

Focus groups to support the industrial/product designer: a review based on current literature and designers' feedback

Anne Bruseberg^a, Deana McDonagh-Philp^{b,*}

^aDepartment of Computer Sciences, University of Bath, Bath BA2 7AA, UK

^bDepartment of Design and Technology, Loughborough University, Loughborough, Leicestershire LE11 3TU, UK

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Abstract

Focus groups are widely used within human factors, social sciences and market research. Whilst user-research methods may be familiar to other disciplines, conventional design training has not, until recently, incorporated such activities. With the increased awareness for the necessity to elicit user needs beyond the functional, design research is becoming more established. However, there is a significant gap in training material for design research. This paper will review the scope of application of focus group techniques, with particular emphasis on the suitability of focus groups for use by industrial/product designers, based on the current literature and designer feedback from two case studies. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The quality and effectiveness of design solutions rely, to a large extent, on the availability of information about the future users of new products. Designers cannot always be knowledgeable about user needs and aspirations. They may benefit from carrying out user research themselves, or being very closely involved in such activities.

The procedural literature available about focus group techniques, such as Morgan (1998a, b), Krueger (1988, 1998a-c), Krueger and King (1998), and Greenbaum (1998), is currently not tailored to the specific needs of designers or design researchers.

The findings discussed in this paper are based upon a research project (funded by the Engineering and Physical Sciences Research Council) that concentrated on the development of methods based on focus groups that suit the needs of designers. This technique has been adapted and combined with a variety of other techniques, such as visual product evaluation and the use of

mood boards. They were developed, evaluated and tested through a 'live' design project for a range of consumer products (i.e. kettle, toaster and coffee maker). The team comprised of an ergonomist, industrial designer, and industrial design researcher.

This paper reviews how focus groups and related techniques are currently being applied for product development by market researchers and human factor specialists—to give the reader an overview of the approaches available. It draws upon a variety of studies presented in the current literature.

Moreover, this paper presents the results from two case studies conducted by the authors that elicited designers' perspectives on employing user-research methods based on focus group techniques—to set out the requirements for adapting the techniques according to the designers' needs and suggestions. In order to encourage the application of research activities throughout the various stages of designing, it is crucial to build on designers' skills, knowledge, and perceptions. Detailed feedback is presented from the following case studies.

Case study (1): Practising designer interviews. An introductory case study was conducted to understand the information requirements of designers, their preconceptions towards focus group techniques and user

*Corresponding author. Tel.: +44-1509-222-665; fax: +44-1509-223-999.

E-mail address: d.c.mcdonagh-philp@lboro.ac.uk (D. McDonagh-Philp).

research, as well as their own working methods and external restrictions. This involved interviewing five practising industrial designers—including two freelance designers, two in-house designers from a manufacturing company, and one designer employed by a design consultancy.

Case study (2): Student feedback. Towards the end of the project, seven students from the undergraduate industrial design course at Loughborough University were selected to take part in a focus group discussion. The majority of them had industrial placement experience. They were presented with an overview of the techniques and provided feedback on the appropriateness of applying the approaches in future design projects.

2. Focus groups supporting designing: perspectives from current literature

2.1. Characteristics of focus groups

A focus group consists of individuals, who have been assembled to discuss a particular issue or concern. A moderator, who leads the group through a number of topics and activities, guides the discussion. The synergy between the participants (the interaction through sharing and comparing of ideas) is one of its distinctive characteristics. Participants stimulate and encourage each other. The technique is suited for exploratory purposes, as questions with an open-ended nature can be examined. The information gained is qualitative, and consists of experiences, opinions, ideas, and motivations for behaviour, rather than ‘figures and facts’ (Morgan, 1998a). It is not suited to be quantified or generalised.

Focus groups have been widely used—the scope of applications is diverse (refer to Table 1 for an overview). They are a well-established technique in market research for the designing of new products (e.g. Savage et al., 1995) as well as for human factor research and usability evaluation (Jordan, 1998). Even though there are many overlaps, human factors research focuses more on the details of ease of use, whilst market research concentrates on the potential success of the product in the market place.

