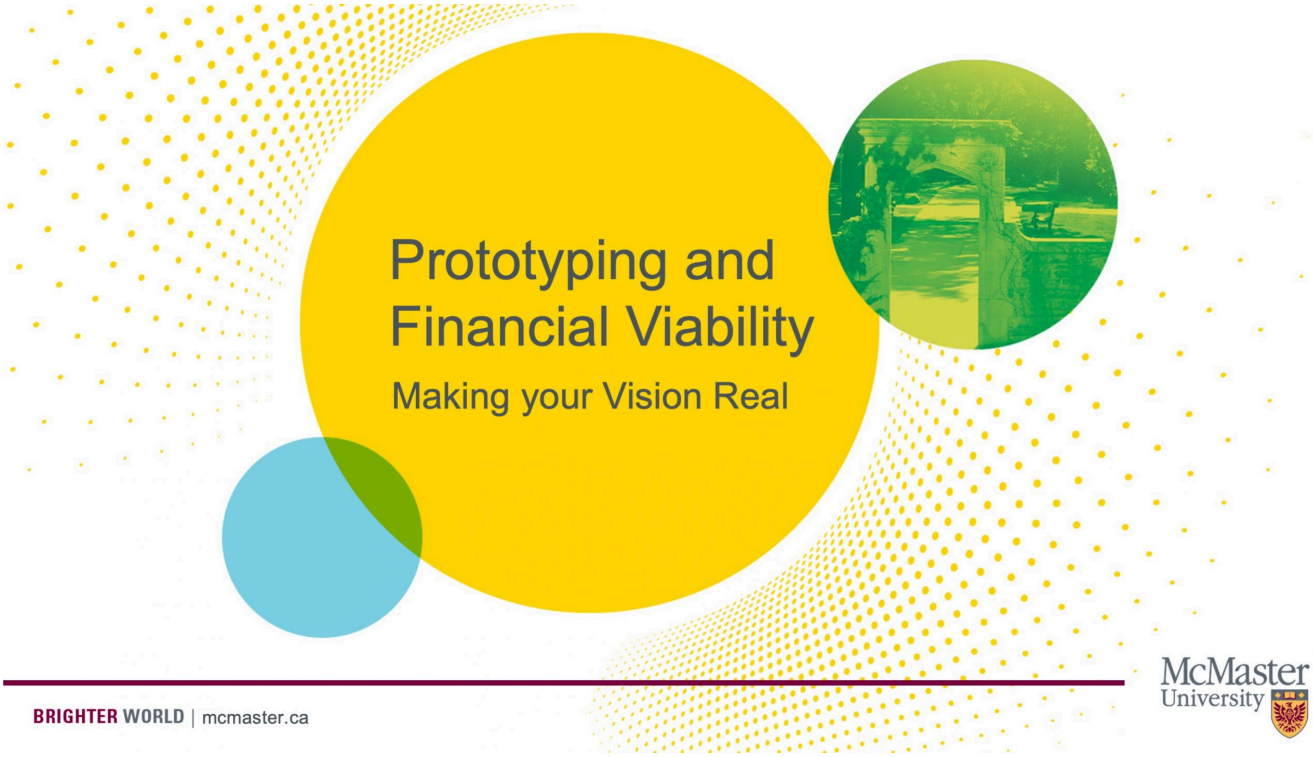
By the end of this work period, you should be able to identify a feasible solution that you will be exploring in solving your Problem Statement.

Now its your turn! In your groups take your newfound insights and form an agreement on an idea to move forward with it. By the end of this time, you should have identified a feasible solution that you will further explore when solving your Problem Statement.

References

Seeds for Change. (n.d) *Short Guide to Consensus Decision Making.* https://www.seedsforchange.org.uk/shortconsensus

15. Module 8 - Prototyping and Financial Viability



Welcome to this module titled prototyping and financial viability, making your vision real.

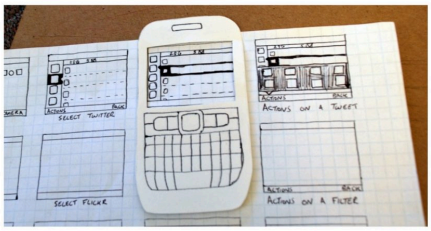
By the end of this module, you should have a better idea of how you might make your idea real in a virtual setting.

Prototyping

What is a prototype?

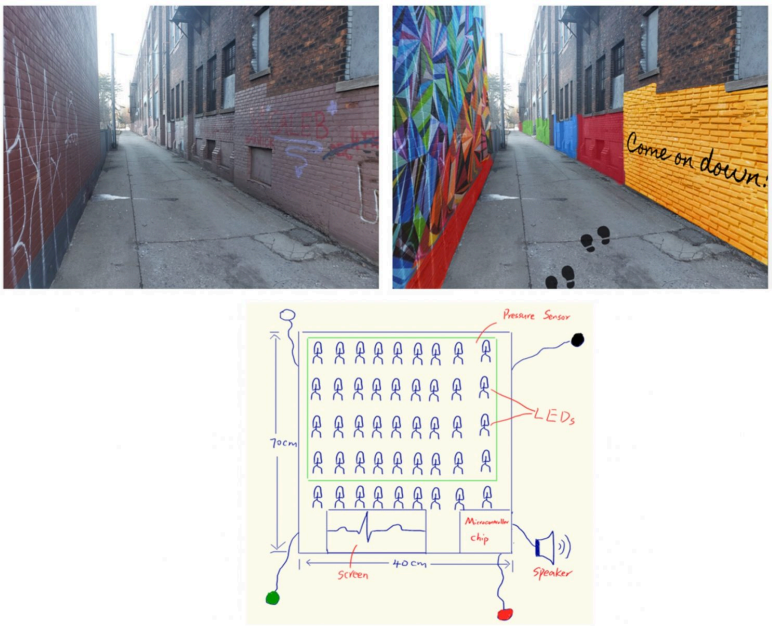
A **prototype** is:

- An early visual representation/model of a concept or process,
- Precise in demonstrating how the problem is reduced or eliminated completely.
- Done in iterations that improve with time.
- A design, a system, a device, or a policy



Let's start by talking about what a prototype actually is. A prototype is an early visual representation or model of a concept or process. I know that sometimes "prototype" can be a really intimidating term because people think, Oh, you need to have a functioning device or you know, something that actually works. But that's not at all the case, especially as early on in the design process as you are.

A prototype is precise and demonstrates how the problem is reduced or eliminated completely. It's precise in the sense that it is devoted entirely to solving the problem, and when you go to mass market to sell your device, then you can add all the bells and whistles and the shiny finishes later. A prototype is done in iterations that improve with time. It's very likely that your very first prototype is not going to be awesome, but it will be good at some things, it will be good at helping you visualize your solution, and it'll only get better with time as you think about it. Finally, a prototype is a design, a system, a device or a policy. A prototype doesn't have to be a functioning device, it can be a drawing, it can be a policy, or it can be a system.



On screen, you'll see two examples of very early versions of prototypes. The example on top is a prototype of an alleyway beautification project with a digital design. The proposed design is overlaid digitally on the alley in which it was to be implemented. This helps give you a sense of what the alleyway might look like following the beautification project.

Below that, you'll see a prototype for a device that consists of a blanket with several LEDs embedded in it. While the circuit is not at all functional, and it's not even a halfway decent circuit diagram, it does give you a basic sense of where components may need to go on a device that exists like this.

Now, you may be asking yourself in a virtual setting when all of my teammates are separated from me, how do we go about prototyping? What are we capable of? And what can be a convincing prototype?

Let's go through a few examples. If you're in the mobility challenge area, you might come up with an idea for a bus shelter that allows proper social distancing by including barriers between passengers. In order to do this, you can simply take a screenshot from Google Streetview, put it into MS Paint, and draw an overlay of what you think this might look like. By creating this design into a quote on quote, real setting, you start to ask questions about it. What should it be made of? How should it be designed to withstand extreme weather conditions? Do I need to make any considerations for it being so close to the road? These are just some examples of questions you might have that you're only going to realize, when you start making your project real. If you were in the food challenge area, you might want to design an app that lets you know of nearby farms that are selling their crop directly to consumers. In order to do this, you can take an outline of a phone, put it into Microsoft PowerPoint, and quickly mockup what the login screen, the main screen, or

