



Client - User Research

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Client



Policy Innovation Lab: Public Interest Technology

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Introduction

Science, technology, engineering, art, and math—commonly referred to as STEAM—is a growing industry, offering lucrative employment opportunities. Demand for STEAM jobs continues to steadily increase, yet representation in the workforce remains stagnant. Analysis of 2017-2019 IPUMS data from the Pew Research Center reveals that persistent gender, racial, and ethnic gaps continue in STEM occupations. Black and Hispanic adults make up less than 10% of those employed in all STEM jobs, despite making up 28% of the workforce in the entire United States.^{1 2} Similarly, males are disproportionately concentrated in higher-paying STEM jobs like computer science, engineering, and architecture, while women are disproportionately overrepresented in lower-paying healthcare-related STEM occupations.³

This lack of diversity in the STEAM field prompted ToyzSteam to develop a program to cultivate a diverse workforce in this industry. Programming entails a multipronged approach. As we sought to add value to ToyzSteam, we framed our engagement with ToyzSteam through the lens of the following problem statement:

*Are college students in the Pittsburgh community **interested in serving as mentors** and would they **be effective mentors** to students enrolled in ToyzSteam programming? If so, what is the **most successful approach to recruit and retain** student mentors?*

As we interviewed users, we sought to understand the user journey for a student of color pursuing a STEAM degree in higher education – seeking information on how opportunities as both mentor and mentee appealed to them. In our research, we also approached subject matter experts to gain insight into trends within the field, and employers to find out what the process for gainful employment was, and particularly to parse out the user experience for people of marginalized groups in the hiring process.

Key Takeaways / ‘aha’ moments

There is a deep sense of community that drives people to do better for those around them. ***One of the most moving ‘aha’ moments for us was when one of the interviewees talked about how we will eventually be passing on the future of this country to the next generation and how the people we invest in today are likely to lead us tomorrow.*** This framework of grooming the youth into future leaders is extremely important as this will determine the future of our communities and should drive us to better for our people.

A sentiment common throughout the BIPOC community is that of isolation. It was surprising to hear that all interviewees shared feelings about the lack of emotional and motivational support in their daily

¹ Fry, R., Kennedy, B., & Funk, C. (2021, April 1). Stem jobs see uneven progress in increasing gender, racial and ethnic diversity. Pew Research Center Science & Society. Retrieved October 31, 2022, from <https://www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/>

² Note: due to the recent addition of art to STEAM, current diversity and wage data exclusively reflects STEM.

³ Ibid.

endeavors and that such support was integral to move forward in their education and career paths. Many students shy away from STEAM education and industry as they do not have a network in this industry. This makes it challenging for them to access and progress in this field thereby negating it altogether. That being said, our interviewees were in favor of the idea of dedicating efforts to guide youth and help them envision a bright future for themselves and their families.

In order to shine in academia and careers, students of color need to be storytellers and have a unique selling point which distinguishes them from the group. This becomes an added pressure for many as they juggle a lack of human support and resources.

What we learned

Our interviews gave us interesting insights into the needs and challenges of students of color from marginalized communities. It was interesting to see similar trends emerge despite the diversity in questions asked. Every interviewee strongly emphasized *the need for a support system* to navigate through personal, professional and academic life. This insight sheds light on our common theme that there *is a need for mentorship in marginalized communities*.

Another important insight was that students of color seek guidance and look up to those who are of similar age to them and understand what it feels to be in a minority thereby having undergone similar challenges. Students of color felt that they did not have enough resources or human support to successfully pass through technical courses and there was a difference in the resources which they had as opposed to those from privileged backgrounds. On the other hand, whilst speaking with employers, it was identified that organizations are always hiring in the STEAM industry but it is difficult for them to recruit high quality BIPOC talent. This is an indication of the mismatch in the demand and supply of talent and implies the underlying need to develop and groom the next generation of future leaders.

As we interacted with our client and scoured through proposals and grant documents by the organization, we also learned that the organization was carrying out many initiatives to positively impact the community yet there was not enough data to substantiate it. This was a major gap on the organization's end.

What we want to learn more about

It would be insightful to get input from education personnel at schools in marginalized communities. Along with their perspectives about the quality of education in these schools, we would like to gain insights into what are the challenges they face when imparting education to students of color. Though this is outside the scope of this engagement, it would be an interesting research question for the future.

Another element which we would like to delve into is whether prestigious universities would be willing to be involved in establishing partnerships with schools in marginalized communities and if so, to what extent would they be willing to contribute to the development of students.

