IN PURSUIT OF MEANINGFUL INSIGHT; COVID REMOTE COLLABORATION AND DESIGN AS PROVOCATION

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ABSTRACT
Conducted from June 2020 until the time of writing, this design research activity was conducted as part of the 3 year, H2020, Pan European TInnGO project which aims to create a sustainable paradigm shift in gender and diversity mainstreaming in transport. Such a shift is needed due to the lack of sex disaggregated gender data, gender gaps in employment and decision making and women in STE(A)M able to rise to leadership positions. This lack of diversity at all levels of transport, together with difficulties in engaging 'hard to reach groups' in transport planning, means that transport services and innovation continue to fail to consider gender and diversity. This would also encourage design input into future transport.
A central concept of TInnGO was to use design activities as provocations and ways to engage with people in new ways – e.g., through visualizations, vignettes and cocreation activities – to develop greater insights into mobility problems and drive gender and diversity sensitive smart mobility solutions. Led by Coventry University, it was anticipated that this would entail management and leadership of codesign sessions in 10 Pan-European hubs.
The Covid-19 pandemic significantly disrupted plans, making travel, physical co-design and contact with vulnerable groups impossible. The paper discusses strategies developed to work with placement students to develop gender and diversity sensitive smart mobility design provocations based on information provided by national hubs, and the technological challenges computer supported co-operative design posed.

Keywords: Codesign, computer supported co-operative design, teamwork, student learning, transport

1   INTRODUCTION
The application of visual design (and other creative media) to present concepts or working ideas is a widely accepted methodology in industry and design education. Using design to induce a response, that can break down barriers to discussion is less common outside of design studios or education where citizen insight is highly prized. Transport planners and local authorities still find citizen engagement difficult, especially with traditionally hard to reach groups. As such, the views of those groups may not be considered. Breaking this cycle is important if future transport is to be inclusive.
The TInnGO project sought to demonstrate the value of collaborative or participatory design, in breaking down barriers, engaging new and different dialogues centred around the conceptual design of gender and diversity-sensitive smart-mobility products based on local needs. A portfolio of design concepts would demonstrate the role of design thinking in a technology and science led sector.
TInnGO's co-design model centred around 10 national EU hubs, recruiting and training citizen scientists meeting in local 'design studios' where they could discuss mobility problems, turn initial ideas into briefs or mind maps which could be transformed into sketches, by designers from the UK hub shared via our Open Innovation Platform (OIP)[1] – a web-based gallery and forum. These could be presented back to the group and other interested parties as design provocations to elicit further, deeper insights based on collective mobility experience, progressing an iterative design cycle. The concepts, termed as

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[1] https://oip.transportgenderobservatory.eu/

'design provocations', are used to 'initiate critical reflection on issues that are often overlooked, obscured or accepted as natural practice' [1].

From March 2020, Europe-wide rolling lockdowns made it impossible to follow the original plans. Rather than active engagement (including visits to European hubs, street interviews and focus groups with vulnerable transport users) we worked remotely with TInnGO's non-design partners, who tried to generate design briefs using their understanding of local users and situations (gained from initial project research) and comment on initial sketches, acting as proxies for end users.

Our distributed student design team (based in Indonesia, Spain, and India) had to develop empathy/envisage the problems of vulnerable user groups in different European cities based on (a)synchronous communication via MS Teams, Mural and Zoom. Design provocations were uploaded on to the OIP for comment by the wider 'nondesign' TInnGO community, using a discussion-board format who mostly have no design background.

Students denied access to the university premises (design studios, equipment and modelling) worked asynchronously at a distance supported by online tutorials and weekly critiques using 'MS Teams'. The initial brainstorming stage relied on Microsoft Teams, Zoom and Mural – all of which can become disjointed, due to bandwidth lag, working across different time zones, and isolated activity. Working with the limits of our devices (none of which were designed to support continuous remote working), we have noticed how the technology interferes with the organic free flow of ideas that might occur when co-located. Based on our 10 months experience we discuss the insights/barriers we have faced in relation to 1) communication with non-designers, 2) extent to which IT solutions can accommodate design activities, 3) development of empathy at a distance, 4) design skills gap 5) design as a provocation to encourage deeper thinking and engagement.

2   COMMUNICATION WITH NON-DESIGNERS

It is important to clarify the meaning of 'non-designer' in the context of TInnGO. The project is formed from a large multidisciplinary EU-wide team comprising of academics, local authorities, transport organisations and SMEs brought together to create a paradigm shift in gender and diversity in the field of smart mobility. The project requires a number of designed outcomes, informed by the collective experiential problems of hard to reach citizens who experience mobility problems. The term 'non-designers' refers to anyone not trained in design language and methods of communication used by design teams. It does not mean that citizens or project members are not designers.