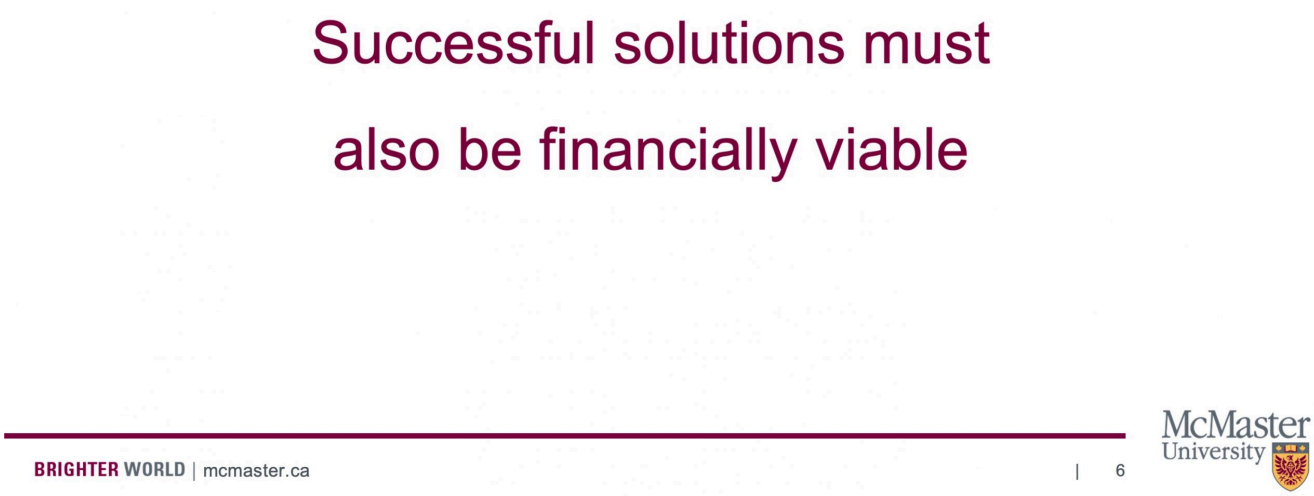
even the transactional screen might look like. It doesn't have to be functional. But you can show screenshots of what the process would look like if someone were going through and using your app. If you're an upper years of study, and or have some experience with 3d modeling, you could surely create a very robust prototype and animate it to create a convincing case of what your solution might look like.

Prototyping

Measuring Success

- As you design your prototype, you need to consider what success would look like.
  - How would you know if your idea worked?
- Imagining the user's experience will inform your design process and prevent under-designing or over-designing.

Please keep in mind that as you design your prototype, you need to consider what success would look like. How would you know if your idea worked? What would it look like? Imagine the user's experience and that will inform your design process. Try to prevent under designing or over designing your solution.



Successful solutions must also be financially viable. Let's dive in to some ways to consider financial viability.

Financial Viability

What will it cost?

In association with your prototype, consider:

- Costs (material costs and operating costs)
- Opportunities (ways of making money and sponsorships)
- Barriers (policies or shortages of resources)

As you create your prototype, you'll need to consider three things.

First is costs, typically consisting of material costs and operating costs. Now, we're not asking you to find the exact number that your prototype will cost. But we want to know what material costs and operating costs are associated with your project. Do you need a stainless steel exterior? Or could you settle for a rather robust aluminum?

Operating Costs consist of things like maintenance or electricity. You'll also want to consider opportunities, including ways of making money and sponsorships. Do organizations exist that might pay you for a solution like this? Is there a way that you could monetize your solution and sell it to consumers?

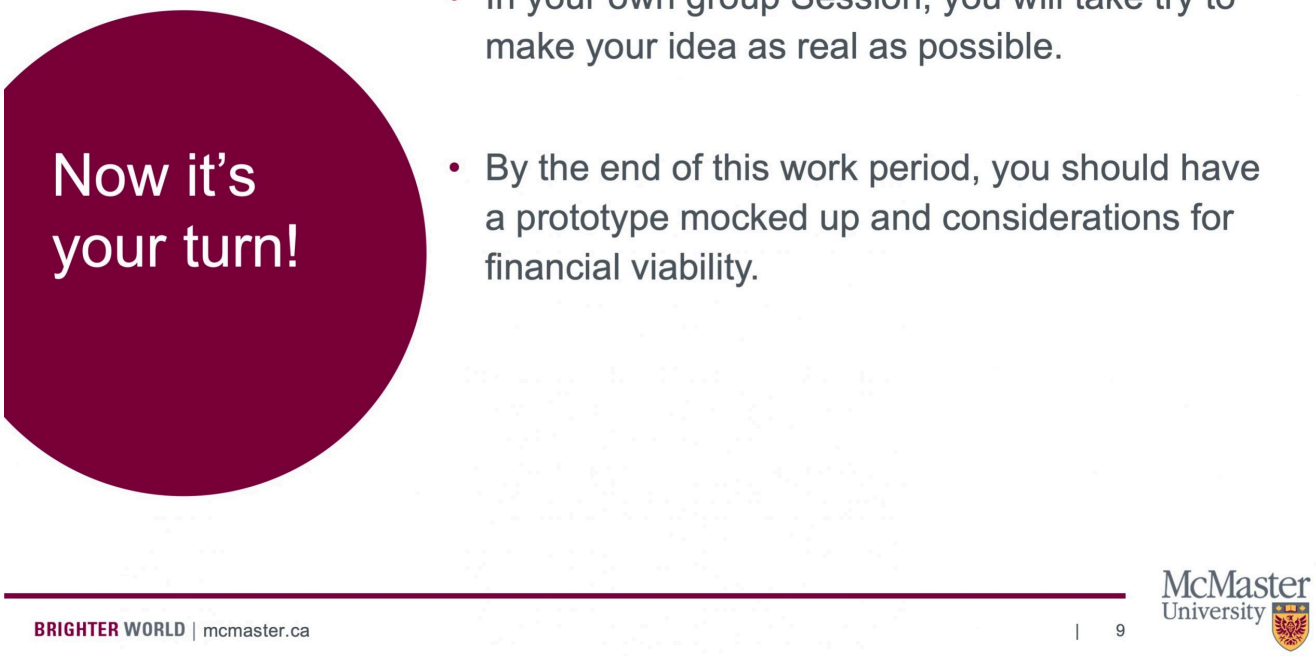
Finally, you want to think of barriers, policies or shortages of resources.Would your solution be affected by a single use plastic ban? Is it using valuable resources that might be better allocated elsewhere? These are the things you'll need to consider when creating your prototype.

Prototyping

To Summarize

- Prototypes come in all shapes and sizes, but all focus on solving a problem
- Thinking about what success would look like is critical in having a precise prototype
- An effective solution must be financially viable

To summarize, prototypes come in all shapes and sizes, but all of them focus on solving the problem. First and foremost, thinking about what success would look like is critical in having a precise prototype. Finally, an effective solution must be financially viable. If it's too expensive for anybody to use it, it's not a realistic solution.



Now it's your turn. In your own group session, you will try to make your idea as real as possible. By the end of this work period, you should have a prototype mocked up and considerations for financial viability.

16. Module 9- Creating and Refining a Pitch

HOW DO WE SHARE OUR IDEA IN A COMPELLING WAY?

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You have spent a number of days now immersed in your theme area. You have brainstormed, refined and strengthened your solution. Now it is time to share it. So, how do you do this?

Pitching your Idea

A **pitch** is a presentation of an idea, available in numerous forms, with the purpose of influencing support or the allocation of resources.

The success of a pitch depends equally on **content** and **delivery**

Photo used from Google CC

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The answer is that you create a pitch. You may have heard this term before and most of you have practiced it, possibly even unknowingly, on your parents as you have tried to convince them of a specific course of action. The pitch can come in a number of forms but the overall purpose of it is to garner support and gather resources. Your success depends upon your content and your delivery.

Creating a Pitch

Content of a Pitch

- In addition to clearly explaining the problem and your solution, you should highlight why your solution is environmentally, socially, and/or economically sustainable.

Environmental	Social	Economic
• What impact (or lack thereof) might your solution have on our natural environment?	• Why might the community continue using your solution a long time from now?	• Why might the community be able to afford your solution for a long time?

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Alternative Text for the Above Table: There is a table in the above image. It has three categories: Environmental, Social, and Economic.
The Environmental category contains the following text: What impact (or lack thereof) might your solution have on our natural environment?
The Social category contains the following text: Why might the community continue using your solution a long time from now?
The Economic category contains the following text: Why might the community be able to afford your solution for a long time?

MacChangers was formed around Grand Challenges and these grand challenges are rooted in sustainability. For your pitch to succeed you need to demonstrate to your audience that you have a well-balanced solution that is environmentally, socially and economically sustainable. Environmental sustainability is about minimizing or removing impacts to the environment, and not trading off impacts (for instance a solution for reducing air pollution that ends up increasing water pollution is not environmentally sustainable). Social sustainability is rooted in equity, accessibility, adaptability and usability. If nobody is willing to use your solution it does not matter how environmentally sound it is or economically stable it will fail. You must develop a solution that appeals to your stakeholders and is designed for the users. Finally, it must be affordable not just in its initial implementation, but over its entire life. In fact, the life-cycle of your solution is important. A great solution is one that is adaptable, that will work under current pandemic circumstances, but can then be adjusted for whatever changes may come in the future.

Creating a Pitch

Delivery of a Pitch

- A pitch should be concise with important information delivered in a short amount of time.
- Be sure to show the benefit.
- Make sure you've got your numbers right.
- Be confident and bold in presenting your idea.
- Don't be arrogant in overpromising with your solution.

