11.155X: DESIGN THINKING FOR LEADING AND LEARNING

REVIEW | 2017

TEACHING SYSTEMS LAB

Design thinking is an approach to problem solving when we don't fully understand what the problem is and we can't anticipate what solutions might look like in advance.

— Justin Reich

On the following pages, we provide an overview of the first run of the course 11.155x: Design Thinking for Leading and Learning (March 21 - May 3, 2017). We consider the impact of the course content and share insights into the learner experience.

TABLE OF CONTENTS

Executive Summary	04
Course Objectives	06
Course Units	06
Course Elements	07
By the Numbers	08
Designing for Impact	09
Measuring Impact	11
Student Work	13
Design Thinking and Technology	16
Going Forward	17
Acknowledgements	18

EXECUTIVE SUMMARY

Created by Justin Reich and a team of instructional designers from the MIT Teaching Systems Lab, Design Thinking for Leading and Learning asks school leaders at all levels—teacher-leaders, principals, superintendents, and public officials—the following key questions:

- Future jobs will require creativity, problem-solving and communication. How do we use design thinking to teach these skills to PK-12 students in meaningful ways?
- How do we bring together passionate school leaders to use design thinking to create systemic solutions to educational challenges?

Organized into three units (one instructor-paced and two self-paced), this course combines the vocabulary and concepts of design thinking with real-world design and educational examples. A core goal of the course is to empower teachers to use design thinking with students and leaders to use design thinking in their communities by showing that design thinking is anchored in the real work of innovators at MIT. We challenge our learners to apply the concepts in their own setting, first in a small, low-stakes design challenge, then in their own educational context. Through presentations by Justin Reich and subject matter expert Blake Sims, case studies from three schools at varying stages of incorporating design thinking in the classroom, and online peer interaction and support, our learners begin to see how a school can be transformed through the skills and mindsets of design thinking: empathy, bias to action, trying things out, getting feedback, and a commitment to iterative improvement.

We developed Design Thinking for Leading and Learning to enable and encourage learners to go out and try design thinking in their educational context, whether that be to use design thinking in their classrooms or to use it as a tool for making change. As a course team, we believe that the impact that mattered most was empowering participants with design thinking skills, mindsets and practices that will allow them to make positive changes in schools. To accomplish this goal, we applied the following design strategies:

- The design process used in this course was developed to reflect the way designers at MIT actually work.
- The first assignment was a low-stakes design exercise so that learners could gain familiarity with and ownership of the process before tackling more complex challenges in their contexts. Both the Unit 2 and Unit 3 assignments encouraged learners to immediately apply design thinking concepts into their practice.

EXECUTIVE SUMMARY

- The last two units of the course were released simultaneously so that learners could self-pace. Learners engaged with content in the way that was most relevant for them and in the way that provided them with enough time to try design thinking in their learning communities. To help learners plan their path through the course, we created course capsule videos that provide a content overview for each unit.
- We included case studies of schools at various levels of incorporating design thinking, from a school at the earliest stages to a school built around design. These case study videos were interspersed with the assignment steps to inspire learners as they got to work.

We measure the impact of this particular kind of learning by our participants' enthusiasm as they reflect on the work they've done in the course and how they have grown as a designer and an educator. Our evidence comes from discussion forums, survey data, and student work. The core ideas of the course are reflected throughout students' observations about their learning in assignments and discussions.

I used to think that I needed to find the solutions of everything myself. Now I think that I need to get input from the users so that I can seek solutions that will work for the users. Feedback and empathy will help to come to a better solution. The design thinking process allows for error and reflection so that the end result is beneficial to all and works!

I used to think the design thinking process could only be used in Design based areas such as Product design—Interior design—Architecture etc. but now I am happy to have figured out how to solve all real life problems with this procedure!

COURSE OBJECTIVES

LEARNERS WILL:

- Gain familiarity with the design thinking process and vocabulary
- Understand why design thinking is useful for both teachers and students to learn and use
- Understand how leaders can use design thinking to tackle sticky educational problems in complex systems
- Adopt a designer mindset and apply design thinking to a problem in their own educational context
- Consider how the thoughtful use of technology can support learning

COURSE UNITS

Each unit of the course was structured around the steps of the design process. Learners watched videos interspersed between the steps of each unit's assignment.