Ideally design challenges should originate from citizens, for whom illustrating a concept or visualizations may be unfamiliar and lack of design literacy may prevent contribution. Design literacy refers to the 'basic skills that are well within the full range of everyone's cognitive capabilities and serve our everyday needs' [2, p9]. Therefore, a lack of formal design training is not seen as an inhibitor to expressing ideas. We aimed to experiment with how the medium of design could enable different flows of communication and insights – as opposed to more traditional, verbal, or written forms of citizen engagement, surveys and focus groups. In the process outlined above 'non design colleagues' acted as informants, clients, co-designers and critics. Difficulties arose in relation to:

- Articulation of a design problem – generally in relation to lack of preparation, so generic images were downloaded from the internet to provide context (e.g., a city street).
- Lack of understanding or ability to convey the mobility problem in sufficient detail for design activity to be meaningful.
- Reluctance to share an idea visually, instead referring to typed text or in conversation.
- Preoccupation with the operation of the software, spelling/typos rather than generating ideas.
- Lack of ability/willingness to provide feedback to young designers or understanding the importance of this engagement for moving out of conceptual design phases.
- Learning how to express their issue or idea, objectively, without personal experience bias.

From the perspective of the student designers, additional difficulties related to:

- Communicating with experts in other fields e.g., engineering, computing, human factors AND those from admin, evaluation in different language.
- Understanding how their visual design communications, varying in scale and context would not be obvious to someone unfamiliar with drawing conventions used by designers.
- Needing to move out of inexperience and comfort zones to respond to the needs of the user group, presented the difficulty of designing for the 'actual other' not 'presumed other' or self.

- Challenge the relevance of a design requirement
- Overprotectiveness and defensiveness over feedback which was experienced in isolation
- Not rushing straight to a design solution – but looking at a wider systems approach

Previously, the authors have positioned the role of future-responsible development as a hybrid, a combination of multiple needs into a cohesive whole [6]. This hybrid progresses the typical perception of users, or designers, or researcher; rather we are all these things, to a lesser or greater extent. Yet, when viewed through the lens of a global crisis and isolated working, restricted empathy compromises the sense of group spirit and leads to miscommunication or reluctance to contribute that ultimately harms the design process, a factor that impacts upon the students training since they are not receiving the visceral responses that would otherwise have been proffered.
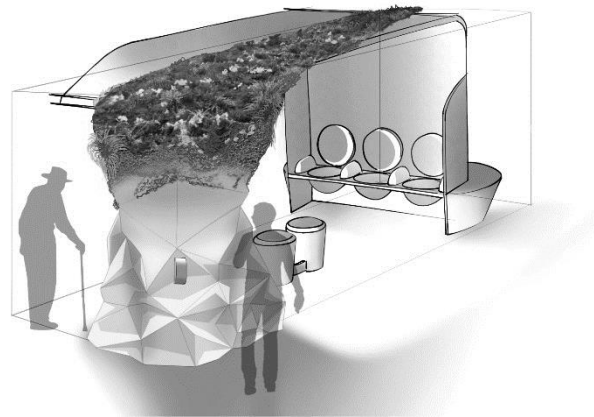

Figure 1. Bus Stop Information Panel, Solenza Lazar (2020)

3 DESIGN AS PROVOCATION TO ENCOURAGE DEEPER THINKING AND ENGAGEMENT

As a learning experience, we encouraged the interns to develop a naturalistic style of their own. When asked to provide feedback on the design communication from the design interns, non-designers found some material difficult to understand. We produced a variety of formats, from rough sketches to detailed 3D rendered views, referred to as 'design provocations', to stimulate debate. Figure 1 illustrates the type of concept generation that expresses an idea, not a finished design. The 'ghosted-in' figures are intended to illustrate scale, whilst text annotations describe the concept. The design intentionally introduces a different aesthetic to the existing waiting stop design and the combination of different styles shown in Fig 1 are intended to provoke a viewer response. The annotations are often written in 1st person, lacking business language, in a social media form that requires significant editing. Indeed, this informality is present when speaking with partner hubs, in emails and during weekly design review meetings. This tendency has almost certainly resulted from restricted contact with external parties. When artwork is posted on the OIP we noticed reluctance from others to comment, critically or constructively, about an image that is observed 'online' rather than witnessed in person, where subjectivity would normally have enabled viewers to construct meaningful feedback.

