

Blossoms - Designing a Better World v5

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Hi. I'm Megha Hegde. I'm a research associate at MIT's D-Lab, where we are filming today. At D-Lab, we work with people from all over the world to develop and advance collaborative approaches and practical solutions to address global poverty challenges. And today we are filming in our workshop space where students and innovators come and make prototypes.

Right now I want you to think about water-- H₂O-- the essence of all life. How clean and safe is your water supply? While the developed world has plenty of clean water, the same is not true for the developing world. Did you know there are over 2 billion people that don't have access to clean water? That every year half a million children under the age five die due to drinking dirty water?

Two key issues associated with water are transportation and purification of drinking water. Here are three proposed solutions to address water-related problems in the developing world.

LifeStraw. A potable water filter that filters out bacteria and other disease-causing parasites from water as you suck on it. It costs about \$20. Rolling drum for water transportation, that costs about \$70. A donkey for water transportation and other work costs about \$25.

So right now I want you to find a partner and discuss these three solutions with them. Then rank order them in terms of their usefulness to someone living on less than \$2 a day in the developing world. We would like to hear your thoughts. Is one of them a real winner, another a dud? Tell us what you think. We will see you back here in two minutes.

Welcome back. So what did you think? It turns out that the donkey was the real winner. Let's see why. Users did not like the LifeStraw design. They had to bend over to drink water, and it was too slow, and kind of awkward to carry it on one's neck. The rolling Q drum was too expensive, and it did not perform well under [INAUDIBLE], and was also difficult to pull.

The donkey, on the other hand, did not have any such problems. Affordable and strong, donkeys could carry more water than the drum and could be used for other productive income-generating work. Recent invention? No. Humans have used donkeys for work for over 5,000 years.

So many technologies such as the LifeStraw and Q drums are created to help improve the lives of people living in poverty. But many times people who create these technologies don't fully understand the context where these technologies will be used. This means they don't understand the user needs and preferences, and end up creating something that's not very useful.

So how can we design more appropriate and useful technologies? Today we will talk about an approach of moving from problem to solution. It is called user-centered design. It's a process we use to understand the user, challenge our own assumptions, and redefine the problem in order to identify an alternative solution.

It's called user-centered design because the designers engage with the users at every step of the design process. Even some of the world's leading brands such as Apple, Google, Samsung, and GE have rapidly adopted this approach.

In this next activity, you will work with your partner to evaluate a few different technologies. Remember, you are the user. You live on less than \$2 a day, and you have limited access to amenities such as electricity, clean water, health care, quality education, and sanitation. Think creatively, and come up with as many critiques as possible. We will see you back here in a few minutes.

Welcome back. How did you do? I hope you enjoyed critiquing those technologies. Solar lanterns are very widely used among low-income households all over the developing world, whereas I'm yet to come across communities where solar box cookers are being used on a regular basis. I'm sure you and your partner figured out why this is the case.

So now let's talk about design. Design is a creative and often a messy process of moving from a problem to a solution. And it's always useful to have a common roadmap or a framework. Today we will discuss the user-centered design framework that D-Lab uses to design solutions along with the users.

It's a process that has four stages. Learn, imagine, create, and test. The user is in the center of this process. And as you can see, it's a cycle, which means it's constantly evolving and improving until you have a prototype or a solution that's most useful to the user.

Let's go through each stage one by one. The first stage is learn, where you, the designer, will learn as much as you can about your user, the problems they're facing, their needs, their aspirations, and their desires. The better you understand your users and their problems, the better solutions you will

create for them. There are many ways to do this, and one of the most common ways is interviews.

Let's practice the design process, focusing on the context that you are in and are familiar with-- that is, your school or your community. Within your school, some areas that we could focus on are redesigning the cafeteria, redesigning the library, redesigning seating arrangements in the classroom, or redesigning the lunch break, or anything that you want to work on. For your community, some examples could be creating or improving parks, improving road safety. Just use your imagination.

In this next activity, you will work with your groups to conduct user interviews. Half of you will be designated as the designers and the other half will be the users. The designers will interview the users to understand their needs, challenges, and aspirations. We will focus on a specific thematic area that your teacher will give you. Make sure to refer to the activity guide for some sample interview questions. We will see you back here in about six minutes. Good luck.

Welcome back. I hope your interviews went well. Did you find some interesting problems that you are excited to solve? Let's move on to the second stage of the design process. Imagine-- now that you know your users' problems, in this stage you will come up with a lot of different ideas to solve the problem. Be as creative as you can, and come up with as many crazy, diverse, and out-of-the-box ideas as you can. The focus here is quantity. We will worry about the quality later.

Now you will work in your groups to brainstorm solution ideas. Write down all your ideas on post-its and post them on the wall. You will have about five minutes to do this. Go wild.

Welcome back. How did the process of imagination go? I hope you now have a lot of new ideas. Are you ready for the next stage? The third stage of the design process is to create or prototype. This is where your ideas will come to life. From the whole set of new ideas that you have, you will select a few best ones to make prototypes.

For example, here is a prototype that was created in the D-Lab workshop. A prototype can be anything you and user can interact with and make changes to as you go. It can be a simple version of a physical product made from inexpensive materials like cardboard, or it could be a drawing of the product. It can be a role-play or it can simply be a process that's expressed in a flowchart. Whatever makes sense for your ideas.

