

*Alice Ashcroft (2021): Gender and Discussion in Innovation Design. In: Proceedings of the 19th European Conference on Computer-Supported Cooperative Work: The International Venue on Practice-centred Computing on the Design of Cooperation Technologies, Reports of the European Society for Socially Embedded Technologies (ISSN 2510-2591), DOI: 10.18420/ecscw2021\_dc002*

*Copyright 2021 held by Authors, DOI: 10.18420/ecscw2021\_dc002 Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers, or to redistribute to lists, contact the Authors.*

# Gender and Discussion in Innovation Design

Alice Ashcroft

School of Computing and Communications, Lancaster University  
*alice.ashcroft@lancaster.ac.uk*

**Abstract.** When it comes to gender and design there seems to be a gap in the literature focusing on the effect gender has on discussions which influences the design decisions being made. This research aims to uncover if there is any effect, and then how this can be mitigated or used to the advantage of the users. So far, this research has looked at the conversations which has taken place, and the aim going forward is to look at the products being designed and to uncover how gender may have played a part in their creation.

# Background and Motivation

## Gender Diversity in Computer Science

In 2018, women made up just 22% of the STEM workforce (WISE, 2019b), with just 16% of the workforce of IT professionals being female. Furthermore, women in STEM apprenticeships are slowly increasing in numbers, but completion is continuing to drop (WISE, 2019a). The proportion of gender in the workplace is significantly different from the audience they are building for.

The effect that the team creating designs and products have on users cannot be overstated. Furthermore, a lack of diversity has shown again and again the major impact that this can have on products and technology released to consumers. For example in 2015, an article was published by the BBC after the launch of the Apple Watch voicing concerns of consumers with tattoos that features such as heart rate sensor did not function correctly, labelled as ‘TattooGate’ (BBC, 2015). The BBC also stated that ‘it can also happen to people with dark pigmentation or black skin’. How a product as highly anticipated as the Apple Watch made it to market with such discrimination built into it is highly suggestive of a lack of diversity in its design.

Often when gender and design are discussed, the problems raised concern a lack of women as designers or developers (Rode, 2011), but there is little on ensuring full gender representation when it comes to users. This issue is critical to consider; as it is not just women who make up around half the design or development team, but the users themselves. The possibility that the women’s contribution to design and innovation should be regarded as important if not fundamental, seems indicative of bias continuing into design processes. Women are, and should be given, equal opportunity to be designers and users, and contributions should be encouraged and supported. As such, this research aims to outline and consider how gender roles play a part in innovation and design with regard to users, as well as designers, by examining any gender differences in design innovation workshops. There are other studies considering Conversation Analysis (CA) and gender e.g. Stokoe and Weatherall (2002), but a much more limited number on how this ties in to innovation and ideation. Consequently, this research has focused on how gender, as an example of diversity, can effect design decisions being made, particularly when it comes to group conversations during the ideation stage of a project.

## Research Questions

Throughout the research so far, these questions have adapted and fluctuated between more broad and very specific. At the time of writing, the current research questions are:

- How does gender influence group design discussions?
- In a group setting, how does the gender diversity of the group effect the product that is created?

## Methodological Approach

Participatory Design (PD) as an innovation workshop, is the act of involving stakeholders in the design process to ensure that all requirements are thought out and well designed and implemented. As a methodology, PD has been used to format workshops (Hansen et al., 2019), which is how it was used in this study. Hansen et al. (Hansen et al., 2019) state, their claim “is not that PD is superior to other approaches” but that an increased interest in HCI should be matched by an increased interest in PD. However, their paper holds a variety of reasons as to why PD is the only way to achieve a design which both users and designers would be able to work with, and other literature supports this. Hansen et al. also state that PD is “not merely a collection of participatory methods or about having an ethical standpoint in design, but an approach to generate effects related to democracy, empowerment, and quality of process and product” (Hansen et al., 2019) which supports any interest in diversity and design through PD. This research aims to uncover to what extent gender is a factor within conversation with group or co-design being used as a framework, as well as the effect that this has on its suitability in organisations. PD in this study was used more as a methodology than as an ideology, therefore the main focus will be on the design groups and innovation.

Innovation has been defined as the creation and adoption of an idea, a product, a technology, or a program that is new to the group using it (Gupta et al., 2007). In line with this, (Fagan, 2004) describes innovation as being able to be focused on one of three areas: person, process or product. Ideation in the context of this study, will focus upon innovation in products. Generating ideas, which could be linked to people or process, with the understanding that the act of creating the idea itself will often, but not exclusively, lead to a product.

