

Simulating 'Lived' User Experience – Virtual Immersion and Inclusive Design

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Abstract: This paper explores the theories and practices underpinning Virtual Immersion, a discount technique proposed to help designers gain deep understanding of, and empathise with, their users. Four essential elements to this technique are identified and empirical evidence for its usefulness is provided. A study is reported in which the technique was applied to establishing design requirements for a mobile phone for two different groups of users.

Keywords: Inclusive design, immersion, user requirements, user experience

1 Introduction

The aim of inclusive design is to design products that can be used by as many people as possible. (Bellerby & Davis, 2003). This calls for all design activities in user-centred design but with a little extra. That is, designers should take a proactive approach and consider the needs, abilities, preferences, and expectations of *diverse* user groups right from the start of the design stage. However, the cost of implementing an inclusive design can soar because of the inclusive user involvement process, i.e. selecting, screening, and recruiting users of diverse characteristics. In light of this problem, this paper proposes a discount technique called Virtual Immersion to help designers quickly gain deep understanding of, and empathise with, their users without having to involve real users directly.

The following sections explore the theoretical underpinnings to Virtual Immersion, describe and discuss the results of an experimental study that assesses its effectiveness.

2 Research Background

2.1 Immersion and inclusive design

Immersion is a technique, originally developed in sociology, for understanding first hand the experiences of other people. It involves 'living' as

another person and facing the tasks and issues that they experience in their daily lives. While 'traditional' user-research methods tend to observe people from the outside, Immersion is about trying to live as the user would, use the products and services the user would use and really get inside the user's skin. An example of the use of this technique that significantly impacted the history of product design is the age research carried out by Moore (1985) who, while still in her twenties, spent three years living the life of an elderly woman. The insights gained from her research about the problems that older people have with products and services have served as valuable input to a whole range of designs ever since.

However, carrying out user needs research with Immersion is not always feasible or practical. Firstly, it is not safe for the researcher *in character* to 'live' in certain social environments. Secondly, it is time consuming – potentially leading to high overheads, low investment return and project deadlines being missed.

Similar approaches, far less extensive in terms of time, have been used for understanding the experience of disability, including the 'Third Age Suit' which simulates a variety of mobility problems for the wearer (Hitchcock & Taylor, 2003). However, designing such wearable simulators is difficult – as they stated, "dimensional fit did not equate to comfortable fit" (p. 108).

While the 'Third Age Suit' aims at simulating the user's experience with an artifact (the suit that the designer must wear), we investigate a more cost-and-time effective approach to help designers live the experience of the user in their minds. The question is whether simulating 'lived' user experience or Virtual Immersion is possible and how it should be conducted.

2.2 Pretense

If, *in reality*, we cannot immerse in the user's experience, perhaps we can do it *virtually* – in our minds, by pretending to be the user.

Pretending is defined as a special case of 'acting as if' where the pretender is aware of the actual situation at the time of pretense (Leslie, 1987). It is making the absent present. In our case, it is making the absent user present in the designer's mind. Research shows that children and adults alike can and do pretend, the difference being in the level of its sophistication (Ackermann, n.d.). But for our purpose, does pretense lead to immersive experience of the person who we pretend to be? In other words, does the pretender who creates the make-believe world also live in the world he/she creates?

The boundary between reality (territory) and pretense (map) can become intertwined in interesting ways (Bretherton, 1989). It is the interweaving of the map and the territory that enables the pretender to live the experience of the world he/she creates, as reflected in the following verbatim of a mother of a 4-year-old:

"It worries me sometimes, he has a vivid imagination; and it goes on and on until he lives it; and sometimes, these imaginary people you have to feed them with him..." (Bretherton, 1989, p. 393).

However, for pretense to be of any use to Virtual Immersion, the would-be situation or the make-believe world that the pretender creates must be correct or at least based on some facts or knowledge of the world. To address this issue we explore the mechanism of pretense.

There have been many theories that explain how different forms of pretense (reality-based or fantasy) are generated and why pretense does not adversely affect the pretender's internal representational system of knowledge of the world (long term knowledge base). According to research reviewed by Bretherton (1989) novel plots are generated from combination of schemas or mental structures stored in the pretender's representational system (knowledge base). This provides a basis for Leslie's (1987) decoupling model to be used in his meta-representational theory of pretense to explain how the representation of a telephone (the signified), for example, is not confused with the representation of a

banana (the signifier) that is used as the pretend phone. Hence, the pretender's knowledge base is unaffected by the distortion of pretense.

To conclude, people have the ability to pretend or act 'as if'. This enactment facilitates immersive experience that enables pretenders to understand the would-be situation or the make-believe world they create from their knowledge of the world, and yet be safe.

Furthermore, pretense provides a safe ground for learning by doing, creativity, and fun. Examples of constructive application of pretense are: imaginary plays at playschools; scenarios and role-playing in product design; role-playing in teaching; role-play simulation software in education or games for entertainment; and acting.

3 Virtual Immersion

The above review provides a theoretical foundation for Virtual Immersion. The next step is considering what its requirements might be. From the research on pretense reviewed we identify four essential elements in Virtual Immersion as follows:

1. The pretenders or actors
2. Factual information about the imaginary characters or situation to supplement the pretenders' knowledge base
3. The stage
4. A signifier and the signified.

In our context, the pretenders would be the designers, the imaginary characters would be the users, the stage would be a room where Virtual Immersion takes place, the signifier would be a prototype or any substitute for the product, and the signified would be the product or service being designed. A formal procedure to carry out Virtual Immersion has not been established. At this stage, it remains experimental.

