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We're the Bosses: Youth Action Council Designs an Equitable Makerspace

Day Greenberg, Micaela Balzar, Angela Calabrese Barton, Edna Tan, and YAC Youth

I want Think Tank to be a place I cannot imagine yet. (Amara, 15, female, Youth Action Council [YAC] member)

MAKERSPACES HAVE BEEN VIEWED AS a new way to support historically marginalized youth in their science, technology, engineering, and math (STEM) engagements—young people of color and kids from low-income communities who have limited access to STEM. Touted as the next panacea to “democratize” STEM education, makerspaces have proliferated in public libraries, science museums, and after-school clubs. Upon its creation at our local science museum, one of the YAC’s first activities as a group was to critically discuss already-existing makerspaces and maker media. As researchers and YAC adult facilitators, we wanted to invite youth voices to collaboratively make sense of what a youth-focused makerspace should or could look like. YAC members repeatedly pointed out how the makerspaces they had seen in person or online and in magazines had “really been more about people a lot older and Whiter than us—usually White, middle-class, male adults . . . We don’t think this is fair. Everybody should have the chance to make something cool, and there should be people and tools to help every kid build things and take things apart. How else will kids want to become engineers or work for NASA one day?”

Despite the increased number of makerspaces in the United States, makerspace participation and culture have been dominated by White, middle-class, male adults (Vossoughi & Bevan, 2014). Unless these spaces more fully incorporate youth of color, they will not serve this important equity goal. In this chapter, we discuss the youth’s design of their makerspace and how it shaped their work there.

Conceptual Framework

The project discussed here involves youth participatory action research (YPAR; Cammarota & Fine, 2008) with a critical justice theoretical framework (Barnett, 2005). We are concerned with expanding making and makerspaces to include voices of youth who have been largely ignored in the dominant maker discourse. Who is making, what products are made, how one accesses resources for making, and how often one is allowed in this making space, are questions too often answered using White, middle-class norms and assumptions. Makerspaces, then, can be symbolically egalitarian yet realistically oppressive. “Critical justice” challenges us to go beyond fitting youth into systems of “what is” to consider and equitably transform systems into “what can be.”

YAC

The YAC, a group of 17 youth, 9 to 14 years of age, were co-designers of the making space at their local science museum. The name of the making space is “Think Tank.” The group represented the diversity of their city, including African American youth (5 girls and 1 boy), Latino (1 boy), Indian American (1 girl), and White (4 girls, 5 boys). All youth entered with prior making experiences, whether at home or in a community makerspace. The youth met every month at the science center.

The goals of the YAC were twofold. First, YAC members were involved in co-designing the actual *physical space* of the Think Tank through both design activities and discussions on (a) what kinds of spaces are attractive to 8- to 14-year-olds and (b) what supports youth in feeling like they belong in the space. For example, youth sketched out ideas for a makerspace, interviewed each other on what activities would be enjoyable, rated furniture and color schemes, and critiqued the design of other spaces. They also considered what types of spaces inspire other youth and adults to take action and what would make the makerspace “really awesome and inspiring” to the community who use that space.

Second, youth were involved in designing/co-constructing the curriculum of Think Tank. YAC members considered what types of making activities would be interesting to other youth. They also considered what outcomes were important for participating in Think Tank making (i.e., to learn, play, tinker, bring something home) and how these activities related to the

design of the space. Finally, they took up the question of how these activities could empower or build confidence in both the short and long term. For example, they tested out initial activities provided by YAC facilitators and modified them according to their interests. They produced short videos on how their making efforts went, what they enjoyed about them, what frustrated them, and what they would change. They completed surveys on activities related to enjoyment, time and scaffolds needed, and ideas for expansion. YAC facilitators used the “house metaphor” to help the YAC members articulate entry points, expansion points, and multiple outcomes for activities. This meant that the science center education director reminded the youth that their house should offer “low floors” to welcome in beginners and equitable activities with “high ceilings” to welcome more experienced participants with many doors and windows reflecting a wide range of possible outcomes.

In designing their makerspace—in both physical space and activities—the youth identified several key themes that drove their efforts. The youth named their primary goal as making the makerspace youth friendly. However, cutting across their ideas were clear justice-oriented concerns about (1) power and respect, (2) making a difference, and (3) empowerment.

Power and Respect

Youth named their desire to be “positioned with power and respect” (Samuel, 14 years old). What power and respect meant to the young people was a highly layered construct that involved *how* they worked together, on *what* they worked, and how the *space* created would make these ideals possible. The major criteria the youth named for makerspace design included welcoming, collaborative, fun/playful, recognizing difficult work, values iteration, and values making a difference.