### Workshops

Since design is often staged through workshops supported by collaboration and cooperation, it is important to consider the effect that gender has on research method. Balka (1997) extended the “analysis of gender as a factor in participatory design initiatives”, and achieved this by focusing on “the challenges of implementing PD in the context of non-profit feminist and women’s organisations” (Balka, 1997). The main challenge encountered in using PD as a framework for design in these organisations was how this process fitted into the organisational structure at large (Balka, 1997). This is particularly relevant to this research within a University setting, as if only a subsection of diverse groups are surveyed and given opportunity to be involved in the process of design, then the products and services made available to students may not be suitable for all. Moreover, overall Balka (1997) supports the argument that PD is “likely to fail unless the gendered nature of expertise is recognised”.

The methodology of PD, has a set structure given that it is a research methodology (Spinuzzi, 2005). This three-stage method includes; “initial exploration of work”, “discovery process” and “prototyping” (Spinuzzi, 2005). In this study of design, the method of “initial exploration” was in the form of an innovation workshop. Innovation Workshops are a style of focus group, where participants are encouraged to adopt an innovative and creative thinking style. In this particular case this included; independent ideation around problem areas, followed by collaborative grouping. The “discovery process” was done through independent ideation of solutions around those problem areas, with the “prototyping” being carried out by the group at large. Ideation, in this instance, refers to the process of noting ideas around a topic on a sticky note. Many innovation workshops are based around this method of ideation; the differences lie in the topics of ideation and how these are derived (Silverstein et al., 2013).

## Online Workshops

Due to the COVID-19 pandemic, workshops are no longer able to be run in person, so these will now be happening online and therefore each stage of the workshops must be redesigned to work online. Below is an outline of how this will happen in the first instance, with an understanding that this may need to be adapted after the first workshop is run.

The first stage is problem ideation, which involves generating problems around a specific area. When the workshops ran in person, participants are asked to write down, individually, on sticky notes as many problems or issues as they can which relate to the workshop theme. Participants are then asked to present their problems to the group, as they would have done had the workshop taken place in person. Once all the problems have been shared, participants are then asked to categorise their problems. When in person, this normally involved asking participants to come up with problem areas/categories as a team and then to sort all their problems under these categories, physically with the sticky notes. Now this is happening remotely, these categories will be achieved through discussion, and then shared to the call’s chat for reference. In the past workshops that have been run, individual ideation took place using sticky notes and placing these under the list of categorised problems as prompts. When running these workshops remotely, participants are asked to individually ideate using the categories as prompts. They are then be asked to present these.

The next stage, involves consolidating ideas and then ranking them between “really helpful” and “would be nice”. When in person, this took place by rearranging a lot of sticky notes. However, instead of this being a physical activity, the focus is more on the discussion and participants are asked to discuss each idea and then to select their top three.

When participants have selected their top three ideas, they are then asked to design these. This would normally be on a large sheet of combined paper, where they all have a pen and start designing. Whilst an online group design tool is being

selected and passed through ethics approval, individual design is to be carried out. Participants are each given five minutes for each of the three ideas to draw how they think this idea would work. Once the design has taken place, the participants present their ideas to the group.

## Analysis

Building upon the research and literature surveys of Stokoe and Weatherall (2002) and Sidnell (2010), CA as a means of evaluation is well rehearsed. “CA provides the tools to explore in fine detail how issues around gender are occasioned in talk” (Stokoe and Smithson, 2001). However, this practice focuses on how things are said, and the interactions between participants. This study aimed was to find the role gender played in a group setting with regards to innovation and PD. Therefore, as well as understanding how interactions took place, there also needed to be a focus on what was being said. In looking at the way participants interact with one another, it is important to understand the more subtle differences in language. Stokoe and Smithson (2001) state that CA is a “fruitful way of exploring links between gender and discourse”, because “rather than imposing the analyst’s assumptions on to the data in which gender may be relevant, CA focuses on what participants themselves focus to talk on”.

Thematic analysis is used to extract themes from a text, or “thematic analyses move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes” (Guest et al., 2012). A combination of Thematic Analysis and CA has been used throughout this research to help understand what is being said in a group context, as well as how it is being said.

## Findings to Date

### Hedging

Hedging is the term referring to the linguistic style of ‘hedging’ your bets with phrases such as “I think”, “you know” and “sort of” (Holmes, 1986, 1990; Murphy, 2010). Murphy (2010) states that “the use of hedges among females before a key word” is used “to avoid the appearance of playing the expert”. Holmes (1990) recognises as well that the context used around hedging also plays a large part in its practise. For example, Holmes (1986) also states that hedging has two purposes, either to express speaker confidence e.g. “you know” or “reflecting uncertainty” e.g. “I think”. Hedging is recognised as a “significant communicative resource for academics” (Hyland, 1996) although Hyland (1996) also recognises that is used by academics. They classify “scientific hedges” into various categories as a means of analysis, and conclude with the statement that hedges “constitute an essential element of argumentation in presenting new claims”. This may be especially important to consider when asking groups to present their ideas to one

another and to reflect on how these are used as either a tool to show certainty or uncertainty, as stated by Holmes (1986). More recently, Gribanova and Gaidukova (2019) also suggested that the style of hedging carried out can be used as a tool and is quite often done so politically.

