

Making It Real in Assistive Technology

Prototype Stage 1

Low-fidelity

Non-functional

Multiple designs for cutout of glove

Tested for comfort, ease of use, Beverly-Ann's personal preference



Students in 6.811 Principles and Practice of Assistive Technology develop their projects in close collaboration with individual clients, learning about their needs and preferences. (Slide courtesy of MIT students. Used with permission.)

In conventional thinking, the “real world” is a different space from the undergraduate experience. In fact, one of the great challenges of education remains how to make theoretical, “book” learning relevant to the practical problems people face every day.

[6.811 Principles and Practice of Assistive Technology](#) breaks through this boundary, “to tap into the interest of undergraduate students to work on service learning projects or to apply their design and engineering skills to something meaningful,” in the words of co-instructor William Li.

The syllabus for 6.811 sums it up nicely: “an interdisciplinary, project-based course, centered

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around a design project in which small teams of students work closely with a person with a disability in the Cambridge area to design a device, piece of equipment, app, or other solution that helps them live more independently.”

User-centered, Iterative Design

The focus is on user-centered design. The students must get to know their clients well, understand their problems and concerns, and make productive use of their feedback on iterations of prototypes. The challenges are varied, substantial, and pressingly real. For instance:

- An attachment to enable the user of forearm crutches to carry a coffee mug without spilling
- A glove to alert a user when her grip is slipping
- A framework to enable a sightless person to sign legal documents in ink
- An app to enable a person in a wheelchair to navigate a college campus reliably and efficiently
- A call-button app that allows users to request urgent or non-urgent assistance from their iPad

The solutions must be functional, inexpensive, and lasting. Not easy!

Students on the Student Experience

The OCW course site captures the student experience in [videos of student presentations](#) at mid-term and semester’s end. The mid-term presentations included video portraits of the clients, a review of the various ideas that had been brainstormed, and metrics for success. Final presentations reported on the latest iteration of the solutions. All presentations were given before a review panel of experts on engineering and assistive technology, who provided key feedback.

A number of students shared their thoughts about the



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course in [video interviews](#) conducted at the final class session. Their remarks can be inspiring: “If there’s one thing that PPAT has taught me, it’s that a disability isn’t a good enough reason to stop doing anything.”

The rewards of the course can be inspiring as well. Beth Hadley, one of the students on Team Margaret, which developed the call-button app in Fall 2014, [continued to collaborate with her client](#) after the semester ended. The refined app, called InstaAid, is now “the preferred communication for residents to reach assistance in any location” at [The Boston Home](#), according to its CEO Marva Serotkin. The app can be downloaded for free on iTunes and uses open-source code. [The Boston Globe reported](#) that the app “won a major award from AT&T and New York University’s Connect Ability Challenge, a celebration of the 25th anniversary of the Americans with Disabilities Act.”

Instructor Insights

The lead instructors of 6.811, [William Li](#) and [Grace Teo](#), reflect on their own experience and how they taught the course in [video interviews](#) on the course site’s [This Course at MIT page](#). They had their own practical challenges, such as how to identify clients willing to work productively with student teams, how to help students face failure as part of the iterative design process, how to assess students in a project-based course, and more.

As Grace says, teaching the course isn’t “so much about knowledge of subject material, or knowledge of a specific skill, but just the ability to facilitate learning, which a lot of times just comes down to knowing how to ask the right questions of what is needed at this moment to help my student learn and succeed, and being able to answer their questions.”

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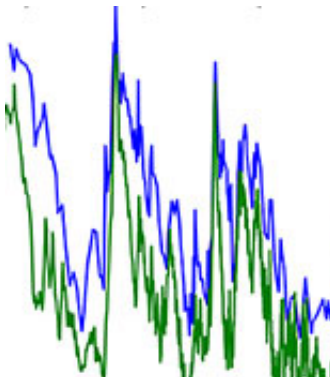
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OCW Educator



Min-Min Liang, the instructor of 21G.107 Chinese I (Streamlined), shares her teaching insights in a new collection of [OCW video interviews](#).

A Welcoming Environment for Streamlined Chinese

What is streamlined Chinese?

MIT offers two different course sequences for students interested in learning Mandarin Chinese. Many of these courses are represented on OCW and can be found on the Global Studies and Languages

course list.

One sequence, designated “regular,” is designed for students who have no background at all in Chinese. Another sequence, designated “streamlined,” is meant for students with some background, typically “heritage” learners who have spoken Chinese at home or taken some classes growing up. These students can usually speak some Chinese, but they can’t read or write it.

Not surprisingly, heritage learners have very different needs from pure beginners. OCW has just published *21G.107 Chinese I (Streamlined)*, the first in the streamlined sequence, that discusses strategies for effective teaching of heritage students. 21G.107 is taught entirely in Chinese, and the skill level of its students can vary a great deal, so the challenges are considerable.

How can the challenges be met?

On the course site’s This Course at MIT page, the instructor, Min-Min Liang, explains her approach to teaching streamlined Chinese in video interviews that have side-by-side English and Chinese versions. This dual-language presentation is a publishing first for OCW.

After teaching the traditional method of drilling for many years, Liang realized that her students could repeat what they had learned by drilling but were incapable of holding a real conversation. Liang realized she needed a new approach.

How do you create a welcoming environment?

Now her primary goal is to create “a welcoming

environment” so students can overcome their inhibitions about revealing their imperfect Chinese in front of others. Every class begins with five or ten minutes of “greeting,” as Liang calls it. Students randomly choose names of conversation partners and talk about what’s happening in their own lives. This allows the students to get to know each other, thus building a community in which they feel comfortable talking about a variety of subjects.