It is not uncommon for design sketches to exaggerate form, but we have been mindful to show work with the minimum of extraneous communication. It is unclear whether the reluctance is attributable to inexperience or whether the current trend for hyperrealism (i.e., Pixar etc.) in rendered images (Fig 3) has in some way skewed the expectation for a 'designed' output. In this case, our experience of an in-person, 2D sketch and 3D sketch model are more powerful media with which to communicate in context and for viewers to evaluate a solution to real world problems. Visual narratives can convey the user experience (UX) of a design concept, and indeed the storyboard technique in Fig 2 shows how viewers can be guided through steps of that design. In contrast, a semi-realistic design provocation, perhaps erroneously suggests that feedback was unnecessary.

We have previously stated the high value of co-creating understanding and collectively seeking solutions, as a more meaningful and inclusive means to prevent stigma. The system around the problem and solution convergence differs to the traditional elitism of the creative arts, thus enabling the capability of experience to improve futures. So, fundamentally things have changed when we are all

designers/hypothesizers/creators. Glancing to design history, acclaimed Industrial Designer, Raymond Loewy, sums up design as *"a simple exercise; a little logic, a little taste, and the will to co-operate."*[2] That was at the height of the excitement of a new machine age. Is design perceived differently today? User values may be similar, when we venture past the glamour and excitement of the new; essentially a solution should, in some way, improve our lives, to paraphrase, one potato peeler at a time[3] even if assistive technology status can become a commercial paradox.
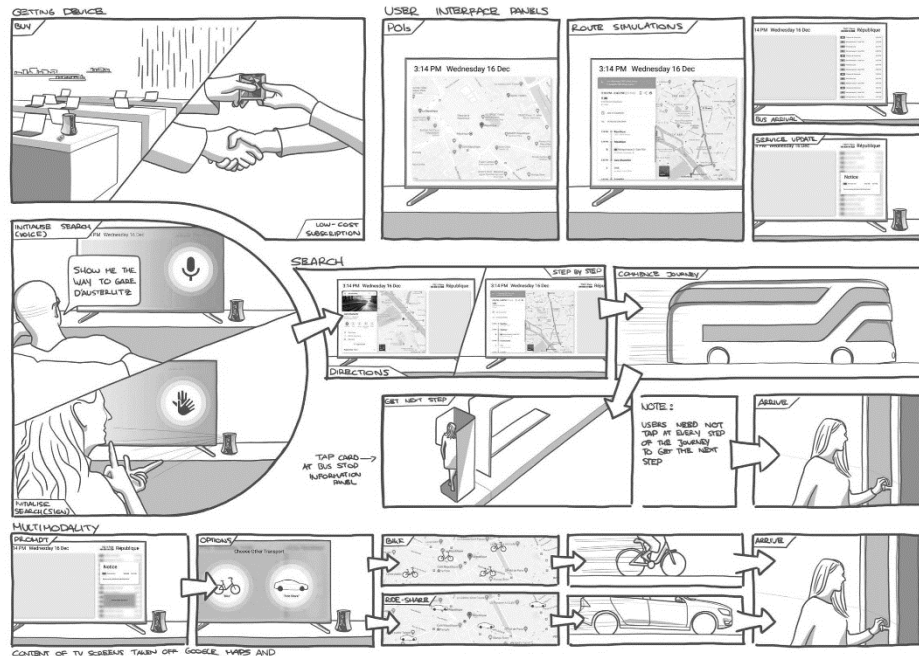

Figure 2. Story boarding, Ronald Jurianto (2020)

Perception then, remains of high importance to a consumer and since design students will ultimately be faced with the notion of commercially acceptable solutions, their ability to move beyond novice skills is paramount. Agile design education can address gaps which may have long lasting impacts. Intern designers are novices using design education as their 'window' to a dynamic industry, that to be fully representative needs the behaviour found in industry. Our experience shows that the COVID-19 pandemic has impacted on design student's exposure to training, and they have had to learn to shift to a predominantly self-directed methodology outside of the usual design studio culture; it is remarkable that the students have adapted and led the development of new methodology but there will be experiential gaps that are hard to fill.

4 EXTENT TO WHICH IT. SOLUTIONS ACCOMMODATE DESIGN DISCUSSION

During lockdown many have become accustomed to, and reliant upon, videoconferencing as a normal way of working or more generally communicating. In this section we look at some issues related to using Microsoft Teams as a means of discussing/critiquing concept designs with students. Here the limitations of internet connectivity, hardware and software have significant effects when working with a small, globally distributed team. Rushing into lock down no one had a perfect, state-of-the art system; no one was a technical expert; everyone had to manage their own local connection. Students (and staff) had to learn to transfer their sketches into a format which could be seen and understood on a shared screen. Confining the medium to this 'window' on thinking may have affected mark making, annotations and what they chose to show. It became harder to understand design progression, than if looking over a sketch book, or mock-up models and objects.