DELIVER

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Once the core sustainability of your solution has been identified it is time to deliver it. Your pitch must be concise and your videos should be between 3-5 minutes in length. This may not seem long enough, but first impressions are important and your pitch is the proverbial foot in the door. In that time, you need to show the benefit of your solution. In most cases community projects are competing for a relatively small pool of money and there may be a number of ideas pitched for a particular problem. Yours needs to stand out. Imagine that every time you mention an aspect of your solution someone is sitting there with their arms crossed saying "so what". Every aspect of your solution should have a benefit. Next, make sure that you get your numbers right. Nothing sinks a pitch quicker than someone catching you with a mistake. In terms of the delivery, be confident and bold in presenting your idea. Nobody can be more excited about your idea than you are. Don't be arrogant in overpromising with your solution. Arrogance is often manifested in stretching the truth about your idea too far.

Refining a Pitch

Practice!

- Practice your pitch and avoid reading from a script.
- Try to speak dynamically and in an engaging tone of voice.
- Pitches should be concise, but do not speak too quickly!

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With all of the elements in place it is time to practice, however in this case memorization is not the key. Memorization is flawed because it can lead to mistakes which can cause a moment of stress while trying to get back to the right words. It is a much better strategy to know key points in your pitch and build your story around those. The sound of your voice is important for your pitch. Try to speak dynamically and in an engaging tone of voice and avoid using a monotone when speaking. Finally, don't rush through your pitch. It is better to cut your material down to the basics and speak at a confident pace, rather than sprinting through the material in order to cram in more points.

NOW IT'S YOUR TURN!

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- In your own group Session, you will create the first draft of your project pitch.
- By the end of this work period, you should have assessed the environmental, social, and economic sustainability of your solution in a concise pitch and articulated the benefits of your solution.

So now you must craft a pitch. In your own group session you will make your first draft. What we want you to focus on the core elements of the pitch. At the end of this session you should have worked out the environmental, social, and economic sustainability elements of your solution as well as its overall benefits. Once you have these core elements down, prepare your final showcase presentation.

PART III

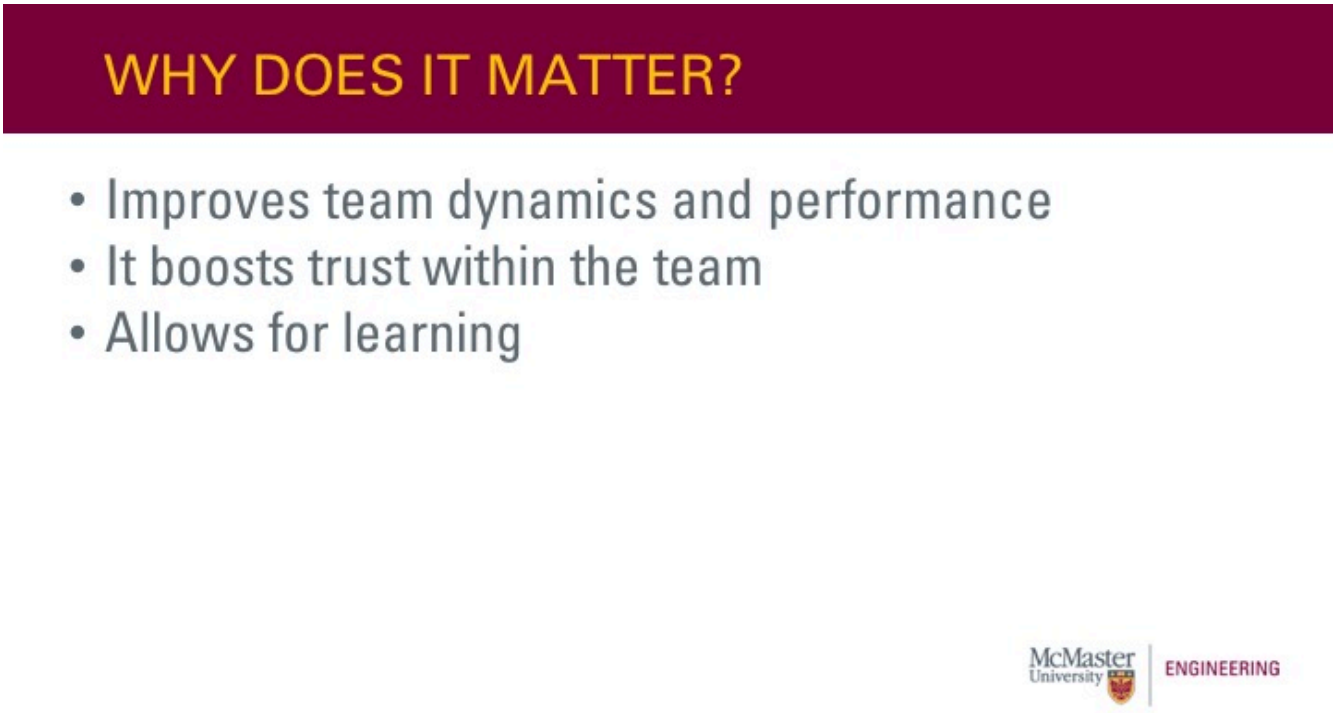
MENTOR TRAINING

17. Mentor Module 1: Accountability

Welcome to the Mentor Training modules. In this module, we will be discussing the act of creating accountability.

The condition that you are held responsible to the given task.

We will begin with the definition of accountability. It is a commonly used term in team settings but not many understand the universal definition of it. Accountability is the condition that you are held responsible to the task that is given to you. In group work, accountability is crucial as it creates an implicit understanding that group members can be tied to their tasks.

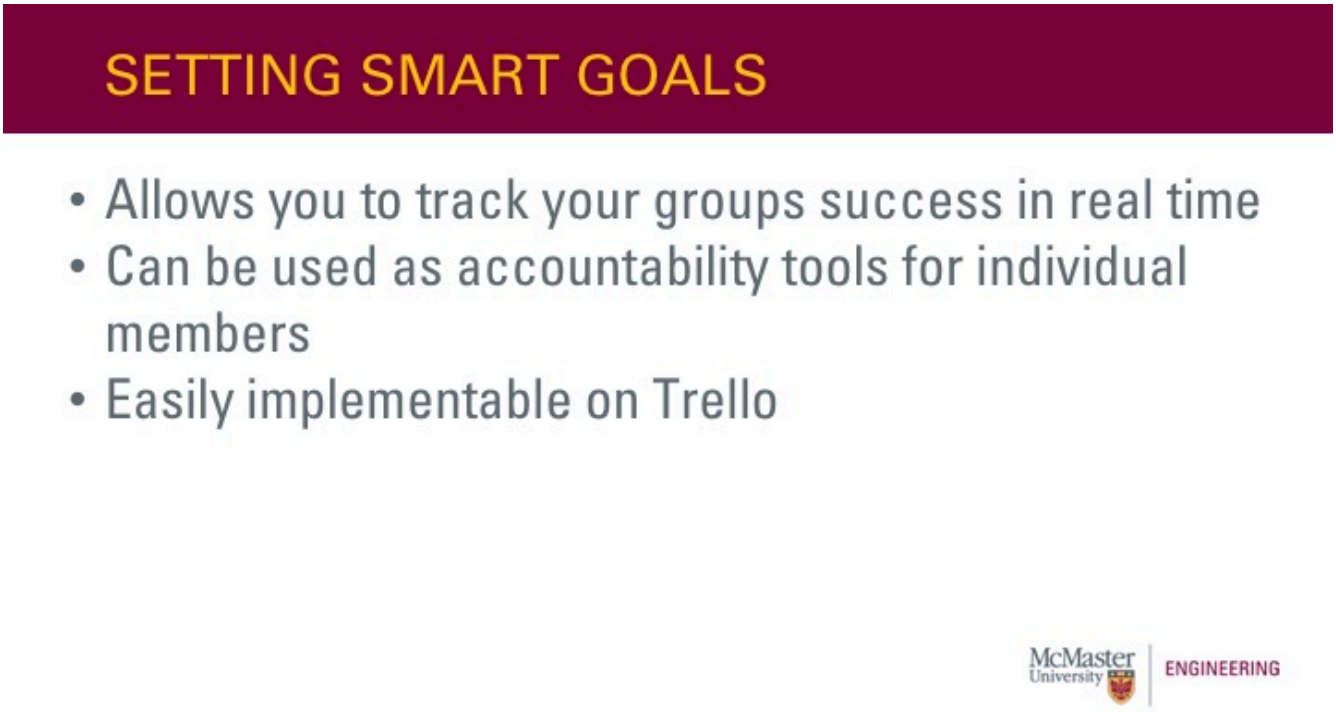


Accountability seems like an implicit topic, so why does it matter and why are we discussing it? Well, it can be the backbone to many aspects of team dynamics. It can improve team dynamics/performance as building a mutual understanding with your team that you are responsible and reliable can lead to an overall well-done project. Along the same lines, it helps your teammates trust you as an individual. If you can consistently contribute to the team by completing high quality work for tasks you are accountable for, the team will have an easier time trusting you and your capabilities. Finally, it allows for learning. By being held accountable for specific tasks, it is your responsibility to be able to complete it, even if that means learning a new topic or skill. Everyday that provides a chance to learn something new is a great day!

