Participatory Design by Proxy? Practices for Ensuring Inclusion of Marginalized Communities

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Abstract

This paper outlines some of the challenges and opportunities we have encountered when working with marginalized communities in a graduate-level software engineering course. We have found that typical participatory design workshops were not suitable for the communities we are working with, and instead propose a proxy approach—relying upon interactions with expert practitioners instead of directly interacting with community members.

Here we share our motivation and experiences from our current course offering, where students are designing applications for a community of neurodiverse users.

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1 Motivation

Academic classrooms are not always well suited to the inclusion of marginalized community members. For example, in the course experience we currently have underway, we have graduate students in software engineering who are highly talented and motivated to build technology that addresses issues of equity [7], but lack experience working with communities of neurodiverse users. These users face barriers in accessing everyday digital services, including basic information from web-based sources. This further perpetuates what is known as "digital design marginalization" [6], where an interface design actually excludes groups of users and contributes to marginalization in other areas of their lives. Our aim is to explore how we can address some of the barriers to inclusion and bridge the gap between our students and these marginalized communities by trying an approach we have called participatory design by proxy.

2 Design Methodology

Throughout several offerings of our graduate level software engineering courses in the requirements gathering processes and as students were making design decisions, they would often fall back into what they had learned in their previous coursework when itis came to best practices and design conventions. So, even though the features they were adding were to accommodate the specific needs of marginalized populations, the foundational assumptions remained. To address this gap, course content was added on developing for accessibility, unconscious bias, and specific information on particular neurodiverse populations. In addition the students were asked to take their own unconscious bias test [5] and abide by the Khoury College Oath for Computing Professionals [2].

In addition, the teaching team brought in advisors that had an advocacy roles for the marginalized population to work with the students every few weeks to give feedback on the progress that the students were making and answer any questions that they had. While best practices are to consult with the users directly, the professors felt that asking so much time of the community members for the development of the students would further tax and already overtaxed population. In addition, while our students have the best intentions and agreed to abide by our code of ethics, bringing community members in front of students who are just starting their journey may be uncomfortable and possibly even harmful.

3 Proxy Selection

An integral part of this design process was the choosing of the proxy. In our first iteration of this course, we used a team of software entrepreneurs who themselves were from a marginalized population. However, the focus was on the needs of the proxies who made all of the design decisions and the students learned little about the target user population. So, for this iteration, the chosen proxy who was not actually a member of the community, but had been an advocate and educator for the community for over twenty years. This broad experience allowed for her to speak to many different types of users and limit the overfitting of the solution to an individual. In addition, she had limited technical expertise, so instead of making design decisions, she informed the students of how different individuals would interact with and feel about the designs that the students chose. This approach led to the students thinking more about the community members' experiences.

4 Key Features of Current Projects

The students currently have 4 projects underway: *Résonance*, *Polish Bot*, *ReadEase* and *LumiRead*. Each project has been developed using an agile methodology and participatory design by proxy. Key features that have been identified in each are highlighted below.

Résonance is an AI-powered assistant that helps users with communication challenges express emotions clearly and appropriately

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across different social contexts. By guiding users through emotion selection and generating personalized, context-aware messages, it reduces communication anxiety and enhances emotional fluency[1].

Polish Bot addresses key challenges in academic communication and learning by assisting users in crafting context-sensitive emails and text messages, and enhancing video-based education with interactive Q&A features to improve retention. It integrates seamlessly with academic tools to support writing clarity, semantic analysis, and social cue awareness, reducing communication anxiety and learning inefficiencies[2].

ReadEase transforms the digital reading experience through three powerful, complementary features: text simplification, summarization, and synchronized text-to-speech. Together, these capabilities create an environment where neurodiverse users can engage with digital content on their own terms, shifting the burden of adaptation from the individual to the technology[3].

LumiRead is a browser extension that makes online reading easier and more accessible. It combines ReadMode, Text-to-Speech, Translation and AI-powered reading level adjustment to reduce distractions and adapt content to different reading needs. The extension aims to create a universally supportive reading experience across the web regardless of language, ability or learning style[4].

With the addition of these key features, the students go beyond current state of the art software offerings by encompassing the complex nature of the user population's need and allowing them to more easily accomplish their desired tasks.

5 Impact of Proxy Intervention

Here we provide several concrete examples of how our participatory design by proxy was able to provide valuable feedback for some of the project work in the class.

The group that created ***ReadEase*** did so to make the language on the websites being browsed more accessible. As they worked through the technical aspects of the projects, the proxies reminded the students to revisit the user's original task. Specifically, while the development task was to find a way to rephrase and display the text on the website, the user's task was to gather information from the website. Realizing this allowed them to add additional features, like ad removal, text centering, and other user interface choices that addressed compounding issues that were affecting the users. These changes made the software more successful. Since the students were unfamiliar with the target audience, this process of re-centreing the users' needs was emphasized multiple times. Each time, the students were able to see where their assumptions were sneaking in and the users' goals were getting lost among the technical specifications.

The students working on ***Polish Bot*** decided that they wanted to help individuals with social anxiety and neurodivergent communication send text messages and email with their professors. Again, they researched the packages and technical aspects, but were having difficulties understanding when the community members would feel the need to use the software. Through conversations with the proxies, they were able to better understand the use cases as well as learned the risks that came with a poor user interface like discouraging the community members and taking away their agency. It was possible that through poor design, their tool could make the users question or doubt themselves instead of having them be heard – the exact opposite of the students' intent.

6 Potential Impact on Community, Conclusions and Future Work

While the practice of incorporating real-world projects into courses has been well documented in terms of benefits to students [1, 3], many schools are working towards having these projects benefit community-based non-profit organizations to make a bigger impact [4]. Unfortunately, due to the many barriers of meaningful inclusion, many students require additional resources to fully grasp the diverse needs of marginalized communities. In an ideal world, this education would be able to be introduced through integration directly with community members—but our priority has to be to limit the knowledge extraction and exploitation of these groups. For this reason, we proposed and piloted a program using community proxies as advisors to our students to provide insight for student learning and better software development for these under-served populations. The results from this pilot have shown there is tremendous potential for student growth with repeated interactions with the proposed proxy client. In the future we hope that with the proxies' guidance, the students will be able to safely receive validation on the software projects from community members directly. We also hope this starts a conversation in the CS Education community on this and other approaches.

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[3] https://github.com/doudou2077/ReadEase
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