**Minutes Equity Meeting 5-16-16**

**A.** This week we shared Seth Godin’s "Art and Science and Making Things" at World Maker Faire 2012 presentation <https://www.youtube.com/watch?v=OZ01MH9BQqk>.

A key point of interest is the difference between two types of educational toys: On the one hand, electronic kits, very highly prescriptive with fully defined product and spelled out step-by-step instructions (e.g. kit to create a radio); on the other hand chemistry sets, providing users with an infinite number of combinations and experiments, risks, and surprises. Seth Godin argues that the former leaves no room for creativity, trains for industrial rule-following work; the latter invites creativity, breeds comfort with uncertainty and risk taking.

We started the meeting reflecting on the relationship with difference and the promotion of difference in thinking and acting.

**B.** We then proceeded with a discussion of Frame 3: Value Difference and elaborated on it in light of Scott Page’s book *The Difference.* Edits and additions are in blue below.

**Frame 3: Value Difference**

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| * Do I provide reference to and/or showcase diverse “engineers” as a regular part of what I do in class, not simply as something “special”?
	+ This is something we can easily do by providing reference to and/or showcasing contributors.
	+ This needs to be done deliberately, consistently, and with care to counterbalance their low numbers and their lack of visibility.
	+ As important as this is it remains an exogenous part of the course. It needs to be complemented with other actions (remaining bullets).
* Do I seek value and acknowledge the contributions and engagement of all the students, not just individuals that look like me?
	+ Do we encourage all students to contribute? When they have something to contribute, do we provide the environment for them to be heard?
	+ Do we offer scaffolding to encourage and magnify voices usually not heard?
	+ What does contribution of all mean?
		- Diversity of perspectives: Do we create exercises/questions that invite them?
		- Diversity of thinking/communication: Do we create space and protocols so that introverts can contribute?
	+ How to avoid putting students on the spot and create discomfort rather than benefit? E. Numbers questions and assigns to students to answer starting with the extrovert students.
* How to acknowledge diversity in a thoughtful and productive way? Treat all students equally? Account for majority/minority differences? No simple answer here.
* Do I share diverse perspectives in problem solving engineering solutions?
	+ Had a lively discussion about grading and incentives and how grades overtake most of students’ focus and attention.
	+ Ch. shares interesting solutions submitted by students, no necessarily the top student’s solution. Focus on diverse and interesting.
* Do I model support for and understanding of different perspectives?
	+ By definition teaching aims to give the students a new perspective.
	+ We go to class to talk about a subject we have deep knowledge and strong sharply defined opinions about. Can we still model different perspectives?
	+ We are very good at recognizing talent that looks like us. How do we handle other types of students especially when they seem “not interested” “not committed”. This was discussed at length. This is the area where we may need to learn the most and change the most.
	+ Different perspective does not (necessarily) mean the invalidation or contradiction of truths we hold as self-evident.
	+ Different perspective is defined by Paige as Different representation.
	+ Changing representations emphasizes different properties, makes some inferences easier, but does not affect what is valid and what is not (e.g, switching from a Cartesian to a polar representation does not change the properties, changes which insights or which inferences are easier to see and make).
* Do I help students develop team-building and inclusive leadership skills?
	+ What do we know for sure that we can apply here? How to select teams?
	+ How to handle teams with few dominant voices with no room for others to contribute?
	+ Maybe we need to seek resources here?
	+ Managing the team for the students vs. empowering them to learn how to run productive teams.
	+ Example, this Google study about effective teams that we discussed back in February http://www.nytimes.com/2016/02/28/magazine/what-google-learned-from-its-quest-to-build-the-perfect-team.html?\_r=0
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Three relevant quotes from the book:

* Scholars from a variety of disciplines have studied how people and groups make breakthroughs. The common answer: diverse perspectives. As the philosopher of science Steven Toulmin wrote, “The heart of all major discoveries in the physical sciences is the discovery of novel methods of representation.” 2 New perspectives, what Toulmin calls “novel methods of representation,” are often metaphorical. The canonical model for earthquakes, for instance, involves blocks connected by springs, which can then be analyzed rigorously using mathematics. 3 Though we know perspectives lead to breakthroughs, their sources remain shrouded in mystery. The only necessary ingredient appears to be hard work and a willingness to look at things that others ignore. That’s also a recurrent theme. Being diverse in a relevant way often proves hard. Being diverse and irrelevant is easy.
* Although common perspectives arise because of imitation and the need to communicate, they also arise for less productive reasons. People are social, and insecure, animals. Members of a group sometimes lock into a common perspective because they feel more comfortable thinking about the world the same way that other people do. These common perspectives can be a type of groupthink. 18 The logic of groupthink rests on our desire to conform. If a majority of people thinks of a problem one way, they often compel others to do so. That way could be a good perspective and, if so, the group will do well. Groupthink need not be bad. But it could mean that everyone has adopted an unproductive perspective, and this can lead the group to make bad decisions. Most relevant for our investigation, groupthink— whether good or bad— reduces perspective diversity and stifles the collective ability of the group to find good solutions. 19
* Thus, if we hope to continue to innovate and reach new understandings, we must encourage the creation of new and diverse perspectives. We should invite physicists into chemistry departments, psychologists into economic departments, and political scientists into business schools. We should include engineers in marketing meetings and marketers in engineering meetings. And when forming committees and teams, we should choose people who come from different backgrounds and have diverse identities. If not, we’re shutting out perspectives. We’re slamming the door on potential savants. Of course, many diverse perspectives won’t be useful; they’ll make rugged landscapes, not Mount Fujis. We have no guarantee that adding someone different will turn our game of Sum to Fifteen into Tic Tac Toe. A new perspective could just as well transform it into the Unpacking Game. Thomas Edison once optimistically said in the face of the failure of a perspective “we now know a thousand ways not to make the light bulb.” Edison rightly saw these failed perspective as a cost worth bearing. So should we, provided we sometimes stumble on a sublime way of seeing a problem.
* Page, Scott E.. The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies (pp. 50-51). Princeton University Press. Kindle Edition.

**C.** We finally turned to discussing one of Gu.’s lessons. The lesson is about loops in programming.

We had a lively discussion about what was conveyed, why students struggle with it. In particular, the following points were discussed:

* What is the goal of the lesson? Syntax vs. Problem solving. E. who teaches linguistics highlighted the importance of syntax as the core of study for her. It emerged that syntax is emphasized because it exercises a way of thinking. Even when students forget the exact rules, they are changed because they acquire a new way of thinking about language.
* The lesson starts with examples of loops in “real life”. These are all analogies. By nature, they are all imperfect analogies. They help some; not others.
* We spent some time discussing vocabulary. Decided to revisit this lesson next time. It is attached.