DESIGN AND RESEARCH:
THE 1992 CONFERENCE OF DESIGN EDUCATORS

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The role of research in design as well as the academic- theoretical versus the creative-applied divide, have long been the topics of debate in both practising and educational arenas. The annual conference of the Design Education Forum held in Pretoria during July, examined some aspects of research and considered the contribution of design education to its development in South Africa.

Research and theory in design have a short history. Traditional methods of practice, perceptions about the nature of design, educational structures and the academic qualifications of design educators, have all mitigated against the development of substantial design-specific theory and a body of research literature.

As the complexity of modern design problems has increased, designers have accepted that personal research and the ability to interpret research results, are essential components in design practice. The need for both designer and non-designer to assess design performance, has encouraged reflection and the articulation of objective evaluation criteria. A new awareness of the social and economic value of design, and a desire to enhance the professional status of designers, have also supported the need for a more objective understanding of the many facets of the design activity. The expectation is that such an understanding will not only provide guidelines useful to designers in their own work, but establish a common theoretical basis allowing designers and non-designers to enter the design dialogue.

In South Africa design educators are under increasing pressure from educational authorities to undertake research. This has led to a quest for the meaning of research in design, a questioning of conventional ideas about research and a re-examination of the design process itself. Should the creative design work not be accepted in its own terms as a legitimate scholarly activity? How does design research fit into existing research programmes? What should design educators be researching and what methodology is best suited to the intrinsic nature and structure of the discipline? How should research skills be integrated into design curricula?

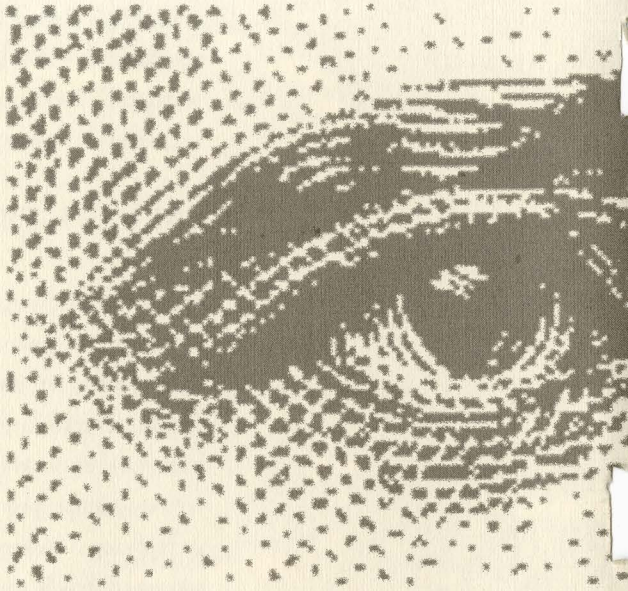
The Design Education Forum's conference, *The Need for Research Development in Design*, lasting three days and attended by 120 delegates, furnished design educators with some answers to these questions, and provided them with the opportunity to voice their opinions and share their views.

The first day of the conference was dedicated to individual discipline sessions, each following its own agenda. The calibre of the papers presented during the main session on the following two days, marked a watershed in the history of the Forum. A total of 12 papers were read. Three keynote papers, seven papers by design educators and two papers by design practitioners, covered a range of topics from the theoretical to the pragmatic and personal.

The three keynote speakers, Frank Sander, André van der Westhuysen and John Butler-Adam, addressed the following issues: the importance of research in design education, design research in the South African context, and the design educator and formal research.

RESEARCH AND DESIGN EDUCATION

In the opening address of the conference, Prof Frank Sander, a practising designer and Dean of Industrial Design at the Trier Institute of Technology in Germany, reviewed the importance of design theory and research, and emphasised the role of design education in their development.



In Sander's view, design education has a dual responsibility. It must provide an education which enables students to cope with the problems posed by society and the profession. It must also create theoretical models and provide information which enlighten the present and future practice of design, and which serve as orientations for the profession.

The need for research, and the scope of research in design and design education were clearly formulated in the 1960s and early seventies. During this period, research was dominated by an emphasis on a multi-disciplinary approach and the study of design methods. Christopher Alexander, Christopher Jones, Bruce Archer, Jay Doblin and Niels Diffrient were some of the protagonists of this movement. Their work may by typified by the consideration of research fields such as the design process, methods for design problem solving, information handling, the production and communication of ideas, the man-machine interaction, and management and design.

Even though the groundwork was laid, educational institutions were slow in establishing research. Sander feels reasons for this may be found in the multi-disciplinary origin of design which makes identification of design-specific research difficult, the historic development of design education and the type of institutions where it was taught.