2.2. The involvement of designers

Garner and Duckworth (1999) found that recently graduated practising industrial designers consider themselves as *poor researchers and would now view researching skills as an important aspect of design education*. The importance of designers working closely together with market researchers and human factors specialists is widely recognised (e.g. Donnelly, 2000; Dolan et al., 1995; Leonard and Rayport, 1997). Porter (1993) and

McKenna (1990) stress that the qualitative information from techniques such as focus groups is particularly vital for design decision-makers, hence, designers should be closely involved into the information gathering process. Quantification of results may contribute to loss of in-depth information, as vital insights into attitudes and perceptions of users tend to be filtered out in the process. Likewise, it is beneficial to make use of the creative capacity of designers when acting as facilitators (Carmel et al., 1993).

Designers benefit from taking part in the sessions—either by

- observing sessions (Wilson and Callaghan, 1994),
- providing responses to users’ questions during the sessions (Sato and Salvador, 1999),
- actively taking part in the discussion (Caplan, 1990; Sato and Salvador, 1999),
- working directly with users in participatory workshops (Fabius and Buur, 2000; Burns and Evans, 2000), or by
- acting as a focus group moderator (MERCİ, 1997).

Focus group activities offer designers a flexible range of techniques that can be utilised throughout the designing process, from pre-concept generation stages through to final concept refinement. Giving designers early access to knowledge collected from users through taking part in sessions, as well as encouraging designers to formulate questions, ensures that the data obtained is well tailored to the specific information needs of designers. Moreover, focus groups are suitable to understand user needs beyond the functional, such as customer *delighters* (Burns and Evans, 2000), leading to products providing enjoyment as well as functionality (Jordan, 2000). Because designers tend to have a particular profile (e.g. white, male, middle class), it becomes even more important for them to gain such exposure to users. They need to recognise situations where their *empathic horizon* needs to be expanded (McDonagh-Philp and Denton, 1999).

2.3. The various ways of applying of focus groups

Focus groups can inform the designing process at various stages. They can support designers in understanding user needs at the outset, and can be re-applied at later evaluative stages (e.g. Savage et al., 1995; MERCİ, 1997). In practice, focus groups can be linked with other techniques to support the discussion, triangulate data, or add insight through a variety of additional activities (see Table 1). Beyond that, they may be modified through the use of scenario techniques (e.g. *focus troupes*—Sato and Salvador, 1999) or *participatory design* approaches (e.g. Fabius and Buur, 2000).

Table 1
The use of focus groups in various disciplines related to designing: an overview

Source (authors)	Field of application	Details of application Codes: P: Focus groups as <i>part</i> of several studies C: <i>Combination</i> : incorporation of other techniques M: <i>Modification</i> of the technique	
Martel (1998)	Human factors (electrical appliances at Whirlpool)	Used focus groups as part of a comprehensive user research strategy parallel to a variety of other methods (e.g. home observation, evaluation of previous products, benchmarking)	P
Arnold et al. (1994)	Human factors (information systems for public transportation systems)	Used a combination of task analysis, travel observations, focus groups discussion, system evaluations, simulation (using inexperienced users), and operator and product developer interviews	P
Nielsen (1997)	Human factors (software and interface design)	Emphasised that focus groups should not be the only source of information and recommended parallel use of observational techniques, because users are not always able to identify all their <i>real</i> needs	P
Jordan (1994)	Human factors (interface of library system)	Used focus groups parallel to think-aloud protocols and a subjective usability index	P
Hone et al. (1998)	Human factors (suitability of speech technology for Automated teller machines)	Conducted a large-scale study incorporating three complementary methods: survey, focus groups, and user trials utilising a prototype Incorporated video simulations into focus groups	P C
Wilson and Callaghan (1994)	Human factors (hand held computer systems)	The contents of the focus group sessions were based on the study of ergonomics guidelines in related fields and expert interviews; together with contextual field research to understand user tasks, focus groups provided the basis for tests on specific aspects (e.g. product handling, form perception, readability) Use of scenario techniques	P C
Porter (1993)	Market research (prototype evaluation)	Focus groups to assess the project terrain, to evaluate early product specifications and provide a 'reality check' for designers; data may be used to design questionnaires	P
Zarean et al. (1994)	Market research (requirements specification)	Quantified the data from focus groups through national telephone surveys	P

Table 1 (continued)