Governments play an important role in the education sector. Connecting with a local government representative to identify the resources the government can direct towards educational development for underserved students would have been a key stakeholder perspective. It would be interesting to see if a local level policy could address increased representation of students of color in the STEAM industry.

Gaps in our understanding

Given marginalized communities lack resources – particularly in technological goods such as phones, tablets/iPads, or basic computers, we are not clear on how we get funding to equip these students with the right technology resources. Toyzsteam currently runs an app to develop digital skills in students. Although we know the client has some development capacity, we are unclear on the extent to which they rely on inhouse expertise or monetary funding to enhance the app or develop new elements that incorporate findings from user research.

It is also important to understand behaviors and circumstances of individuals from marginalized and privileged communities. To gauge insight into this, one needs to study students at a younger age to observe their behaviors and development overtime. This would come in handy to ideate a solution which could be incorporated into the lives of students at an early age. Addressing these gaps would help us to further investigate issues from secondary resources and gain a deeper understanding of the problem from a diverse perspective.

Insightful quotes

“A lot of these classes are not beginner friendly and a lot of the policies in this class aren't tailored to help beginners. Getting too much help from the TA was considered academic dishonesty. People are telling you if you can't figure it out on your own, like getting other help is cheating.”

“Many of them are eventually graduating from high school, but they don't have the basic skills the twenty-first century requires and if we don't do something to address that, you know, fundamental deficit, then we're not going to solve the problem, right?”

“If we don't have any representation, if we're not showing these opportunities on a broader scale, it seems less likely or less important. As a black man, I see rapping, NBA, etc. I didn't have STEAM/STEM people who I could look to or ask questions about.”

“We are only around for so long, and everyone's dream and goal is to have a better future for the next generation. There is going to be some day, we are going to be old, the ones we have invested in are the ones who are going to be in charge.”

“I think that [mentorship] is so important, honestly. On every level, you really see that having near-peer mentors is very effective for students if they can see someone who's a few years older than them. If you bring an example of somebody who is similar to you and you put it in front, you're more likely to feel motivated.”

Emerging themes

Three common themes emerged after we carried out a synthesis of the interviews. These encompass feelings about support and being able to positively impact the lives of people around oneself and the country itself.

1. Educational Support

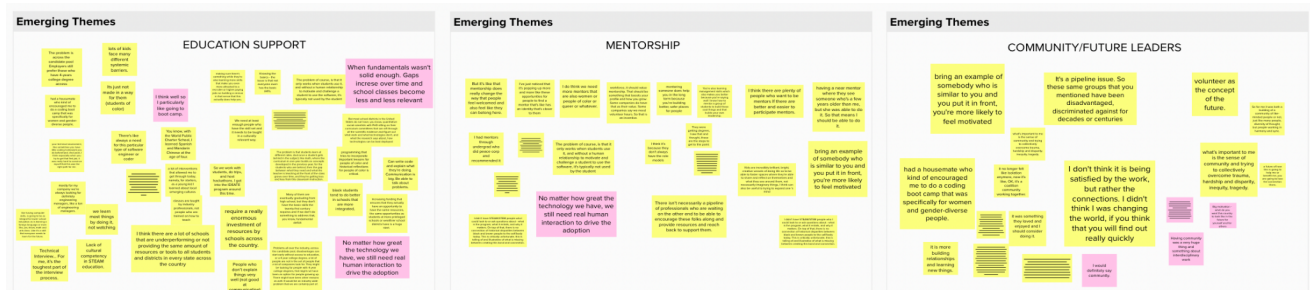
Students of color from marginalized communities faced difficulties with technical subjects in school and often felt that there were no support resources to reach out to. Asking for help was considered cheating. There was a discrepancy in the resources used to impart education which automatically made students of color underperform. Therefore, access to quality education - through bootcamps, institutions of higher education, or K-12 education was valuable. They needed to put in extra effort to develop a skill-set/hobby which was unique to them and helped distinguish them from the other students. However, overarchingly people of color found navigating education alienating and institutions left them feeling disconnected, as though these institutions were not created keeping them in mind.

2. Mentorship

A mentor in the form of a parental figure, other family member, near-peer or community member has a valuable impact in the lives of students of color. A mentor serves as a lighthouse in guiding individuals through the challenges of personal and academic life and is testament to the fact that one can really achieve his/her dreams. However, it was identified that access to ongoing, long-term mentorship opportunities seemed sparse. Users were divided on ease of access to mentorship, with some speaking to the availability of mentors within their journey and others stating they had gone through it alone. Encouragement from near-peers and mentors was instrumental in setting individuals up for success in STEAM endeavors.