From a physical design standpoint, designing a kid-friendly making space was an issue of creating a more equitable opportunity for other youth to enter STEM areas of learning and practice. The description of friendliness was connected to opening up and democratizing access so that making and STEM learning would be welcoming, fun, and a space of practice that recognized their value as people. One youth, Ivy, explained:

Kids should have endless possibilities . . . I think it is important for everyone to have access to engineering, and I wanted to help make that a reality. I was excited about working on building the space so that it is fit for all kids . . . There is now a place open to everyone to make things.

Additionally, constructing the space to “fit” a diverse group of young people was central to this point. They collaborated to use their different sets of perspectives, interests, skills, and experiences as shared resources for innovative space-creation together. “What could kids accomplish with YAC? A lot, because we all think differently,” stated one youth, “But we are all creative and good thinkers. We compromise a lot so we can become a group that makes awesome things.”

In a speech delivered to members of the press and supporters at the grand opening of Think Tank, 10-year-old Jay announced:

The YAC is a group of kids who want to inspire other kids on making. We are a group of 9-year-olds and up. We had many meetings to help design activities and give feedback. We also gave ideas for what the space needed to look like—VERY COLORFUL! We designed the room to be a place where we can be inspired and have fun. When we started this off this was just a room full of dust. We built the space for other kids to innovate and be creative.

From a maker curricular standpoint, similar themes were echoed about power and respect. Ivy stated, “[We want] activities that can let us be who we are. I want to do things that let me be me. In school sometimes, it’s hard to be me.” Megan pushed on how respect meant not essentializing youth:

We want to see activities that are not traditionally feminine or masculine or that split us up because of who we are. We think that the best activities can let you use your interests to make that activity better . . . these activities allow for different interests. It makes it easier for us to work with others, and to spend a lot more time on our project, taking it to new levels.

Power and respect in activities also reflected the youth’s desires to do things that mattered to them and their communities. Abby had prototyped a “justice box” as part of her initial making activities: a small box constructed by Abby and her friend, which contained items that had different justice-oriented messages. They included a blindfold to ask users to imagine a world they could not see. They also included a mask so that people could not immediately judge someone as male or female, racially, or otherwise. As Abby stated, they wanted their projects to make things that mattered to others: “I hope our box of justice impacts how some people think of the issues in things we used. The things we made is like kind of metaphors . . . I care about those things.”

The last aspect of this theme revolved around helping others. YAC member Megan explained the importance of activities that were not only interesting but that helped others:

When we did paper circuits, some of us were really excited with the crafting part of the activity. But others of us really liked playing with the circuits. Some of us wanted to use our paper circuit expertise to do cool things in our community, like make

paper circuit mini maker kits to give out so that other kids could learn circuits in a fun way, and like starting a greeting card collection that reflected our humor.

Making a Difference

In the examples from both Abby and Megan, we see an orientation toward making a difference. According to YAC members, activities that matter involve a deep connection to who youth are as young people, as people growing up in particular communities, and as people with particular interests, challenges, and concerns. The youth activities that matter involve making things that address problems that (a) they care about, (b) they find interesting and (c) are highly inclusive.

For example, Fall stated that “activities that matter” are “activities that let us take action on the things we care about.” Megan added:

Whether we are making paper circuits to make a card for a friend, to make a nightlight or designing something to change the world like a jacket to prevent bullying, we want to be supported in having our concerns matter, and in being able to take action on those concerns.

Focusing on the communities where youth come from is a part of what mattered to youth.

Part of taking action for youth involved “be[ing] allowed to make changes” to planned activities “so that they can matter to us” in unique and personally meaningful ways. When YAC members and adult YAC session facilitators prototyped an activity using a stop motion animation app on iPads, youth stated, “We had fun playing around with different approaches.” For example, some youth used playdough to create claymation, while other youth used whiteboards to tell a story.

Central to “making that mattered” was being inclusive. As Jazmyn noted, it included “activities that welcome all of us, young and older kids, and kids with different knowledge or skill level. We want to make sure that no one feels turned away from an activity because ‘they can’t do it’ or because the directions sound really complicated and boring.”

Megan agreed in a presentation: “We do NOT want youth to feel ‘babied’ because the activity was made too easy. We want to see activities that let everyone use what they know and learn something new.” It was important to the youth that various entry points and a range of final products are equally valued so as to take into account youths’ varying interests and agency to pursue what mattered to them and not what the making activity may have scripted.

Empowerment

At the Think Tank grand opening, 12-year-old Ivy stated:

Why Think Tank? To empower youth to learn about science and how to make things! Kids sometimes at their school science programs do not always have the materials and the lessons to teach tinkering and how kids can build anything they want if they put their mind to it. Think Tank teaches kids that they can be a scientist and they can build something and have fun with it. Science can be fun and it does not just have to be like school work. It can also empower kids and no matter what, they can build things and realize that maybe they don’t think they are good at science, but they can go to Think Tank and have so many different tools that they realize that they can do it and it is interesting. For example, some kids might think it’s too hard to make a circuit, and then they make electric art and they realize it is easy and fun, and then they can go onto make even bigger things like light up bracelets. Kids can choose to put their projects in the showcase or take it home, and people will be proud of them because they made it.

