

Tinkering Spaces: How Equity Means More Than Access

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Katrina
Schwartz

The Maker Movement has helped spur renewed interest in hands-on learning and the value of spaces where children can explore their own ideas, be creative, and tinker. Some [schools have made makerspaces](#) and [FabLabs a priority](#), building making activities into the curriculum and encouraging kids through afterschool activities. In large part, this new excitement has come from a [predominantly white, male sensibility](#) and conversations about equity and tinkering tend to focus on questions of access to makerspaces and to tools.

Makerspaces are much less common in low-income schools where the academic focus remains on raising test scores, often through drill and practice. However, many communities of color have long traditions of using their hands for work and play that get left out of the discussion around making. Existing inequities play out when adults engage with kids around tinkering or making. And, while makerspaces are a unique kind of learning space, many of the [techniques thoughtful educators are using to improve their interactions](#) with students could be used in other venues.

'Kids are brilliant and it's our responsibility to notice their brilliance and deepen it.' *Shirin Vossoughi*

One basic way to bring more cultural awareness to making is to carefully design activities that make space for the expertise, stories and experiences that students bring from their homes and families. But also, “make that assumption that social injustices and educational injustices are ubiquitous and they’re happening everywhere. Be ready to look for them,” said Meg Escudé, director of community youth programs at the Exploratorium, including the [Tinkering Afterschool Program](#).

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Escudé has spent a lot of time thinking about how social inequities are played out in moment-to-moment interactions. She believes that in order to change those structures, each educator must be on the lookout for her own biases at work and be willing to shift when they inevitably come up.



Zoe and Kevin make milk carton characters. (Courtesy Franco Nguon/Boys and Girls Club of San Francisco)

Sewing has been one of the most successful projects in the program Escudé helps run at the [Boys and Girls Club in](#)

[San Francisco's Visitacion Valley](#) neighborhood. Kids shared their family histories of sewing and even invited grandparents to participate and share. The activity was framed as intellectual thought and valued as equal to any other tinkering task. The success of this activity came from giving students the space to share themselves and build relationships with one another and the facilitators, not because they were using the most recent technology or because they were building robots.

One activity students have when they dive into technology is to take apart electronics and toys. Students find it to be a rich experience, but not all kids dive right in.

"It was really hard and there were a lot of reactions," Escudé said. Some kids wanted to take the toy home, others didn't want to take it apart because it was cute. Escudé realized it's a cultural assumption that kids would think taking apart toys would be fun. "On the one hand, I hate using that example because it's hard to see what I might have predicted happen, but it's also very confirming," Escudé said.

The facilitators of this tinkering club have done a lot of work to think through the many ways inequalities and power dynamics are reenacted. And they've found ways to help the tinkering facilitators leading workshops examine their actions, reflect and improve. Before every tinkering session, the facilitators talk through how they will approach various interactions, anticipating points of tension or potential questions. Immediately after the sessions they also debrief how they interacted with students, how well they got to know them, and what they might have learned about a student that day. They also record every tinkering session and [review video](#) to improve their teaching.

"We feel there's not enough of a focus on pedagogy," said [Shirin Vossoughi](#), assistant professor at Northwestern University's School of Education and Social Policy. She says the rise of maker education activities have coincided with calls for more student-directed learning. But just because kids don't learn from overly didactic experiences doesn't mean adults should be completely hands off. She has observed that often, maker educators assume that because they've offered students freedom and choice, the space is automatically equitable. She says being intentional about how adults interact with kids in these spaces is more important than self-direction.

"There's an emphasis on self-directed learning, but in that process there's not enough of a conversation about all the ways we might subtly in our talk and action reproduce deficit views of kids, or really transform some of those," Vossoughi said. And, when self-direction takes primacy it's easy to blame a student's lack of success on him, rather than thinking about the power dynamics at play in the space.



