

# CO-DESIGN INVOLVING PEOPLE WITH DISABILITIES

**Dr Hua DONG<sup>1</sup> and Dr Bella VIVAT<sup>2</sup>**

<sup>1</sup>School of Engineering and Design, Brunel University, Uxbridge UB8 3PH, UK

<sup>2</sup>School of Health Sciences and Social Care, Brunel University, Uxbridge UB8 3PH, UK

## **ABSTRACT**

When designing for people with disabilities, it is essential for the designer to understand the user. This paper reports on a pilot study of bringing together design students and people with Multiple Sclerosis (MS), which explored the effect of such an experience on design students' understanding of the issues relating to design for people with MS. Seven students studying design participated in the study. They worked with two people with MS and one student studying Occupational Therapy for two days, and proposed two design concepts: a speech aid and a foot support. To test the students' knowledge about designing for people with MS and to find out whether their understanding increased after the project, they were asked to complete a questionnaire before starting the project and again after finishing it. The students were also asked to take part in interviews to reflect on their experience of the project. They highly valued the project, especially the experience of working with end users: they were motivated and inspired by the two people with MS, focusing on solving real, practical problems using the principles of inclusive design. Bringing people from different backgrounds/disciplines into the design process therefore seems to enrich design students' experience, and result in more thoughtful and inclusive design solutions. The implications for design educators are to help students share learning and develop the skills of working with real users.

*Keywords: co-design, people with Multiple Sclerosis, inclusive design, questionnaire*

## 1 INTRODUCTION

Design is a profession that aims to improve people's life. When talking about inclusive design, we aim to target the broadest range of people, including older people and those with disabilities. An inclusive design process is centred around users. The most important rule in user-centred design is to ensure end-user involvement and to run iterative design-prototype-evaluate loops from the very beginning [1]. However, despite increasingly available literature (e.g. [2], [3]) and toolkits of inclusive design (e.g. [www.inclusivedesigntoolkit.com](http://www.inclusivedesigntoolkit.com)), teaching the topic still presents a challenge for design educators, owing to issues such as the short time-scale of course projects and the complexity and ethical challenges of involving real users. Existing design education rarely incorporates opportunities for students to work with people with disabilities.

This paper is based on a pilot study of co-design involving people with Multiple Sclerosis (MS), the most common neurological disease for young adults, which affects 120 in 100,000 people in the UK [4]. The project was initiated by two lecturers at Brunel University, one from the School of Engineering and Design, and the other from the School of Health Sciences and Social Care. The initial plan was to involve equal

numbers of students studying design and Occupational Therapy (OT) and to find out how the students shared learning through working both with end users and with students from different disciplines. As only one OT student could attend on the days on which the project ran, the project focused mainly on how design students learn from working with people with MS.

## 2 RESEARCH QUESTIONS AND RESEARCH DESIGN

- *Does design students' participation in co-design projects involving people with MS increase their understanding of issues relating to design for people with MS?*
- *What are the benefits to design students of co-designing with people with MS?*

The research questions were answered through the following procedure:

- *Questionnaires exploring the student participants' understanding of the particular needs of people with MS, in order to investigate whether participation in the project changed students' understanding of the issues relating to design for people with MS. These were completed 3 times: once immediately before the project began, a 2<sup>nd</sup> time just after the project finished, and a 3<sup>rd</sup> time 3 months later.*
- *Short interviews with the student participants after the project about their experience of the project, including their views on the value and benefits of co-designing with people with MS.*

### 2.1 How were the participants recruited?

The participants were selected by opportunity samples. This was because the project took place in the summer vacation when most of the students were not on campus. The two lecturers sent a circular email to all 1<sup>st</sup> year students of Design and of Occupational Therapy, explaining the project and asking whether any of them would be interested in participating in it. The people with MS were recruited via a local branch of the MS Society with exclusion criteria such as excluding people with communication or cognition problems.

