Towards human-centered design solutions: Stakeholder participation during brief development

Lizette CARSTENS

University of Pretoria and Design School of Southern Africa

Abstract

"...the [designer's] task is to design for the individual placed in his or her immediate context." (Buchanan 1998, p. 20)

This paper about a graphic design case study discusses the positive impact of stakeholder participation during the problem-setting phase of the design process on the designer's ability to reframe the design problem and to conceptualise human-centered design solutions that add value and enrich people's everyday lives.

A participatory action research methodology was followed with the designer in dual roles of designer and researcher. Mixed methods including interviews, participatory workshops and critical reflection were employed during four distinct phases — evaluating and comparing the development of the brief, framing of the design problem and the designer's proposed solutions after each phase.

Ethically the design process benefitted from participatory action research in terms of empowering stakeholders to actively, democratically and equally participate in the identification and solving of their own problems. The strict guiding principles of participatory action research guaranteed the designer's critical evaluation of and reflection on the process and the impact of potential solutions. Lastly, rich information about user needs enabled the design of innovative, useful solutions that addresses individual user needs on a practical level rather than only the aesthetic appeal of the product.

***Keywords**: Human-centered design; brief development; stakeholder participation; participatory action research; design research; design process*

Introduction

“The true challenge for design today is to arrive at engaging, meaningful outcomes in a way that addresses longer-term systemic issues rather than mere short-term desire fulfillment, while still giving joy…” (Eisermann, Gloppen, Eikhaug & White 2005, p. 20).

Current design discourse proposes that the ultimate task of designers is to effect design outcomes that empower individual human beings to become active participants in a search for, and agreement on what is good, just, useful and pleasurable in their local context or culture, (Buchanan 1998, p. 20).

By implication, the designer has a responsibility, an ethical obligation to correctly identify the stakeholders within a context or culture and to treat them with respect while making every effort to ensure that the design outcome creates economic, social, environmental, moral and aesthetic value, (Buchanan 2001, p. 16; Frascara 2001, sp; Morelli 2007, p. 5). Meeting this obligation requires an acute awareness of the complexity of the problem at hand, a concerted effort to ensure that the problem is framed correctly and a care to include a systematic evaluation process before any commitment is made to a specific design outcome (Findeli 1994, p. 65).

On a methodological level, it means that more time and effort should be extended to research and frame the design problem and to explore individual user values, needs and expectations during the initial phases of the design process.

The theoretical implication is that designers need practical research approaches that meet ethical research requirements, have built-in evaluation processes and are suitable for everyday use in day to day design practice (Findeli 1994, p. 65).

Yet, according to the International Design Alliance (IDA) World Design Survey Pilot Project's South African Findings (2010, p. 62), research is regarded by many designers as one of the least important prerequisites for successful design!

This paper focuses on participatory action research and specifically Open Space Technology as a useful research tool to discover and understand user needs and expectations and to reframe the design problem during the early phases of the design process.

Design involves an iterative process that can be modeled as a system of three demarcated spaces, each with related activities, rather than as a series of orderly steps (Brown 2008, p.88), as illustrated in Figure 1. Phase one, the inspiration phase, is exploratory in nature: Apparent random information is gathered, observations are made, questions are asked and ideas are discussed, elaborated or rejected (Swann 2002, p. 52, Brown 2008, p. 88). Two focus areas are discernible, namely brief development and interpretation of the design problem, (Tan & Melles 2010, p. 465). During phase two idea generation activities occur as the designer explores, develops and presents different conceptual ideas based on the brief. Phase three, the implementation phase, represents the final execution of ideas generated and tested during phase two.

