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DESIGNING FOR USERS: THE GLOBAL STUDIO

Boeun Bethany HONG, Erik BOHEMIA, Ruth NEUBAUER and Laura SANTAMARIA
Loughborough University

ABSTRACT
User-centred design (UCD) has deployed methods such as user surveys and interviews, user focus groups, personas, user scenarios and participatory design to identify users' needs and desires. Although UCD has become a dominant design innovation strategy, we argue that design major students are insufficiently versed in their user constructions. To illustrate this, we will examine students' take-up of UCD within an international cross-cultural collaborative project undertaken within the Global Studio which involved 7 universities located in Austria, Brazil, Italy, Japan, Spain, Turkey, and the UK.
From the data analysis, we have concluded that most of the students failed to engage with end-users and developed only superficial insights about their intended users. We argue that this was mainly due to a failure to involve the 'real' users from the start of the project, which meant that users were only represented as fictional characters in later design development stages.

Keywords: User-centred design, Human-centred design, User-understanding, Design education

1 INTRODUCTION

The introduction of user-centred design (UCD) has refocused design development processes on users [1] who have become an essential component of design processes. Additionally, as globalisation has led to an increase in cross-cultural and cross-disciplinary projects [2], UCD has attracted more interest from international society as diversity in globalised contemporary society proliferates [3]; the segments of users in design have been enormously varied and defining usability and user needs has become even more complicated [4]. Therefore, it is important that contemporary designers develop more sophisticated processes to understand their users. Accordingly, it is also crucial for design major students to learn how to 'construct' their users more intimately. Although design major students have been taught the concept of UCD and exposed in their classes to various UCD applications, we will argue that students are insufficiently versed in their user constructions. In this paper we will examine the current situation of university students' user-construction process by observing the cross-cultural collaborative project among 7 universities located in different countries.

2 LITERATURE REVIEW

2.1 User-Centred Design (UCD)

UCD development was mainly influenced by the field of human-computer interaction (HCI). Prior to UCD, design innovation followed a long tradition of 'technology-centred' [5] or 'system-centred' [1] innovation strategies which focused on 'technology push'. In this mode it was the users who were expected to adapt to new products [5]. One of the shortcomings of this innovation strategy is that the actual end users might be unable to use the product properly [5]. According to Norman, UCD aimed to overcome this limitation [6]. Mao et al. [1] suggested that UCD enables active involvement of users throughout the design process. It considers users as the most important factor in the design development process and reflects their needs, circumstances and characteristics to inform this. Zoltowski et al. [7] defined it as different from simply pursuing a 'user-friendly' environment at the end of the design process. Sharp and Rogers [8] stated that by reflecting users' goals and their needs, the UCD innovation strategy has increased productivity and users' satisfaction. Endsley and Jones [5] also suggested that use of UCD is reducing design errors and improving user safety, which in turn is increasing market efficiency. Moreover, Salvo [4] emphasised that UCD is encouraging

communications between designers and users, and this may help designers to recognise the humanity of users.
Regarding these benefits, as Endsley and Jones [5] have pointed out, UCD has had a significant impact on the contemporary design industry and has built a new notion of design which aims to focus on the actual needs of end users. It is considered as a key concept for creating usefulness and usability of design by the majority of designers [1] and it becomes a dominant strategy in the design field [9].

2.2 UDC research methods

Over the past three decades, UCD has incorporated and developed various techniques such as user interviews and surveys, user focus groups, personas, user scenarios, and participatory design to establish users' needs and desires [10]. These techniques can be used individually or in combination [11]. All of these techniques have merits and perils. Accordingly, design institutions seek to equip their students with practical research skills and teach them the core spirit of UCD: design for human (users). The popular techniques are briefly introduced below.

2.2.1 Qualitative interviews and surveys

User interviews and surveys can be used at different stages during the design process development. For example, background interviews and surveys which are methods to collect user data related to their needs and expectations are generally conducted at the very early stages of the design development process [12]. However, interviews and surveys about user satisfaction in relation to the new design product proposed by designers, which are also called 'user-feedback' are applied at the final stage of the design development cycle. Thus, the background interviews and surveys are used to facilitate the user construction. Generally, interview data analyses are represented in a narrative form. As one of the most popular UCD techniques, this qualitative research approach helps designers to understand the context around users, product use and market business in a more holistic way than quantitative research [13]. By synthesising the collected data, designers construct their users and derive insights for the projects [13].

