



Product design and action research: the Interdesign 2005 workshop on Sustainable Rural Transport

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Examining the viability of rural manufacturing, the existing structures of rural manufacturing practices reflect the prevailing conditions under which production takes place and therefore contain features which are fundamentally appropriate to their context. An approach to intervention is therefore proposed which capitalizes on existing skills, practices and social relationships, and it is shown that by working with existing structures and skills rather than undermining them, the sustainability of the enterprises which are developed is greatly enhanced (Poston 1994:xi).

Introduction

In the contemporary world where scientific knowledge often leads to remarkable technological innovation, the role of the designer in developing this technology is entrenched and adequately defined. When a product designer works in partnership with a scientist in the development of new technology, he/she is required to understand the fundamental scientific principles underpinning the new product and, at the same time, to be sensitive towards the needs of the marketplace. The awareness of stylistic requirements to 'sell' the product to consumers is considered integral in this translocation of science into technology.

This task becomes more complex, however, when designing for technologically disadvantaged communities in developing countries. These communities often have specific design needs, accentuated by a lack of basic infrastructure such as electricity and running (tap) water. The development of products for these communities requires sensitivity to their needs, as well as recognition that the communities often retain large parts of their traditional societal structures and indigenous knowledge systems (IKS) in their day-to-day living. Their local knowledge has been used over millennia to construct systems for survival in a sustainable manner – systems that are considered to be under growing pressure.

For any product to succeed, the application of appropriate research methods sensitive to these realities should be considered important. The importance of acknowledging IKS in technologically advanced product design activities in developing countries is consequently receiving growing academic recognition amongst designers. The research mechanisms utilised strive to promote the integration of different epistemologies ('western-style' and indigenous technologies) with global needs and trends. In South Africa,

as in other parts of the developing world, these mechanisms include intercultural and interscientific interventions that necessitate the identification and assessment of various perspectives that reflect a multicultural society. This leads to an increasing obligation on the side of local designers to assess and develop intellectual understanding of local conditions and cultures when embarking on the design of products for rural use. The article devotes particular attention to a single case study to illustrate the complexity of the process and the need for cultural understanding.

To illustrate this perspective this article appraises the design process of the Interdesign workshop on Sustainable Rural Transport that took place in South Africa in April 2005. The focus of the workshop was the development and design of appropriate products to address the transport needs of rural communities. The successful management of the project required sensitivity towards the needs and perceptions of the community without the loss of sensible design criteria. The underlying aspiration of the project was to contribute to the sustainable and successful management of research-based community development projects in the future.



Theoretical considerations for Interdesign workshops

Design and technology constitute the map for tracking the development of human societies. Despite an impressive record in the deployment of advanced technologies and industrial-driven design solutions aimed at the global marketplace in South Africa, designers have yet to regard existing products designed in rural communities as important enough to incorporate into the formal design field. The distinctive needs of various groupings within a given community (for instance, gender, economic status, age, and educational) expose a further hierarchical complexity in the sustainable design process.

To embark on a collective research vision for such strategic *design for development* ideals successfully, it is imperative to bring together designers, social scientists, natural scientists and engineers as research partners. The need might not necessarily be to find new solutions for old problems but to create an awareness of challenges in communities that are embedded in tradition, while simultaneously having to evolve rapidly owing to global influences. Environmental change, increasing scarcity of resources like water and fuel and large-scale migration of people because of political instability are some of the factors that need to be considered. Multidisciplinary teamwork that enables designers

to reveal different experiences and methods to solve specific design problems in developing countries may well drive appropriate innovation, but also renders sustainable management more complex owing to the above mentioned problem areas.

In recognition of these complex developmental design needs, the International Council of Societies of Industrial Design (Icsid), has engaged in organising international workshops as part of its mandate since 1971. The design teams attending workshops constitute industrial designers, engineers, graphic designers and architects amongst others. Some 35 Interdesign workshops have been presented in 18 different countries over a period of 32 years, starting in Russia with a workshop on the production of bread. Textual evidence and the documentation of past research methods from these previous workshops is not readily available.¹

What have the general objectives of these Interdesign workshops been since 1971? Of high priority is the identification of appropriate social conditions to inform the design process in ensuring sustainable product development. What should have been of equal importance is a consideration of responsible methods of research during the collection of knowledgeable community-based information. These primary concerns could address local problem areas and provide scholarly support to the following crucial questions

when designing for development:

- What is design knowledge and what constitutes research in culture and science when looked at from an intercultural design perspective?
- What are the main characteristics of local and global design epistemologies in relation to cultural and science studies?
- What types of relationships exist between dominant science theories, IKS and the diversity of local design epistemologies?
- What could be the most sustainable relationship between local knowledge and sustainable knowledge?
- How do designers look upon endogenous development and how can such an engagement contribute to a co-evolution of epistemologies?
- What steps could be taken to enhance co-evolution of different ways of knowing?