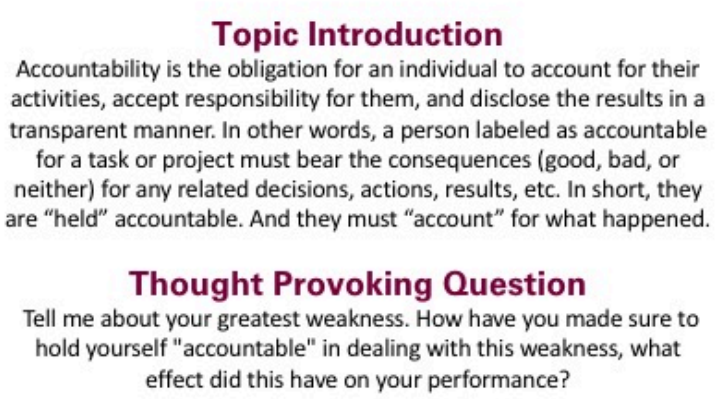
Now that we have navigated through what accountability is and why it matters, the next step is to discuss how we can increase accountability within groups. First of all, if you make a mistake as a mentor, whether it is a communication error or a feedback-based error, make sure you own up to it! Clear channels of communications between you and your group will ensure their efforts are directed towards completing accurate deliverables. Next, involve students in goal setting. By accounting for their schedules and responsibilities while setting goals, the group as a whole will be more successful as they can trust that individuals assigned to a specific goal have the resources to complete the task. Furthermore, by setting clear expectations, you will be removing any ambiguity that may arise from the task they are assigned. By providing clear instructions and resources and ensuring your group understands their task, they will be inclined to complete the task to a higher quality than if they did not understand it. Moving forward, providing beneficial feedback on deliverables or when the group needs help can increase accountability in the same way. If the group understands the direction of their project and the goals they must achieve, you as a mentor can gain trust that they will complete the work they are accountable for as they know what they are doing. Last, but definitely not least, it is really important to be able to continuously have communications with your groups to maintain the built accountability and that will be by running successful meetings.

As a mentor, you will be part of a lot of meetings. Being able to run a successful meeting is crucial, especially in an online setting when communication is a bit more difficult. To begin, make the purpose of your meeting clear. When the group knows the purpose of the meeting, they will tend to prepare for the conversation. You can do this by explicitly mentioning the purpose as well as creating and sharing an agenda. By providing talking points prior to the meeting, the students may prepare any questions or concerns they may have along the lines of the talking points. Next, have an assigned note taker. It is important to record what happens in the meetings as a lot of information can be portrayed at once and having a written recap will ensure nothing gets lost in-between the meeting and the group completing their task. Next, you want to delegate tasks to group members, if they haven't done so already. Each task assigned should be attached to an individual and a deadline. When the task is mentioned, call out the person it is meant for and then confirm the deadline with them. Any further discussions can be done after the meeting. These tasks can be brought up as "action items" which can directly be translated to deliverables, whether they are the final deliverable they are working on, or for a progress check-in. These action items can be aligned to SMART goals, which we will discuss now.

SMART goals will fit alongside action items as they will ensure accountability per action item and group member. A SMART goal is specific, measurable, assignable, relevant, and timely. It is specific to their upcoming deliverable, measurable in the sense that the progress can be tracked, assignable in the sense that it can be delegated to a group member (or two) and they can be held accountable to completing the goal, relevant to the upcoming deliverable, and timely so it agrees to the timeline set in place for the deliverable.



These goals will help you track your groups success in real time and can be used as accountability tools, not only between group members but between the group and you as the mentor. It is your job to help the group succeed and by setting SMART goals within action items, you are setting the group up for success for the major deliverables. Finally, these goals can easily be implanted on Trello so it is easy for students to update their progress and it is easy for you to track how well they are doing. Trello is a project management tool where you can create categories for a project, individual, or assignment and then add cards under each category with an action item to complete. You can assign a person to the card, add any notes they may need, set deadlines and overall it will establish expectations and provide resources all in one place. Any project management tool can be used with SMART goals and they help in successfully tracking project completion.



Now that you have successfully read through our module on accountability, it is time to put these ideas into action! Either as a group with your organization or on your own, ask yourself, "How have I made sure to hold myself accountable to my weaknesses? How does holding myself accountable effect my performance in these areas?"

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18. Mentor Module 2: Group Dynamics

Hey everyone! Welcome to the next module in the mentor training. In this module, we will be discussing group dynamics.

BREAKDOWN

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1. Time Zone Variations
2. Navigating Difficult Situations

In today's session we will start with time zone variations, the problems that arise and potential actions that can be taken to help groups that are facing an issue with time zones. Next, we will talk about navigating difficult situations in group settings as they tend to come up quite often and it is always good to be prepared in advance.

TIME ZONE VARIATIONS - PROBLEMS

- Not everyone will be in the same time zone
- Causes barriers in successful group dynamics
- Need to find ways to mitigate the side effects

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We'll start off with time zone variations, specifically the identified problems. The biggest problem is that not everyone may be in the same time zone. Right away, there is a division within the group, even before a single word is said between them. This is the main theme that comes up in all time zone related problems, so even if it may not seem as that big of a problem right off the bat, once groups get going it can severely impact group dynamics. Time zone barriers can be the rift that prevents a team from having successful group dynamics. Between communication barriers, different work hours, having difficulty with collaboration, and lack of team building resources, group dynamics tend to take a hit. Successful groups must work in unison, so time zones create an issue there. Finally, there is not one key solution to reducing time zone related conflict. There are several "best practices", but those may not be the solution for some teams. On the next slide, we will go through some good practices to equip yourself with so you can help your teams if they face any of these issues, but keep in mind that a final solution will look different to each group.

TIME ZONE VARIATIONS – POSITIVE ACTION

- Communication is key
- Make it easy to collaborate
- Push organized meetings
- Focus on the benefits

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There is positive action you can take as a mentor to ensure your groups have a high success rate, even if they are facing time zone barriers. So the first point here is quite straight forward, I'm sure you've heard it 100 times whether it was from prior teammates, your significant other, or your boss but communication is KEY. It is important to take notice of individuals communication styles. Some people prefer to communicate through email, others video calls or even group text. By acknowledging and respecting everyone's communication style, you are setting your group up to succeed, at least as far as talking to each other is concerned. A simple honest conversation can eliminate almost any problem, make sure you encourage your teams to share their style and to respect each other's preferences.

Next, make it easy to collaborate. This can be a shared hard drive, a shared google drive, onedrive, dropbox or any platform that lets them share their work in progress. It can get frustrating waiting for others to send their updated work when it is your turn to work, so by having a system in place that allows all members in

the group to access the documents at all times will ease a lot of unnecessary stress. Moving forward, you want to push organized meetings. A meeting can be the difference between high-quality and poor-quality work. Even though we don't assign grades, A+ works is associated with groups using their meeting times efficiently. A successful meeting includes meeting minutes, meeting agendas, action items assigned to each teammate with accompanying deadlines, and check-ins. We will talk more about these in future modules, but organized meetings will be the catalyst to success for a lot of groups, so encourage them as much as possible!

Finally, focus on the benefits of a diverse team. Focus on being grateful for the new opportunities rather than the new setbacks. Having a diverse team will open up brainstorming sessions with new ways of thinking, it will bring a new culture to the team as they may not lead a typical day in their life like you do. Every chance to learn from people around you is a good one, so seize the day and the opportunity.

NAVIGATING DIFFICULT SITUATIONS

- There are various reasons that can cause conflict
- Not every scenario will have a one-size fits all solution
- Need to build an intuition to counter these conflicts

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Lets move forward to the discuss navigating difficult situations. First things first, there are various reasons a conflict may arise. For example, individuals may be sensitive to some conversations or topics, they might feel uncertain about a decision or the resulting action, or even two group members may just not get along. They are all causes for conflict and each cause requires a different approach to mitigate them, so it is important that we discuss various scenarios and how to approach them. Like we just discussed, not every scenario will have a one size fits all solution. There will be multiple scenarios that one solution could resolve, but that often will not be the case. Conflict resolution is more about intuition than anything else. I could write you a textbook with 100's of scenarios and have you read through the solutions, but it does not matter unless you can pinpoint what the conflict is and develop steps to work through the conflict. Groups will rely on you as the mentor to be a supportive third-party throughout conflict resolution, so staying calm and bringing empathy to all parties will go a long way in conflict resolution.