### 2.2 What tasks were involved?

The student participants were asked to do the following tasks:

- *To complete a questionnaire immediately before the project (questionnaire 1)*
- *To spend one and a half days designing an aid or adaptation for people with MS*
- *To complete the questionnaire again immediately after the project (questionnaire 2)*
- *To take part in a short interview just after the project to reflect on their experience of the project*
- *To complete the questionnaire again 3 months after the project (questionnaire 3)*

### 2.3 How was the project conducted?

The participants were divided into two groups of five: one with four design students and one person with MS; the other with three design students, one OT student, and one person with MS. Each group worked in a designated room (Figure 1). These are adaptable rooms (kitchen and bathroom) for OT training at Brunel University.

The project ran over two days. The students spent the morning of the first day exploring the needs of people with MS. They spent the rest of the first day and some of that evening producing models of their ideas and thinking about how to present them. The morning of the second day was spent on finalising their designs and presentations, and then, after lunch, each group presented their ideas to two professional judges (an independent occupational therapist and an expert on inclusive design), the two lecturers,

and the other group.



*Figure 1 A project team working in an adaptable kitchen*

#### **2.4 What other issues were considered?**

The Research Ethics Committee of the School of Health Sciences and Social Care granted ethical approval for the project. Information sheets containing the details of the project were sent to all the participants in advance and they were asked to complete a consent form. The participants were told that they were free to withdraw from the project at any time and without giving a reason. Light refreshments were provided for the two days, and all the participants were given a certificate and a small gift. A prize was given to the winning team.

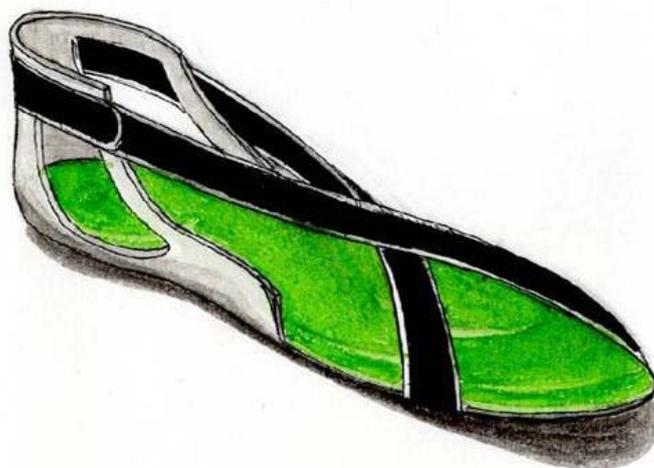
### **3 DESIGNS AND RESEARCH FINDINGS**

The winning group's idea was a speech aid for someone who has difficulties speaking. This device (Figure 2) would come ready programmed with frequently used everyday phrases, which the user could either keep or substitute with their own choice of phrases and/or a voice of their own choice. The judges thought this device would benefit a wide range of people and increase social inclusion.



*Figure 2 The speech aid 'freepeak'*

The other group proposed a foot support (Figure 3), which would be more discreet than current aids, fitting inside a shoe rather than extending up the user's leg as these aids do at present. The judges thought it had the potential to be commercialised.



*Figure 3 The foot support*

The students participated in focus groups after the project had finished on the second day to discuss their experience of the project. They all said that they had enjoyed taking part in the project and many said that it had been “informative”, “interesting” and “inspiring”. They were asked to identify the best thing about the project, and six of them said that this had been the opportunity to work with end users who brought “totally different viewpoints” to the design process. The users’ involvement motivated the students because the students could see clearly that their design would make a real difference to the users’ quality of life. Most students had gained an insight into MS, and none said that they had found working with people with MS difficult. Instead, they said that this had been “useful” (mentioned four times), “rewarding” (mentioned three times), “amazing”, “enlightening” and “inspirational” (each mentioned once).

All the students said that they would like to do another similar project in the future, and suggested adding several such short projects to their programme, with credits awarded for their participation. Their main suggestions for changes for another time included “more time” (two or three full days) and a “better introduction to the other discipline and the end-users”. Students thought that the ‘ideal’ team would have 3 Design students, 2 OT students and 1 or 2 people with MS. The design students also liked conducting the project in a new environment: the adaptable rooms differ from design workshops, and they felt that working in a different school and interacting with students from a different discipline was beneficial.

Table 1 compares the students’ responses to the questionnaires they completed before the project started and again after it had finished.