Experience indicates that community based research requires acknowledgement of the *worldview* of the society involved to ensure successful interaction between the researcher and the *researched* (Hountondji 1997; Eze 1997; Sardar 2002). Formulating a better understanding of the *worldview* of the community generally requires the prioritisation of the following aspects:

- Research should be undertaken about how local cultural values and practices and indigenous aesthetics inform



the historical and contemporary design of artefacts and utility objects that are used in the target communities; and

- Research should consider the impact of recently introduced or emerging technologies on community development (Smith 1999).

When engaging with rural communities these two aspects are rendered complex as these communities usually exhibit complex social structures that consist of a variety of cultural and ethnic permutations. At the same time, designers who participate in Interdesign workshops come from diverse nationalities and backgrounds. This generates repetitive design cycles, originating from the different social, educational and aesthetic backgrounds of visiting designers and the participating community. In a multifarious situation such as this, the responsibility of creating awareness (during the research process) of the interests, ideologies, ritual and cultural needs of the community adds to the complexity of the task. Careless or unplanned transfer of technologies might result in an unfavourable effect on the community.

Participants in Interdesign workshops generally include a number of academics from institutions of higher education. These institutions deal with *known knowledge* transmitted through education and training, but are also responsible for generating new knowledge through research and development (R&D) initiatives. The application and improvement

of these *systems of knowledge* are traditionally measured through processes such as formal assessments and research outputs. There is, however, a third often neglected requirement and that is to measure the *impact* of a new product or project against local knowledge systems prevalent in a community; a positive impact can be calculated in terms of ensuring sustainability. The community becomes the guiding force and it is wise to '... take more heed of the voices of marginalized people and minority groupings who could contribute to a more empowering and creative approach to the empowerment of people' (De Beer 1997:56). Engagement with research in rural communities inevitably requires academic recognition of the existence of local IKS.

Designers need to support the notion that IKS must be acknowledged, measured and incorporated into technology transfer processes during any design practice that involves the innovative adaptation of traditional products and systems.² IKS is based on the 'common sense' survival strategies of a specific community. Such 'common sense' or IKS can be defined as:

... local knowledge i.e. knowledge generated and transmitted over time, by those who reside in a specific locale, to cope with their agro-ecological, economic and socio-cultural environments. Such knowledge is passed on from generation to generation. It is knowledge that develops from the

experience of the people and is influenced, but not dictated to, by specific ideologies. IKS is stored in peoples' memories and quotidian activities and is expressed in stories, folklore, proverbs, myths, cultural values, belief systems, rituals, metaphors, idioms, local language artefacts and above all in production systems and innovation chains (Starkey 2001).³

Pitsedisulejang

Interdesign workshops apply the methods of participatory action research (PAR),⁴ where the community become active participants in the research process. The research usually includes qualitative as well as quantitative methods consisting of interviews, data collection by means of questionnaires and interactive surveys. PAR can be seen as a shared, logical and supportive technique of information gathering as it enables designers to assess the particulars of human experience while incorporating the appropriate local values into the environment surrounding design and technological innovation. Properly executed, PAR increases the validity of results for the end-user – hence the original argument that the *impact* of research on a community should be measured. There are a number of factors particular to action-based research:

- The researcher's beliefs and perspectives play a significant role in the conceptualisation, implementation and analysis of research;
- Research is always implicated in relations of power with



political and social consequences;

- Unequal power relations exist between researcher and the 'researched'; and
- By means of his method, the researcher has a political and social responsibility (Calhoun 1995; Munns & Rajan 1995).