01

MEET DESIGN THINKING

Designers at MIT introduce learners to the concepts and vocabulary of design thinking. Each designer provides advice to help learners with a specific stage of the design process for their assignment.

02

DESIGN THINKING FOR STUDENTS

Learners see how design thinking can be applied in a classroom context by hearing from schools at various stages of presenting design thinking to students. While Benjamin Banneker Charter Public School is just starting to share design activities with students, the Meadowbrook School has incorporated design thinking into entire content units, and NuVu Studio's entire curriculum is framed around two-week design projects.

03

DESIGN THINKING FOR SCHOOLS

How can design thinking be applied to large systemic educational challenges? Learners hear from designers who work with a large urban school district. School leaders from NuVu, Benjamin Banneker Charter Public School, and Meadowbrook talk about how they view design thinking in their schools and beyond the classroom.

COURSE ELEMENTS

INSTRUCTOR VIDEOS: Instructor Justin Reich, as well as subject matter expert Blake Sims, provide conceptual framing through presentations and conversations.

DESIGNER VIDEOS: Designers from MIT and around the country contribute their design expertise and perspectives to introduce participants to the basic vocabulary and concepts of design thinking. Each designer also provides advice to guide learners on particular design stages in the assignment.

SCHOOL VIDEOS: To give learners a glimpse into the range of school experimentation around design thinking, we feature voices from three inspirational schools at various levels of implementing design thinking in their curriculum and leadership practices. Watching these videos, participants can see both the challenges and rewards of using design thinking in an educational environment.

ASSIGNMENTS: Each unit contains a seven-step assignment that takes learners through one complete cycle of the design process. The assignment steps are interspersed with supporting videos from designers and schools.

FORUMS: Design thinking is best learned by doing, iterating, and collaborating with others. The community forums are essential as participants give and receive feedback on work and explore course concepts through conversations with their classmates.

WEEKLY UPDATES: Our forums contain so many excellent posts that we have found it is helpful to have an instructor curate. Every week, Justin Reich features student work and thoughtful learner interactions so that students can feel connected, especially throughout the four weeks of self-paced content.

LIVE VIRTUAL EVENTS: Participants from a variety of countries and time zones tuned into the three live streaming events that we hosted throughout the course. These live events allowed participants to interact in real-time and ask questions of course staff.

BY THE NUMBERS

INITIAL COURSE RUN: 6 WEEKS (MARCH 21 -MAY 3, 2017)

156

TOTAL COUNTRIES

Learners enrolled from around the world. Top countries were US, India, and Brazil.

12,005

LEARNERS ENROLLED

* AS OF MAY 18, 2017

1,419

ACTIVE FORUM MEMBERS

2,079

TOTAL FORUM TOPICS

49.6%

LEARNERS WITH
ADVANCED DEGREES

34

MEDIAN AGE OF LEARNERS

DESIGNING FOR IMPACT

The crucial marker of success in our courses is that participants are able to take their learning out of the online course and apply new ideas in their own learning communities. This engagement could look like an elementary school teacher introducing prototyping in his second grade classroom, or it might look like a high school principal using Discover stage techniques to find out what key problems her school will focus on in the coming year. We designed our course to encourage this real-world engagement using the strategies of self-pacing, inspiring case studies and multi-step assignments interspersed with video.

DESIGN PROCESS

The design process we developed for the course reflects the work of the Teaching Systems Lab and the engineering-related processes used by professors and others also at MIT. The language **Discover**, **Focus**, **Imagine**, **Prototype**, **Try**, and **Reflect & Share** was chosen to be accessible and understandable by course participants and the colleagues and students they might share the course with. One example is our decision to use the term “try” instead of “test.” While “test” is a common word in the field of design, it has decidedly different (and unfortunately more negative) connotations among students.