Designers tend to focus on the design solution and do just enough design-specific research to enable them to complete the design process, (Swann 2002, p. 54; Tan & Melles 2010, p. 474). Relying heavily on and combining tacit knowledge and own understanding with new information gathered, designers often depend on the design brief – based on the client's knowledge and perceptions of the broad target market and sometimes on research done by external researchers – to frame the design problem and to supply any information with regards to user needs and expectations, (Swann 2002, p.54). This approach presents two stumbling blocks to discovering the values, needs and expectations of end-users and to framing the design problem:

Firstly, the designer has little or no direct interaction with the intended end-user of the design outcome. Consequently, discovering what users need, expect and value and anticipating their potential interactions with different design outcomes may be very difficult, especially when working with smaller businesses with limited research experience and/or capacity, (Bruce, Potter & Roy 1995, p.416; Brazier 2004, p. 69).

Secondly design clients who have a limited understanding of what design is and does, may require the designer to merely add aesthetic enhancement to a solution already created by other business units (Paton & Dorst 2011, p. 573; Phillips 2012, sp), thereby excluding the designer from the initial exploration and framing of the design problem.

Poor problem formulation, lack of clear objectives and insufficient information about the end-user, impede designers' ability to understand and consider potential interactions with and impact of design outcomes. Disregard for the importance of research and poor research skills among designers aggravates this problem which can and do result in a failure to deliver design outcomes that are respectful of user values and needs and considerate of economic, social environmental and moral impact. The consequence of such failure is dissatisfied end-users, disillusioned design clients, frustrated designers and design outcomes where the negative unintended consequences outweigh the aesthetic value of the design outcome, (Friedman 2003, p. 513).

This paper presents a case study borne of a designer's frustration with the gap between information regarding user needs and expectations contained in the typical design brief and the information

required to deliver empowering, respectful design solutions that are considerate of the individual end-user and his or her immediate context.

Said frustration led to the question: *How might a designer with limited research skills discover what users value, need and expect and what impact might this information have on re-framing the design problem and on the final design outcome?*

Theory suggests that stakeholder participation and/or collaboration during the exploratory phase of the design process may offer useful insights into common user values, needs and expectations, be helpful in identifying underlying design problems and could inspire new innovative outcomes that enrich users' lives (Sanders 2002, sp; Eisermann et al 2005, p. 19; Prahalad & Ramaswamy 2000, p.80).

This study investigated stakeholder participation during the exploratory phase of a design project. The primary aim was to supplement the design brief through the discovery of user needs and expectations by involving users in identifying underlying design problems and proposing possible solutions. A secondary aim was to explore participatory action research in the context of design practice as a research approach suitable for application in practice. An action research methodology was followed with the designer in dual roles of designer and researcher. Mixed methods including interviews, participatory workshops and critical reflection were employed during three distinct phases that are discussed in detail later in this paper.

Participatory action research: how and why can design practice benefit?

One approach that appears to answer both Findeli's (1994) practical methodological requirements and the theoretical research requirements of ethical design, as discussed in the introduction, is participatory action research (PAR).

PAR is a collaborative, situation-specific approach to problem-solving with a social purpose. The premise of PAR is that all stakeholders can learn from and influence each other's knowledge (O'Brien 1998, sp; McNiff & Whitehead 2006, p. 23).

On a methodological level, many similarities exist between participatory action research and design in terms of process and practical application, (Cole, Purao, Rossi & Sein 2008). Ethical, responsible design, like action research, is a problem-solving activity with a social purpose and impacts positively where action is informed by knowledge. However, the biggest challenges for design practice – and the areas where it can most benefit from PAR – are to apply the conditions of empowering participation and of critical, systematic reflection that are inherent in PAR (Swann 2002, p. 52).

Ethically, the democratic nature of PAR implies very specific considerations such as the identification of, consultation with and respect for all stakeholders; equal significance of all ideas and values and an acceptance of pre-negotiated guiding principles by all participants (O'Brien 1998, sp). It also demands a commitment by all stakeholders to seek an understanding of an agreement on the problem and its hypothetical causes in order to effect change, (Davison, Martinsons & Kock 2004, p. 75). Lastly, PAR demands ongoing, disciplined, systematic critical reflection during the process to ensure that focus on the problem is maintained and after the process on the outcomes, to evaluate and determine impact. (Cole et al 2005, p. 9).