Community-based product design in South Africa has resulted in a number of reports over the past decades that investigate the standing of such research. It is widely acknowledged that the failure rate of introducing new products and new technologies to rural communities is high in Africa.⁵ The reports all comment that the failure of this process can be attributed to a number of issues:

- The culturally *incorrect* way the product is introduced to the community;
- Failure to take into account the existence of specific (culturally orientated) designs in the community;
- Failure to include and consult the community in the design and development process;
- Introducing products that by nature or utility are foreign to the specific community; and
- Ignoring the specific socio-economical circumstances and needs of the specific community.⁶

The Interdesign 2005 workshop in South Africa

When the South African Bureau of Standards (SABS) was approached by the provincial government of the North West Province to develop appropriate transport for local use, the opportunity for a multidisciplinary Interdesign R&D design project was presented. The South African role-players were:

- the R&D division of the SABS;
- the SABS Design Institute, a division of the SABS;
- the National Department of Transport, Roads and Public works of the North West Provincial Government;
- Bojanala Platinum District Municipality;
- the Industrial Design Departments at the University of Johannesburg and the Cape Peninsula University of Technology;
- the Department of Visual Arts at the University of Pretoria; and
- Communities such as Pitsudesuleyang in the North West Province.

The Interdesign workshop brought a team of researchers and designers from different disciplines and 14 different countries to South Africa.

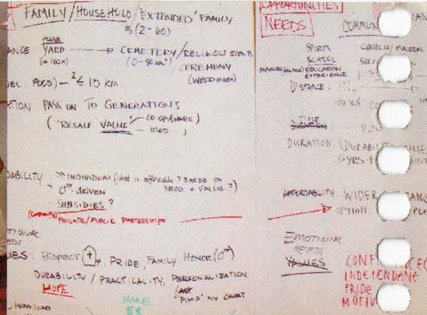
The design brief required the design of a donkey cart, a donkey harness and a sturdy bicycle for rural use. An oppor-

tunity was also created to design other innovative alternative forms of transportation. The selected communities in the North West Province became partners with the international design team and the workshop provided an opportunity for the type of strategic design collaboration discussed in the introduction of this article. The design brief was formulated to move the design process beyond the boundaries of industry and the marketplace to the rural area where local communities stand to benefit directly from proposed solutions.

Concise information regarding the social background of the community was provided to all the participants before the start of the workshop. This provided an insight into the social conditions of the community and made informed consideration of relevant social aspects possible during the design process. The aim was to foster a good research relationship between workshop participants and members of the local communities and a communications team was included to facilitate this interaction.

The stated aim of the workshop was to accommodate the IKS prevalent in the North West Province. It was generally anticipated that this recognition would enable participants to conceptualise socially responsible products that would impart a positive impact on the specific communities. After all, design is considered to reflect a society's technological ability and in current times, design and technology are con-

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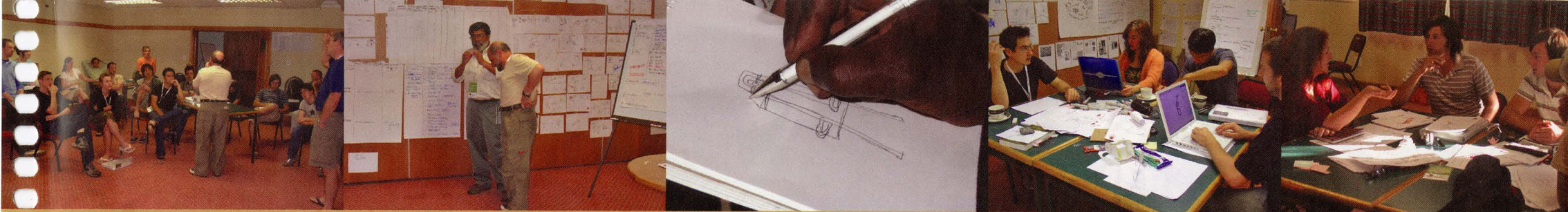


the physical terrain, the social needs, the immediate and long-term design requirements and the local hierarchal support systems that would assist in the acceptance of such a transport system. A prototype was developed to fulfil these requirements and it is still to be tested in the community during 2007, possibly leading to further methodological insights.

This exercise demonstrates that women can contribute to the innovation and improvement of technology to which they previously had little access. They are able to provide insight to the use of technology in alternative ways not envisaged by designers and in this manner they become 'co-producers' of technology and innovation. In such instances they may be considered as 'designer-users' through their adaptation and specialised utilisation of the new technology.

