

EnGendering Design: Implementing Interdisciplinarity

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ABSTRACT

In addition to the ongoing dearth of women and other minorities in STEM fields, there are increasing reports of sexism in Silicon Valley at all levels. Such gendered biases get written into the technologies designers and developers create. We discuss the value developing interdisciplinary connections and gaining in-depth and nuanced understandings of gender theories could have for creating technologies, both to help develop more inclusive and gender-aware technologies and to help make design and tech cultures and practices more gender aware and gender sensitive. In particular, we look at performative and intersectional theories of gender, as well as reflexive and situated methodologies.

Categories and Subject Descriptors

H.5.2 Information Interfaces and presentation (User Interfaces):
User Centered Design

General Terms

Design.

Keywords

Interdisciplinary research; Gender; HCI; Performativity; Co-production; Intersectionality; Reflexivity; Curriculum.

1. INTRODUCTION

Despite decades of research and efforts, including publications, scholarships, conferences, mentorships, apps, and groups aimed at understanding and improving the so-called “gender gap,” the dearth of women in computer science and other STEM fields persists [15, 24]. The efforts aimed at helping women have undoubtedly improved some of the experiences and lives of women studying and working in technology fields. Nevertheless, the recent diversity reports released by large tech companies continue to show low numbers of women (10% – 30 %) and ethnic minorities (<10% – 30%) [22]. There are also increasing reports of sexism in Silicon Valley at all levels, including implicit and explicit biases as well as overt sexual harassment [e.g. 6]. The growth in reports may partially represent the increasing resources available to women in sharing their experiences through the Internet and social media. However, they are also likely tied to the “brogrammer” culture that has become prominent, promoting a

narrow and misogynistic version of masculinity that excludes most women and any others who do not conform [20].

Such gendered biases also get written into the technologies designers and developers create. In particular, the numerical dominance of men in technology fields alongside the prominence of exclusionary forms of masculinity significantly impact what and how technologies are designed and built. Oft-cited and evident examples that show how women and others are not even being considered in relation to technologies include: voice-recognition software that does not recognize most female voices [9]; air-bags designed for a male frame often injuring women and children [9]; more recently, the iPhone 6 being too large for most women’s hands as well as catching and tearing out long hair [27]; and a new Apple Health App that tracks almost everything about user’s bodies, except for women’s periods [25].

When gender is considered explicitly, designers and developers often use reified and stereotyped notions of how men and women differently use technologies. In the case of designing for women, the practice is often to ‘shrink it and pink it’. There are many current examples of such designs, including pink razors, pink Lego, and even pink laxatives marketed to girls or women [29]. Technologies designed un-reflexively or specifically for women also commonly re-inscribe gender roles, norms, and distinctions, such as placing change tables only in women’s washrooms or creating games and other technologies for girls and women based on fashion, sociality, or romance [9, 8]. These technologies may be used and enjoyed by girls and women. However, women’s (and men’s) use of technology should not be limited to or defined by ideas of ‘traditional femininity’ or ‘traditional masculinity.’

We discuss here approaches developed in gender studies, feminist technology studies, and gender HCI that provide nuanced ways of understanding how gender relates to technology. We also discuss the value developing interdisciplinary connections and gaining in-depth and nuanced understandings of gender theories could have for developing more inclusive and gender-aware technologies and to help make design and tech cultures and practices more gender aware and gender sensitive. This paper is based on previous reviews we have made of recent developments in the field of Gender HCI [3, 4]. Here, we provide a broader and more applied perspective, highlighting the value of interdisciplinary research.

2. DOING DESIGN, DOING GENDER

In 1949 feminist scholar Simone de Beauvoir famously stated that “one is not born a woman, but rather becomes, a woman” [12]. This idea entails a distinction between gender and sex, where sex is what one is born with or assigned at birth in relation to reproductive anatomy, sex chromosomes, and hormones. Gender, however, is the performed roles, behaviors, and characteristics associated with femininity and masculinity. For many in Canada, the US, among other places around the world, a person’s gender is

considered to be directly tied with their sex, which is constructed as a male/female binary. This is referred to as an essentialist concept of gender – that persons have an essential gendered-identity tied to an inherent biological identity.

What de Beauvoir’s statement suggests, however, is that there is no necessary relation between being female and being a woman or being male and being a man. At the same time, however, there are certainly societal norms and habits in many cultures around the world that structure an equation between masculinity and being male and likewise for femininity and being female, as suggested above. Yet, a person may also perform a gender that does not fall in the binary categories of man or woman – such third-genders are increasingly being recognized by different states [21]. Gender can then be seen as an ongoing and repetitive performance, often in reference to norms of ‘manhood’ or ‘womanhood’ but not necessarily so [7].