NAVIGATING DIFFICULT SITUATIONS

- Quiet Groups
- Dominant individuals
- Members won't pull their weight
- Morals and ethics for sensitive topics

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So the first situation would be having quiet groups that tend not to talk during meetings. The way to approach this scenario would be to have a round table chat with the group. You can simply warm them up with an icebreaker or small talk until they feel comfortable getting into the rhythm of things with their group. It is okay to carry the conversation for the first little while of the meeting, but be sure to pass the torch to the group and have them initiate their own conversation amongst them. Sometimes, all they need is a little push and that is where the magic starts.

Next, having a dominant individual in the group, or someone who will always talk and not give others the chance to speak. You want to call on everyone individually and hear everyones thoughts. Just because they are shy or are choosing not to talk does not mean they do not have really good ideas that can further develop the project that is being developed. This is a very simple and extremely effective strategy. This is also a great opportunity to amplify quieter voices. You can say, for example, "I thought person X had a great idea when they mentioned Y. X, could you please elaborate on your thinking?" It can also be great to remind to individuals to ask for input from their fellow teammates before moving on to the next topic. In follow-up meetings, you can specifically address quieter team members to fill you in on updates since your last meeting to continue promoting participation from all group members. Keep in mind that some individuals might feel anxious being put on the spot, so a follow-up private communication with team members to see how they feel could also be appropriate.

Next is a common issue which is that members won't contribute equally to the project. This can be a tricky situation to navigate as not all individuals will respond to the same level of authority. Some may require someone kind to approach them whereas you may need to be firm with others. Again, this is part of your intuition and real life experiences that should lead you to decide which authority level to take. A potential solution could be having a group meeting with you present and you ensure tasks are equally delegated between group members. You can also require the team to set deadlines for when each task should be done,

and tell them to include a role table with their signatures. A role table would include their name, their task, and their signature that they completed it themselves. This is a form of accountability, which is exactly what is needed here. In follow-up meetings, asking participants to speak to their designated tasks can help to identify individuals who are not able to contribute equally. If a team member is not contributing equally and there is now a record to demonstrate they were aware of their role, it is important to follow-up with the team member. This can be done privately or with the larger group. This is another scenario in which you need to rely on your intuition. The individual may feel uncomfortable with their role. They may have disagreements about the direction of the project, leading them to feel uncomfortable moving ahead with their tasks. In other cases, team members are simply overwhelmed with too many things on the go. As you can see, it is very important to be kind and approachable when speaking with a team member who isn't achieving your expectations. Once a discussion has been approached, come up with a solution with the team member. A team member who is disenfranchised will not feel more inclined to accomplish work through you being strict; meanwhile, a team member who is overwhelmed may only feel more overwhelmed by a terse interaction. Instead, remind the individual that everyone on the team is accountable to their task and ask what they need to remain accountable. Then ask what the team member feels would be a fair response should they be unable to meet their agreed upon role. Whether this discussion occurs privately or with the rest of the team, the final decisions and consequences associated with the conversation should be made transparent to the entire team so that everyone can feel reassured a plan is in action.

Finally, morals and ethics. This can be a much larger conversation, but we can keep it straight and to the point. Sometimes, conversations will come up that not everyone will be okay with. Whether it is the topic, the response, or the way the conversation is going, there can be many ways people may feel uncomfortable in a conversation if they feel their values are being compromised. If this comes to your attention, remain calm. An extreme reaction may worsen things, so try to not react largely. In the moment, it is alright to intervene by changing the topic or by telling the individuals you feel this is an inappropriate conversation for the setting. It is alright to say, "This conversation feels that it is outside of my area of knowledge and has the potential to make people feel uncomfortable. I'd appreciate if we can not discuss this further at the moment." Feel free to then contact a main staff member or an event organizer. At MacChangers, we would likely contact the Office of Equity, Diversity, and Inclusion so as to provide participants with the appropriate assistance. Knowing how to manage these difficulties is outside the scope of your role as a mentor and it is okay to acknowledge that.

Navigate through the described case.

Alright! Now it is your turn to walk through a difficult situation. Here we go: Alex lives in LA and his teammate, Willy Wonka, lives in his chocolate factory in Austin, Texas. When it is 12 pm for Alex, it is 2 pm for Willy, which did not seem like it would be an issue. It turns out, whenever they discussed meeting times based off their time zones, they got into an argument about who should need to settle in the time choice as when it is convenient for one person to meet, it is not convenient for the other. What advice would you give Willy and Alex?

Topic Introduction

The term "group dynamics" describes the way in which people in a group interact with one another. When dynamics are positive, the group works well together. However, when dynamics are negative this can lead to various obstructive outcomes that have direct effects on overall group deliverable progress, person-to-person chemistry, team morale, individual's enthusiasm, and can lead to a rise in the occurrence of difficult situations.

Thought Provoking Question

Tell me about a time in which a team conflict arose within one of your school/professional project groups. Why did it occur, and was it avoidable?

Thank you for completing the second module in the mentor training module series. Take time to reflect on a professional project you completed that involved a conflict Why did it occur, and was it avoidable? What made the situation better or worse? If you had a third-party available for support, what would you have wanted them to do?

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19. Mentor Training Module 3: Roles Within The Project Lifecycle

Welcome to the third module in the mentor training! The topic we'll be going through now is titled the roles within the project lifecycle.

MENTOR ROLES

- Educator
- Collaborator
- Manager
- Empathizer
- Critic

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To begin, we'll be going through the many different roles a mentor can take on. First off, the educator. You're there to help guide your groups the same way a teacher guides their students. While you may not be giving lectures, you're there to help them develop a better project and to further explain core concepts associated with the short-duration learning experience. Your goal as a teacher should always be to help your participants achieve their full potential.

Next is the collaborator. It's crucial to be a strong leader in a group setting. You want to be able to not only collaborate with your own groups, but with your fellow mentors for presentations, taking on side tasks, or whatever may require a team approach.

The manager role is the most common as you are the one managing the groups. Think of yourself as a coach in the major leagues. You have a group of talented athletes with their own strengths in their game. At the end of the day, championships are won by strategies and techniques set up by the management. Your management style can help your groups be the best they can, just assess how much intervention is needed at any given time.

Next is the empathizer. I'm sure you have heard about empathy a few times by now so we can keep it quick. We need to keep empathy high and ensure it is shared with our students so they feel heard and recognized. Try to put yourself in the shoes of your participants so that you can best understand where they are coming from and where they need to go next.

Finally, the critic is more so based on the fact that you will be assessing their work. While you may not be assigning formal grades to participants, you will be providing them with feedback to help them build the best project they can.

Initiation
Planning
Execution
Closure

Moving on to the project lifecycle. We'll be using this four step methodology for each deliverable associated with the short-duration learning experience. The four steps are initiation, planning, execution, closure. We will be going through each individually and talk about the participant roles and mentor roles.

INITIATION - STUDENTS

- Identify scope, deliverables, and stakeholders
- Identify project risks
- Create initial proposal for project plan

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First off is the initiation stage for the participants. In some projects, participants will be encouraged to identify their project scope, outline their final deliverables, and identify stakeholders. They need to identify project risks or any areas they may need help moving forward so they can make sure they can get the resources they need from our team. Finally, teams will need to create an initial plan to move forward with so they can complete the deliverable to the best of their abilities.

Now we will review the role of the mentors during the initiation stage. Your responsibilities here are to double check if the participants scope is feasible for the project. Make sure they identify all of their stakeholders. Failing to consider who their intended stakeholders are could prevent the team from hearing important opinions or from understanding how their problem might impact others. Finally, give feedback on the initial proposal if need be. This can help you map out how their future deliverables will look and if you think any interventions are necessary.

PLANNING - STUDENTS

- Creating and assigning tasks
- Create short term SMART goals
- Identify your teams pool of skills

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The next step is planning. During this stage, participants will create and assign tasks for the deliverable to come, creating short term SMART goals (like we discussed in the accountability module), and identifying which group member is capable of completing specific tasks. By doing all three, participants will be setting themselves up for short term success.

