Life Improvements: DIY in Low Socio-economic Status Communities

Dhaval Vyas
The University of Queensland
St. Lucia, QLD 4072, Australia
d.vyas@uq.edu.au

ABSTRACT[1]

This paper aims to explore practices and motivations associated with do-it-yourself (DIY) in people from low socio-economic status (SES) backgrounds. We carried out contextual interviews with nine individuals who were involved in a wide range of making activities. Our findings showed that DIY processes were centered around improving our participants' existing living conditions and were manifested through two main motivations: sustainable and economical living; and social and community wellbeing. We contribute to the CSCW research in two ways. First, we provide a nuanced view on DIY involving a group of economically struggling individuals that is not well aligned with the traditional narratives. Second, we highlight the societal and economic factors that influenced the specific types of DIY activities that helped improve their existing lives.

INTRODUCTION

Recent efforts in the HCI and CSCW research have increasingly focused on designing technologies for economically struggling individuals and families [4, 20]. In particular, there has been a strong push to look at the empowering aspects of people's lives such as resilience and resourcefulness [4, 20]. Studies have shown that while people with low socioeconomic status (SES) have negative stereotypes attached to them [13], there is a creative and entrepreneurial side to their lives that gets overlooked in research studies. Earlier work on DIY and maker cultures has focused on values [8], care [19], learning and education [10] that maker cultures support. There has been a growing

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KEYWORDS

DIY, low SES communities, HCI

RELATED WORK

Research into DIY has focused on making and repairing of digital and non-digital artefacts. DIY has been shown to foster innovation, creativity, learning and entrepreneurship. [2, 7, 9, 10, 12, 17].

Over the past few years, it has been well acknowledged in the HCI research that while the Silicon Valley type making is an important topic of study, making can take any form and can take place anywhere. There is a growing body of work that seeks to explore novel forms of making from a diverse population, critiquing the area's overwhelming focus on technology enthusiasts. Recent studies have focused on women [5], elderly [14, 16], stay-at-home fathers [1], and under-resourced makerspaces [18].

Recently, this field of research has also seen calls to involve excluded members of the society [17]. Target groups such as refugee children [15], low SES member of the society [21] and people with special need [6] are also emerging as new makers of advanced technologies. A study [18] similar to ours has shown how being involved in a maker organization helped individuals learn work ethics and acquire new skills. voice to expand the current focus of making, as seen in traditional makerspaces, by involving the excluded members of the society [17]. The recent HCI literature has shown new and more inclusive types of DIY, that involved feminist spaces [5], under-resourced community members [17, 18], older adults [14, 16] and stay at home fathers [1]. In this paper, we provide an inclusive view on DIY by focusing on individuals from economically struggling, low SES background.

Using contextual interviews with nine participants, we aimed to understand motivation, practices and circumstances of their involvement in DIY activities. Our participants followed a wide range of DIY activities involving electronics, woodwork, and art-craft based making. Our findings show that DIY practices were strongly shaped by participants' motivation to improve their existing living conditions. We highlight the societal and economic circumstances that had led people into specific DIY activities. There is a need to move away from the stereotypes generally associated with low SES communities [13] and treat people as active members of the society who are capable to create their own future. Based on our findings, we discuss implications for extending DIY research by providing an alternative narrative on 'making'.

THE STUDY

Our methodological orientation in this study was focused on looking specifically at DIY activities. We believe that by looking into such an empowering aspect can help provide an understanding into 'what people can do' rather than 'what they cannot'. Such orientations treat under-resource settings and low SES individuals as an opportunity and not as a problem. Our study took place in Brisbane, Australia where nine participants aged between 38 and 76 participated in an interview study. We explicitly looked for participants who were currently involved in some sort of DIY activities. We recruited participants through word of mouth and contacted two non-profit community organizations. Table 1 provides details of the participants. All the participants were either retired or unemployed and relied heavily on the government and charity support. We organized contextual interviews with our participants in their homes, where they did their making activities. Our questions were related to their overall motivations and workflow of making, tools and skills they used, and the effect of making in their domestic lives and health (and vice versa). We audio recorded the interviews and took photos of their environments. We applied thematic analysis [3] and looked for common patterns across the dataset. We then inductively created categories and themes that will be discussed in the next section.