Meg, Elena, and Ciara make prints. (Courtesy Franco Nguon/Boys and Girls Clubs of San Francisco)

The



Students make wooden automatas. (Courtesy Franco Nguon/Boys and Girls Clubs of San Francisco)

Visitacion Valley tinkering club runs with the help of teen facilitators, who carry with them experiences of being taught that are reflected in their work with kids. Early in the program Escudé and Vossoughi realized that time to plan and time to reflect after a tinkering session were both invaluable for calling out inequities when they happen and figuring out new strategies for the future.

For example, Escudé described a debrief with the teen facilitators after they had been working with a group of middle schoolers for the first time. One boy came in late and had missed some of the tool training, but was nevertheless using tools quickly. One facilitator kept describing his actions as “dangerous.” Escudé recognized that in this description of the students’ actions, the facilitator was already creating an image of him as a behavioral problem.

To move past this, Escudé asked the facilitator to stop focusing on the student’s actions and instead to look closely at her own interactions with him. This method of carefully reviewing interactions helps facilitators slowly recognize how and where things might have gone wrong and what could be done differently next time.

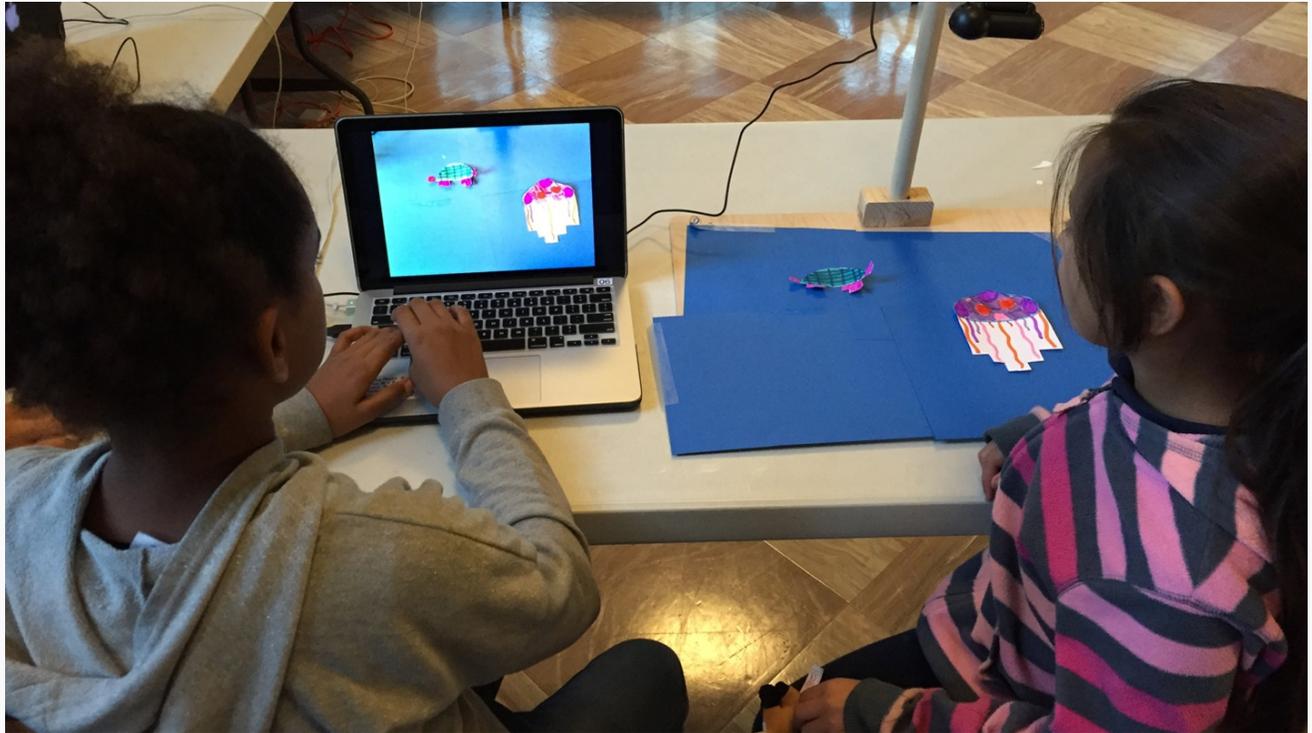
Two days later, the same facilitator described an interaction with a girl who hadn’t started her work after several minutes of the workshop. It would be easy to assume that the student was off task or didn’t want to do the activity, but instead of assuming the worst about the student, the facilitator went over and started asking her questions that centered around agency and how she’d like to be involved. This gentle support helped the girl figure out how to start the activity. Analyzing video footage of interactions and constructively calling out interactions that assume deficits in a child or demonstrate a power dynamic is a big way Escudé and Vossoughi work to get everyone noticing the moment-to-moment inequalities.