2.2.2 Focus groups

Focus groups are discussions and activities among selected participants (users), related to the project idea, contextual issues around the project, the user requirements or the (development of the) product [12]. The main purpose of this technique is to gain insights by encouraging participants to have active discussions with one another, rather than direct question-and-answer conversation. If there are sufficient interactions, this can also promote positive effects of synergy which allows the participants to exchange their various viewpoints [14]. Focus groups can also be used at different stages of the design development process, such as during the idea generation, concept development, concept selection and refinement [14], but this research approach usually occurs in the early stages of the process [12]. To facilitate the active involvement of all participants, focus groups typically involve a minimum of 8 and a maximum of 12 people [11]. Because of the relatively small size of the sample groups, this method has been criticised for its statistical unreliability [14]. However, the most powerful strength of a focus group is that researchers can 'catch' the different kinds of 'natural' reactions of the participants in the informal atmosphere [13], if the observers are aware of the effective way to use this method.

2.2.3 Personas

Personas are fictional characters representing the design targets (users) based on field research [15]. Personas are imaginary but have human characteristics, such as name, age, gender, occupation, family, and likes and dislikes, including a life story. In general, three to seven personas are developed often including pictures or illustrations of these imaginary people [16]. Since the term personas implies the specificities of potential users, Marshall et al. [17] emphasised that they can be helpful in encouraging designers to have engagement with their actual real-life users and their specific needs. However, as personas are imaginary people based on a data condensation, it is important to distinguish a research-based representation from an assumption-based fabrication [13]. Nevertheless, the method is really useful to complement the obstacles that the design field has been through [13]. As Cooper, Reimann and Cronin [13] explained, personas can be used as a quick version of a test model to measure the feasibility of the design solutions and simplify the marketing and sales plans by clarifying the target

segments. In the contemporary design field, personas are used as a means for designers to build empathy with their end users [15].

2.2.4 User Scenarios

User Scenarios are stories or the activity of building stories which indicate user characteristics and behaviours and the context of their product use [15]. These are based on storylines which reflect the environmental framework of the product, such as house preparation for winter or having ready-to-eat dishes, and the participants are asked to accomplish the task or to create their own story of doing it [11]. The initial idea behind user scenarios is to identify the needs and requirements of users in a comfortable and informal atmosphere. By doing so, researchers expect to uncover hidden or unseen user data which is not visible through traditional research methodology [11]. Since scenarios are narrative descriptions of user experience, interpretations of these can be time-consuming and the cost of designing and organising the workshops can be high [11]. However, by building an empathetic relation (a holistic understanding. including backgrounds and contexts [13]) between designer (researcher) and users, many UCD advocates expect this method to develop valuable insights for designers [11].

3 RESEARCH OBJECTIVES

So, what is the situation regarding design education in universities? Does it actively respond to the tendency of multi-disciplinary or cross-cultural working environments in contemporary society and teach how to construct variable user segments in terms of user-centred design? Most design major students have been exposed to UCD or related design innovation concepts and would have been encouraged to incorporate the UCD techniques in their in-class design projects [7]. However, Zoltowski et al. [7] pointed out that students are not engaging with 'real' users' situations and tend to solve users' issues by reducing or dealing cursorily with problems.

This paper aims to examine how design students construct their users using UCD techniques.

4 RESEARCH METHODOLOGY

An international 10-week-long collaborative design project involving 7 universities was used to explore the stated paper objectives. Participating design students were located in the following countries: Austria, Brazil, Italy, Japan, Spain, Turkey, and the UK (Table 1.). During this international project, which was part of the Global Studio long-running project series, the participating students performed the dual roles of a client and a designer. In one of the roles as clients, they developed and provided design brief and related information, including information about the users, to their collaborative designer team who were located in another country. The overall target users were elderly and students were encouraged to use their grandparents as the proposed subjects. To locate the brief within the local cultural context a local folklore was used to inform the theme. As designers, the students responded to their clients' briefs and suggested design solutions. The important project outcomes and students' tasks at each stage are described in Table 2. Students interacted through internet-based platforms such as the course blog (WordPress), Skype, WhatsApp, and other 2.0 internet-based communication technologies.