Source (authors)	Field of application	Details of application	
Codes: P: Focus groups as <i>part</i> of several studies C: <i>Combination</i> : incorporation of other techniques M: <i>Modification</i> of the technique			
Savage et al. (1995)	Market research (requirements specification)	Used the results to re-examine competitive product analyses and devise competitive trials for concept designs Included questionnaires and presentations of product concepts; used scenario techniques to understand the different modes of use for new products	P M
Blatt and Knutson (1994)	Human factors (software/interface design)	Included questionnaires and presentations of product concepts	C
O'Donnell et al. (1991)	Human factors (interface evaluation)	Used focus groups as an evaluation technique for a central heating controller, using software simulation	C
MERCİ (1997)	Human factors (interface evaluation)	The new system (interface solution) was kept running on a large screen throughout the session to offer inspiration and provide a memory aid	C
Caplan (1990)	Human factors (photocopier development)	Developed focus groups to extend the qualitative results with quantitative data—to expand the applicability of focus groups beyond the stages of early exploration; included performance testing sessions of prototypes with individual participants one or two weeks before conducting focus groups; the group session was expanded with a 'decision making analysis'—to establish performance criteria during the session, and rate the criteria—as a basis for ergonomic experts to rate each concept	M
Sato and Salvador (1999)	Human factors (software/interface design)	Modification of focus groups to sessions termed 'focus troupes'—either by letting participants act out scenarios or by letting audiences observe actors demonstrating scenarios of use. These may followed by structured conversations to comment on the concept; beneficial to create a shared context of use; can be used to deal with the challenge of developing and evaluating a new product for which there is no experience of use—because in this case there is a lack of knowledgeable users	M

Table 1 (continued)

Source (authors)	Field of application	Details of application Codes: P: Focus groups as <i>part</i> of several studies C: <i>Combination</i> : incorporation of other techniques M: <i>Modification</i> of the technique	
Dolan et al. (1995)	Human factors (development of electronic handsets)	Extended focus groups through creative activities (e.g. drawing and clay for modelling) that inform designers about needs that are more difficult to express in words	M
Burns and Evans (2000)	Design research (car design)	Engineer/customer workshops where design engineers work directly with customers to generate solution ideas; focus groups and participatory user workshops provided the main design research tools besides observational techniques; use of scenario techniques to understand the different modes of use for new products	M
Fabius and Buur (2000)	Design research (re-design of a commercially used electrical device)	Participatory workshops involved 3 designers and 2 usability specialists in an open-ended discussion and were held both at the workplace of the users and in a usability lab; they were analysed collaboratively by usability specialists and designers, where pre-selected video clips were represented by cards with pictures	M

The efforts required in validating the results through involving larger numbers of participants or a variety of studies depend on the purpose of the study. Design research is often limited by time as a resource. Its main objective is to create communication with users and to directly inform the designing process—without claiming to be comprehensive. Ideally, the research incorporates human factor researchers and market researchers from early in the process, working in close collaboration with designers and users.

User-centred design methods differ by the degree of user participation and the amount of control given to users in the decision-making process. Carmel et al. (1993) distinguish three levels of user integration for group-based sessions:

1. *Consultative design* – users are incorporated primarily as sources of design information.

2. *Representative design* – selected user representatives take part in design decisions.

3. *Consensus design* – responsibility for the development is assigned to the users.

Leonard and Rayport (1997) suggest an alternative to traditional market research methods, such as focus groups, called ‘empathic design’—based on the finding that members of discussion groups can only report needs they are consciously aware of. They argue that true innovation can only stem from observing people using products in the context of a natural setting, such as the home environment. However, this type of research can be time consuming. Focus groups provide an efficient method for revealing issues, users perceive as important. Observational techniques are a valuable addition to focus group research. Rayner (1997) reports that traditional market research techniques, such as

focus groups, are suitable to complement empathic design methods.

3. Case study 1: interviews with practising designers

3.1. *The intuitive designing process*

It is difficult for designers to describe their own designing process—partly because it varies from project to project, but mainly because intuitive processes are difficult to articulate and analyse, as they happen largely unconsciously. It is difficult to predict how and when the ideas and solutions occur. The following comments highlight the individual views of the designing process:

It is difficult to understand/conceptualise your own designing process...it's got something to do with the information you 'suck in', the individual's scars of life, the daily experience...you tempt yourself with resources you enjoy and bits you play with...it's intuitive...it happens but it's out of our control.

Ideas just come up, from looking at existing products...and combining them with your experiences.