4 Empirical Study

This study was carried out to assess the effectiveness of Virtual Immersion technique on participants' understanding of users and their ability to predict their target users' preferences for mobile phones.

4.1 Methodology

Focus group and the experiment method were employed in this study. Focus group facilitates open-ended discussion that helps reinforce participants' understanding of their target users holistically while the experiment method facilitates controls and comparisons. The experiment was a between-subjects design. Two groups of participants took part in two separate focus group sessions and

subsequently performed the same experimental tasks, imagining themselves as their respective target users and, subsequently, as *themselves*.

4.2 Hypothesis

Should Virtual Immersion have any effect on participants then pretending to be the user would give a different set of outcomes than not doing so. Therefore two hypotheses were formed as follows:

Hypothesis 1. The outcome of the two groups *in character* of their respective target users would be different.

Hypothesis 2. The outcome of the two groups when participants were *themselves* would not differ.

4.3 Method

4.3.1 Participants

Twenty-seven MSc students at London Metropolitan University participated in this study. They were randomly divided into two groups: one would pretend to be *Young* people and the other *Older* people, 14 and 13 participants in each group, respectively. The average age of participants in the *Young* was 25 while that of the *Older* was 28. The former group was assigned teenagers (13-19 years old) as their target users while the latter was assigned to older users (from 41 to retirement age). All but two participants owned a mobile phone.

4.3.2 Materials

Six randomly selected participants from each group were assigned as facilitators of their groups. One week prior to the experiment, they were to research information about their respective target users' lifestyles, beliefs, limitations, etc. They were to produce materials to be used during their focus group sessions. These materials consisted of a live concert video, some UK magazines for teenagers and for older people, photographs, fact sheets, etc.

Four questionnaires were used: pre-test, main, *self* and post-test questionnaires. The pre-test questionnaire asked for demographic details. The 5-point scale main questionnaire asked participants to rate each question while *in character*, i.e. imagining that they were the users. The multiple-choice *self* questionnaire asked the same questions as the main questionnaire but participants were to complete this questionnaire as *themselves*. The 5-point scale post-test questionnaire asked for ratings on issues relating to the usefulness of Virtual Immersion.

4.3.3 Procedure

The two groups held their respective focus group sessions in two separate rooms. Participants were given the pre-test questionnaire first. The six facilitators in each group then instigated the discussion with their presentations. None of the participants knew what the experimental tasks and

the targeted product would be. The focus group sessions lasted approximately 45 minutes.

After the focus group sessions, participants were given the main questionnaire. They were instructed to imagine themselves as a youngster (for those pretending to be *Young*) or as a middle-aged or retired person (for those pretending to be *Older*) who owned or was considering buying a mobile phone. When they finished the main questionnaire, they were given the *self* questionnaire and asked to complete it as *themselves* who were the owners or the would-be owners of a mobile phone. Finally, the post-test questionnaire was administered.

5 Results

Ratings on the following issues were acquired:

1. Reasons for having a phone
2. Criteria for choosing a phone
3. Functions of the phone that users find useful
4. Extra cellular technology that users may want to have on their phones

There were 32 preferential factors for phones in all. Mann-Whitney tests and Fisher's Exact tests were conducted on each of these factors for the data from the main and the *self* questionnaires, respectively.

When participants were 'in character'

Mann-Whitney tests revealed significant differences (all p 's < 0.05) in 22 of the 32 factors as follows.

For reasons for having a phone, significant differences were found for five factors: business use, emergency, security, social status, and contacting family and friends.

For criteria for choosing a phone, significant differences were found for five factors: appearance, brand, functionality, health, and size.

For useful functions of a phone, significant differences were found for six factors: email, games, preference setting, profile setting, ring tone setting, and text messaging.

For extra cellular technology wanted, significant differences were found for six factors: camera, full Internet, infrared, online games, voice activated phone book, and WAP.

When participants were 'themselves'

Participants' answers were nearly the same for all factors. Fisher's Exact tests found no significant difference for any of the factors.

Ratings on the usefulness of Virtual Immersion

On a scale 1 to 5, average rating for questions concerning user's understanding, imagining oneself as the user, empathising with the user, and immersing in the user's live experience was 3.7.

6 Discussion

Both hypotheses were supported. Preferences and opinions of the two groups varied when they were *in character* (pretending to be the users) but did not when they were *themselves*. This evidence shows the effect that Virtual Immersion had on participants' ability to place themselves in the users' shoes.

How do our results compare to other research?

Our pretenders' statistics show that the factors identified by those pretending to be young differed from those identified by the participants who were pretending to be older. This agrees with results from a survey of 326 (actual) mobile phone owners in which the same 32 preferential factors were used (Chattratichart & Brodie, forthcoming). The survey found significant differences for 21 factors, 16 of which were also found in this study. In other words, 76% of the findings with real users were correctly identified in this study. Accounting for those not identified (misses) there were 59% hits, 22% false predictions, and 19% misses. This result is encouraging in comparison to data for heuristic evaluation (also a predictive method) - 36% hits, 43% false alarms, and 21% misses (Bailey, 2001).

Considering that Virtual Immersion is still in its infancy, our results suggest that it merit further development and that this new technique could play a significant role in the future generations of user-centred and inclusive design practices.

7 Conclusion

The outcomes of this study show great promise for Virtual Immersion as a technique for setting user requirements. Results indicated that getting into character enabled participants to gain a far better understanding of what their users wanted as compared with standard predictive approaches. Virtual Immersion helps us to empathise with our users and understand their needs. These are crucial

steps in creating useful, usable products that are a genuine joy to own and use.

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