

Tinkering Together

Fireside Chat

The Fireside Chat was a live online event that featured Anya Kamenetz, in conversation with Ihuoma Iheukwumere, early childhood educator with the Transbay Child Development Center, South of Market Childcare in San Francisco, California; Raemona Little-Taylor, Deputy Director of County Library

Services at the Marin County Free Library; and Mike Petrich, Director, Informal Learning Center, Exploratorium, San Francisco California; as they discuss current making and tinkering practices in early childhood settings, and the implications and future of tinkering.

The fireside chat was developed as a stand-alone event and a companion to the Tinkering Together Podcast Series to engage the community in discussions about the tinkering in practice.

WHAT IS THE TINKERING APPROACH?

To start, speakers share their non-negotiable elements of the tinkering approach.

For **Iheukwumere**, **curiosity-driven play** is at the center of tinkering. She explains that tinkering looks like: “playful experimentation” where the **engagement is iterative** and constantly changing as children observe and reflect on the things that they’ve done. Through this experimentation, **children construct understandings** of the topics that naturally interest them. Tinkering, says Iheukwumere, **“looks like it’s not purposeful, but it is**, and the more they do it, and they revisit, they get even deeper and they create this understanding of what they’ve been able to.” Another important aspect of tinkering for Iheukwumere is that **failure is part of the learning process**.

Iheukwumere finds it rewarding to see children persevere through these inevitable failures.

Play is also a central element of tinkering for **Little-Taylor**. On the Learning Bus, a mobile learning vehicle operated by the Marin County Free Library, play is considered to be the child’s work. Little-Taylor and her staff also see **children as experts**. As she explains, “our staff and team we learn from the children every day in our spaces, and they teach us so much about how to engage with the world and how to see it.” The Learning Bus team also takes the stance that **tinkering is the child’s experience** as opposed to

what parents or other adults think children should be doing, and how. For Little-Taylor, “There’s no prescriptive way. It is however the child wants to enter that space.”

Petrich also emphasizes the key role of **play**. He describes tinkering as a **purposeful focus for exploration** that is **driven and directed by the child**. Tinkering for Petrich also involves **collaboration between the adult and the child**. This collaboration goes beyond children building something together or building something side by side and learning from each other. Instead, says Petrich, tinkering allows adults to learn both from and about children.



TINKERING SPACES & MATERIALS

DISCUSSING THE ROLE OF MATERIALS IN TINKERING, Iheukwumere notes that “the environment is a third teacher.” The speakers agree that intentionally setting up the environment as a provocation allows children to express their creative genius. Having a variety of carefully chosen materials is central to this exploration, and the speakers discuss whether children can experience the same level of knowledge-building through virtual tinkering. Petrich raises the possibility of exploring digital tools such as coding or animation programs that children can use with a tablet.

The speakers discuss the affordances of their different tinkering settings:

The Learning Bus, a mobile vehicle that brings preschool experiences to historically underserved communities in Marin County, California. Little-Taylor explains that the Learning Bus is an extension of the county's public libraries and is seeking in part to overcome the historical legacy libraries have of systemic racism and gatekeeping. Because it is mobile, the Learning Bus can reach even the remote corners of the county. Another advantage is that the Learning Bus is designed to serve families, and often sees the same families week after week, from when their children are born until they go to school. The staff puts the child-caregiver relationship at the center of its activities. The Learning Bus makes 11 stops every week and each stop lasts 45-60 minutes. It is designed as a supplement rather than a full preschool experience, especially for families that do not have access to preschool programs.

Transbay Child Development Center, a preschool in San Francisco that serves children from a range of racial/ethnic and socioeconomic backgrounds. The center has a dedicated maker space and structured time for children to explore their curiosity. Iheukwumere explains that the center's teachers understand that every child "comes to school with something more than their backpack—they come with their stories, their experiences, their cultures." Teachers at the center use children's diverse experiences and knowledge to support their tinkering work. Iheukwumere and her staff take extensive notes, pictures, and videos of tinkering activities. They use that documentation to reflect on their roles as facilitators and on how children engage in the activities to continually improve the tinkering experience.

The Exploratorium's Tinkering Studio, is a drop-in setting for families to play and explore together. The Tinkering Studio designs interesting experiences for and with children, with the goal of supporting the relationship between the caregiver and the child as they learn together. Materials are a key element of the Tinkering Studio. The materials are recycled materials and everyday objects that the staff repurposes in unusual and playful ways. Petrich believes that "it's important that we're doing it with materials that don't feel like they're built by experts." The Exploratorium also uses the interactions that happen between children and caregivers during tinkering as a professional development model for its community partners.



Kamenetz asks the speakers

to reflect on how tinkering as an approach can be inclusive, empowering, and give children a sense of agency. Petrich explains that equity is at the forefront of the Exploratorium's Tinkering Studio and notes that "if this work is not culturally relevant, if it's not linguistically accessible, and if it doesn't...reflect the values of those in the communities that want to support this type of learning then we're not doing our job well." He points out that although there is no single approach to equitable teaching, it is inherently equitable for educators to believe that all children are capable of exploring and complexifying many types of problems, and to provide opportunities that support children's thinking. Petrich believes that tinkering can be especially valuable for learners who experience fewer successes in the education system because they can engage with concepts in ways that are more tactile, more meaningful, and more expressive.