In the early seventies, the tertiary education system in Germany was restructured, allowing for an interaction between design and engineering, economics and social science departments. This, together with a growing awareness and recognition of the social and economic role of design, created a basis for design research which turned to a greater discipline-specific and social orientation. It was felt that the multi-disciplinary approach had contributed little to the improvement of design practice, because an adequate link between theory and practice had not been established.

The three examples of research development in Germany presented by Sander, indicate some current directions in research activities there, and illustrate how closely this research and practice are linked. The basic theory model of sensuous functions, the applied research of social environments and the marketing orientated research for product development objectives, were all generated at educational institutions.

A model of sensuous functions in design

The rejection of a multi-disciplinary approach to research initiated a debate and reflection on discipline-specific theory and its role in design. In 1976 Siegfried Maser, a leading German design theorist, described design theory as model-building based on an acceptance of design as a science.

Maser stated that theory derives its meaning and content from practice, where the complexity of problems has necessitated teamwork and a common theoretical platform from which objectives, knowledge and methods may be communicated. Design theory should not be compared to formal, exact or normative sciences like mathematics, physics and law. It is intrinsically an interdiscipline, similar to communications theory and cybernetics, which draw concepts and vocabulary from other disciplines.

Maser saw the functions of design theory as political, critical, communicative and educational. He proposed that theory define objectives and value systems, as well as provide explanations and knowledge about design. He felt it essential that theory and practice remain closely linked and that theory be developed as a tool for the designer to improve the practice of design. At the same time theory should assist the general public in its understanding of design.

The implication of this description, which is accepted by many researchers, is that relevant design theory should only be developed by designers themselves transferring their practical experience into theory. The prerequisites of such theory must be a clear definition of the object of study, the selection of appropriate methods of study, the specification of social objectives and interests and the development of a professional language.

An example of such a theory is the model of sensuous functions in design, developed by Prof J Gros of the Hochschule für Gestaltung in Offenbach, near Frankfurt. The object of study in the formulation of this theory, is the psychological man-object relationship. Implicit in this relationship are both emotional attraction and rational understanding. Their manifestation may be termed the sensuous functions of design, as opposed to the practical functions which are a manifestation of the physical man-object relationship.

The model of sensuous functions and a professional language were developed by firstly isolating the sensuous requirements from other user requirements like physical function, service and information. A framework of expanding definitions and expression which detail and clarify every dimension of the sensuous interaction was then devised and gradually refined.

The model proposes that the sensuous functions of a product include a formal aesthetic as well as a semiotic dimension, which in turn may each be described by a number of attributes. For instance, semiotic functions are sub-divided into visual and symbolic facets. Symbolic facets are clarified by style, look, ornament and so on. Style may be classified by Art Nouveau, Functionalism, Post-modernism etc.

The model thus allows a systematic examination of the rational and emotional interaction of user and design solution at different levels. The designer may use the model as a guide in decision making, to evaluate, or to clarify an uncertainty in aspects of the design.

The personal and social meanings attributed to design pose complex and complicated problems for designers. Sander indicated that the model of sensuous functions is only one example of research reflecting the social context of design, and that many other institutions are involved in research on similar topics. Currently the exploration of individual and group values and perceptions is providing designers with useful information.

Lifestyle research

In his second example, Sander described research into target buyer groups. No matter how similar consumers may be with regard to income, education, profession and family size, their social values and their perceptions of style and aesthetics will influence their buying preferences.

In 1985 the Sinus Market Research Institute in Heidelberg published the results of a project called *Research into the World of Living*, which revealed new insights into the structure of German society. The analysis of data from unstructured interviews with several thousand households

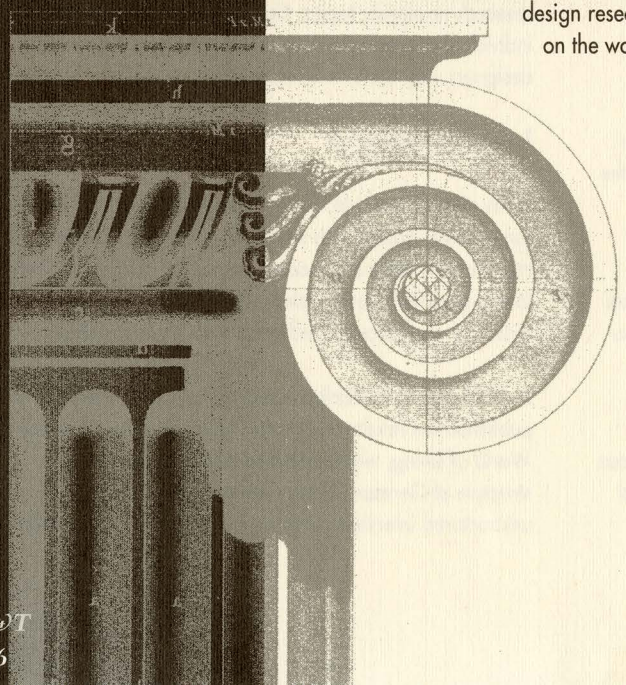
spanning a number of years, enabled researchers to define the concept of social environments.