As noted in Ivy’s comments, YAC members described the importance of being able to represent themselves to others as capable, powerful makers. To this end, they consistently worked toward designs that would allow them to showcase their work in order to help others. YAC member Jazmyn stated:

We want our work to be recognized by others because our work deserves a LOT of respect. We also want others to see that they can do this kind of work, too because they CAN. Projects do not have to be perfect.

One way in which this dimension of empowerment played out was in how the youth sought to design a physical space for their work to be displayed publicly at the science center. For example, youth devised a Presentation Station, which was to be a digital and physical place to hang work both inside and outside Think Tank. They also argued for a “rough draft workstation,” where they could share their in-progress work in a highly visible way. As Fall stated, “Kids need to know that nothing is perfect. Nothing is done.” Here, Fall meant to help others realize that the process of making involves many iterations. YAC members also noted that their new makerspace should include a glass wall so people outside could see them working inside

and an opportunity for people to provide positive feedback. They wanted the public to value their work as young people. As Abby noted, “we actually don’t get praise a lot from grown-ups.”

Sharing ideas with each other during work sessions and being able to share both in-process and finished projects with others whenever they entered the space was important to YAC members. This was just as much about learning from each other as it was about demonstrating their expertise on a public platform.

Empowerment also meant learning critical making skills. Ivy noted, “I love crafts . . . but I kinda realized that to make my nameplate really good I had to know more . . . like how to use these tools and stuff.” Other youth noted similar points around the importance of making technical tools and skills easily accessible but on a timeline that made sense to kids. Jay noted, “It’s ok if we have to learn something, but it shouldn’t be like school. Like I need to know when I need to know it.”

Looking Ahead

The YAC youth wanted a space that promoted playfulness and legitimized different forms of embodied expertise, allowed accessibility through activities that bent norms of being/becoming, shared ideas through non/traditional channels, made “rough draft work” visible, and provided opportunities for movement and voice. In short, the youth wanted a generous, empowering space where mistakes could be made, decisions changed, multiple iterations were encouraged, and efforts celebrated. They thought it key to focus on the making process and on celebrating the process rather than focusing only on a polished, completely made artifact. It was also important to the youth that making activities prioritize the interests and agency of the youth-makers. They stressed that fidelity to these was more important than fidelity to the making activity. They wanted activities that allowed them to draw on and develop their interests or to take actions on concerns they cared about.

YAC youth also wanted to be active partners in the research conducted about their ongoing efforts. YPAR approaches are useful for this goal because they position youth as researchers who can identify and frame problems, design research investigations, collect/analyze data, interpret findings, and take evidence-based actions. This challenges and inverts traditional ideas of who has the authority to produce knowledge and whose knowledge is deemed valuable. It can empower youth who have been historically excluded to deconstruct the deficient views, oppressive systems, and subjugating discourses affecting their daily lives.

We end this chapter with a collective statement from YAC members explaining why youth action councils and youth participatory action research should continue to shape making programs, makerspace design, and maker movement research:

We are the youth that the makerspaces hope to serve, so we are key stakeholders who *should* be involved in discussing the equity issues of makerspaces. We think that is important to include young people’s voices, perspectives, and experiences as critical resources in designing inclusive makerspaces for youth from diverse backgrounds. If the focus is to design inclusive makerspaces for all youth, then why not listen to us? We are right here! Why not give us the power to design and to develop our own makerspaces? We can help. We want to be active partners in the research and design process.

Supporting Youth in Taking the Lead

Getting comfortable with working with youth as educational design leaders in your learning space (e.g., classroom, museum, after-school program) can start with simple steps in daily practice. Youth want to be involved in important conversations, and they have valuable knowledge and experience that could greatly enhance institutional impact. Too often, youth expertise remains an untapped resource. Tapping into that resource can begin by asking youth if and how they want to get involved as recognized leaders in your shared learning space. Presenting them with a range of options for taking on more leadership positions in curricular design and/or teaching practices can help to jump-start the conversation, but leaving room for them to define their own goals in a partnership is equally important.

Reflection Questions

The following are three question areas to support a critical reflection of assumptions, roles, and responsibilities to enhance your institution’s developmental goals through a YPAR-informed approach. With your group, consider together:

What goals do we have for this unit or project? Who developed those goals (and whose voices are currently missing from goal-setting discussions/decisions)?

Who do we want to “reach” with this unit or project, and what do we actually mean by that? How can empowering youth to co-direct/co-teach/co-design the unit or project assist us in achieving that outreach mission?

If we invite youth to join us as partners, how are we prepared to support and respect them as colleagues from start to finish? What hidden assumptions about youth capabilities would we need to address in order to make that support real in daily practice?

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