This approach redirects attention from questioning how women and men differently use and interact with technologies, which would suggest we may need distinct technologies for men and women. Instead, it allows inquiry into varying gender and other identities and how these are facilitated or hindered by particular designs. This provides new possibilities for how we understand, develop, and design technologies. Scholars from feminist technology studies argue for looking at gender and technology as “co-produced” [13]. That is, who we are as gendered persons and how technology is used and understood are intimately connected.

For example, even mundane technologies, such as shavers, inscribe ideas about gender – that men want to tinker and women prefer simplicity [30]. This occurs through marketing, advertisements, instructional materials, and the design and functionality of the object itself. The men’s shavers developed in the 1970s and 1980s projected ideas of technological competence, both repeating and reinforcing the idea that men like to and are good at using technology by providing options for adjustability and incorporating various monitoring features on electronic displays. In comparison, the women’s shaver hid the technology by hiding screws and providing no options for adjustment, and was marketed as a cosmetic product, suggesting shavers for women are not technological things and, in the process, women should not like to or need to use technologies [30].

This example illustrates how particular “gender-scripts” can become embedded in technologies, and how these scripts can be read and analyzed. Done unconsciously, these scripts often follow developers’ own behaviors. More specifically, in Europe and the United States, these scripts commonly follow the values and behaviors of white educated males below the age of 55 – the majority demographic of designers and developers [10, 19]. This is clearly illustrated in the examples discussed in the introduction. The notion of co-production and of gender performance allow us to examine and consciously consider what values and behaviors in terms of gender are being written into the technologies we design and build. A wide variety of research in feminist technology studies and science and technology studies also provides many examples of the ways this occurs, pointing towards pitfalls designers could avoid and alternative design values, practices, and ideas that they can incorporate [14, 30].

A conscious attention to gender scripts and co-production suggests even an activist stance is possible in technology design, where designers can “take steps to ask questions that challenge ‘naturalness’ and embedded assumptions” in current and future

technologies [9]. The goal is to move beyond reliance on stereotypes and “regressive” norms in society and explicitly act to change them and consciously include otherwise marginalized groups in technology design and use [2]. We can consciously, for example, produce technologies that incorporate or promote feminine values [26]. This is a different approach than designing technologies for women. Rather, the goal is to include particular styles of usage or learning, for example, often coded as feminine, but for use by users of all genders.

At the same time, by creating such technologies we work towards developing feminine identities and values that incorporate technology – a “technical femininity” [26]. That is, a normalized form of femininity that encompasses usage and skill in relation to technologies that maintain their status as Technologies. Think of the technological status of an oven versus a VCR and their relative association with femininity for the former and masculinity for the latter [26]. Such design practices would work alongside the many and valuable efforts to increase the number of women in technological fields and to promote identities such as “Geek Girls,” by diversifying the ways in which people are able to interact with technologies and diversifying the recognized identities of people who use and make technologies.

3. DESIGNING INTERSECTIONALLY

Margaret Mead’s classic study *Sex and Temperament in Three Primitive Societies* from the 1930s challenged the notion that gender norms are universal, showing how men and women had vastly different degrees of aggressiveness and cooperativity among three different cultures [23]. More generally, gender is only one dimension of a person’s identity and is performed in intersection with culture, race, class, nationality, sexuality, and other facets of identity, inequality, and privilege all with different historical and present realities [11, 16]. Second-wave and liberal forms of feminism focused primarily on “Western” middle-class women’s lives, experiences, and concerns, treating them as universal. However, the experience of being a black woman in the United States, for example, is different than that of white woman. There are certainly shared or overlapping values, experiences, behaviors, but these identities are not reducible to one another.

More generally, there is more than one way of being a woman or a man, which is equally true for developers and users. Attending to multiple forms of identity allows us to explore people’s behaviors, values, and interactions with technologies in more complex and detailed ways. Considering how gender varies cross-culturally is a useful way of countering tendencies to rely on stereotypes about masculinity and femininity and works against reducing users to single dimensions of analysis and designers and developers to a single ‘brogrammer’ or even ‘geek’ identity.

The consideration of multiple and intersecting identities can also be extended further to consider the ‘lived body experience’ of different persons, which “attempts to understand an individual’s unique viewpoint in the context of a particular history and culture” [26]. The point is to understand a person’s experiences as they are lived, concomitant with the messiness of identities and situations. This works against assumptions about how a person does or should use a particular technology according to their categorical situation - being a woman, being white, being poor - to focus on how users (people) use technologies in action, fitting well with user-centered design and more ethnographically-based methods such as contextual inquiry. It allows for the design of a wide variety of lived experiences and identities.

An intersectional approach also highlights that designers and developers may hold different values than the intended users. In a concrete study of the use of VOIP and other communication technologies for long-distance relationships in an Arabic cultural context, Alsheikh et al. argue an “Islamic feminist model” that recognizes the agency that women gain in following and submitting to Islamic practices and laws, thereby becoming pious subjects, is likely more relevant for users [1]. They suggest designing VOIP and social media technologies in ways that give women the choice of enacting piety or not by giving them control over what and how much information about themselves, their accounts, and their social networks are shared with their husbands, families, and others [1]. This is contrasted with a “liberal feminist” approach, more familiar to “Western” designers and developers, which would focus on the imbalance of power that is exhibited in women’s choices to veil or to share their passwords with their husbands. The Islamic feminist model provides a culturally and religiously relevant approach to supporting gendered usages of these technologies.