The process is ever-evolving; it evolves with you...I am not sure how to apply focus groups to this intuitive learning process...it's all so close together.

Design processes vary substantially between different design areas, product types (complex area or more focused targets), design tasks (incremental change or 'blue-sky'), and individual approaches due to experience and training. The approach an individual designer may take to a design task may vary significantly from designer to designer. Although a large number of formalised techniques and systematic approaches are available, they are rarely applied as such. *Formal methods such as QFD [quality function deployment] are too 'artificial'...designers are aware of the issues but don't tend to work through them in a systematic way.* When formal methods are part of the training of designers, then they adjust them to their needs: *...you tend to put your own edge to it, by ...trying and combining the information as necessary with that project...there would be certain elements you'd use.* The methods are used in an intuitive and iterative manner (*...touch and feel your way through*), often driven by time constraints.

3.2. *Practical constraints*

Designers find it difficult to dedicate time to conduct additional user research, particularly freelance de-

signers, and perceive that they might 'lose out' when spending extra time on user research:

...most market analysis is carried out by the client company, all the testing is done externally, most of what I do is hands-on design work...I generally have to put a price against the brief.

If my client comes to me and I don't know the answer...then he'll go to somebody who does...he'll say 'just get on with the design work'...the designer is expected to know.

[focus groups] detract too much from the designing activity.

Freelance and contract designers emphasised that the opportunities for conducting design research often depend on the client. Designers are under pressure to respond rapidly to design briefs and generate initial concepts. Only occasionally, there is scope to involve users at the later stages of the project:

People are very conservative, you have to be quite careful about picking your terms.

The clients' perception is that the designer will draw it—by the end of the afternoon he [sic] should have something, that's a common perception. They still think black and white drawing is going to be cheaper... they want something they can keep and show it to people.

Sometimes clients are knowledgeable about the market and have pre-determined what they are looking for. They may insist on their perceptions, although the clients' market research is frequently based on sales figures. Designers observed that perceptions about the need for user research are changing—reporting that designing now tends to be more market driven and that user research is being emphasised more strongly.

In-house designers do not depend on clients' perceptions and contracts and tend to be able to dedicate more time to considering the user. They draw largely on input from market research departments or ergonomics guidelines.

3.3. *Designers' role; perceived limitations of users*

Designers perceived various drawbacks when eliciting needs from users:

Users don't always know what they want.

It is more likely that you get an answer based on what they already know, based on what new technology is already available, or what is just coming up...Their thinking is very conservative.

Users will often not be able to talk about it or don't realise they use a product in a certain way...

Several designers were concerned that the success of the research is limited by the restricted ability of users to be creative and innovative:

I don't think that is a good creative process...it may depend on whether these people have creativity and imagination.

Designers are expected to design for the future, users tend to only consider what they have experience with. It may be difficult for people to get out of their usual mode into a different dimension...how long does it take for an individual to become relaxed.

...their input may be limited because they are not being part of the whole process.

Designers were worried about how their image is being perceived:

...as a professional...if you go and ask the public what to design you are not flowing, you are following culture rather than shifting.

It is not a good idea to spend lots of time to convince a client that I am a good designer, and then to start asking for money to do user research to generate novel ideas.

There were concerns about how the additional task of carrying out user research would change the role of designers:

Using the method to generate new designs may be constraining...you end up doing what other people have in their imaginations...it's up to the designer to push a bit further.

[When users are given brainstorming tasks] ...what would then be the role of the designer—creator or mediator

I would have to give up something else for it, designers would not be designers anymore.

3.4. Lack of skill and knowledge

Although several designers had some limited experience of focus groups, their lack of understanding of what is involved and the potential benefits was evident. There seemed to be a perception, based on designers' experiences, that focus groups are mainly used to evaluate concepts.

There was concern about the absence of skill to be able to prepare and conduct focus groups. There was a lack of confidence in developing questions to ask. *I need to know about writing questions to get meaningful answers.* Having observed a session, one of the in-house designers commented that *...some of the questions were too open, others too close...it is necessary to tease the individual to understand their real views.* Designers

require moderator training. *...it needs to be done properly and professionally.; I think a trained moderator would probably do the job better.*

There was a resistance to changing the current working practices. "Designers have gone into using a method through an evolutionary process...the use of new techniques may require to be linked more into education...designers would require 'brainwashing'". Moreover, the concern was raised that there are already many training requirements for designers.

