

Caregivers and Researchers in synergy: Two perspectives on collaborative research

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For too long, institutional practices in informal STEM learning, including research practices, have reflected the dominant cultural, social, and societal structures and values while marginalizing non-dominant communities (Garibay & Teasdale, 2019). In an effort to co-develop research with participants from the projects' intended audience, Oregon Museum of Science and Industry (OMSI) hired three mothers of teenage girls to join the Designing Our Tomorrow research team as Storytelling Ambassadors (Storytellers) to work on a study to explore approaches to communicating with the public about engineering in their day to day lives. Designing Our Tomorrow: Mobilizing the Next Generation of Engineers is a 6-year, National Science Foundation-funded project, carried out by OMSI and its partners: Adelante Mujeres, the Biomimicry Institute, and the Fleet Science Center.



All three of the Storytellers identified as Latina women with no prior experience in research; they brought invaluable life experience, rich cultural backgrounds, professional skills and enthusiasm as caregivers and communicators. Working alongside OMSI researchers*, the Storytellers participated in data collection and analysis; they created narratives to communicate the relevance of engineering practices at exhibits, analyzed data from listening sessions with educators and caregivers, identified features of effective stories, and created conjecture visualizations to document and communicate their work. They contributed knowledge, viewpoints, and information that appealed to the intended audience (girls ages 9 to 14 and their families) and helped refine the study. As part of the

research team, the Storytellers provided a better understanding of the needs and experiences of girls in this age range, which was helpful in creating and sharing stories that were more meaningful and relatable for their parents. Reflections on the process revealed that the experience was valuable and rewarding for both the Storytellers and the OMSI researchers.



A Storyteller perspective: Storytelling has always been a constant in my life—a part of my culture and heritage. Telling stories is a way to connect with our ancestors and preserve our traditions. Venturing into the research field, however, was completely new for me. Working and learning alongside my fellow Storytellers was inspiring; each of us so different yet, equally passionate and opinionated. We all brought our unique experiences and viewpoints to the table, making for an enriching, dynamic environment. With direction and guidance from the OMSI researchers, we learned new approaches and applied them to our stories, building on theory and data to enhance our storytelling skills. The combination of research and storytelling opened up so many new possibilities, allowing us to share our lived experiences and knowledge in a more informed and impactful way. Weaving personal anecdotes into my story from my day to day life as a mom and wife helped me connect with my listeners, and encouraged them to see how engineering can be applied in various aspects of life. A sense of shared knowledge in even the most everyday activities, such as cooking or organizing household tasks, helped break down the perception that engineering is only relevant in professional settings. By highlighting the practical applications of engineering in relatable scenarios, we were able to inspire others to think

creatively and problem-solve in their own lives. This approach not only made engineering more accessible but also empowered individuals to embrace their own potential as problem solvers and innovators.

Participating in the research process not only strengthened our own storytelling abilities but also fostered a sense of unity within our team as we worked together towards a common goal of creating meaningful and impactful stories. Our stories prompted the parents we spoke with to reflect on their own experiences and share their own perceptions through back and forth conversations. Reviewing data from the story and conversation sessions opened my eyes to the power of storytelling as an approach for encouraging connections. I felt proud and inspired to contribute significantly to a study that felt like so much more than just a study; it felt like a movement towards positive change because people of different cultures and life experiences co-developed this research, helping bridge gaps and dispel the idea that knowledge, and work in STEM, is only for certain groups of people. As research team members we challenged that idea and helped break down those barriers. Our voices provided insights that may have otherwise been overlooked, and created opportunities for sharing diverse perspectives to help create an inclusive research environment that promoted a sense of equity, respect, and shared humanity.



A Researcher perspective: As a museum professional and father of two, I have spent much of the last 25 years in science centers. I recognise the privilege I have as a white man, and consider myself an ally of traditionally underrepresented communities in STEM. The research and evaluation studies I have worked on have almost always included representatives from projects' intended audiences. At the most fundamental level, the audience was often the "subject" of the work; more recent efforts have been made to partner with organizations and individuals from intended audiences to help co-develop and guide the questions asked, and the data collected. Designing Our Tomorrow was the first time I worked on a project in which members of the projects' intended audience were actually part of the research team, and I found the experience to be exciting, valuable and rewarding. The Storytellers' perspectives and insights were a great benefit to the research because the questions they asked about definitions and terms prompted OMSI researchers to unpack and re-examine ideas we were building on. Our conversations also helped me confront assumptions I was making about what was important, relevant or of interest to members of the projects' audience. The Storytellers contributed an intuitive sense of how to communicate with other caregivers, and what approaches help participants connect engineering practices from exhibits to situations in their everyday lives, such as brainstorming meals with their families, or considering criteria and constraints when rearranging furniture with a teen. I can't state enough how much I learned from working with the Storytellers, what an asset they were to the project, and how doing research *with* participants from the project audience was so much better than doing research *on* participants from the audience.

For more information on the work of the Storytellers, check out the *Storytelling and making meaning about engineering practices* poster presented at the ASTC conference held in October 2023 (<https://omsi.edu/dot-astc-study-2-poster/>)

*The term 'OMSI researchers' is being used here to identify permanent OMSI staff who work primarily as researchers and evaluators. The Storytellers were paid special project OMSI staff and recognised as part of the Designing Our Tomorrow research team.

[Garibay, C., & Teasdale, R. M. \(2019\). Equity and evaluation in informal STEM education. In A. C. Fu, A. Kannan, & R. J. Shavelson \(Eds.\), *Evaluation in Informal Science, Technology, Engineering, and Mathematics Education. New Directions for Evaluation*, 161, 87–106.](#)