Course Flow and Self-Pacing: Our course welcomed school leaders of all kinds, including teacher leaders, department heads, coaches, librarians, principals, superintendents, and others. We designed the course so that each learner could engage with the material in the way that makes the most sense for their time and context. All participants spent the first two weeks of the course working on the assignment in Unit 1. After the first two weeks, participants were invited to engage with Units 2 and 3 at their own pace. To help learners approach the course, we identified specific pathways and made recommendations about which might be most appropriate and relevant:

Pathway 1: Participants who wanted an equal balance of design thinking for learning and design thinking for leading could spend two weeks on Unit 2 and then the next two weeks on Unit 3. They could then put an equal amount of effort into both assignments.

Pathway 2: Participants who were eager to learn more about sharing design thinking with students, could focus on Unit 2, both the video content and the assignment, but still spend some time exploring Unit 3. This pathway could be especially relevant for classroom teachers.

Pathway 3: Participants who felt most excited about using design thinking for systemic change, could peruse Unit 2 and engage with parts of the assignment, but spend most of the time on the content and assignment in Unit 3. This pathway could be particularly exciting for teacher leaders and administrators who already have some familiarity with design thinking practices.

Assignments: Each assignment was designed so that learners could experience the various stages of the design cycle. We wanted learners to gain skills and confidence, and take on the designer mindset. After a practice project in Unit 1, participants began to make change within their school organization with the assignments in Unit 2 and Unit 3.

Designer Videos: We realize that educators may have questions about this way of thinking, of its value for both adults and students, and we thought that hearing from these designers would be both effective and useful for conveying both authenticity and the benefits of considering this approach.

Case Studies: It was important for us to help learners see what experimentation around design thinking looks like in schools. We interviewed educators, administrators, and students from three schools, each at a different stage of implementing design thinking, to help participants envision the possibilities.

MEASURING IMPACT

We know this course was captivating and timely for many; around 12,000 registrants joined us from over 150 countries. However, measuring impact is still complicated when considering diversity of participant goals. From edX analytics and hearing from the learners who participated in the surveys, we know that learners were engaged with the content and eager to share what they learned:

95% of survey respondents described the quality of instruction as good to excellent

97% agree "I will use material and/or ideas from this course in my future teaching efforts"

93% agree "perspective gained in this course will adjust how I teach future courses"

Responding to our survey, learners confirmed that they enjoyed the flexibility and independence of the course's innovative hybrid approach to self-pacing:

“ I liked it because it allowed us to work at our own pace, with our team, and truly personalize our learning.”

“ Self pacing actually help me to learn more about leading which was my preferred option.”

“ I was less stressed because I could fit it into my own schedule—I didn’t have to worry about falling behind everyone else.”

Core to the design process is an emphasis on reflection. In the final step of each assignment, participants shared observations about their own learning.

I used another real-world project in my school as the subject of some activities in the recent MITx course Launching Innovation In Schools. I find that using real, actionable projects with real people to be an optimal way to engage with the content of these online courses, despite the fact that work time constraints have limited my participation in the online course discussion forums. ... The timing of these courses being offered has made a powerful impact on my ability to demonstrate leadership in my role at work; and —even more importantly—has improved the richness and quality of my contributions to the mission of the school. This was unexpected, and very much appreciated!”

Once again, I think the design process is a really great tool to address challenges to ill-structured, complex problems. While for this particular solution, we are just beginning, I am still hopeful that we will achieve amazing results. Plus, the beauty of design thinking is that is the first solution doesn't work, we can try again until we find something that does work.

We know that not all registrants intend to complete the MOOCs they register for. People register for a myriad of reasons: to explore content produced by a certain school or institution, to get a cursory overview of topics, and sometimes to get an idea of how a certain subject could be presented online.

In this course, as in others, we had some learners who joined us only briefly and others who stayed to complete assignment work and interact with their classmates. 302 participants passed the course (completed more than 60% of the work), and 169 of those participants received certificates. When the course launched, we were upfront about the content in all units and assignments. Some participants used this information to customize their experience. For example, we had participants that already had familiarity with design thinking basics and they decided to only engage with Unit 2 and Unit 3.