The students' level of user construction was qualitatively measured, based on their team interactions in the course blog and the assessment grades of the user engagement criteria produced by course instructors. The important data for this study was students' blog post data in their team blogs. Each team was allocated a project team blog to record the process of the project, including the team meetings. Altogether, 26 teams generated 797 posts including students' profile introduction and the notices from the instructors. The important blog posts were randomly selected and observed by the authors. In particular, the posts were selected based on phenomenographic study which seeks to understand the qualitatively different ways of experiencing the phenomenon [7]. This means that the posts were selected because they were considered by the researchers to show how the students understood 'user-centred design'. The specific numbers of the posts of each blog are presented in Table 1 (lecturers' comments were not included in the count). The observation was focused on identifying the following questions: a) how client students conducted user research and generated design briefs based on the real-life situation of users and b) how designer students produced design concepts while understanding the different circumstances and backgrounds of users.

Table 1. Summary of collaborative teams

No.	*Team*	*Location*	*Number of members*	*Number of blog posts*
1	1	UK	4	30
	11	Spain	5	27
2	2	UK	4	56
	13	Italy	4	41
3	3	UK	3	35
	24	Italy	3	44
4	4	UK	3	27
	12	Turkey	4	25
5	5	UK	3	33
	14	Japan	8	32
6	6	UK	3	21
	15	Japan	4	18
7	7	UK	3	38
	17	Austria	3	30
8	8	UK	3	34
	25	Brazil	5	25
9	9	UK	3	39
	18	Austria	3	25
10	10	UK	3	25
	19	Austria	2	29
11	20	Austria	2	31
	23	Turkey	4	31
12	21	Austria	2	41
	16	Japan	4	25
13	22	Austria	3	11
	26	Turkey	5	24
		Total	93	797

Table 2. Summary of the Project Outline

Stage	Outcome	Designer task	Client task
1	Design brief	Clarifying the design brief given by the client team	Conducting user research and writing a design brief related to local 'folklore'
2	Design concepts	Developing initial/final design concepts	Evaluating the design concepts provided by the designer team and providing feedback(s)
3	Detail design	Constructing a detailed design concept	Evaluating and clarifying the concept
4	Prototypes and testing		Building prototypes based on the instructions from the designer team and testing the product
5	Presentation	Delivering a final presentation	Providing feedback

5 RESULT AND ANALYSIS

5.1 Design briefs informed by UCD

Regarding the learning outcomes from the project, at the very early stage of design development, design briefs provided by the client teams were expected to imply user requirements based on research about 'real' users. However, only 8 (30%) of the 26 client teams had tried to define user needs and requirements from interaction with possible 'real' end users; on the other hand, in comparison, 18 (69%) client teams did not engage with the users at all, while 5 client teams within those 18 teams had not conducted any user research at all.

The 8 client teams which engaged with 'real' users conducted interviews with their grandparent(s) to capture their requirements and understand the contexts surrounding them. However, only one of those client teams developed user personas based on their field research, while the rest only provided the interview results. Only 13 client teams had conducted user research but did not reach the real users. Their research was based mostly on literature and web searches. Some of them tried to build a persona or user life scenarios, but these were often based on their assumptions, and not driven by the research data. In total the 5 client teams who failed to carry out any user research hardly mentioned users' circumstances or the contexts of user lives in detail, and described the target users based on their background knowledge or simple presumptions.