Methodologically, PAR and design follow similar processes of iterative cycles (figure 1), suggesting that the PAR process and methodology might inherently feel familiar to designers.

Figure 1: The design process (Brown 2008)

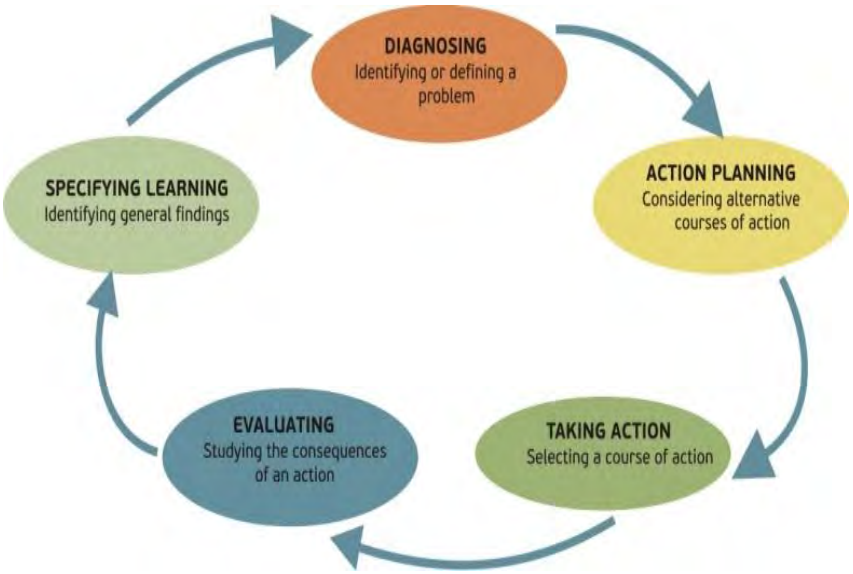

Figure 2: Actin Research cyclical change process model (Susman 1984).

The first phases of both PAR and the design process are exploratory and diagnostic in nature.

Participatory action research requires the researcher to conduct an independent diagnosis to confirm or refute the nature of the problem as presented by the research client, (Davison et al 2004, p. 73). Diagnosis is followed by the Researcher Client Agreement (RCA), an explicit written commitment between researchers, stakeholders and clients on approach, research focus, objectives and roles. (Davison et al 2004, p. 70; Cole et al 2005, p. 3). The RCA ensures that the ethical requirements of transparency and equality are satisfied and should therefore be in place before a project formally begins.

Theoretically, responsible design requires the designer to assume the role of researcher, collaborating with the client to identify and understand the design problem and study the context in which the problem exists, (Buchanan 2001, p. 19; Frascara 2001, sp; Blankenship 2005, p. 24-25). Before any design work commences, the designer and design client should ideally commit to the

design brief — a written agreement on approach, scope, objectives, roles and responsibilities and time frame. In practice, however, design work often commences without a clear comprehensive brief, (Phillips 2012, sp) which may result in outcomes that neither addresses underlying design problems, nor adds any real value in terms of economic, social, environmental or moral context.

The design process includes an evaluation and reflection cycle (Brown 2008), but as designers are usually not required to make their findings explicit, reflection and evaluation may not be systematic, disciplined, or critical, (Dorst 2008, p. 6). Adopting a PAR methodology ensures systematic, critical reflection that could help the designer to recognise potential negative impacts of a design outcome early on and to accurately measure and evaluate impact at the end of the design process.