Iheukwumere agrees with Petrich that "equity is...in the eyes of the beholder, because it looks different for every different child." She emphasizes the role of the teacher in validating every child's curiosity. Teachers in her center build strong relationships with each family and each child to learn about their stories and experiences, so that they can use those stories and experiences to support each child's learning. Staff members also have conversations

amongst themselves and with families about what inequities look like for people from different races, different genders, and different socioeconomic levels. They ask families about their expectations and their values to help their work with the children in their center. Program staff make concerted efforts to help children understand that they are relevant and that their ideas are important. They also celebrate children's successes during tinkering to help them persevere through the frustrating times.

Little-Taylor also believes that equity and empowerment must be intentionally cultivated. The success of the Learning Bus depends on trusting relationships with families and the community. The staff thinks about equity in every aspect of their work, beginning with where the bus goes. Says Little-Taylor, "We focus on the communities that have been most impacted by the systemic inequities in being excluded from participation and having access to many things. And that's where we root ourselves and root the work, because those are the communities where we see we can make the greatest impact..." They also hand select every book with specific families in mind and the graphics on the outside of the bus depict children who have been in the program.

Iheukwumere and Petrich also discuss gender equity in tinkering. They agree that the

facilitators play a significant role in engaging both boys and girls. In Iheukwumere's center, they have found that when teachers approach activities with joy and curiosity, the children want to participate because they want to be with their favorite person. She points out that, "the girls are actually elbowing the boys out to participate..." Petrich explains that the Tinkering Studio staff is a mix of males and females, and they strive to design tinkering experiences that are relevant and interesting to everyone. He believes that by "paying attention to what our own instincts are about what we love, and what we're interested in" it is easier to create gender neutral experiences and honor diversity.

Little-Taylor adds that the Learning Bus staff is conscious of the language they use around gender because "we want the child...to identify themselves, as opposed to staff." Instead of referring to boys, girls, men, women, or men, they use general neutral terms such as "friends," or "co-conspirators."

Kamenetz praises the speakers for their efforts to offer activities that aren't sorted or pre-labeled by gender and that allow young children to explore different phenomena in ways that are natural to them. Petrich believes those designs result from the general stance of not presuming to know what is good for the other person, and from being open to learning from colleagues and collaborators.



I USED TO THINK *THIS* ABOUT TINKERING, NOW I THINK *THIS*

Kamenetz asks the speakers

to reflect on how their thinking about tinkering has changed as they have gotten more involved with the approach. She prompts them to frame their reflections by saying, “I used to think this, and now I think this.”

Iheukwumere: “I used to think that tinkering was very frustrating for young children. But now I think that frustration is actually valuable.”

Little-Taylor: “I used to think that tinkering required a lot of technical skill and expertise. And now, I think that anyone can tinker and it’s happening all the time, even if it’s not described as tinkering.”

Petrich: “I used to think that tinkering was about experiences for children, teens and adults that could communicate to each other

clearly about how their ideas are immediately changing and build out and explore and experiment. And it was required that you actually had that discourse ... to really deeply understand the change in [someone’s] understanding... And now I realize that tinkering as an early childhood experience, it is at its core, the way that children come to understand the world in natural and important ways.”



I used to think tinkering was an activity. And now I think it’s a worldview, I think it’s a way of being. And it’s not just a way of being for children, it’s a way of approaching the whole world.

ANYA KAMANETZ

AUDIENCE Q&A

The fireside chat closes with a few questions from the audience.

Q: How do you support adults in their evolution and in being co-learners with the children?

A: Iheukwumere responds, “Sometimes it just takes just diving right in. If you’ve never tried something, try it.” She notes that it is important to provide support and prompts to let adults know there is no perfect approach or answer. When this happens, Iheukwumere says, “[Adults] let go of all the fears and all the stresses and actually start enjoying themselves and enjoy being silly and goofy and discovering something new with a child.”

Little-Taylor adds that it is important to have materials that inspire adults to engage as learners alongside their children.

Q: What is the difference between how children and adults engage in tinkering?

A: Petrich observes that it is more likely for a young child who is pre-verbal or developing their language ability to express their ideas through actions. For example, they will reach for objects or make a shadow on the wall. Older children and teens, he says, are “really good at playing right at school. So they’ll tell you what they think you want to hear from them.” For both children and adults, though, the “aha moments” show in their eyes.

Iheukwumere adds that “for the child, [tinkering] is mostly about the process. And for the adults it is the product.”

Q: What feedback do you get from the people who show up? And what changes have you made as a result?

A: In the Tinkering Studio, says Petrich, “there is no tinkering development without the direct and immediate feedback from all users.” The staff is always facilitating and observing how adults and children use the materials, what questions they ask, and what suggestions they have, and using that feedback to improve the experience.

Little-Taylor says that the Learning Bus experience is similar, and explains that “staff are so embedded in the community and with the families that they have an ongoing feedback loop.” They invite and engage the families in designing the programs with them on the bus.

For Iheukwumere, the most rewarding feedback comes from parents who say, ‘This is the most fun I’ve had with my child while learning.’ She explains that parents are often grateful for the opportunity to see their children as experts, and pleasantly surprised by the children’s knowledge.