Dixon and Foster (1997), found that hedging was used the same number of times by both genders, contradicting what was found by Holmes (1986). They did however find that the results based on the gender of the audience of the speaker had a significant influence on “their use of epistemic sort of and confident you know.” A study conducted as part of this PhD research found that hedging was used differently by men and women, but due to the sample size, no statistically significant differences were able to be concluded (Ashcroft, 2020b).

## Group Dynamics

Other workshops have found gender differences displayed with regards to problem raising, apologetic language, asking for help, hedging and group practices such as writing and turn-taking are all indicative of gender differences in group design processes (Ashcroft, 2020a). This ties back into the discussion around hedging made above where it is important to recognise the position of the talk and to understand the context (Holmes, 1990). To deconstruct the effect gender has on this process, each of these areas must be taken and investigated in further detail. Due to the small sample size, it is important to test if these issues would still hold when applied to a large proportion of the population. This study does however stand as a strong foundation for this research and gives direction in where thought should be applied. For example, would apologetic language still be used in single-gendered groups? Would turn-taking still happen by simply going around the table but without a leader, or would a woman step forwards and lead the design? And then depending on the outcome of this, what can be done to allow equality or equity in a group setting? It is vital that these questions are looked into in further detail in more extensive research to ensure that design workshops are carried out in a way that is sensitive to all genders.

## Next Steps

The next steps for this research is to focus more on the designs being done by participants in the workshops, and look at the potential physical differences in the designs are changed based on the gender diversity and interactions which take place in the design groups.

## References

Ashcroft, A. (2020a): ‘Gender Differences in Innovation Design’. *OzCHI '20, December 02–04, 2020, Sydney, NSW, Australia*.

- Ashcroft, A. (2020b): 'Hedging' and Gender in Participatory Design', no. 1986, pp. 176–180.
- Balka, E. (1997): 'Participatory design in women's organizations: The social world of organizational structure and the gendered nature of expertise'. *Gender, Work and Organization*.
- BBC (2015): 'Tattooed Wrists Can Stop Wearables Like The Apple Watch Working'.
- Dixon, J. and D. Foster (1997): 'No Title'. *Journal of Psycholinguistic Research*, vol. 26, no. 1, pp. 89–107.
- Fagan, M. H. (2004): 'The influence of creative style and climate on software development team creativity: An exploratory study'.
- Fita, A. (2020): 'How to run a remote brainstorm'.
- Gribanova, T. and T. Gaidukova (2019): 'Hedging in different types of discourse'. *Training Language and Culture*, vol. 3, no. 2, pp. 85–89.
- Guest, G., K. MacQueen, and E. Namey (2012): *Applied Thematic Analysis*. SAGE.
- Gupta, A. K., P. E. Tesluk, and M. S. Taylor (2007): 'Innovation at and Across Multiple Levels of Analysis'. *Organization Science*, vol. 18, no. 6, pp. 885–897.
- Hansen, N., C. Dindler, K. Halskov, O. Iversen, C. Bossen, D. Basballe, and B. Schouten (2019): 'How Participatory Design Works.'. *Proceedings of the 31st Australian Conference on Human-Computer-Interaction*, vol. 45, no. 4, pp. 675.
- Holmes, J. (1986): 'Functions of You Know in Women's and Men's Speech Language in Society'. *Source: Language in Society*.
- Holmes, J. (1990): 'Hedges and boosters in women's and men's speech'. *Language and Communication*.
- Hyland, K. (1996): 'Writing without conviction? Hedging in science research articles'. *Applied Linguistics*, vol. 17, no. 4, pp. 433–454.
- Murphy, B. (2010): *Corpus and sociolinguistics : investigating age and gender in female talk*. Amsterdam ; Philadelphia: John Benjamins Pub. Co.
- Rode, J. A. (2011): 'A theoretical agenda for feminist HCI'. *Interacting with Computers*.
- Sidnell, J. (2010): 'Conversation analysis'. In: *Sociolinguistics and Language Education*.
- Silverstein, D., P. Samuel, and N. Decarlo (2013): *The Innovator's Toolkit*. Hoboken, N.J.: Wiley, 2nd edition.
- Spinuzzi, C. (2005): 'The methodology of participatory design'. *Technical Communication*, pp. 163–174.
- Stokoe, E. H. and J. Smithson (2001): 'Making gender relevant: Conversation analysis and gender categories in interaction'. *Discourse and Society*, vol. 12, no. 2, pp. 217–244.
- Stokoe, E. H. and A. Weatherall (2002): 'Gender, language, conversation analysis and feminism'. *Discourse and Society*, vol. 13, no. 6, pp. 707–713.
- Whear, L. (2020): 'Break out rooms are the actual worst part of being a student in 2020'.
- WISE (2019a): '2018 Workforce Statistics - Welcome to the WISE Campaign'.
- WISE (2019b): 'Women in STEM Apprenticeships 2017/18 - Welcome to the WISE Campaign'.