Case study: Packaging for Body Inc Diet Clinics

The case study presented in this paper documents the impact of stakeholder participation on brief development during the first phase of a design project by a graphic designer for a long-time client, Body Inc Diet Clinics. The designer is the owner of a small design consultancy, with projects for SMMEs contributing most of its revenue. The study was conducted in four distinct phases:

Phase one: The designer-client interview

Usually, the designer commences all projects with a semi-structured client interview to gain information about the client organisation, identify design problems and understand the client's needs. This information is analysed to write a creative proposal containing a short summary of the business problem, a profile of the business, competitors and target audience and a creative proposal for addressing the problem. Sadly, clients often have little information available about customer's needs or sometimes fail to see how the interview questions relate to their design requirements, causing considerable frustration and sometimes resulting in unsatisfactory design outcomes.

Figure 3: Body Inc. products, from left: slimming tablets, colon support, multivitamin, slimming drops and slimming gel

Body Inc. had been using design services from the designer since 2008 and its briefing method generally consisted of an informal verbal discussion with the designer, or an emailed design instruction. This project was no different, commencing with a design instruction to change the colour and styling of product labels on dietary supplements (figure 3). No clear design problem was identified, nor any information given about the business objectives, intended audiences, or competitors. The designer arranged a semi-structured interview with the client hoping to discover the business objectives that motivated this change, and to gain an idea of project scope, time frame, and target audience. As no market research had been done, the client had limited information about user needs and could only offer her own opinions based on her and her sales consultants' interactions with and observation of customer behaviour.

Phase two: Analysis and interpretation towards a creative proposal

Mutual trust between the designer and the client based on their long-time business association was beneficial to the interview process as the designer had developed a strong sense of Body Inc.'s identity – a common occurrence in close client-designer relationships (Bruce & Docherty 1993, p.416), that allowed for the careful selection of questions. The designer could supplement information from the interview based on incidental knowledge gained through previous experience on projects for the client. This tacit knowledge and the client's information were combined with observational notes about packaging trends in competitors' products and analysed to draft a written design proposal.

The designer's interpretation of Body Inc's business objectives hinted at a wider underlying design problem: A younger than expected target audience and observation of competitor brands suggested that a stronger, more dynamic visual treatment of the entire brand identity was called for. Some products appeared to have wider appeal than the identified target audience. An umbrella strategy with a tiered branding approach and visual differentiation between product ranges would enable Body Inc to take advantage of this opportunity, while maintaining a cohesive brand.

The designer suggested a phased approach, starting with subtle changes to the existing brand identity, followed by the development of variations on the logo that could be applied to different product ranges and concluding with a new visual treatment of all product labels.

The designer's interpretation of the design problem, based on wider information and the proposed solutions, had already departed from what would have been a mere visual redesign of product labels as expressed in the client's instruction, yet notably excluded any consideration for user needs.

Available information offered little insight into customer interaction with products, what they needed, or how value could be added to enhance their experience. Based on theoretical knowledge gained from studying towards a Master's Degree, the designer suggested that stakeholder participation in the form of participatory action research could aid in discovering user.

For this project, the following stakeholders were identified:

a) The designer
b) The design client
c) Sales consultants
d) Customers / end-users

Phase three: Participatory workshops

A major ethical requirement of PAR is mutual trust and respect among participants (O'Brien 1998, sp). An existing cordial long-term relationship between the client and the designer, a flat management structure and intimate working relationship enjoyed by the design client and her sales consultants and close relationships between customers / end-users and consultants made this project ideal for participatory action research.

Renowned for its effectiveness in situations where diverse people must deal with complex issues in productive and innovative ways, Open Space Technology (Owen 1992, p.12), a recognised PAR tool, developed by Organisational Transformation Consultant, Harrison Owen, was selected specifically for its strict governing principles that would satisfy the ethical need for democracy, equality and empowerment. OST has been in use since 1985 and has been used to great effect by large organisations such as NASA Goddard Flight Centre (Open Space Technology 2015).

Two creative workshops were arranged where participants, randomly selected from the client's customer database and from her sales consultants and including the client and the designer, were invited to explore and share their views on how Body Inc's product packaging could be improved through design to fit their needs.