Some designers expressed that they would be happy to try focus-group techniques after appropriate training:

If the designer is going to use it to improve designing, than a very strong designer might want to be part of that...I would be happy to try it with some training.

It might be useful, I might be willing to try it at certain clients at certain times.

3.5. Designers' information needs

Designers often experience a lack of information about user needs. In situations where designers can become involved in user research, it is often based on observation and/or studying existing material (e.g. evaluation of prototypes or mock-ups by users and/or clients). When designers had an opportunity to understand more about the user tasks and the user environment, then they valued that information. Some designers were confident that focus groups could provide useful information. Often they tended to envisage a situation of product evaluation. Freelance designers perceived focus groups to be useful *if the client was market-led and wanted to respond to everything that their customers wanted.* The in-house designers had already observed a focus group, but were sceptical about how to use the information from this particular session.

Designers emphasised the importance of ensuring that research retrieves valuable information efficiently. The objectives have to be clearly defined. The reasons for conducting the research and the resources available need to be made clear. It is vital to retrieve information that is important specifically to designing. There was a concern that, without careful preparation, the research may retrieve an *abundance of information.* It is important to discuss *real issues* in relation to the designers' task, which is often to *make products identifiable and distinct to others.*

All the designers interviewed, expressed that user information is important:

Cost and manufacturing...that's the pressures that I get most of, I don't get enough seeing what people need, what people want, that's much more difficult to get at...that would certainly be very useful, lots of it is guesswork, intuition, and feel.

I'm not that aware of the end user, neither are my clients, because when I ask and I always do because I like to get a picture in my mind about what this person does, I get a different answer from every one.

The majority of designers receives information about user needs from market research departments or clients, and saw little point duplicating those activities. Information is available without speaking to the customer directly. For some designers, the need for information about user needs depends on the project. For well-known areas it may be the case that designers ...*know what styling the customer wants*. In other circumstances, there may be a wide user group and complex design tasks, where giving the research task to designers would be too demanding, or evaluation of full-scale prototypes too costly. There was a fear that user research could constrain designing in certain situations.

Where designers are provided with user information from market research, there was a clear indication that this information is not adequately presented. In-house designers reported that documentation tends to involve quite detailed, tedious and long-winded documents. Designers tend to prefer the research findings to be presented concisely.

We don't carry out consumer research, we get it from the market research department...we interpret it the best we can.

The marketing specification is often too restrictive, not intuitive enough, the information collected might be irrelevant...

On other occasions the information may be very limited. User research and designing is not always sufficiently integrated. The information does not always suit the creative process of designers. In-house designers observed that designing is closely related to cultural aspects. *It is easy to get sucked into details...the wider issues...the cultural issues are more important, such as 'why does the kettle exist', why is it used...It is useful to consider the history of objects*. Designers need to consider peoples' lifestyle, and need to be continually aware of trends, ideas and fashion. One of the designers emphasised the need to understand user characteristics beyond the generalising term 'customer'.

The type of data required depends on the particular stage of the designing process. In evaluative sessions, there is *no point in finding out what you want to hear, you need to find out about problems*. It was observed that, although users might have the 'wrong' (unfounded) perceptions (e.g. need for holes in a shower wheelchair), their wishes have to be considered and are important. *The perception of quality is often important, rather than real quality*. Moreover, it

was found to be helpful to know more about different possible situations of use.

The opportunity for informal discussion with users was considered helpful to designers. It was observed that it might be useful to bring in techniques beyond the discussion activities. Observation techniques were recognised as useful, especially when expert users are involved.

3.6. Designers' involvement

Some designers view user research as a skill that does not suit the characteristics of designers: *Focus groups should be a specialised input by a qualified practitioner*. Two of the designers, however, stated that they had no reservations about directly interacting with users. One of them expressed a preference for talking to people, rather than receiving the information from a marketing department. Three of the designers felt in some way uncomfortable about talking to users directly. Their concerns were:

The presence of the designer may be problematic in a heated, emotional discussion about design concepts ...how to deal with personal 'attacks' of the users...this may require the presence of an impartial moderator to be the 'referee'.

Designers tend to fall in love with what they have done, hence, they may be the wrong people to take part in evaluative sessions.