The course forums provide many examples of how design thinking has influenced participants' practice. We have seen sample lesson plans for implementing design thinking in the classroom and even examples of student work. These artifacts have helped us gain more insight into impact.

UNIT 1 ASSIGNMENT

BE A DESIGNER

User Problem: User worries when he wakes in the morning. Instead of lying in bed when tired, he gets up and distracts himself with technology.

Interview Questions:

Q: Tell me what you are thinking about when you're awake? Can you describe how you feel?

A: "Tired and scared of the day in school." (He began fidgeting at this stage.)

Key Takeaways:

- He gets up to distract himself from negative thoughts.
- He places a high value on "doing stuff he wants," meaning watching YouTube and using Tech.

PROTOTYPE

"I was hoping that he would rotate the window to find an emotion to describe his feelings and then rotate the next circle to think of an action to deal with

the emotion. Because he currently chooses to get out of bed and watch YouTube to distract himself from worries I hoped that choosing a more appropriate action and also importantly an appropriate time to do it on the wheel will reassure him that the worry can be dealt with later and he will be less tired and moody during the day."

IMAGINE

TRY

REFLECT & SHARE

"I was happy with how the user engaged with the solution. I really think the more cycles of iteration, trys, and reflections the more the solution will become useful."

UNIT 2 ASSIGNMENT

DESIGN WITH STUDENTS

User Problem: How might I teach Explain Everything [an app] to 6th grade students by using the Imagine and Prototype stage of design thinking in an engaging way?

Interview Questions:

Q: What limitations do you have when learning a new complicated app?

A: Time, troubleshooting if technology doesn't work. Some students' prior experience may vary and lessons are too hard or easy.

Key Takeaways:

- Students like to jump right into exploring an app with support but without a lot of directions.
- Not all users are coming with the same experience.

Prototype Overview:

Students will be working in partners to imagine and quickly prototype the other student's dream vehicle (land or space). This is designed to be done as quick sketches/ recordings. It is more about the process and the app than the success of their drawings.

At first Unit Two was very hard for me to initiate. ... I felt that I understood the process from Unit One but was struggling to see how this would work in my classroom. Once I finally dove in, I really enjoyed it, students were very engaged, and it was fun. It surprised me that the students easily took to the plan, they did not hesitate. ”

UNIT 3 ASSIGNMENT

DESIGN FOR CHANGE

User Problem: How might we help teachers to implement changes in the management and practical use of devices in the classroom so that meaningful learning takes place in given time frames?

Interview Questions:

Q: Why do you not use tablet technology in your classroom?

A1: Getting them out takes time, the ways they are stored does not work for me. I teach from concrete to abstract and the [tablet] don't really work for this. There are not enough devices for all to use at once so they don't work at stage 1 or introductory learning

A2: The time it takes to set up and pack away; issues with tablets that need support input; not enough tablets to do individual work; challenges with charging for use the whole day / Issues with connectivity i.e. Wi-Fi; issues with knowing what apps / programs to choose for a specific activity.

Key Takeaways:

The teachers are keen to use the technology but have several problems in the implementation. The teachers are frustrated by the devices and new ways to use and administrate the devices needs to be found.

"My colleague was very excited about the prospect. She thought that going into the classroom and helping/ guiding the teacher to use the technology was a good way to encourage the use of devices and to make the teachers grow in confidence so that they can ultimately work on their own."

"The design process certainly gives me a tool to use when approaching problems that I encounter both inside and outside the classroom. The empathetic approach is new to me and I think will help me to find more creative solutions... and also will get much more buy-in as the users feel that their needs are taken into account and they are part of the solution. I am happy with my solution now and look forward to the next step"

Action Steps:

1: Discuss proposed plan with the head and get approval

2: Teachers who show a desire to learn more about the program are interviewed, and three are chosen to participate in a pilot.

3: The teachers all submit ten plans to ICT teacher with weekly sub-plans. ICT looks for possible ways to implement technology into the planned lessons.

4: ICT teacher and class teachers discuss the solutions and choose the most appropriate to use in the pilot...