Gathering information from women provided new insights. At the Pitsudesuleyang clinic, local women are employed as caregivers to HIV/Aids patients in the community. They expressed very specific requirements for an appropriate bicycle. The women see a bicycle as a working tool and not as a recreational or 'fun' item. They travel far carrying packets containing basic care equipment required by patients. The women indicated a need for a sturdy bicycle with extra provision for carrying space in the front and back of the bicycle. This could be to transport not only care packets, but also sometimes the patients or occasionally their own children. The women exhibited a high level of technological expertise regarding the specific requirements for the bicycles – including a preference for a sturdy frame and puncture free tyres. They exhibited a high level of knowledge regarding

As the understanding of the role of women undergoes change, gender-based research input should increase in importance where developmental design projects take place (Ananad 1992). The bicycle team illustrated the usefulness of community input combined with gender sensitising. Through this exercise, the team proved the benefit of focusing on the design needs of the larger community and on the importance of including social needs from a gender perspective into pre-design research and development.



Comments from Interdesign participants

Towards the end of the workshop the 64 Interdesign participants were asked, by means of a questionnaire, to comment on a number of aspects regarding the organisation and proceedings of the workshop. They were requested to comment on the design constraints they had experienced during the workshop and were asked about their reactions regarding the research methods of the workshop.

When asked about the satisfaction of the initial planning and background information provided, 90 per cent of the sample felt the need for a better understanding of research methods when doing community research. Ninety per cent of the designers commented that they needed more information on the culture of the local community. Fifty per cent considered the information provided in files to each participant on the social structures of the communities adequate. Visiting the community during the design process was seen as essential by all (100 per cent). Fifty per cent of the designers wanted repeated visits and (surprisingly) almost 90 per cent would have liked to stay within the community rather than at the conference venue provided by the organisers.

All the designers (100 per cent) found the interaction and information they collected in the community useful in their

work. Regarding the role of communication during the interaction between the designers and the community, 65 per cent needed more information and commented in general on the inadequacy of the information supplied by the 'community representatives'. These representatives were not from the community involved but appointed by the provincial authority.

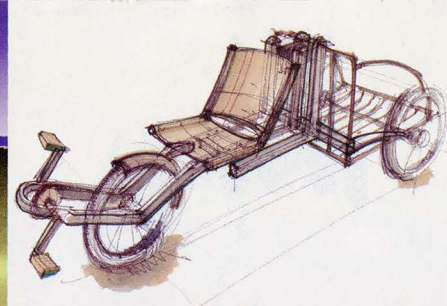
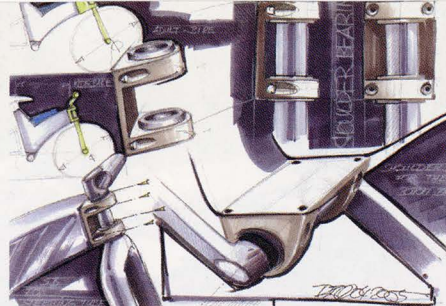
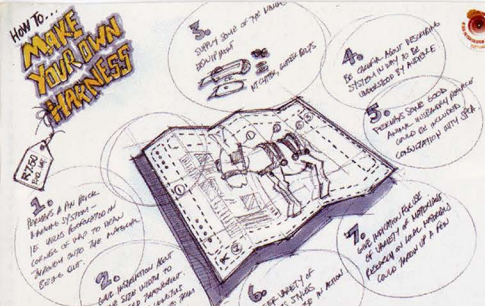
In terms of the design process, 100 per cent found the role of technical experts useful, 70 per cent found the input of the Communication Group useful and 60 per cent indicated that they needed more support during the field visits. As a whole, the designers recognised the value of greater insights provided by community-based research.

It would be fair to argue that this data points to the acknowledgement by designers of the value of a better understanding and interaction with the community during the design process. This openness and curiosity from the designers indicates not just a willingness to follow an interactive, action based research method, but also acknowledges a need for increased research-support such as background information during future design projects. It is also clear that a theoretical base, relating to specific research methods for the developing world, should be provided in this context.

Conclusion

The Interdesign workshop provided a unique opportunity for South African designers to participate with international associates in the neglected area of community-based product design. Clear demarcation of the roles of the scientific community (the researchers), civil society (the community) and the policy makers (government) provided a workable structure for this Interdesign workshop. Understanding of the complicated relationship between society and researcher, society and designer and even the relationship between scientist and artist is of primary importance (Creswell 1994; Bulmer & Warwick 1998) and should be encouraged during the planning stages of future Interdesign workshops. Inclusion of sociologists would be an advantage for future workshops of this kind.

Despite a substantial number of Interdesign workshops having taken place in a variety of international settings, the documentation and reflection on successes and failures of these workshops are not available. This creates a gap in the scholarly understanding of developmental design problems and hinders the process of finding possible remedies regarding research and design for development. Identifying problem areas in need of intervention is just the start of a prolonged process to ensure the sustainability and the effective management and marketing of these valuable community projects.