They also focus on race and gender patterns around who is using which tools and the kinds of projects different kids are drawn towards. “There were some patterns around which students get intervened on more often and which students have projects taken out of their hands and fixed more often,” Vossoughi said. The video reviews help them

notice these patterns and correct them.

“Kids make sense; what they’re doing makes sense and it’s our responsibility to figure out how it makes sense,” Vossoughi said. For example, a facilitator was trying to help a student, but in doing so became so focused on finishing the product, that he lost sight of the process. The student quickly realized her lack of agency and announced she was going to start a new project, he could keep that one. Those are the moments Vossoughi and Escudé say adults can pick up on, recognize their own values and biases at play, and try to shift.

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Two students work on a stop motion video. (Courtesy Franco Nguon/Boys and Girls Clubs of San Francisco)

trying to bring equity to every moment of tinkering is to see students as full of strengths from their home community, their families, and their experiences. “Kids are brilliant and it’s our responsibility to notice their brilliance and deepen it,” Vossoughi said. This perspective has allowed kids who don’t fit into traditional ideas about what it means to be smart, or academic, thrive in the tinkering space.

“There’s this one kid who does not sit still and he’s never quiet,” said Erin Gutierrez, the Visitacion Valley Clubhouse director. This boy clashes with his teachers a lot. “As far as emotional intelligence goes, he notices everything and I’m always impressed by how much he’s aware. I feel like I can’t get anything past him.”

Tinkering club is much more his style. “In tinkering he thrived because there you share your opinions, and question things that don’t make sense for you,” Gutierrez said. “You walk around the room and learn with your friends and get to disagree in a safe space. It’s a space where all of that is a good thing.” She notices this tension between school and tinkering a lot, but is glad there are spaces where kids who don’t often feel smart in school can shine.

She’s also noticed that kids who regularly participate in tinkering display confidence in other Boys and Girls Club activities. “The one trend I’m always surprised by is that the kids who go to tinkering have been the kids who come to the club and want to start their own programs,” Gutierrez said.

A group of girls came to her and wanted to start a “book club,” where they would write and illustrate stories together. They asked for a room, made flyers, presented their idea in front of other kids and ran the program on their own for about a year. One of the main instigators of that effort was a very quiet, smart, introverted girl.

“It was a whole new side to her that she attributes to the work she did in tinkering and particularly to Shirin,” Gutierrez said. Watching her present in front of peers and organize activities was so different from her usual shy demeanor.

“I’ve worked with kids my whole career and there is something unique about the agency these kids show and feel,” Gutierrez said. The kids are also vocal about things going on at school. “I was kind of surprised at how articulate they can be at times at calling us out and calling teachers out when something doesn’t feel right,” Gutierrez said. “They’re highly sensitive to good pedagogy and bad pedagogy. They’re aware of what feels right.” They complain when their teachers post their grades publicly or if one student’s work is publicly highlighted.

“Making is one potential space that has affordances for how to reimagine education,” Vossoughi said. But this careful attention to how adults talk to kids, the messages body language communicates, and being very attentive to how socio-political biases play out could be a larger part of every education space.

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