Adhering to Owen's guidelines(1992, p.24), a venue offering an informal environment with movable furniture and a pin-up area was selected. Seating was arranged in a circle in the centre of the room. Work areas in the form of large tables were placed around the edges of the room and a pin up area was created along the front wall.

Participants were asked to create visual presentations of their proposed solutions, which would serve as a visual record for reference and analysis by the designer. To this end they received pre-packed toolkits, containing stationary and other creative aids, upon arrival (figure 4).

Figure 4: Toolkit given to participants.

Open Space Technology (OST) has specific strict governing principles that ensure democracy, equality and empowerment of all participants (Owen 1992, p.68-74). A trained OST facilitator was employed to facilitate workshops that commenced with an introduction to and explanation of the basic governing principles:

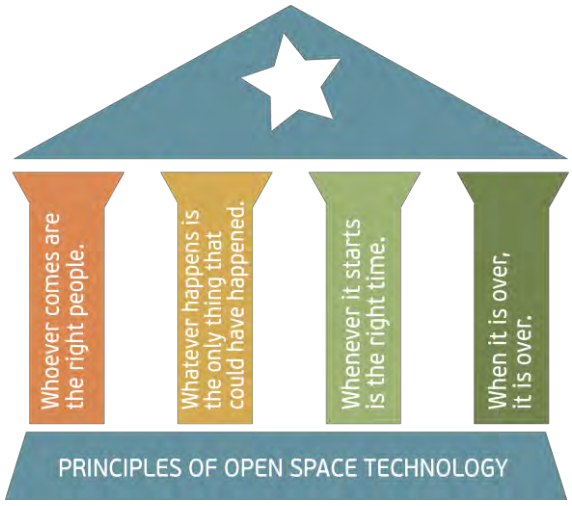

Figure 5: The guiding principles of Open Space Technology (Owen 1992)

Principle 1: Whoever comes are the right people

Participants were reminded that the number or status of contributors, is not important, but rather the quality of interaction and conversation. They were also advised of the ethical principles of PAR:

a) all ideas were equally important and valid,
b) all participants were on equal footing,
c) any participant was free to withdraw at any time and
d) decisions were to be made collectively.

Principle 2: Whatever happens is the only thing that could happen

In the opening session, the facilitator explained that real progress and learning could only take place when all participants move beyond their own agendas. Owen (1992:70) strongly discourages the presence of any agenda or guidelines in workshops, as these limit discussions and hamper the discovery of true problems and solutions. Participants were requested to give free reign to the imagination disregarding production limitations or cost, and to consider all aspects of packaging rather than visual appearance alone.

Subsequently, participants were asked to publically "announce" and post any problems / concerns they had with the existing packaging on a bulletin board (figure 4). Participants decided to group products together per problem/concern. For example, they found the size of both the whey protein and the slimming gel containers too big, so these products were grouped together for one discussion.

Figure 6: Issues posted on the bulletin board, workshop one on top and workshop two below.

Individuals chose discussions they wished to participate in and formed groups at the various work areas. Concerns related to chosen products were discussed and ideas for alternative solutions were brainstormed. More concerns and problems emerged and ideas voiced, triggered other ideas that gradually merged into possible design solutions.

As possible solutions emerged, groups created their own designs, drawing, cutting, pasting, colouring and adding written captions where their drawing skills failed.

Workshops concluded with an open floor where groups took turns to visually present their ideas, give feedback on discussion outcomes and consider comments from other participants. Very few questions were raised and participants expressed satisfaction with the outcomes presented. Because initial groups are formed by participants who feel strongly about a specific problem, they are most likely to solve it and consequently consensus on outcomes is a common occurrence in OST (Owen 1992,pp.104-106).

Principle 3: Whenever it starts is the right time

In the opening session, participants were reminded of the nature of creativity – it appears in its own time, which by definition is the right time. Groups were free to start their discussions at their leisure. Tea, coffee and refreshments were available on a continuous basis and participants were free to schedule their breaks and work time as they deemed fit.