I'd prefer discussion groups...with people of similar beliefs, where you have a common ground. I would feel more comfortable if I was asking people whom I trusted than asking strangers, they got opinions, but everybody has.

I'd rather not directly interact with the users...I'd like to just observe interaction... designers are essentially good with 'things', other people are good with 'people'...those who are good with things just see how it is, solve it, and make things. People who are good with 'people' talk about things and analyse things—there is a distinction.

The in-house designers observed that focus groups would be useful to understand user needs earlier, before the designing process commences. *It would be important to know early on in the process how the user would interact with the product*. Other designers envisaged the use of focus groups at the evaluative stages. They may be useful *for evaluating certain aspects of the design or design route...to get comments and feedback on prototypes, to observe how people interact with the products...as people may use it differently than expected*. It was suggested that it would not be difficult to invite users to test mock-ups and capture their expressions on video

camera—just as the feedback from clients is often judged by their initial reactions. There is some indication that designers would benefit from input into the preparation of the design research:

I always wonder whether they ask the right questions...I would like to have asked some of the questions myself, because you have a feel what precisely you are looking for...I am always suspicious of material that has been gathered and then modified.

It would be valuable to have a say in the preparation of market research for aspects to be included that are valuable for designing.

4. Case study 2: design student feedback

4.1. Experiences and perceptions of user research

The sample of students had been introduced to user research during undergraduate design projects, but had not come into contact with focus-group techniques. They had mainly applied questionnaires and one-to-one interviews. Often they consulted their peers—usually fellow student designers—to examine the design problem or gain feedback on potential solutions.

There were mixed opinions about the usefulness of user research. It was recognised as important and was often conducted, being part of the project requirements, but was perceived by some as a ‘hassle’ and time consuming. Some students were unsure about the value of the research—as they often found out mainly what they knew already—so the research just tended to confirm their point of view. Others could see clear benefits, had gained vital insights for their designing work, and valued user research as an important part of their activities: *I have gained from the experience...when you finish your user research first then the concepts are much better and more focused.*

It was seen as important to receive constructive criticism early in the designing process, as it can significantly help to enhance the final design proposals. It was recognised that user research can be integrated within the information search that designers carry out as part of the creative process: *Having to prepare a focus group is a way of defining a problem, to keep the project on track, set your boundaries at the beginning and be clear about them...it's part of your research.*

There was a concern about the ability of users to contribute to visionary designs, stemming from their perception that users are not creative: *Often there is that perception that you should know better than the user, because you are the one who is designing...when you ask the mainstream user about the design of a product then they'll say 'you are the expert, you tell me'...often you*

have come up already with a few ideas...and there is a mental block there.

Users are quite forgiving and might not always be aware of the problems that they adapt to. Given that new products usually tend to be developed within a very short span of time, it was perceived that it might be *difficult to predict with current research what people want 4 or 5 years ahead.* There was a “worry is that you don’t come up with something new when doing too much research of current perceptions”. It was perceived that, *some new products are technology-led, often people don't know about the possibilities.*

Designing was perceived as the ability to ‘create’ user needs through novel shapes, functions and technology. Designers considered themselves as ‘trendsetters’. Many of the designers perceived a conflict between being innovative and asking users about their needs. They are under constant pressure to generate innovative ideas and may feel that users may hold them back. However, it was recognised that designers have difficulties in acknowledging that users *can* provide valuable information. It was seen as important that focus groups provide information about aspirations beyond the functional.

4.2. The benefits of focus group research

The student designers recognised users as a valuable design resource. They identified opportunities arising from user research in providing evidence on which to base design decision-making. The opportunity to share ideas with users was perceived as valuable in supporting concept generation. Early involvement of users was recognised as important. Users may be more suitable to pick up on potential flaws regarding the operation of product concepts, as they provide a different angle to viewing the product use.

The group interaction (the synergy) was appreciated as being potentially useful to stimulate thoughts through sharing and comparing of examples and mutual stimulation. It was recognised that users appreciate the opportunity for discussion, above questionnaire form filling. Group discussion was viewed as providing more valuable data, whilst *form filling is not as careful and considered...it is important to sit people down and spent some time and focus on the topic.* Questionnaires had been experienced as limiting: *For my project I have spent hours designing a questionnaire and it was so difficult to get adequate responses...it is so much easier just talking to people...most of the information I eventually used for the project came from conversations.*

The semi-formal setting of a focus-group session was viewed as beneficial. Involving users within a relatively long session (e.g. 3 h) with a pre-determined structure allows the use of a series of exercises and visual aids. The

opportunity to share experiences can lead to a deeper immersion into the design problem. Likewise, a friendly and informal environment increases the confidence of both participants and designer-moderators, and encourages a creative atmosphere.