Prototyping allows you to test and prove the feasibility of your ideas before investing resources to further develop them. And remember, you can make more than one prototype. Now you will create prototypes. You only have about 10 minutes to do this, which may not be enough to create something like this. So for the scope of this lesson, your prototypes can be a drawing, a flowchart, or a role-play. I would also encourage you to think of some other creative and easy ways to prototype. And don't forget to refer to the activity guide for some more useful tips. Have fun.

Hello again. How did the prototyping go? I hope you had fun bringing your ideas to life. OK. Now we are in the final stage of the design process, which is to test. Once you have your prototypes ready, you will take it back to you user and test it for their feedback.

The purpose of asking for and receiving feedback on your prototype is to make it better and more useful for the user. This is also another opportunity to learn more about your user. Based on the user feedback, you will refine your prototype and it will continue to improve.

There is a rule of thumb in this process. When you prototype, always prototype as if you know you're right. But when you test, always test it as if you know something is still wrong. When you test your prototype, you will always learn something new from the user, and you will again imagine, create, and test something new.

The design process is a cycle, which means you will go through this multiple times, and your solution will keep evolving into something better and more useful. In the next activity, you will test your prototype to get user feedback. You will work in the same teams as you did during the interviews.

In the future, if you choose to design outside of this classroom, you will work with the real users to get their feedback, and this practice will come in handy then. Refer to the activity guide for more tips. Have fun.

Welcome back. How did the user testing go? Was any feedback surprising? When I do this work, I get surprising, unexpected feedback from the users all the time. In this next activity, can you share your experience and thoughts on how you would use this design process in your school or in your day-to-day life? We'll see you soon.

Welcome back. In this last segment we have a special guest who will talk about how D-Lab is using this process to help create solutions all over the world.

Hi. I'm Sher Vogel. I'm the MIT D-Lab global trainings manager. I help people to utilize the user-centered design process to address some of their challenges. Through this design process we engage MIT students, community members, designers, and many others to co-create technologies and solutions all around the globe.

Here are just a few examples. Sustainable firewood alternatives to save trees made from agriculture waste in Guatemala; a moringa seed sheller that currently employs hundreds of farmers in Ghana; a mobile app for improving savings and financial education of millions of people in Brazil; an avocado oil press machine that adds value to an abundance of avocados growing in Tanzania; and an easy to use wheelchair that operates in all terrains, like this, in India. What else do you imagine we could create when we co-design together?

Let's all thank Sher. I hope you enjoyed learning about the user-centered design process. In that, you are now equipped with skills to critically analyze the problems that you come across. Whether or not you will become an engineer or an inventor or an entrepreneur, I hope that you will continue to use the skills and approaches we discussed today to creatively solve the problems around you, and around the world every day.

Hi. Thank you for your interest in this lesson. User-centered design approach is gaining a lot of popularity in the private sector, especially in the product-design space. Some leading brands like Apple, Google, and Samsung have adopted this approach. And some leading universities like Harvard, MIT, and Stanford also recently have been teaching students the design-thinking and user-centered design. It's not just a framework for product design, it's also an approach to problem-solving-- a very important skill to have.

This lesson may or may not inspire the students to become engineers or product designers, but it will certainly equip them with skills to solve problems around them and come up with creative and usable user-centric solutions.

Before the lesson, please bring the activity guides for yourself and for the students, and give one guide to each pair. It will help navigate the activities and help you facilitate them better. Activities 1 and 2 will happen in pairs, and activities 3 to 6 will happen in a group of four. So you can just-- for activities 3 to 6 you can combine two pairs and make it a group of four.

For activity 3, which is user interviews-- to keep the scope narrow and achieve user interviews within the short time that we have, the design

process will focus on themes around the school. Within school, you, as a teacher-- since you know better-- will select from a menu of thematic areas and give one focus area to each group. And the interviews will focus on identifying and solving specific challenges within those focus areas. Some examples of focus areas include redesigning the cafeteria, redesigning the library, redesigning the seating arrangements in the class, redesigning the lunch break. It could be whatever you think is appropriate.

Interviewers will interview the users to understand their needs, challenges, and aspirations within the focus area that you have given them. For activities 3 and 6, in each pair one student will be designated as the interviewer or the designer, and the other student will be the user or the interviewee. And then have each such paired matched up with other pair, equaling the group of four students. Two of them will be the designers or the interviewers, and two of them will be the users or the interviewees.

For activities 4 and 5, the same group of four students will work together, but all as designers. For activity 5, which is prototyping, it will be good to provide students some basic stationery such as cardboard boxes, markers, scissors, maybe some tapes. It will be good to have them ready before the lesson. There will not be enough time to make a whole physical prototype, but if students want to quickly put something together, it will be good if they have access to these materials.

During the activities, please encourage participation from every student. Some students might be more dominating, whereas others might be more shy. If you see some students dominating conversations and activities more than others, please make sure to intervene and balance the participation. One hour is not enough time to complete the design process, you know? So they won't have enough time to complete activities, especially 3 to 6, and at times it might be frustrating for the students. Hence, it's very important that you frequently remind them that the goal of this lesson is just to give them a taste of the design process. And if they are really interested, they can complete these activities later or they can always do a full-on project in the real world.

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