The Silicon Classroom:
Education, Technology and Equity in the Digital World

Winter Quarter Directed Reading Class
Satisfactory/No Credit, 1 unit
Tuesdays 4.30 - 6.20pm, Lathrop 292
Register on Axess for EDUC 180S (section 6, course ID: 27963)

Instructors

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Please don’t hesitate to call, text, or email us with any question or concerns.

Faculty Advisor

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Director, LDT MA Program

Course Description

Innovators in the intersection of education and technology promise radical improvements in the way we teach and learn, and their products are surfacing in schools around the nation. At the same time, voices of concern abound. On one hand, how might education technology (even when “free”) accentuate socioeconomic, cultural and even gender divides; on the other, how can education technology bridge them?

We will discuss emerging trends from an interdisciplinary perspective, and examine the history of educational technology and digital divides. What, too, are some other broader systematic forces in play, that limit effective technology adoption in the classroom and school system? What should determine whether a new technology is introduced into the classroom and what provisions are necessary? If designed and implemented effectively, how might our traditional notions of teaching and learning be transformed by educational technology? What other considerations need to be taken into account when designing educational tools with equity in mind?
Throughout the course and trip, we will explore the meaning of educational equity in this rapidly shifting digital world, in the epicenter of the movement and the heart of Silicon Valley. We will engage with top entrepreneurs, critics, and thought leaders and work directly with students and teachers. A quarter-long project with a community partner, around the topic of educational technology and equity, will culminate during the trip as well.

Learning Objectives

- Synthesize an informed and nuanced personal perspective on how technology can be designed with improving educational equity in mind
- Develop critical and nuanced definitions of “learning,” “education,” “technology,” and “equity.”
- Build a critical understanding of technology’s complex and evolving interactions with the other stakeholders in the educational system
- Become active participants in conversations surrounding education, technology, and equity, favoring action over apathy

Course Website and Email List

- Handouts and readings will be posted in the Google Drive folder, and sent via email.
- Announcements and reminders will be posted to the mailman list: siliconclassroom2016@lists.stanford.edu

Course Expectations

1. Attendance
   Attendance at all meetings and functions is required in order to receive credit and to go on the trip. The trip leaders must be notified by email in advance of any potential absence. Please arrive on time. Students will be allotted one excused absence. If you have extenuating circumstances, please speak with the trip leaders.

2. Participation
   Students are expected to participate in class discussions. Participation is essential to get the most out of the ASB experience. As some topics are sensitive and participants come from diverse backgrounds, please always be respectful when voicing your opinions.

3. Readings
   Students are expected to complete all assigned readings before each class and to write down questions or comments for discussion. Readings will be sent out via email and posted on Piazza.
Project Description
You’ll be embarking on a journey to embody what you learn in the class through actively playing the role as a technologist/designer/teacher/community member in the design project!

The objectives of the project are to:

- Understand the real-world intricacies of introducing technology to address issues in educational inequity faced by various stakeholders, including educators, community partners and students
- Utilize what you are learning in the class and trip to impact real lives
- Actively reflect on the questions and considerations around the theoretical issues of education, technology and equity discussed in class in the role as technologist/teacher/designer/community member

About our Partner

We will be partnering with the San Jose Third Street Community Center provides educational programs and enrichment opportunities for children in San Jose, particularly children of underserved communities. You will work with students across 4th-8th grade who are participating in Young Engineers Program (YEP), a 14-week project-based program (Jan-Apr) that prepares them for the Tech Challenge organized by the Tech Museum of Innovation in April 2016.

The Design Challenge

In our preliminary conversations with Third Street, we understood the following challenge they face:

By the time Spring break rolls around, students are in their 10th out of 14 weeks through their preparation for the Tech Challenge. At that point, some feel jaded or bored, and some may be tempted to quit. How might we reinvigorate their interest in STEM, through the Tech Challenge and beyond?

This is the entry point into this particular design challenge. As you gain more understanding of the students and educators, you may very well find a more pertinent need to address. Feel free to take whatever path you find leads you to a solution that means something to the students and the organization!

On Mar 26, the last day of the ASB, we will visit Third Street during their weekly Saturday sessions. We have reserved 2 1-hour blocks of activity time with the students, during which we will execute our final prototypes.

As with many design challenges, we leave the shape and form of the final prototype open-ended. Some possible outcomes could be a learning experience, game, a technological tool, a rocketship, a garden, etc. - the only limit is that you must be able to execute and share your
ideas with the students at Third Street on Mar 26. (e.g. If you plan a workshop, you conduct the workshop for the students; if you develop a tech tool, you should be able to let the students interact with a working prototype of it for their benefit.)