Principle 4: When it is over, it is over

As is common in OST workshops, some groups concluded their discussions early, allowing these participants to move to and participate in other groups, or take a break. Groups that did not

complete their discussions by the end of the workshop were free to present the ideas and outcomes they did produce. These outcomes were considered equally valuable and valid.

As neither the designer nor the client could be present in all groups all the time, all rough drafts, flip chart pages and notes generated during group discussions and all outcomes presented at the end of workshops were collected. This material served as a record of workshop outcomes and combined with the designer's personal notes and observations, as crucial source material for analysis and interpretation to inform a final brief.

Phase four: Analysis and interpretation of workshop outcomes

Workshops proved useful in highlighting concerns and needs that Body Inc had been unaware of. Participants' solutions were not always practical, but provided the a wealth of ideas and options for further exploration, enabling the designer to propose solutions that address much more than visual appearance.

Workshops identified similar issues. Participants appeared more concerned with practical usability of packaging than visual appearance, which the designer took as an indication that the design problem required a wider focus than the visual appearance of product labels.

Participants did express a preference for black paired with vibrant colours. The size and readability of product information on containers also emerged as a concern.

The main concerns emerging from workshops were a need for smaller, handbag-friendly packaging that would reduce the need and temptation to cheat on the diet when away from home and a need for containers that could accurately dispense the correct number of slimming tablets or drops at a time.

The absence of some products from discussions, raised questions for further investigation. Participants were, for example, not interested in discussing two products identified as poor sales performers in the client interview.

Information gathered inspired ideas that address users' needs and significantly increase the client's value offering. For example, based on user feedback, a pump-action dispensing bottle was sourced for the slimming gel and the product offering was expanded to include a 100ml travel-size option. The slimming tablets' pop-top container was replaced by a container usually used for artificial sweetener tablets, with a self-dispensing mechanism. Packaging costs on some products increased slightly, but smaller packaging options for example, could be priced lower, resulting in more frequent purchases, increased sales and higher income per unit, while raising customer satisfaction.

Analysis and interpretation of information from the client-designer interview combined with workshop outcomes impacted significantly on the content of the designer's final creative proposal, resulting in a major expansion of project scope and creative strategy.

Impact of stakeholder participation on information and brief development

This case study suggests that a combination of client-designer collaboration on brief development and stakeholder participation in the information gathering phase of the design process, impacts positively on brief development, providing the designer with a rich picture to draw on when developing a creative strategy. From Table 1, comparing the impact of information from each phase of the study on brief development and creative proposal, it is clear that stakeholder participation had a major impact on brief development. Based on an analysis of information gathered, the designer was able to reframe the design problem in a way that stimulated the development of outcomes that would truly address user needs, rather than offer a mere aesthetic enhancement.

Table 1 (following page): Comparison of impact of information from each phase of the study on brief development and creative proposal.