3. Community / Future Leaders

Individuals were inclined to give back to the community, especially to their communities. Many individuals had carried out community service not for the resume but with the genuine intention of changing someone's life. The idea that they could make a difference in someone's life was enough of a motivator for them to dedicate their time and efforts for marginalized communities. Being involved in the community meant having a sense of responsibility thereby helping individuals overcome trauma, inequity and disparity.



Where we're headed next

As we look to further ideation, it is clear from our user research that overwhelmingly, users find a need for educational support and mentorship and community representation in the field. Our client initially spoke to the difficulties of scale in successfully mentoring and showcasing community representation in the field of STEAM. These issues were reiterated in our user interviews. People of color, and Black men specifically spoke to the lack of ability to create networks of individuals, given the paucity of representative individuals in the field. Overall, each of our users spoke to the importance of mentorship and representation as motivators in their journeys and in POC student journeys more broadly.

Given this information, we are seeking to demo an ambassador program, through which college students can act as mentors for high school students. Our client's use of narrative is extremely compelling – giving a voice to students and creating role models through “superheros”. Given our client's existing app and website, we are aiming for this program to be scalable to multiple different platforms on different devices. As we continue refining our prototype, a challenge we will encounter is limiting our scope to what is actionable for the client, before we can refine the cosmetic aspects of the project. An overarching challenge we face is creating a usable product for our target demographic – students pursuing higher education and in high school. We anticipate addressing this problem through user feedback, yet we acknowledge that downloading an app may prove to be a barrier to implementation for our key users. As we continue to iterate, we will keep these challenges in mind as we aim to produce a user-friendly prototype for our client.

Interview Structure

In order to explore issues identified by the client and problem statement, we interviewed seven individuals from different walks of life to gain a comprehensive understanding of the challenges faced by students of color with regards to the STEAM Industry. Our sample group consisted of students of color, employees, field experts, community ambassadors, and recruiters, aged between 24 to 50, who are either part of or interacted with marginalized communities and/or the STEAM industry. Their experiences spanned across the US and Africa. Our intention was to get a wide variety of perspectives so we established a base criteria of interviewing individuals who had some level of involvement with students of color and marginalized communities.

We started our user research journey by first identifying the categories of interviewees we would like to reach out to. We mutually agreed on four types of categories namely student of color, employer, field expert and community ambassador. Each team member recruited at least two interviewees, but everyone was encouraged to find as many viable users as possible from their personal and professional networks. Once we identified the individuals who were willing to speak to us, we scheduled interviews with the interviewee and at least two team members. Once the interviewee signed the consent form, a pseudonym was assigned to them and used as their sole identifying feature. Six of our interviews were conducted over Zoom while one was conducted in person. We developed a list of questions tailored to each category of the interviewee. Each team member proceeded with the understanding that it was not likely that all questions would be asked, or would even be relevant, but to stick to questions that were applicable and

follow up with questions relevant to the conversation. This allowed us to have uniformity with the questions we asked, but gave each team member agency in refining the path of the interview as unique information from the interviewee emerged. Interviewers had autonomy to ask new questions if they felt it would lead to information pertinent to the theme. As new questions were developed they were included in the interview documents along with the corresponding responses.

Our questions were designed to be open ended while tailored to the interviewee to gauge insightful personal experiences regarding their involvement in/with students of colors and the STEAM industry. Our list of interview questions is included in the User Research Plan document in the Google drive. Every interviewee was assigned an alias which was utilized across all documentation and none of the interviewees were asked to identify their organizations, communities or individuals they had interacted with. We proofread all interview transcripts and removed any personal identifying information to maintain the confidentiality of the interviewee.

We started each interview with our introduction and the following statement:

“Hi, my name is [Meher/Nahal/Oravee] and I’m a student at Carnegie Mellon University. Thank you for filling out the consent form ahead of this interview. Today I’d like to talk to you about increasing diversity in STEAM fields and we’re interested to hear your thoughts on how we can push this forward, particularly for Black and Latino communities. We’re interested in talking to you specifically because [reason]. I’m here with my colleague [Meher/Nahal/Oravee] who will be taking notes. There aren’t any wrong or right answers, and we won’t be writing down any personal information. We’ll also share a copy of the notes with you after the meeting if you like, and your participation is voluntary. You can stop the interview at any time. Do you have any questions or concerns so far?”

“Ok, so first we’d like to get to know you a little better.”

Once the introductions were complete, it was at the interviewer’s discretion to steer the interview in the appropriate direction. Once the interview was completed, the interviewer and the notetaker huddled together for fifteen minutes to review the material, fix any errors in the transcription and identify the key takeaways and ‘Aha’ moments. Once all interviews were completed, the whole team met to review each interview and carry out the interview synthesis exercise.