5.2 Design concepts informed by UCD

Based on the design briefs provided by the client teams, the designer teams had developed initial design concepts and refined a final concept based on their clients' feedback. Design concepts were

expected to consider the circumstances of the end users and the contexts in which they lived. However, this study found that none of designer teams had conducted real-life based user research, although 8 of the 26 teams tried to do research based on secondary resources such as literature, web searches, and so on; however, more than two-thirds (18 of 26) of the designer teams did not conduct any further research about their users. When the research was based on secondary resources, some designer teams were proactive in interacting with their client teams to gain further information, but their interactions were somewhat dependent on the limited information given by the client teams. Some research was only focused on the product, but not on the users.

5.3 Prototypes and testing informed by UCD

After a final concept was decided, the client teams were asked to produce a prototype model according to the instructions provided by the designer teams and to test the products. Since the products were developed for a clear target (the elderly who live in the client teams' location), product evaluation implies testing by end users. However, only one of the participating teams had achieved 'real' user testing and adapted their recommendations to the final product evaluation boards. Most prototypes produced by the rest of the teams were focused on the product manufacture and were evaluated by the client teams, not by the 'real' users.

6 DISCUSSION

From the analysis, although design major students have learnt about the principles of UCD and its implications, the analysis indicated that students had very limited involvement of their 'users' in their design development stages. At the research stage, which is crucial to articulate user needs, only a third of student teams interacted with possible 'real' users. In addition, the interactions (mostly by interview) were rather superficial, while most of the questions were focused on general questions, such as users' understanding of the given project theme, or users' general experiences in relation to the product. In-depth user understanding is closely linked to unexpected insights, which can produce better design outcomes. This usually emerges from a careful investigation of users with multiple perspectives and plentiful research agencies [11]: we argue that these one-dimensional interactions are insufficient to identify the users' actual needs and requirements. In addition, students were rarely able to connect the feedback results they provided to their design teams with various UCD techniques, such as personas and/or user life scenarios, to encourage the teams to have active discussions in idea generation. None of the designers at the concept development stage had interacted with the real users. However, this limited engagement with users can be explained by the lack of resources and the distance between designers and users, since the project was collaboration between universities in different geographical locations. Nevertheless, little engagement was also shown during the prototyping and testing stages, during which the students and the users were located in the same country, thus substantially reducing the barrier of distance. Only one of the student teams had conducted a real user prototype testing; but this was not carried out in detail, and the feedback only provided fragmentary words like 'good' or 'satisfied'. As the prototype and testing are a crucial stage in involving user opinions, this unexpected failure of user engagement is important.

Instead of 'real' user interactions, secondary research based on web searches and related literature was often conducted by the student teams. This might indicate the lack of awareness by the students of the difference between data searching and 'real' user engagement. Certainly, secondary resources are valuable as a forerunner to research which is based on real users, but it must be acknowledged that this can include common generalisations about users, which are easily challenged by UCD advocates, especially when it comes to a simple web search. Therefore, it can be argued that further education, which emphasises the importance of 'real' user involvement in UCD innovation strategies and the clear distinction between field work and simple 'googling', should be suggested in the future.

Lastly, at each project stage, there were cases where the students conducted neither field nor secondary research. This was significant as all the students were unfamiliar with their users, as the users lived in a different country and were older. Under these unique conditions, both designers and clients needed to understand the foreign folklore and culture, and the different backgrounds of the elderly users, who were, of course, 'foreign' to the students. However, despite these extraordinary settings in a cross-cultural design context, many students tended to rely on the limited information provided by their collaborative teams. This might remind us to ask ourselves whether UCD education in universities is offering sufficient preparation for future designers.

7 CONCLUSION

The paper has examined the current status of UCD education in a context of international higher education: it evaluated whether in these universities design education has successfully incorporated to increased needs for working in a multi-disciplinary or cross-cultural context in contemporary society and understanding different user variables in their teaching, by observing a cross-cultural collaborative project among universities in 7 countries. The results suggest that most of the students failed to engage with actual end users. This has left us with a question as to why the students have not engaged with the 'real' users. We suggest further research to interrogate this and to find out how university education can facilitate the development of skills for more genuine user-focused design. As Donald Norman [9] has pointed out, to develop UCD as one of the important contributors to a humanistic and well-balanced design spirit in the world, UCD and UCD education are in critical need of improvement and must be regularly revised.

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