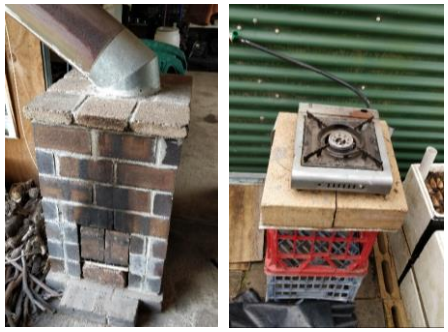
FINDINGS

Sustainable and Economic Living

This theme indicated that a majority of our participants' involvement in DIY and making was motivated towards supporting a sustainable and economic lifestyle. As all of our participants were

Table 1. Participant Details

#	Age (Sex)	Making Activity
P1	76 (M)	Restoration/repair of electrical products
P2	65 (M)	Electrical and electronic products
P3	51 (M)	Electrical and electronic products
P4	76 (M)	Electrical and household DIY projects
P5	52 (M)	Woodwork and household DIY projects
P6	38 (F)	Knitting and art-craft based making
P7	61 (F)	Leadlight making
P8	57 (M)	Electrical and electronic products
P9	58 (F)	Knitting and art-craft based making



(a) **(b)**

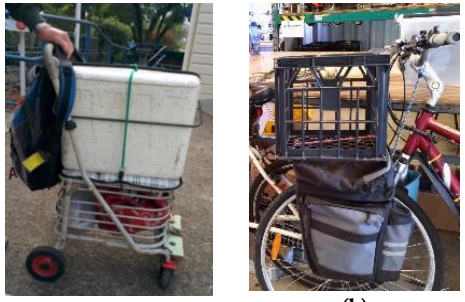
Figure 1. P3's thermal mass heating systems (a) and gas-stove running on a biogas plant (b).

struggling economically, making practices in these cases were driven by our participants' motivations to improve their existing living conditions.

P3 lived in a garage shed of his friend's property. His place would go cold in winters. He lived on government support which was good enough for him to buy food and other everyday used materials, but he was unable to afford a heating system. In response, he developed a thermal mass heating system (Fig 1a), which used specialized bricks that once heated can sustain heat over a longer period. His regular practice during winters was to heat up the thermal mass heater using wood sticks and once fully heated he would close the garage and sleep. Similarly, he also developed a small biogas plant that he used to run a gas-stove (Fig 1b). P3 developed several other DIY technologies that would play a positive role in his existing economic circumstances. DIY in this case was a way to cope with the adverse financial situation that P3 lived in. Both P1 and P2 had health conditions that affected their mobility. P1 designed a trolley (Fig 2a) that can carry food and other items from charity organizations. The trolley also gave him support during his walks. His trolley was appropriated over time, with the main steel frame still intact. He used wheels from a broken lawn mower, and handles and other parts were re-used from different discarded objects. As he had issues with walking, the trolley was used as a support system; where he would often simply sit on it when he was tired of walking. P2 designed a battery powered bicycle - eBike (Fig 2b) that he would use for getting around. P2 got help from a friend who was into the business of e-waste recycling. As a result, P2 was able to build his bicycle for less than AU$200, as everything he used for building it was recycled. The examples of P1 and P2 show how the DIY approaches were strongly influenced by the need to support the health and wellbeing of our participants, while continuing to be economical about it.