Steps Continue

DESIGN THINKING AND TECHNOLOGY

Design thinking is a powerful tool for helping educators leverage technology with students in more effective ways. Here we show examples of participants applying the design process to challenges around technology from assignments from Units 2 and 3.

I am a Technology Integration Specialist at the 6th grade level and am in charge of training students and staff on new tools/apps. ... In applying the design thinking stages imagine and prototype to learning an app, the training was engaging and fun for the students. I saw students who were highly engaged and interacting with their partners in an inquiring empathetic way.

This participant represented her Unit 3 action plan prototype in the form of a flow diagram.

CHALLENGE & USER NEED

Our current integration of computing skills and digital citizenship into the K-12 curriculum is incomplete, loosely structured, undocumented and not vertically aligned beyond grade 6.

Students need a comprehensive program if they are to graduate as responsible, confident and safe digital citizens. Teachers need to know what skills and understandings students have acquired in previous or concurrent classes in order to design lessons that incorporate technology in effective and appropriate ways.

I am happy with my solution now and look forward to the next step. The issue of not using devices for meaningful learning in the classroom has been a concern of mine for a while as I feel our learners deserve the best methods for the job. I am also aware that the tool must fit the job but I am convinced that the learners will show more interest in learning if we make it more fun to learn. I am certain that this is the start of change in my school. I also look forward to sharing the design process with my fellow teachers as I know that they will come on board.

GOING FORWARD

Design Thinking for Leading and Learning built upon the success of Launching Innovation in Schools. In both courses, we engaged over 20,000 registrants from nearly every country around the world. Participants who dropped in for a few videos or spent dozens of hours working through assignments told us that the learning experiences were powerful and had a direct impact on their practice. We are excited to continue to explore how these courses can support the communities of Microsoft educators around the world. We hope to be able to develop more courses that help school leaders, broadly defined, engage in the transformative work required to ready schools to serve future generations.

REFLECTIONS AND RECOMMENDATIONS FOR FUTURE RUNS

- **Diversifying Voices:** We know that outstanding work is happening in design thinking around the world. Our course would be strengthened if participants were able to hear a wider diversity of perspectives of designers and educators than those we were able to feature in the first run of this course.
- **Diving Deeper into Certain Phases:** The process of launching change in schools is difficult and requires a sensitivity to stakeholders' needs and deep understanding of the problem at hand. For the next run of the course, we would like to have the Unit 3 assignment focus mainly on the problem-finding parts of the design process.
- **Supporting Self-Pacing:** Many learners valued the flexibility of self-pacing; however, a few learners expressed a desire for more structure. Providing more explicit suggestions for pathways through the course will support time management and allow learners to remain more connected with each other, even as they engage in different paths. We also want to support participants by increasing interaction between participants and the course staff.
- **Connecting to Blended Experiences:** We're interested in finding partners who are teaching design thinking in person. Our online course could extend on-site learning experiences by providing opportunities for practicing design skills and examples of design thinking implementation.

ACKNOWLEDGEMENTS

TEACHING SYSTEMS LAB

This course could not have happened without the collaborative efforts of staff across MIT, edX, and our freelancers.

We would like to thank the following people who contributed to the creation, development, delivery and marketing of this course.

Course Instructor:

Justin Reich

Engineer for Forums:

Kevin Robinson

Subject Matter Expert:

Blake Sims

Video Producers:**FreshCognate**

Aimee Corrigan

Doug Pietrzak

Denez McAdoo

Daymian Mejia

Course Staff:

Elizabeth Huttner-Loan

Alyssa Napier

Garrett Beazley

Rachel Grubb

Key Team Members at MITx:

Brad Kay.Goodman

Colleen Cressman

Shelly Upton

Community**Teacher Assistants:**

Vladena Baetge Jahn

Brandon Zoras

The Design Thinking for Leading & Learning review was written, edited, and produced by the Design Thinking for Leading and Learning course team: Huttner-Loan, E., Napier, A., Beazley, G., Grubb, R., Reich, J.

This review's content is made available under a Creative Commons CC-BY 4.0 license. Please share widely.

Graphics, images, and template are copyright. No part may be reproduced without written permission.