Table 1 Comparison of questionnaires 1 and 2

<i>Questions</i>	<i>Questionnaire 1</i>	<i>Questionnaire 2</i>
1. What does Design mean to you?	<i>The students all have a general and broad understanding of their own discipline, but a very shallow and narrow understanding of the other discipline</i>	<i>The OT student's understanding of Design improved: shifted from focusing on function to meeting user needs. One design student's understanding of OT improved (this student was in the same group as the OT student)</i>
2. What does Occupational Therapy mean to you?		
3. What does Multiple Sclerosis (MS) mean to you?	<i>The students' understanding is limited and very general: MS is a disability affecting mobility; it is a degenerating disease</i>	<i>The students' understanding significantly improved, with 6 students mentioning that MS affects the nervous system; and 3 students identifying symptoms of MS</i>
4. Please list 5 disabilities which someone with MS might experience	<i>1 student listed 5 disabilities, 2 listed 4, 1 listed 2, 2 listed 1, and 2 students listed none (Average: 2.1)</i>	<i>7 students could list 5 disabilities and the 8<sup>th</sup> listed 4 (Average: 4.9, <b>an increase of 2.8</b>)</i>
5. Please list 5 actions which someone with MS might find difficult	<i>3 students could list more than 3 actions, 1 student listed 3, 1 student listed 2, and 3 students listed none (Average: 2.4)</i>	<i>7 students could list 5 difficult actions, the 8<sup>th</sup> could list 3 (Average: 4.6, <b>an increase of 2.2</b>)</i>
6. Please list 5 aids or adaptations which someone with MS might find useful	<i>1 student listed 5 aids, 2 listed 4, 1 student listed 3, 1 student listed 2, and 3 students listed none (Average: 2.1)</i>	<i>5 students correctly identified 5 aids, 2 identified 4, and the 8<sup>th</sup> identified 3 (Average: 4.9, <b>an increase of 2.8</b>)</i>
7. Can you suggest how any existing aids or adaptations might be improved	<i>Half of the students had no idea about this. Three made suggestions which were mainly concerned with aesthetics, the 4<sup>th</sup> suggestion included the improvement of comfort and manoeuvrability</i>	<i>Each student had at least one suggestion, ranging from 1 to 4 ideas, with an average of 2.6. Some suggestions were specific to the design concept students had generated during the project.</i>
8. Can you suggest any ideas for new aids or adaptations?	<i>5 of the 8 students had no idea. Suggestions made by the other 3 include 'automated application' and 'aids for leisure activities'</i>	<i>All the students made at least one suggestion, ranging from 1 to 4 ideas, with an average of 2.3. Their suggestions tended to focus on the designs resulting from this project.</i>

#### 4 DISCUSSION

The project sought to facilitate collaborative working between students and people with disabilities, and it proved beneficial to design students. They valued the experience highly, stating that co-designing with users made communication easy: the users were an integral part of the design-prototype-evaluate loop, and the students could ask them whenever they wanted their specific input.

The project was conducted during a vacation period (September 2007) and the participation was voluntary. It only involved those who were interested in the project and no formal credits were given to the participants. However, it suggests a possible solution to the challenge of teaching inclusive design: Voluntary projects during the summer vacation complement short-scale course projects; and there is sufficient time for recruitment. It is beneficial to conduct the project with 1<sup>st</sup> year students just before they begin their second year of study, as they can apply all their skills (in this case, the skills of model making, design communication, and team work) while learning new ones.

## 5 KEY CONCLUSIONS

1. *The students' understanding of the issues relating to design for people with MS significantly increased after their participation in the co-design project.*
2. *Co-designing with end users and students from a different discipline can broaden design students' horizons and help them appreciate different viewpoints.*
3. *The implications of the project for design educators are that small, voluntary design projects can facilitate co-design and help students develop a range of new skills (such as the skills of working with people with disabilities).*

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<sup>1</sup>Dr Hua DONG  
Brunel University  
School of Engineering and Design, Brunel  
University, Uxbridge UB8 3PH, UK  
Hua.Dong@brunel.ac.uk  
44-01895-267254

<sup>2</sup>Dr Bella VIVAT  
Brunel University  
School of Health Sciences & Social Care,  
Brunel University, Uxbridge UB8 3PH, UK  
Bella.Vivat@brunel.ac.uk  
44-01895-268850