Eight social environments were identified for the Federal Republic of Germany, based on information about daily living as well as on the value orientations and views of the sample. The Sinus Institute provides detailed and on-going descriptions of each of these social environments across a number of critical dimensions. Information on factors like personal aspirations, social position, lifestyle and furniture style, assist the designer in gaining insight into a particular market segment.

A clearer understanding of social values and perceptions, market fragmentation and the growing demand for designs which satisfy even smaller market segments, impact on manufacturing decisions. What criteria should be used, for instance, to decide whether to produce a high quality, low volume chair or a low quality, high volume chair?

Definition of product development objectives

Sander's third example of current design research in Germany, focused on the work of Prof Koppelmann of the Faculty of Social and Economic Science at the University of Cologne. Guidelines to assist designers, educators and manufacturers identify which market segments a company is best qualified to produce the correct product or product range for, have been developed by Koppelmann.



These guidelines enable designers to formulate product development objectives in their product planning policies, based on product characteristics. Using two different product groups as examples, Sander demonstrated how the systematic articulation of objectives regarding factors like design, manufacturing capacity and production technology, pricing, distribution, communication and service policies can be used to guide production decisions.

The value of research

In Sander's view these three examples of design research are complementary. They all support the designer in both practising and teaching contexts, and demonstrate that design and product development can be based on precise research and analysis.

Sander feels that design theory and research will become even more important, influenced by continuing and dramatic changes in society. These include developments in the former socialist countries, the ecological dilemma, widening social differences, worldwide migration, conflict between the dominance of global design trends and the desire for cultural identity. He stressed that designers cannot exclude themselves from these changes, but must define their role and contribution.

DESIGN RESEARCH IN SOUTH AFRICA

Mr André van der Westhuysen, Programme Manager at the Foundation for Research Development, defined some priorities for research development in South Africa. He outlined five areas, with specific reference to design and technology, which he feels currently deserve attention.

Developing communities

An obvious area of focus for research in South Africa, must be on meeting the needs of the developing communities. Van der Westhuysen outlined the importance of taking the full environment of these communities into account. Some of the characteristics of developing situations are the use of basic and often scarce energy sources, limited financial resources, unemployment and rural poverty, limited health sources, shortage of housing, poor maintenance of complex mechanisms, little expertise for improvisation, costly services because of the elementary level of urban development, harsh environmental factors and a lack of highly trained human resources.

Existing financial, organisational, economic and social situations need careful consideration and integration into design solutions. In addition, the approach to research in this area should be cooperative and support the individual's own initiative and desire to achieve improvements. Local communities must be involved in research and be allowed the opportunity to take ownership of projects.

Natural resources

Contrary to conventional wisdom which says that natural resources are no longer an advantage, Van der Westhuysen feels that South Africa should build upon its competitive edge and expertise in this area, and not try to emulate the newly industrialised economies of the Pacific Rim. The existing strengths of our position in natural resources, should form the base for the application of thinking and technology which contribute to any possible addition of value.

Mixed intelligent systems

The economic structure in our society must increase opportunities for employment. The trend in South Africa during the last few years has been to design manufacturing processes which are as independent of labour as possible. However at this stage, automation is still not capable of achieving the finely attuned levels of human sensory and tactile capabilities.

Van der Westhuysen thinks that the challenge in South Africa, is to design manufacturing processes in such a way that these human sensory and tactile abilities are used where they are the superior tool. Mixed systems will allow the tough and unpleasant jobs to be done by machines, while leaving the fine, sensitive things to skilled and specially trained workers.

Design for manufacture

At the completion of the design process, the traditional designer has committed his company to nearly seventy per cent of the final cost of the product. The possibility exists that he may have neglected some important aspects in the design process. A lot of thinking has gone into developing a technology to address this weakness.