Information	Client instruction	Brief based on interview	Brief based on interview + workshops
Project overview	Limited to *what* the client wanted done.	Motivation became clear. Project scope emerged.	Expansion of project scope to include type of packaging rather than only visual appearance of packaging.
Category or industry overview	No information.	Expansion into new industries.	Workshops offered no additional information.
Company portfolio	No information.	Strong and weak performers in the existing portfolio were identified. Reasons for performance could only be guessed at.	Expansion of existing product ranges might be in order. A need for smaller handbag-size alternatives.
Industry trends	Only stated desired visual outcomes in vague terms.	Colour trends were identified. Trends cited as motivation for visual changes.	Visual appearance of stakeholders' workshop designs confirmed client's desired appearance as stated in initial instruction.
Competitors	No information .	Direct and indirect competitors were identified.	Competitors in secondary industries affecting individual products emerged in group discussions.
Strategic business considerations	No information .	Existing strategy reviewed and change in strategy to accommodate portfolio expansion discussed.	Branding strategy identified as area requiring further research.
Target audience	No information.	Demographic and socio-graphic profiles based on customer database.	Rich information in terms of user needs and expectations. More concerned with usability than visual appearance. Participants' solutions provided inspiration for idea-generation Identified areas where value of product offering could be enhanced through simple changes or additions.
Creative strategy	Suggestions on visual appearance based solely on aesthetic enhancement.	Changes to visual appearance and branding strategy based on existing portfolio, competitor review, industry trends, target audience review and business objectives.	Comprehensive proposal addressing a wide range of issues including changes to: • Project scope • Visual appearance • Type of packaging • Product ranges in company portfolio • Branding strategy
Practical concerns	None were given. Designer was aware of existing practical limitations due to pre-existing client-designer relationship.	Practical limitations with regards to suppliers and type of packaging available. Limitations in terms of cost of sales. Legal requirements on labelling.	Limitations identified in client interview rendered some proposed workshop solutions impractical. Workshops solutions offered ideas for exploration to overcome limitations imposed by suppliers and cost.
Timeline and budget	Deadline for completion of project. No indication of budget. Designer had difficulty providing a cost estimate as project scope was unclear.	Project scope made the identification of project nodes with timelines possible. Allocation of responsibilities. Client unwilling to disclose budget. Designer could base cost estimate on scope and responsibilities.	As scope expanded, timelines expanded and project nodes added and prioritised. Cost estimate increased, but workshop outcomes suggest that increased cost could be offset by value increase of product offering.

Conclusion

The introduction to this paper discusses the ethical challenges faced by the design profession to create engaging, useful design outcomes that are valued for their positive impact rather than mere consumption driven desire fulfillment. Prominent design authors, such as Buchanan (2001:16) emphasise designers' responsibility to deliver design that is useful, just and pleasurable while empowering people to create their own solutions for their specific problems, (Morelli 2007:5-6).

Delivering on this responsibility requires the designer to have a clear understanding of the underlying design problem, to recognise and respect user needs and expectations and to take care to include a systematic process to evaluate the impact of potential solutions before any commitment is made to a specific design outcome (Findeli 1994, p.65).

Insufficient information, limited research capabilities and a lack of understanding and knowledge of design by the design client appear to present major stumbling blocks to correctly identifying and framing the design problem and to understanding user needs and expectations. Designers need practical research skills and approaches with built-in evaluation processes that they can use themselves and that are suitable for everyday use design practice (Findeli 1994, p.65).

The aims of this study were firstly to investigate the impact of user participation during brief development on discovering user needs, framing the design problems and the subsequent proposed design outcomes and secondly, to explore PAR in the context of design practice as a research approach suitable for application in practice.

In terms of brief development, the user participation had a major impact, enabling the designer to reframe the design problem in a way that inspired more useful outcomes than what the client's initial instruction demanded. New product research and development was driven by design, based on ideas generated by participants during workshops, which enabled the designer to demonstrate to the client the value of involving design early on in product development.

As a research approach, PAR fitted seamlessly and effortlessly into the design process, allowing for quick results, at relatively low costs as research was not done by outside researchers, but rather by stakeholders. The well-established and tested methodological guidelines and principles of action research ensured ongoing analysis and evaluation of and reflection on all information and outcomes gained from the process. They also proved extremely valuable in guaranteeing rigour, reliability and validity.

The specific ethical considerations of PAR guaranteed an equal and democratic consideration of all stakeholders' concerns, frustrations, needs and expectations and empowered users to voice their frustrations with products in their current form, and to explore their own ideas for solutions.

Whether PAR approaches will be useful to other designers in different projects is open to exploration. Conducting qualitative clinical research implies that each situation, as well as its role players, is unique, which makes inferences and replications a difficult task. The purpose of action research is not to prove or disprove specific patterns, but to explore possible relations and to illustrate potential new models. Nevertheless, this study raises questions about the wider application of participatory action research in design practice and its potential to facilitate human-entered design outcomes that empower people to create their own solutions for their specific problems.