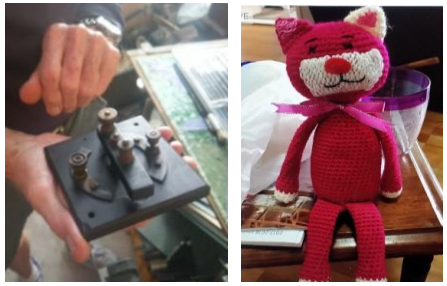
Social and Community Wellbeing

This theme referred to participants' DIY practices aimed towards supporting social and community wellbeing. The examples here ranged from repairing and refurbishing old technologies to knitting and crocheting for family and community members. Some of our participants were involved in a kind of making that utilized tools and techniques that may be considered out-of-date or old fashioned. We observed that there was a strong tendency among our participants to keep knowledge about the use of those tools and techniques alive. P1 did a lot of restoration and repair of old mechanical and electrical products, such as type writers, gas light bulbs, electrical switches (Fig 3a), and record players. He had a large collection of items dating back to early 1900s. He would often bring such products to local exhibitions and city council events to make the younger generation aware of these products. He said, *"Every invention has a day 1. These days we see completely different electrical switches. But the one that I have restored are over a hundred year old….This is one facet of our history that is not being safely captured. There is a lot of technology here that will die when I die."* P1 was an active member in his neighborhood who was very keen to share the knowledge he had. He did repair works for others without charging them any money. P1 spent



(a) (b)

Figure 2. P1's trolley (a) and P2's e-bike (b)



(a) (b)

Figure 3. P1's showing an electrical switch that he repaired and restored (a) and a crocheted toy (b)

most of his time in his garage doing the repair and restoration work. This kept him busy physically and mentally, while also giving him the opportunity to engage with other people.

DIY also had strong social and familial drivers. Our participants connected with their family members and close friends. During our interview, P9 used her making skills as a way to connect with her daughter and grand-daughter. P9 lived alone and had been living a bit isolated from her daughter. She wanted to keep in touch with her family through crocheting stuffed toys that she can gift to her granddaughter. She regularly attended a community center's art and craft service and learned to knit and crochet. As shown in the Fig 3b, P9 designed a range of different crochet toys (using the amigurumi crochet technique).

DISCUSSION & CONCLUSION

In this paper, we joined the chorus that sought to develop alternative narratives around the DIY culture [1, 5, 6, 15, 16, 18]. We particularly focused on understanding what factors motivate people from low SES backgrounds to engage in DIY and how such making is manifested. By looking at their DIY practices of an under-resourced population, we treat them as self-reliant, creative and active members of our society. Previous studies [14] have shown that people involved in creative work generally develop a feeling of ownership, self-esteem and social connection. It was clear from our findings that the kind of making that was seen in the low SES population was driven by their adverse circumstances. Clearly, the examples of making that we have seen here, especially in Fig 1 and 2b are not simple form of technological artefacts; these in fact show the depth of creativity and technological aptitude of the individuals. However, these were not just technological gizmos but there was a deep-rooted need for such creations. For example, the thermal mass heater and bio-gas plants that were developed by P3 were the absolute necessity. This example highlighted the economic side of the participant. Whereas the eBike example represented a solution to P2's mobility issues. Similarly, making was shown to be a social and community-oriented phenomenon where participants repaired and created artefacts for engaging with their family members and the larger community.

One of the main take-home messages of this paper is that making is strongly habituated in the economic and societal structures. The kind of making that was seen in this paper ranged from house-hold objects to repaired and refurbished technologies that may not be useful in the existing times. But these extremes have shown that such diverse examples of DIY serve differing needs of people. As an implication for design, we believe that sharing such experiences associated with DIY and making within a larger community can greatly help towards the upliftment of the community. As we saw, several examples of DIY creations shown in this paper are quite inexpensive way to support everyday needs of people from low SES backgrounds (e.g. heating in accommodation). One can think about designing a platform for sharing insights and experiences that go in making such technological creations. Such a technology can play a pivotal role in not only improving people's technological aptitudes but also improve community building and sharing practices. Overall, we highlight the need to make stronger connections between DIY and resource-limited settings.

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