PLANNING - MENTORS

- Delegate tasks, if need be
- Track short term SMART goals

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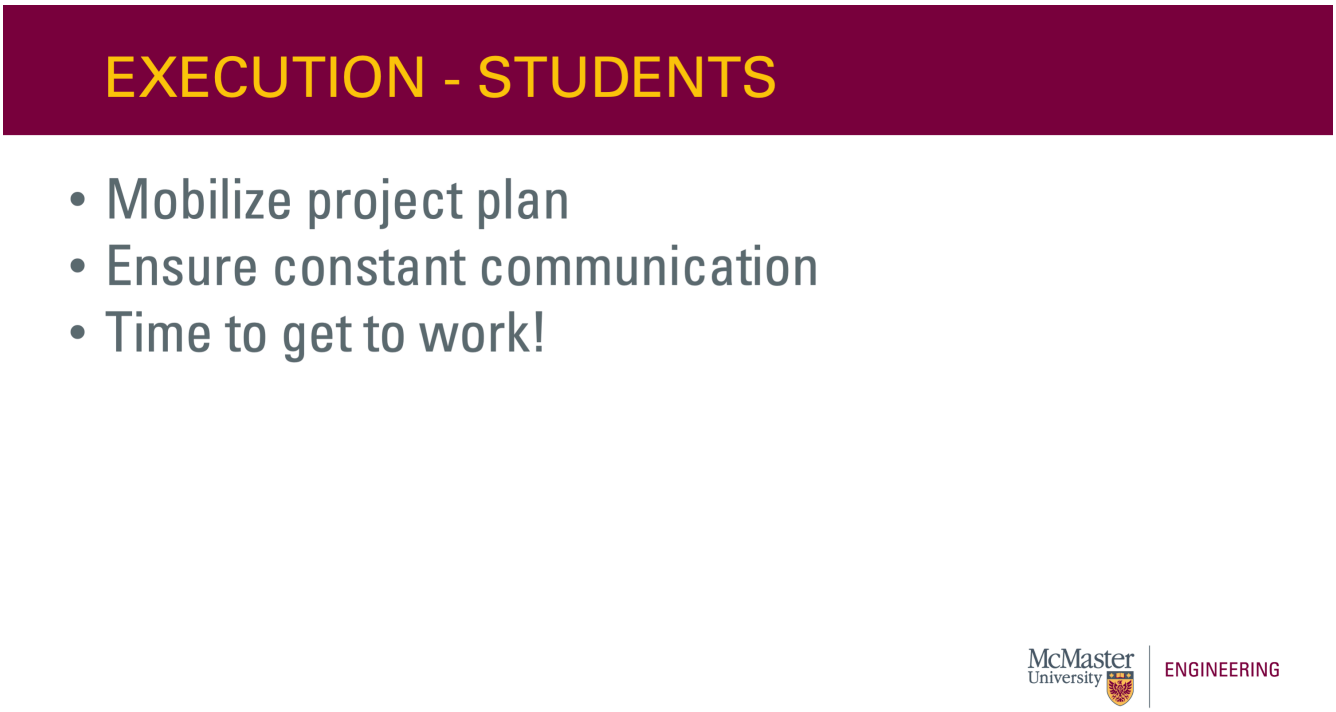
If the groups are struggling in the assigning tasks phase, it would be your responsibility as a mentor to help them delegate the tasks. When doing so, make sure you are logical in your choices as one task may be appropriate for one student but maybe not another. As such, encourage the participants to share their strengths, weaknesses, and their personal goals for the program. Next, track their SMART goals. You may want to suggest students use a project management software like Trello or Miro. These tools that help tracking progress in the short-term and on their overall project. Ensure you have access to these tools and it will be easy to keep an eye on whether the group is staying on track.



Once the planning is done, the participants will be moving onto the execution stage. They will be mobilizing their project plan here. This should have been creating the deliverable in the planning stage. They should be pushing constant communication as that is what will help them get through the execution of it all. They need to be able to work together, hence the term group work. Finally, it is time to get to work! There is nothing more to it.

EXECUTION - MENTORS

- Monitoring and controlling execution
- Constant communications with groups
- Give feedback along the way, if necessary

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For you, the mentor, you should be monitoring the project execution. You shouldn't be micromanaging the teams, but you should be knowledgable about how the project development is coming along. It is really easy to get a little too creative and absolutely erupt the scope of the project, so being able to keep your groups in line during their deliverable process will help in creating a feasible bigger picture. Like the students, you should also have constant communication with your groups. In the perfect world, the students will come to you when they need help. However many participants will feel embarrassed or nervous if projects they experience a problem, so you may need to reach out to your groups during this stage to ensure everything is going well. Finally, give feedback along the way. Try to give as detailed information about what the team is doing well in addition to letting them know about opportunities for improvement.

CLOSURE - STUDENTS

- Hand in deliverables
- Analysis on team and project performance

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The last stage is closure, the participants will be in charge of handing in deliverables. They should be assessing how well they worked together and making sure they have next steps outlined in case there was any conflict.

CLOSURE - MENTORS

- Provide feedback on deliverables
- Analysis on team and project performance

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For the last stage for the mentors, you will be providing feedback on their deliverable and ensuring they are on the right track in the short term and the long term. Finally, you will also assess their group dynamics and ensure there is no room for conflict moving forward.

Your group is working to assemble a work plan to move forward. They are currently working on a shared Google Doc and verbally accepting roles. What stage are they in and what advice would you give your group?

Finally, the activity! Your group is working to assemble a work plan to move forward. They are currently working on a shared Google Doc and verbally accepting roles. What stage are they in and what advice would you give your group?

Topic Introduction

Concisely defining each person's role, their responsibilities, and success criteria within the team can have an instant positive impact. It ensures that everyone knows what they're doing. It sounds simple, but when roles are clear, people know what's expected of them, how to behave, and what they need to accomplish.

Thought Provoking Question

During your many experiences on group projects (whether professionally or as a student), what roles have you taken up? Was there any time in which you had to assume several roles at once? Why do you think it is necessary to have dedicated roles assigned?

Thank you for completing the third mentor training module, roles within the project lifecycle. Take time to reflect on your experiences in a group projects (whether professionally or as a student). What roles have you taken up? What made the experience successful? What could have made the experience better?

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20. Mentor Training Modules 4: Starting and Leading Conversations

Hey everyone, welcome back to the mentor training modules. This time around we will be discussing starting and leading conversations. Just a quick note, this module is best run synchronously so that mentors can practice starting and leading conversations.

ICEBREAKERS

- Great way to improve group dynamics from day 1
- Encourages students break out of their comfort zone
- Can alleviate stress by building trust

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The best way to start conversations is none other than icebreakers! They are a great way to improve group dynamics from the beginning. Imagine being in a group where everyone feels awkward talking to each other versus a group where everyone is excited for meetings and doing group work because the group just communicates well. The second scenario sounds a lot more fun, so that is something ice breakers can push you towards. Encouraging students to break out of their comfort zone, at least communication wise, will help them bond and work better together in the future. Take it from a physics perspective. One of Newton's three laws is inertia. A body of mass at rest takes an external force to move. In an ideal world, that body of mass will continue moving until there is an equal and opposite external force. Take the icebreakers as a way to alleviate stress and provide your groups the external force they need to get going and gain traction and trust amongst each other as a group.

STARTING CONVERSATIONS

- Start with a greeting
  - Follow up with something pleasant
- Introduce yourself and your role

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If icebreakers aren't the right fit, here is an accepted way to professionally start a conversation. Start with a greeting. A simple "hey!" or "hello!" is great! Notice how I am starting off with a higher tone so the other feels welcome to the conversation and can clearly see that you are trying to make the effort to have a conversation with them. Next, follow up with something pleasant like a compliment or something warm, again, to welcome others to the conversation. Finally, introduce yourself and your role.

STARTING CONVERSATIONS

- If it is a difficult conversation
  - Choose the right time and setting
  - Start and continue with respect
  - Be open minded
  - If hostile, ask for a second staff member

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If you anticipate a conversation to be difficult, we have a few different tricks to get your started. First of all, choose the right time and setting. Make sure you get the individual at a good time and make sure they are not occupied with anything else at the time. Next, be respectful. Just because it is a difficult conversation, that does not mean you need to be rude. There is always a way to be kind, just do your part to practice saying your points and finding that kindness. Next, be open minded and make sure you're willing to listen to the others in the conversation. This will make sure there are no confusions and make sure everyone feels heard, especially during in a tense environment. To recall our conversation about accountability, if you have been keeping track of project expectations and if you have been defining each group members role throughout the process, even difficult conversations should not be coming as a surprise. Rely on the evidence you have to explain your reasoning. If it feels like the conversation could become hostile, ask a second staff member to attend the meeting to ensure that you have someone from the team there as help keep emotions controlled and calm.

MAINTAINING CONVERSATIONS

- Embrace small talk, especially online
- Ask a lot of questions about their thought process
- Go with the flow

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Now that the conversation is started, we get into maintaining conversations. In an online world, small talk is a lost art. Learn to embrace it, have small talk with your groups and learn to talk to them beyond just the conversation on the agenda. It will make them feel more human in the process.

Next, ask a lot of questions! If I were to put two dots on a paper, I could connect them with a straight line, a zigzag, a concave up curve or whatever other way you can imagine. Just like that, there are multiple ways to get to an answer, so try to understand their thought process.

Finally, just go with the flow. If you had something to say about a topic that has already passed, don't bring it up again, rather bring it up later through email. Keep the conversation flowing and get through the entire agenda.

MAINTAINING CONVERSATIONS

- If it is a difficult conversation
  - "This is strictly professional, but…"
  - Be consistent with your beliefs
  - Take time to understand the other side
  - Have evidence so you don't dampen the topic

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Now, let's suppose it's a difficult conversation. Just like we have techniques for starting difficult conversations, we have techniques to maintain them. First, start with "This is strictly professional, but…". Establishing the personal versus professional connection is crucial. You may be peers with the group members, but in this scenario you are the leader. Make sure you understand your role as the professional and don't take anything personally nor make it personal for them.