References

Berman, BD 2009, *Do good design. How designers can change the world*, Berkeley: New Riders in association with AIGA design press.

Blankenship, S 2005, Outside the centre: Defining who we are, *Design Issues 21(1),* pp. 24-31

Brazier, S 2004, Walking backward into design: support for the SME, *Design Management Review* 15(4), pp.61-70.

Brown, T 2008, Design Thinking, *Harvard Business Review,* pp. 84-92.

Brown, T 2009, *Learning to measure participation. Design Thinking, thoughts by Tim Brown,* viewed, 25 May 2009, <http://www.designthinking.ideo.com/?p=292#content>.

Bruce, M & Docherty, C 1993, It's all in a relationship: a comparative study of client-design consultant relationships. *Design Studies* 14(4), p. 402-422.

Bruce, M, Potter, S & Roy, R 1995, The risks and rewards of design investment, *Journal of Marketing Management* 11, pp. 403-417.

Buchanan, R 1998, Branzi's dilemma: Design in contemporary culture, *Design Issues.* 14(1), pp. 3-20.

Buchanan, R 2001, Design research and the new learning. *Design Issues*.17 (4), p. 3-23.

Cole, R, Purao, S, Rossi, M & Sein, MK 2005, *Being pro-active: where action research meets design research*, viewed 25 November 2011, <http://aisel.aisnet.org/icis2005/27/>.

Davison, RM, Martinsons, MG & Kock, N 2004, Principles of canonical action research. *Information Systems Journal.* 14(1), pp. 22-43.

Eisermann, R, Gloppen, J, Eikhaug, O & White, P 2005, Responsible design leadership: The initiatives of professional organizations in Europe and the US. *Design Management Review* 16 (3), pp. 19-22.

Findeli, A 1994, Ethics, aesthetics and design. *Design Issues* 10(2), pp. 49-68

Frascara, J 2001, *The dematerialization of design. Reprinted from Tipografica Magazine.* [O], viewed 12 March 2011, <http://www.icograda.org/feature/current/articles73.htm>.

Friedman, K 2003, Theory Construction in design research: criteria, approaches and methods. *Design Studies* 24(6), pp. 507-522.

IDA World Design Survey Pilot Project South African Findings, p. 62, viewed 18 February 2011, <http://issuu.com/designinformation/docs/wds_report_lr#download>.

McNiff, J & Whitehead, J 2006, *All you need to know about Action Research*. London: Sage Publishers.

Morelli, N 2007, Social innovation and new industrial contexts: can designers "industrialize" socially responsible solutions? *Design Issues* 23(4), p. 3-21.

O'Brien, R 1998, *An overview of the methodological approach of action research*, viewed 11 January 2010, <http//www.web.net/robrien/papers/arfinal.html>.

Owen, H 1992, *Open Space Technology.* Maryland. Abbot Publishing.

Paton, B & Dorst, K 2011, Briefing and reframing: A situated practice. *Design Studies* 32, pp. 573-587.

Phillips, PL 2012, *Creating the perfect design brief.* New York. Allworth Press.

Prahalad, CK & Ramaswamy, V 2000, Co-opting customer competence, *Harvard Business Review* 78(1), pp. 79-88.

Sanders, EBN 2002, From user-centered to participatory design approaches in *Design and the social sciences* edited by Frascara, J. New York: Taylor & Francis Books Ltd:sp.

Swann, C 2002, Action Research and the Practice of Design. *Design Issues* 18(2), pp. 49-62.

Susman, GI 1983, *Action Research: A Socio-technical perspective*. London: Sage Publishers.

Tacit knowledge 2013, viewed 21 February 2013, <http://en.wikipedia.org/wiki/Tacit_ knowledge>.

Tan, S & Melles, G 2010, An activity theory focused case study of designers' tool mediated activities during the conceptual design phase. *Design Studies* 31(5), pp. 461-477.