Many concepts and techniques have been incorporated into an approach called concurrent engineering or design for manufacture. They generate, through reiteration, strong interactions between design action and its aftermath. Although they were developed for the high technology environment and are normally applied there, Van der Westhuysen feels there is no fundamental reason why they should not be incorporated into design for third world conditions.

Collaborative projects

South Africa is one of the world's top producers of chromium which until now, has been exported mainly as ore. The Columbus project, a collaborative arrangement, has resulted in the production of stainless steel which will be exported as sheet metal. The value added is a factor ten higher. Should the effort stop there? Working the stainless steel sheet metal into utensils would add another factor one hundred in terms of value added.

Van der Westhuysen proposed that if South Africa could mobilise a team which sets itself the target of ten per cent, or even twenty or thirty per cent, of the world's stainless steel cutlery market in ten years time, a number of parallel actions would be initiated across a broad front in the areas of design, materials, manufacturing, manpower development, and finance.

Similarly, the scenario for a team effort by the Technikons can be envisaged. For example, Eskom has the capacity to produce much more electricity than is currently used in South Africa. There are millions of people in this country who cannot use this power because they are not connected to the grid. Practically all Technikons offer electrical engineering, and so could participate in a project to design a reticulation system suitable for getting electrical power to the disadvantaged communities on an enormous scale.

Van der Westhuysen stressed that South Africa needs to develop a culture of cooperation in both industry and academia. Not only would this be of enormous benefit to many sectors, but it would provide massive scope for research development.

DESIGN EDUCATORS AND FORMAL RESEARCH

Prof John Butler-Adam, Vice Rector: Development, at the University of Durban-Westville, considered the dilemma of the educator of creative disciplines, when faced with the need or demand to undertake formal research. Many design educators in South Africa feel themselves dictated to and trapped by rigid perceptions, concepts and definitions of research, what it means, how it should be practised, and how it is assessed and rewarded.

In a witty and well-structured argument Butler-Adam put forward three propositions which he feels might empower creative practitioners to challenge the conventional wisdom regarding research, and at the same time encourage them to undertake research.

Research as a contingent social construct

Butler-Adam's first proposition is that research is neither an absolute nor a 'given' practice. It is socially defined and temporally circumscribed, even though it appears to be a positively defined activity. Thus what constitutes acceptable research and research practice varies with time, place, social and political ends and power.

Although the core meanings of social practices and human activities may remain standard, their everyday meanings and understanding shift in response to prevalent circumstances. For instance, recreation has consistently meant the things people do during discretionary time. But what is done, how it's done and with whom, shifts according to social, economic and temporal contexts.

The accepted core definition of research in western society is that of formalised human curiosity directed at the extension of knowledge. The way it happens, who does it, how, why and under whose influence it is done, have varied greatly from time to time. According to Butler-Adam, the two most critical factors which cause this shift are firstly, consensus regarding what constitutes knowledge and secondly, how that knowledge is to be extended.

In nineteenth-century Britain, geographic knowledge which amplified the power and economic might of the Empire, was considered valuable. This knowledge, which identified what was where, and how to get to and at it, was generated through exploration as well as locational and geo-economic analysis. In the 1960s, this type of knowledge was rejected amongst geographers because of its context and its lack of analytical rigour. Today, because of a general deep-seated ignorance of where what is, locational knowledge, and its accompanying research, methodology and teaching practices, have again become acceptable.

Similarly, an examination of the definitions and accepted standards concerning what constitutes the extension of knowledge, show that they keep changing to meet the conditions and needs of society. For a long time, new information was seen to be the basis of extension in the social sciences. Then the extension of knowledge was seen to operate through the verification of existing information and analyses. Now knowledge in the social sciences tends to be extended through theorising, speculation and even personal observation and experience.

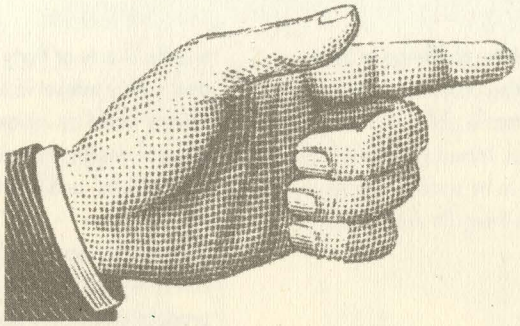
It follows that if knowledge and its extension are subject to shifting definitions and practices, then research methodologies and techniques must also of necessity change. The positivism of the social sciences which has been replaced by the current emphasis on meaning and a concern for experience, clearly illustrates this.