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[2]https://www.raymondloewy.com/about/quotes/
[3]OXO,https://www.fastcompany.com/90239156/the-untold-story-of-the-vegetable-peeler-that-changed-the-world

Connection stability has been an issue. In prioritizing the need to hear the students, see the designs in a larger format and reduce lag, cameras and sometimes microphones were turned off. This effectively reduced telepresence - facial expression, tone of voice and other aspects of presence, such as clothing; face-to-face communication is rich because it includes deictic elements and objects, which are visible to all participants [3,4]. The fact that we were not in the design studios, surrounded by design ephemera was a clear disadvantage.

We had to experiment to find solutions which worked for us. Previous research [5] has looked at the social factors in teleconferencing in educational environments. The TInnGO design team comprised of lecturers and student designers, so student learning was a key element. [5] stressed that the educator is essentially "responsible" for the group's bonding, guidance, and progress of the learning process; and emphasized that the development of social skills is more easily fostered though direct communication.

In our work, collaboration differed to that of lecture or tutorial delivery. There was therefore a big learning curve. Students and staff needed to cohere as a unit, develop trust and understand the nature of the work (i.e., to develop gender and diversity smart mobility concepts). We then had to present design 'provocations' in a short period of time which could be used by other members of the project. [5] found evidence of awkwardness, anxiety and stress as people start to become familiar with each other and the technology and highlighted the role of the educator in creating atmosphere around interaction and performance. In our small group, the students were initially shy and reticent – learning how to present designs within the technology; their first experience of contributing to a project, of which they did not retain control. Although we set individual projects, over the course of a couple of months they started to work together and defend each other's designs. This was unexpected and does not have a direct equivalent when we have conducted local internships. This may indicate a protective instinct over their remote social group and development of remote social skills as a future skill for designers, who need to empathise with subjects and benefit from intra-empathy, which may differ to collaboration when in local competition.

Figure 3. Bus stop design, Sanjeevi Suganthi Pugazhenthi (2021)

Are we seeing the limitation of telepresence as a creative tool? Stability aside, the digital methods did not match the analogue activity of a post-it on a wall or the cardboard sketch-model. We are of the shared opinion that there is no substitute for the large roll of paper – it can be drawn on, cut up, things stuck to it - not just digitally observed. Digitally capturing and recording the flow of design ideas is difficult. For design research it is important to see ideas – in any form. In a physical studio there would have been more of a sense of immediacy, materiality, and ownership and of seeing ideas emerge and blossom. This sharing and sense of achievement was missing. Lack of group copresence has severely hampered spreading design insights and understanding the value added of design.

5   EMPATHY AT A DISTANCE AND DESIGN SKILLS GAP

Development of empathy is a challenging task and typically comes with maturity and experience. Design students are frequently required to design for others, which requires clarity, rather than biases from limited life-experience preconceptions. On reflection, a number of normal activities that have been unavailable due to lockdown impacted the student experience due to:

- Lack of tactile modelling – students are reluctant to make models or have no local facility in which to 'make'. Feedback gained from interacting with prototypes and sketch models is lost.
- Lack of self-motivation and speed, without the sense of 'competition' found in studios.
- Lack of visible body language with cameras turned off, that would allow designers to adjust their 'pitch'. Establishing the skill to read the audience is vital for professional practice and interviews.
- Lack of access to end users, who are able to define their needs and preferences.

Design education endeavours to provide a broad enough design knowledge so that graduates may reasonably design for the masses, and essentially be employable, Design as an industry still struggling with the paradox of designing for all [7]. We have sought to alleviate the issue of miscommunication of need, and misinterpretation of solution requirements that are endemic of working with young people for whom limited life experience limit understanding and typically concludes with partially suitable solutions for older/marginalised people. The classic undergraduate response is to develop an app as a solution to everything – yet digitalization may further exclude certain groups.

We have embedded empathy as a tool for enlightenment and reflected on its value from both perspectives. Not only have the students not had contact with end users, but they have also been in lock down, with few opportunities to observe travel behaviour. We have used journey maps, experiential maps, and personas. Interestingly, students who have developed personas during this period have tended to dwell on the negative aspects of existence to a larger extent than we have previously noticed, creating scenarios full of grief and despair when trying to understand the holistic experience from someone from a marginalised group.

6   SUMMARIES

The social skill of empathy remains at the core to improving the future. Based on our experience thus far, the social aspect of empathy needs further highlight, and its importance in remote collaboration is at least equal to that of visual communication training. In fairness, the team involved in this research have adapted during difficult and uncertain times. The level of coherence has been commendable, especially that of the student's support of one another. It has required a concerted effort to maintain progress, respectful communication, and an appropriate sense of the group hierarchy. Training of next generation empathic-hybrids as solution-facilitators and generation of a Post-pandemic design language may help to ensure the influence of perception results in solutions that serve us all.

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