Meanwhile, the students are learning to read and write Chinese. Once students have developed some basic literacy skills, they are tasked with writing short essays at home. These essays then become the topics for further discussion in class. Liang praises students for venturing beyond their comfort zones, using new vocabulary and trying new things.

Where did the Language Lab go?

Technology is a big help. Liang employs an online tool called Lingt, developed by two MIT students. The tool is a kind of virtual language lab. Most students can understand simple written Chinese, but they can’t pronounce it. So using Lingt outside of class, they record themselves reading assigned passages. Liang then checks their pronunciations online, and this frees up class time to do more fun things, like talk about the weather.

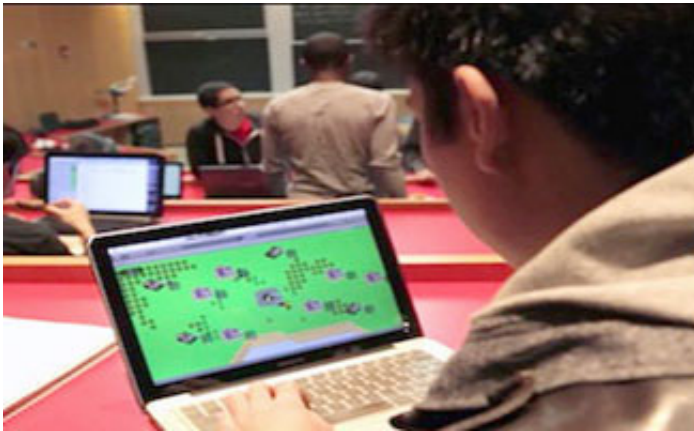
What else can you do on the site?

The 21G.107 course site has a wealth of resources for students and teachers, including assignments and in-class activities for each of the course’s five modules. There is also an abundance of study materials, such as study notes for pinyin and characters, Chinese character exercises, writing

assignments, and charts of required characters for each lesson, plus a variety of links to online tools and resources that help with writing and pronunciation.

21G.107 offers many ways to learn more about Chinese and how to teach it. Like the other courses on OCW, this site is available for free, 24-7, all year round. Pay a visit. You will be most welcome!

Highlights for High School



A student playtesting a game.

Can you spend hours playing [Halo](#) or [Assassin's Creed](#) on your gaming system? Or maybe you prefer [Bejeweled](#) or [Tetris](#) on your mobile phone?

Maybe you don't know this, but you can learn to actually *make* your own videos games! The field of gaming and game design is huge, and [Highlights for High School](#) has many courses you should definitely check out.

In particular, I think you will find the course *Creating Video Games*, particularly interesting. It has full [video lectures](#)!

In this course, MIT students met with the Red Cross, who wanted the students to create a game focused on emergency preparedness. The games students created were:

- [Hello Waves](#) is about how to fund disaster preparedness.
- [Cholera Control](#) puts the gamer in the middle of cholera outbreak that needs to be managed.
- [Saving Gora Gora](#) informs players about the causes, symptoms, and prevention techniques of cholera.
- [Heat Wave](#) links early warning with early action in the event of an impending heat wave.
- [Snap!](#) focuses on word association as a tool for brainstorming.

Educators, there is something in this course for you too! *Creating Video Games* has a very in depth [“This Course at MIT”](#) section that presents a behind-the-scenes look at how the instructors developed this impressive course.

MITx News



MITx courses to help bring out the spirit of innovation in all of us in 2016

It's a new year and its time to finally think about what to do with that great idea you've had sitting on the shelf for a while now. Lucky for you, MITx has a variety of free MOOCs available this month that can not only teach you how to develop those ideas, but provide you with a community of like-minded learners who can provide feedback and share insights.

Are you a teacher with a great idea for how to integrate technology into your classroom? Or are you thinking about how to turn a concept into a educational product? Register for [Design and Development of Educational Technology](#), starting January 27th to learn directly from experts in the industry and create a pitch for your idea.

Are you eager to produce the next big thing in the billion-dollar mobile application industry? [Mobile Application Experiences](#), a 5-part series starting February 1st, will walk you through the steps of defining, designing, building, and testing a mobile app for both Android and iOS.

Or, are you a young person wondering how you could start your own business? [MIT LaunchX: Becoming an Entrepreneur](#), starting January 25th, is designed just for high school students and based on MIT's successful summer program. It will introduce you to the business skills and startup mindset needed to embark on the entrepreneurial path. While intended for high schoolers, learners of any age are welcome to join.

Check out these and our wide variety of MOOCs at <https://www.edx.org/school/mitx>.

Views From Our Supporters



"For literally my whole life I was mechanically inclined before my first Lego set. I remember drawing planes and trucks. Around age 7, I asked my uncle to explain to me how Radio works. He as he always did and went into the details, about sound, frequency, oscillation and it's only now that it amazes me but I understood everything he said.

I never made the connection till years later when I realized that I was also electrically inclined. As long as I can see it working, I can fix it. If I can touch it, I will start to know how it's wired. At times after touching it, it works (not a good feeling to have growing up) when it was faulty and needed repair.

There are many things I would love to work with and pull apart to understand. I don't have the financial resources, MIT courses shed light where I cannot touch and tinker. I still need to read some beginners books to get what is missing in my knowledge but MIT information is awesome and I want to "eat" as much of it as I can.

This is why I donate what I can today hoping maybe it will keep that info available a little longer."

- Luther, Independent Learner, USA

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