Organisers of future events should consider procedures to facilitate the structure of workshops, research focus, measure outcomes and evaluate their impact on the community. A more systematic approach will ultimately provide more informative and comparative data for future Interdesign workshops and ensure the successful continuation of community-based projects. The Interdesign workshops are in a unique position to contribute to a re-consideration of design methods, methodologies and design responsibilities.

South Africa provides designers with a ready-made and competitive manufacturing industry, as well as various indigenous communities with their own special knowledge systems and technologies. A large number of other developing countries (such as Namibia and Nigeria in Africa, India and countries in South America) share this distinctive environment. Combining this manufacturing position with a sound design epistemology and appropriate research methods, could provide designers with a unique opportunity to address the technological needs of developing countries while focusing on real and valued outputs.

Notes

- 1 This was verified by the current membership services manager of Icsid, Neil Griffiths (2006) in response to an e-mail enquiry: '... Unfortunately as I went through the

files [of the Secretariat], there was no great deal of information that would be any use to you, as most of the material was administrative files transferred to us for our reference. As I have also subsequently discovered, the vast majority of our archives are located in several places in Europe and I am making an effort to reunite them to one location. This being the case, I am sorry to say that I won't be able to help you in your search for info on previous Interdesigns'.

- 2 As an example of how difficult and even ideologically charged such a notion could become, the following must be noted. A former manager of the IKS Focus Area at the National Research Foundation (NRF) in South Africa, Mr M Masoga, wrote in a newsletter: 'IKS is my life. I joined the NRF because the ancestors wanted me here. I am here because of my *badimo* (ancestors). I become angry when researchers do not show any respect for the "sacred" life of our ancestry. Recently, researchers have jumped on the bandwagon, and everyone speaks the language of IKS. Why? Partly because it pays to speak this language. One thing that has to be taken into account is that local voices (communities that own the knowledge and wisdom) are continually directed by the ancestors' (*IKS Newsletter* 1 July-August 2003) This serves as an example of traditionalism, and raises concerns regarding aspects of cultural fundamentalism and how it influences the funding of design-based research.
- 3 The official South African definition of IKS: 'Indigenous Knowledge (IK) is local knowledge generated by people

living within a particular community – hence it is unique to a given society or culture. Indigenous knowledge is tacit knowledge and therefore, not easily codifiable. It is dynamic and based on innovation, adaptation, and experimentation, thus codifying IK may lead to the loss of some of its properties' (www.dacst.gov.za accessed 03/02/2006).

- 4 'In the past decades various people-centered participatory appraisal methodologies have been developed, such as Participatory Rural Appraisal (PRA), Participatory Learning for Action (PLA), Participatory Technology Development (PTD), Rapid Appraisal of Agricultural Knowledge Systems (RAAKS), Participatory Gender Analysis (PGA) and Participatory Poverty Assessment (PPA). A large number of participatory tools have been developed and rooted in these participatory tools; the Sustainable Livelihoods Approach was developed in the UK in the late 1990s. In this framework livelihoods and the enhancement of well-being are conceived in terms of different types of capital (natural, produced, financial/economic, human and social). These are perceived both as resources (inputs) that make livelihood strategies possible, and as outputs that make livelihoods meaningful and viable (Van t' Hooft, Reintjes, Haverkort & Hiemstra 2004:5).
- 5 Some examples of such failures are cited in the study on the introduction of solar cookers to a rural community in KwaZulu-Natal by Prof. Maryann Green from Community Resources at the University of KwaZulu-Natal



- as well as from Joyce Otsyina and Diana Rosenberg who introduced and adopted an improved wood burning stoves in Shinyanga, Tanzania (Sweetman 1998:53).
- 6 Research methods need adaptation as the sciences excluded the concept of 'ignorance'. This relates to Baudrillard's ideas that 'the map precedes the territory': people (researchers) tend to tread the known path and not the unknown (Bauman 1992:17). As ignorance (not knowing) is not deemed solvable by means of ordinary research, we normally do not acknowledge it and have no notion of its existence (Sardar 2002:147 - 149). Research priorities and choices are usually based on the known rather on the unknown. What is not evaluated as 'important' gets low research priority (and as a result we stay ignorant).
- 7 A questionnaire was compiled by Esme Kruger of the SABS Design Institute and the author.

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