Next, be consistent with your beliefs. Nothing dilutes a conversation quicker than having someone question whether their opinion is correct or not. So you would be doing everyone a favour by sticking to your beliefs.

Next, take time to understand the other side. It is crucial that everyone feels heard in the process. No one should leave the conversation with discomfort knowing that they did not say what they needed to say.

Finally, just like being consistent with your beliefs, you should try to have evidence to ensure you point is not dampened. Dampening the point will only make it feel less important, which is definitely not the case if you are having this conversation, so bring some evidence to back up the point you want to make.

Get a partner, have a conversation that lasts at least three minutes. Key point: you may not know your partner well or at all, this is an activity to test your small talk skills.

For this modules activity, get a partner. Have a conversation that lasts a minimum of 3 minutes. The key point here is that you may not know your partner well, if at all. If you are not participating in this module as a group, try to initiate the conversation in the next scenario you find yourself in. How long can you keep it going?

Topic Introduction

A conversation is more than just a communication/socializing method that we use. Conversations are key in the exchange of thoughts and ideas through listening to each other. People learn by hearing each other's thoughts while observing facial and body expressions that show emotions

Thought Provoking Question

What makes a conversation inviting to you, and through your past experiences what caused certain conversations to become more memorable than others?

Thank you for completing the fourth module in the mentor training series. Take time to reflect on what has made you feel comfortable in conversations with new people. Consider also difficult conversations you may have had in the past. What could have made them a better experience?

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21. Mentor Training Modules 5: Verbal Feedback

Hey everyone, welcome to the final mentor training module. This time around, we will be discussing verbal feedback.

ACTIVE LISTENING

- Listen to understand, not reply
- Pay attention to body language and tone
- Reiterate the speaker's words
- Once you understand, respond honestly (be kind)

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To start, we will be discussing active listening. Giving verbal feedback consists of stages, one of which is listening and understanding the individual you are giving the feedback to. First off, listen to understand, not to reply. Your reply will be the feedback once you have finished, so have some patience and take your time to understand what the individual is saying before you go about providing feedback.

Next, paying attention to the body language and tone of the individuals. This also applies to online settings, whenever possible. They may feel uncomfortable, not as confident, or unsure when they are presenting their ideas so that is a good indication to put a bit more time into guiding them towards a good project.

Thirdly, to show the speaker that you understand them, try reiterating their words back to them. Not only will this show the speaker you understand, but it will solidify your understanding of their idea as well.

Finally, once you understand what they are presenting to you, respond with honesty. Being ambiguous or indirect can be confusing and might frustrate a team you are working with, so respond honestly. With that being said, be kind! There is always a kind way to communicate whatever needs to be said, so take a second and find the kinder way to proceed.

SHOWING EMPATHY

- Connects to human centered design and active listening
- Aids in conflict management
- Allows you to take positive action

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Showing empathy is extremely important when providing feedback. Having empathy will help you with conflict management. You'd be surprised how many conflicts can arise when you provide feedback. When you identify areas for growth within the project it might make participants feel defensive. Participants may turn on each other, saying "so and so was supposed to do this part but didn't do it." They might feel defeated, wondering if any part of their idea is worth keeping or they may fear they do not have time to come up with a new direction. Being empathetic will help you take positive action and help you provide further feedback or guidance beyond what may was initially needed.

SHOWING EMPATHY - EXAMPLES

- Listening to your students when they want to discuss an issue
- If they make a mistake, tell them it is okay
- Recognize their efforts and applaud them

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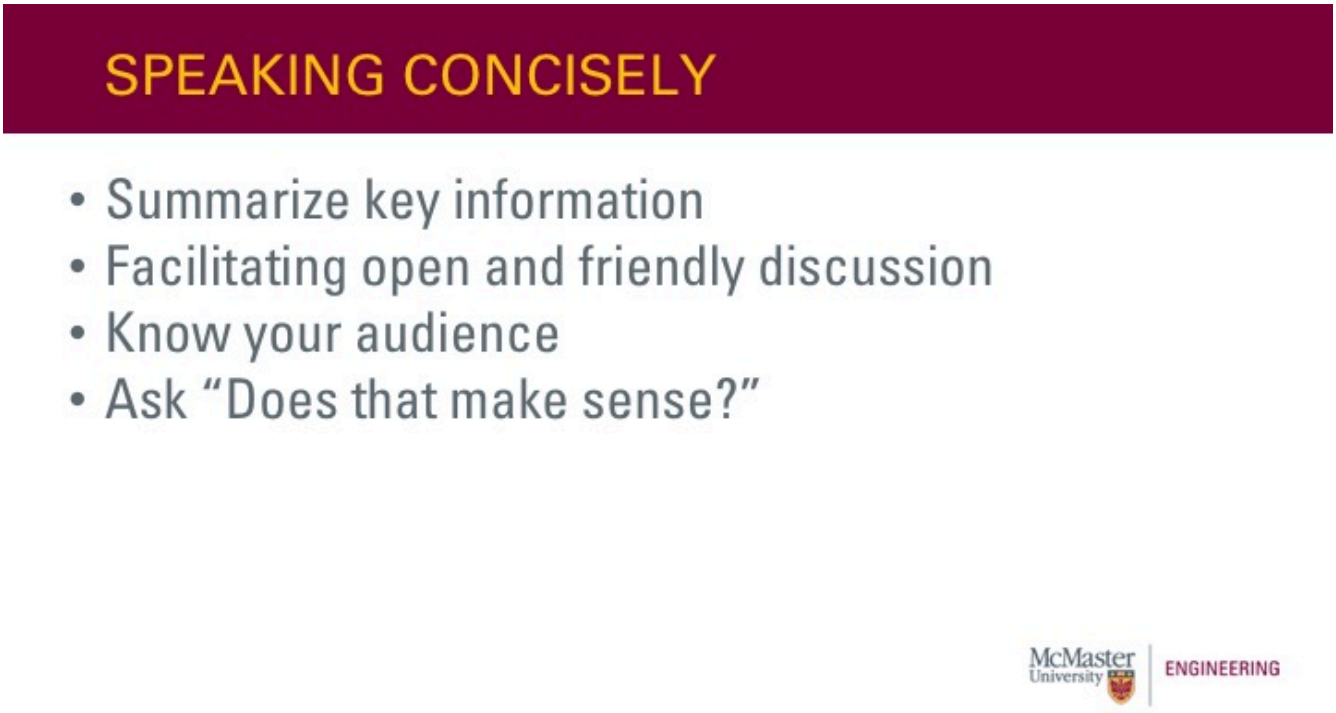
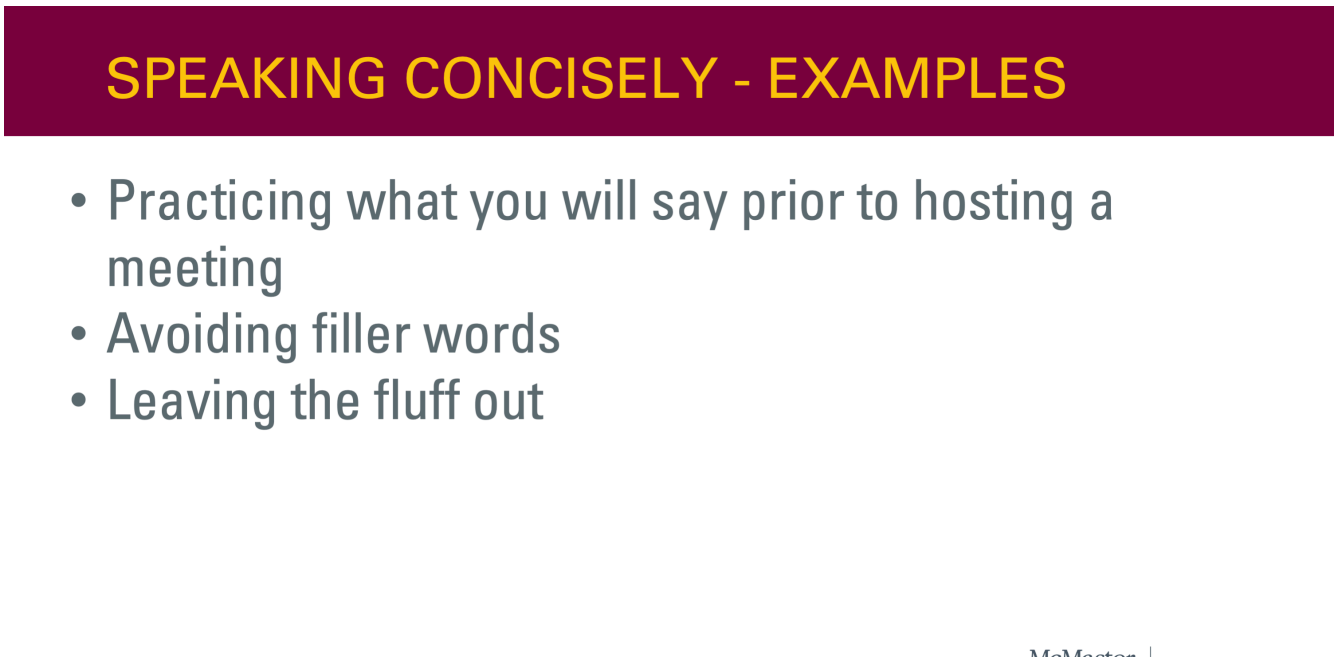
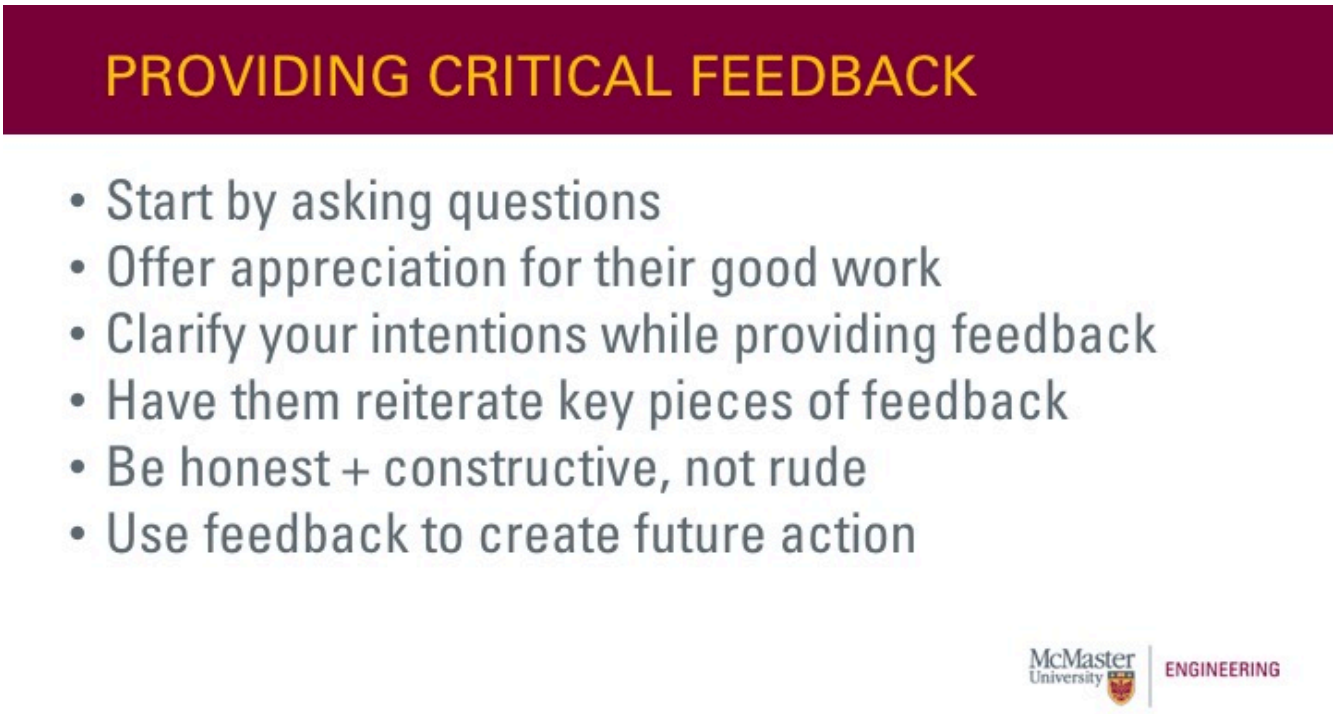
Some examples of showing empathy would be listening to your students when they want to discuss an issue. If they make a mistake, tell them that is okay. You want to encourage positive failure as it is a way to grow as a group and to learn from their mistakes. Like they say, failure is the best teacher! Next, recognize their efforts and applaud them. They are working hard between many obligations and their personal lives, so make sure you appreciate their effort. It may seem like these are obvious things to do, but when you are balancing multiple teams or dealing with your own stress, these little things can be easy to forget. Take a moment to find empathy in the moment, and it will make a difference to your teams.