You will be split into 4 groups of 3, and each group can pursue its own problem statement and solution. Tentatively, each group has 30 minutes with the students, and can choose to do anything with that short time frame.

Before you rush in and start brainstorming solutions, we will be taking a human-centered approach to this challenge, aka design thinking as popularized by the d.school. Such an approach challenges you to authentically understand your users’ challenges and needs before developing solutions.

In order to guide you along with this very open-ended challenge, we have planned several milestones

- **Design Thinking workshop (Week 2, in-class):** A crash course on the design thinking process
- **Needfinding preparation (Week 3, in-class):** A session where you will decide on the objectives and actual activities for the needfinding session described below.
- **Initial empathy/needfinding session (Week 3 Jan 23 Sat, 9.30-10.30am):** In order to better understand the needs of organization and students, we will be going to Third Street Community Center during one of their weekly sessions to interact with the students there face-to-face. You will be entirely in charge of what will happen in this 1-hour session.
- **Mid-quarter check-in with community partner over the phone (Week 6/7, out of class):** You will engage on a phone call in Week 6 or 7 with the community partner’s staff to share their project plans and to seek feedback for a second iteration
- **Project Implementation / Execution during ASB (ASB, Mar 26):** You will execute/implement your project with the students at the Third Street Community Center in the 2-hour session there.

**Time commitment**

Please expect 1 hour/week of extra time outside of class for the project. We will try to keep this to the minimum, but the nature of such a project is the more time you dedicate, the more you and the Third Street students will be able to get out of it. Imagine if you are in their shoes - what will you hope to get out of this session? Please do talk to us before Week 2 if you find that this is not possible to commit to on your part.
## Course Calendar

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<td><strong>What is EdTech and Equity?</strong></td>
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| 1  | **Course Overview + ‘Fixing’ Education?**  
   - *What Can Technology Do For Tomorrow’s Children?* by Arne Duncan  
   - *Why Technology Alone Can’t Fix Schools* by Kentaro Toyama | In-class: Introduction |
| 2  | **History of Education Technology: Past and Future**  
   - *A Personal Computer for Children of All Ages* by Alan Kay  
   - New Horizon Report  
   - (Optional) *An Interview with Computing Pioneer Alan Kay* by David Greelish | In-class: Design Thinking Crash Course |
| 3  | **Full Prep for Needfinding Session**  
   - Third Street Community Center Website  
   - Tech Challenge Website | Sat Jan 23: Needfinding Session at Third Street San Jose |
| 4  | **Framing Equity**  
   - *Whom Must We Treat Equally for Educational Opportunity to be Equal?* by Christopher Jencks  
   - *Will the Free Benefit the Rich?* by Justin Reich | In-class: Needfinding debrief |
|    | **Beyond the Classroom: Other forces at play** |         |
| 5  | **Economics of Edtech**  
   - *A Closer Look at K12 EdTech Funding in 2014 by New Schools Venture Fund*  
   - *Google’s Chromebooks Make Up Half of US Classroom Devices Sold by CNBC*  
   - *Philanthropy’s essential role in K-12 EdTech and Strategies for Impact* by New Schools Venture Fund | In-class: Presentation of Prototype version 1  
   - *Guest Speaker: John Snyder, Executive Director of Stanford Center for Opportunity in Education* |
| 6  | **Politics of Edtech**  
   - *Making Sense of Unexpected Outcomes (Chapter 5), Overused and Undersold* by Larry Cuban | Outside class: Mid-quarter check-in with Third Street |
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<td>Critical Pedagogy as a Framework</td>
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- Pedagogy of the Oppressed (Chapter 2) by Paulo Friere  
- Travels in Troy with Friere (Pp 7-26) by Paulo Blikstein | |
| 8    | 2/23 | Constructionism and the Maker Movement |  
- Four Vignettes and Many Lessons About Digital Fabrication in Education (Part 4) in Digital Fabrication and ‘Making’ in Education: The Democratization of Invention by Paulo Blikstein  
- Why I am Not A Maker by Debbie Chachra | In-class: Presentations of Prototype version 2 |
| 9    | 3/1  | Computer Science Education |  
- Computers and Computer Culture (Chapter 1) in Children, Computers and Powerful Ideas by Seymour Papert  
- De Blasio to Announce 10-year Deadline to Offer Computer Science to All Students by NYTimes  
- Cursive Writing and Coding by Larry Cuban | |
| 10   | 3/8  | Identity: Culture, Language, Gender | In-class: Presentations of Prototype version 3 |