

# The 3D PrintShop - Client-based Work as Pedagogy at Digital Harbor Foundation

*Rafi Santo - New York University*



This case example explores what client-based work looks like at Digital Harbor Foundation's 3D PrintShop, with youth maintaining technology, managing workflows, and creating 3D fabrications for community-based clients.

Every day at the Digital Harbor Foundation (DHF) 3D PrintShop, youth employees are working together as a team to help clients bring projects to life. The print shop is currently managed by a staff member, Darius, who has been with DHF since he started as a sophomore in high school, shortly after the organization's Tech Center opened January 2013. He worked his way through DHF's Maker Foundations and member courses which build skills in areas like graphic design, web design, 3D printing and coding, and eventually he created the position of PrintShop manager after he graduated from high school.

Darius' interests were piqued by the 3D printer he was able to learn about and use at DHF, and he began to print cell phone cases as a side-job, selling them to his classmates. Darius gained familiarity with 3D printing hardware and software, developing a number of projects at DHF, which eventually lead him to be a presenter at a White House Maker Fair in 2014 and a participant at various national maker conferences. At the PrintShop, Darius started out as a volunteer who was interested in 3D fabrication. His role shifted as he neared graduation from high school.

*I was still a member. I was still volunteering, but I started becoming a staff member during the summer employment. And then my senior year of high school I started working here. My role was to manage three assistants. So straight out of high school I was managing people.*

Darius sees confidence as a major skill that his employees develop.

*When they come in. They don't really want to do anything. They don't want to break anything. They're afraid. If they're afraid to do some stuff, we're going to give them the confidence to do it... Because I fixed this printer, I can do anything in this field. I can be confident...*

Working with local artists, universities, and businesses, the print-shop serves as a learning environment for youth participants who have been through the earlier 'Maker Foundations' elements of DHF's programming. Usually staffing about eight youth employees, the bulk of work in the DHF PrintShop involves taking orders from clients through a web interface, and printing those orders according to customer specifications. Facilitator staff at DHF also look for leads on clients from within the local technology and education communities. For example, a local artist reached out to the PrintShop to print a number of objects for an installation. Youth employees also maintain shop equipment, work with clients on side projects, and keep a portfolio of work for the shop's web presence. As manager of the PrintShop, Darius was the point



*Darius, who was manager of Digital Harbor Foundation's 3D PrintShop, assembling a 3D printer for the first time.*

of contact with the adult staff at DHF who offer guidance in management, helped him mentor the youth employees, and troubleshoot issues that came up both with clients and internal technology and workflow challenges.

DHF's 3D PrintShop is partially self-funded, using the proceeds from the shop's client-based work. It is also funded partially by a grant from the National Science Foundation in collaboration with a professor from the University of Baltimore-Maryland who has an interest in youth pathways in technology careers. Youth are paid for their work at the shop, and Darius was paid as a full-time employee. Darius describes youth development in the print-shop as focused on

*...trying to give them confidence and make them makers so they can be what they want to be. Our goal is to give them the skills or experiences to try and take that leap when they go on from high school to college or whatever they want to do next in their life.*



Youth employees at Digital Harbor Foundation's 3D Print Shop

Darius shared an example of a PrintShop employee who recently graduated and was able to use her PrintShop experience as an element of her application to Yale University's engineering program. Darius' own story has led him in a different direction. He pursued college after graduating high school, but found that it didn't quite fit with his current goals and interests. Instead, he's been working full time at DHF's PrintShop, and as of 2018, has been promoted twice—first to the role of Youth Employment Program Manager, which oversaw all youth employment programs at DHF, and then to Tech Center Director, overseeing all programs at the DHF Tech Center. These two stories point to the importance of recognizing many pathways in digital youth development, whether the path is college or career.