Next is speaking concisely. Do you think the students would rather listen to two minutes of your concise feedback or 10 minutes of conversation with 2 minutes of feedback sprinkled in? Well, I am talking to a screen right now but I'm assuming you chose the first option. An easy way to do that is by knowing your audience. When you know your audience, you know if you can speak fast, or to speak slow. You know who responds well to jokes and stories and who prefers facts and statistics, or when to sprinkle in both. Knowing who you speak to will let you decide what speaking concisely looks like for them. Finally, ask "Does that make sense?" before moving on to a new topic. This will help you understand if everyone is on the same page and help you move forward with the project.



Some examples of speaking concisely would be practicing what you say prior to hosting a meeting, avoiding filler words, and leaving the fluff out. All of these are excellent practices to ensure you are successful in being concise when you speak, but they aren't everything. Feel free to further explore some techniques on your own to be the best communicator you can be.



Here we will discuss some methods to ensure you provide critical feedback to your groups.

Start by asking questions. Sometimes when you provide feedback to a groups submission, you can benefit from learning more about the topic. Give the group an opportunity to elaborate on where you have confusion. It is imperative that if a group explains there idea differently to you verbally than whatever you are evaluating, you explain to them what you had understood from their deliverable. Doing so will prepare your participants to make alterations to their explanations in the future and will help to identify their assumptions in what must be explained to their audience.

Another effective mechanism for offering feedback to groups is to appreciate what they are doing well. A lot of time mentors can fall into the habit of saying, “This is great, keep up the good work!” When you provide such little information, it is actually a disservice to the group you are mentoring. The participants need to know what specifically they are doing well. Are you impressed by their communication style? Do you admire their aesthetic? Do you believe their current project is well-scoped with feasible ideas? Do you think it is creative? It is important to both acknowledge good work and provide detailed information that a team can continue to build on.

Thirdly, clarify what outcomes you’d like to see when providing feedback. Sometimes participants need to understand the bigger picture of what you are trying to say. Rather than just explaining that you think their project lacks creativity, it might be helpful to say, “You might be competing against ten or twelve other ideas for solving this problem. If you want to grab the attention of the audience, you’ll want your idea to stand out. Your current solution is effective, but similar solutions exist. It might help to engage in another brainstorming session to think outside the box. You can even use your existing idea as a jumping off point.” This type of feedback gives the team an understanding for the broader implication of your feedback and even provides them with a potential next step.

Furthermore, ask teams to repeat what they understand your feedback to mean. This was referenced above as a mechanism to listen deeply. You will be able to evaluate if your expectations are clear to the group moving forward.

As always, ensure you being honest and constructive, without being rude. There are always kind and compassionate ways to go about offering feedback. Always choose the kindest option for offering feedback, even if you need to take a moment to collect your thoughts before offering your opinion.

The final piece of advice we’d like to offer you when providing constructive feedback is to offer a group direction moving forwards. During short-duration learning experiences, time is limited. Although it is great to let a team work through feedback on their own, losing momentum can be devastating to a team working until timely conditions. Try to offer the groups a few mechanisms to move forward when you provide them with constructive feedback to help maintain high energy and enthusiasm with the group. This is especially true if you feel that you are offering difficult news to the team.

SANDWICH FEEDBACK

Positive Statement
Corrective Feedback
Positive Statement

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One way to deliver constructive feedback is through the burger method. Like we discussed before, start with a compliment. Then provide critical feedback, and finally finish with a compliment. They worked hard to be where they are so ensure you recognize that and lift your teams up. Just make sure that the feedback and compliments you offer the team are honest. People can tell when your comments are disingenuous, which will diminish the desired outcome of offering feedback using the burger method.

START, STOP, CONTINUE

✓ Start

✗ Stop

» Continue

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Another option for delivering feedback is using the start, stop, and continue method. You want to describe what a group can start doing to improve their project outcome, what a group is doing well and should continue to do, and to stop doing anything that you feel is getting in the way of group productivity. Typically, we recommend that unless your suggestion needs to be salient, try to rephrase any "stop" items into start. For example, instead of telling a group to "stop" being disorganized, you could recommend telling a group to "start" improving their organizational skills. Sometimes if a group is participating in an action you consider inexcusable, telling them directly to stop is necessary. As such, it is up to your judgement to decide how to lay out information using the start, stop and continue method.

Topic Introduction

Verbal feedback is an effective way to provide learning opportunities because it is often given during, or very quickly following, the learning or task. It offers more opportunity for dialogue between you and your mentee, ensuring that they understand the feedback, enabling them to respond to it and to action the feedback straight away.

Thought Provoking Question

In your opinion why is feedback important? Reflect on a time where receiving certain verbal feedback was not a pleasant experience. Explain Why.

Thank you for completing the fifth and final module in the mentor training series. Take some time to reflect on your own experiences either receiving or giving feedback. What worked well? What went poorly? Drawing on your own life experiences will help you to bring empathy and consideration to the role when you are giving feedback to your teams in the future.

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