This points to the importance of considering the particular contexts where and when technologies are used, and the people who use them, as well as for designing in ways that allow for future, unforeseen contexts, identities, and usages. Increasing the diversity of tech teams is an important goal and will certainly offer new insights in to women’s perspectives and lives and increase the overall diversity of perspectives and ideas being incorporated into technologies. However, an intersectional perspective also suggests women developers and designers cannot represent the perspectives of all female users. Streams of HCI such as Universal Usability/Design for All, which argue for the importance of facilitating technology usage by a diversity of users in terms of abilities, skills, and preferences, represent already existing efforts in HCI to design for future technology usage [28]. An intersectional approach provides a way to understand identities, subjectivities, and behaviors (i.e. diversity), pointing to considerations for facilitating current and future variation across the world in terms of technology usage and social interaction.

4. REFLEXIVE METHODOLOGIES

‘Objectivity’ has long been a hallmark of scientific inquiry and technological development. Technologies are evaluated based on seemingly ‘objective’ measures by an unbiased and distant observer, such as efficiency. Yet, as with the examples in the introduction, many technologies are nevertheless embedded with gender- and other value-scripts – assumptions about who interacts with technologies and what kind of people they are, often modelled on the designers and developers own assumptions, behaviors, and values. More generally, knowledges, designs, and technologies that are produced are most definitely done by particular people in particular places and times [17, 14].

Aiming to understand and explore the particularities of knowledge and technology production, anthropologists and feminist scholars have developed reflexive approaches to understanding of and explicitly discussing one’s own position. This is not meant to do away with scientific forms of research or technological development, but to make them more accountable and situated. At the same time, the goal is not to create a more strongly objective research, but to consider and evaluate what gendered and other identities, behaviors, and values might be facilitated and hindered by particular design practices, questions, and products.

This suggests new methods for development and design that explore developers’ own positions in terms of gender, culture,

ethnicity, etc. and consider the ways such a position shapes the particular design questions, interactions, and technologies that are being produced. This is also facilitated by an intersectional approach to identity, discussed in the previous section. Of course, it is not always clear or straightforward to understand what is being inscribed into technologies and users may themselves make use of technologies in unscripted ways. Nevertheless, if designers and developers can build an understanding of theories of gender, technology, and identity they simultaneously build a vocabulary and way of understanding themselves (and others) as situated persons with multiple facets of identity that they perform in certain contexts and in relation to certain social norms.

Acknowledging that designers and developers have particular identities and positions also breaks down distinctions between users and developer/designers and points to the value of more participatory forms of development and design. Developers, designers, and users can collaborate to create more useful and relevant technologies, which are inevitably themselves situated in particular contexts. Numerous HCI scholars addressing the concept of gender and other dimensions of identity also point to the Participatory Design movement originating from Scandinavia as a means of engaging different groups into the design process [2, 18]. Agile, iterative, and user-centered processes are also useful in this context. These focus on ongoing and repeated stages of design, development, and testing in interaction with users, allowing design to be more of a collaboration and discussion involving users and their varying and complex subjectivities. Reflexively considering the designers’ own position and contribution, however, makes the relationship explicit and accountable. By being reflexively aware and accountable of how one is situated in relation to users, design practices, and technologies themselves contributes to a more diverse, accountable, and engaged process of design.

5. TOWARDS INTERDISCIPLINARITY

We have discussed three nuanced approaches to gender developed in social science fields that should be considered in relation to technology design and development: treating gender as something that is *done* rather than something that *is*, seeing gender as done in multiple ways in intersection with race, culture, class, etc., and reflecting on designer and developers own gender identities. We have proposed elsewhere [5] a Gender HCI module that centers on these three topics, to integrate as part of HCI and computing curricula, as one way to integrate interdisciplinary knowledge with technology design and development. A great deal of excellent theoretical work is being done in Gender HCI towards combining HCI and the theories on gender discussed here, among others. Scholars with cross-appointments, earlier degrees in different fields, and diverse research interests all can provide bridges between computing and social sciences.

Continuing and developing more interdisciplinary connections in research and teaching can help situate the technical knowledge on which computing is centered. Learning and understanding theories developed in the social sciences, particularly relating to gender, can make designers and developers more self-aware of the identities and values that they perform in interacting with others, as well as those they are embedding in their technologies. This brings to the forefront the possibility exploring and widening the identities that are seen as normal in computing, beyond ‘brogammer’ and ‘geek,’ while recognizing the significance of those identities for many in computing.

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