4.3. Practical aspects

The opportunity to observe user communication directly was welcomed, as the tone of voice, facial and body expressions are useful cues, whilst written notes are often more difficult to understand. All students welcomed an opportunity to directly observe focus-group sessions and take part actively through co-moderating. They were uncomfortable with being solely responsible for moderating sessions. They feared that they would have to concentrate far too much on thinking of the next questions and keeping the momentum of the conversation going, rather than making use of being present in the session.

The students were also concerned that they *might sub-consciously try to influence what the users are saying*, because designers may be overly focused on the project. However, the opportunity to ask additional questions during the discussion was welcomed, particularly as new questions may be triggered during the session.

The majority of the student designers highlighted their lack of skill and experience in formulating questions. It was recognised that asking users about ‘needs’ is difficult—they have to be uncovered and elicited skilfully. Designers would need support in generating the questions at the right level of detail, in ensuring one question leads to another, to avoid influencing users’ views, whilst gaining useful information, and encouraging users to be creative. It was identified that it is important to encourage users to express their honest opinions when evaluating design concepts in the presence of designers, as users might hold back too much to please designers.

The student designers displayed a preference for generating data that provides insight into product aesthetics and semantics. They suggested the use of *mood boards*, which is a collection of abstract images to represent an emotional response to a product, problem, or user (Garner and McDonagh-Philp, 2001). A list of positive and negative evaluative adjectives based on user evaluation of existing products, which had been introduced as an example of how to analyse and present data, was perceived as particularly useful.

The time-consuming nature of the techniques was considered problematic. It may be difficult to know when to stop researching. There may be a problem with trying to evaluate products outside the context of their typical user environment. Being able to select suitable samples of users to obtain a representative view and

extract valuable information from a variety of opinions caused concern.

Conducting focus-group research requires training as well as practice to become more confident. Given the benefits, several students stated that they would be prepared to make the effort.

5. Discussion and conclusions

To suit the needs of designing processes, user-research techniques:

- should be suitable for use *during all* stages of the designing process, as well as *prior* to concept generation;
- need to adjust flexibly to the varying requirements of design processes and should only include a basic level of formality;
- need to provide data to suit designers, such as visual material information that inspires rather than feels restrictive;
- need to enable designers to involve users in suitable exercises, retrieve needs beyond the functional, and to ‘unlock’ users’ creativity.

Designers confirmed that knowledge of user needs and aspirations is valuable for their designing processes. The additional effort spent on user research may be worthwhile. Designers (as well as clients and manufacturers) need to understand that consulting users directly is not a way to take away the task of designing from designers, but to enhance their designing process through deep immersion into the user experiences, aspirations, and dreams. Users’ creativity can be encouraged through a variety of exercises. The ‘needs’ retrieved from users require ‘translation’ into designs. Users help to formulate the problem, but do not necessarily provide solutions. This is still the designers’ task. Focus group techniques suit designing as they:

- provide an efficient technique to gain a diverse range of insights about user needs and aspirations that may be particularly suitable for designers—as a variety of user-research techniques can be incorporated into a research session, thus providing a rich source of inspiration for designers (Bruseberg and McDonagh-Philp, 2001);
- can be applied to a small-scale study and still be useful, due to the opportunities for communication with users and the qualitative character of the data;
- aid participants in articulating their needs through the group interaction (synergy).

Design work is often carried out in a design team. By applying focus-group techniques, users can be made as a part of this team. Moreover, discussion sessions with users may be suitable to link together different professionals, such as ergonomists and designers. They aid and

encourage collaboration through joint user-research activities. This also enhances designers' communication skills.

Designers need to receive appropriate training. Undergraduate degree programmes have not, until recently, integrated research methods during design training. The industrial design and technology programme at Loughborough University is integrating user research from the first year of undergraduate training onwards. Moreover, the studies presented here have been instrumental to the development of guide material for designers by the authors. It aids designers as well as design researchers in conducting user research based on focus-group techniques as an integral part of the designing process.

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