Variations on the basic theme of defined research

In his second proposition, Butler-Adam pointed out that even within a defined and socially acceptable code of research, it is possible to identify many different operations and processes which seemingly answer to the requirements of that code.

In South Africa, a distinction is made between research and creative activity, based on a definition which holds that knowledge is extended by following a prescribed route. The assumption is made that creative activities do not fall within this framework, while scholarly activities, based on the products of the creative disciplines, do.

By comparing the activities of author John Fowles in writing the novel *Daniel Martin*, and a literary scholar making a study of the same work, Butler-Adam illustrated that both the 'creative act' and the act of scholarship, may be seen to adhere to the steps required of the contemporary research process.



The complementarity of design and research

According to Butler-Adam, design educators are in a far better position regarding research than they imagine. His third proposition, that the processes of design and research are complementary, and can even be seen as being coincidental, should strengthen educators' claims that designers have been practising research by designing, and even encourage design educators to undertake formal research.

While Butler-Adam maintained it would be silly to suggest that design and research are the same thing, he feels their similarities offer design educators unique opportunities, even in the context of the present, fairly rigid definitions. Design educators could easily overcome their dilemma by asking more and slightly different questions about the very things that are questioned at the outset of a design exercise. These slightly different questions would lead to a different course of action and enquiry, and ultimately to a research finding.

Butler-Adam suggested that design educators view research in the same light as the value added concept in design. Research could be seen as knowledge added. He urged design educators to learn more about the language and practice of research as he felt value and knowledge constituted a formidable pair which designers could bring together for their own benefit.

RESEARCH AT SOUTH AFRICAN DESIGN SCHOOLS

Only three of the papers by design educators dealt directly with research at educational institutions.

Joan Fourie (Port Elizabeth Technikon) expanded on some of the points made by Prof Butler-Adam. In her paper *Research: In Search of Evaluation Criteria for Art and Design*, she proposed that artifacts be recognised as legitimate academic outputs which qualify for state subsidisation similar to that received for journal publications. She argued that supporting theses for artifacts were unnecessary and that it was possible to formulate academically valid criteria for evaluation. Practical procedures for the assessment and recognition of art and design outputs, using structures currently in place, were recommended.

In contrast to this, *Developing a Culture of Research*, a paper by Marian Sauthoff and Jacques Lange (University of Pretoria), stressed that design education must, of necessity, formulate and implement clear strategies to foster research skills and a research mentality. They explained, and demonstrated by means of specific research projects, how both formal research and research as an integral part of the design process, are meaningfully and deliberately integrated into under-graduate courses, taking into account the intrinsic structure and nature of the discipline, the type of students studying design and the realisation of course objectives.

An experimental and comparative study by Rudi de Lange (Technikon OFS) questioned commonly held assumptions that Roman typefaces are more legible and appropriate for reading material than Sans Serifs. His investigation, based on the results of five different experiments with 450 primary school pupils, revealed that Roman and Sans Serif typefaces were equally legible at the 0.05 level. No

statistical difference was found between the reading speed, scanning speed, eye movement, accuracy and comprehension of text set in either group of typefaces.

Other topics of design educators' papers, as well as panel and group discussions at the conference, indicate that many educators still need to resolve a number of issues relating to research. The comment by Rick Andrew (Technikon Natal) in his presentation that '...there is a danger we become too obsessed with defining research in design rather than actually doing it', summarises the current status in design education very adequately.

THE WAY FORWARD

The keynote speakers emphasised the critical need to undertake design research by identifying its scope and impact. Prof Sander was particularly successful in conveying the dynamic role of research and theory by illustrating their potential value to designers and design planners.

In his closing statement to the conference, Sander provided a clear direction for research in South African design education. He said that the end to economic isolation, entry into international competition and the integration of diverse cultures into one nation, will increase the complexity of design problems and the responsibility placed on South African designers.

Sander stressed that these factors made it imperative for designers to increase the strength of the profession, and to change their own feelings of being misunderstood and poorly acknowledged. Although design decisions and success cannot be based nor measured solely by facts, it is crucial that design develop tools which will enable it to be more convincing than it has been in the past. He strongly believes that one such tool is the development of research in design education, and that it has a vital role to play in this country's process of change.

In his view, the presentations and the complexity of the topics considered by the speakers during the conference, proved that design educators can be excellent researchers in support of their work and their profession. What is currently needed is an openness to research questions and the research process from design educators, a willingness to open design and education to research and an immediate readiness to become involved in research.

The overriding message flowing from the conference, is that design educators will have to take a greater proactive stance, if any development is to occur in South Africa. Whether they debate the acceptance and recognition of research as an integral part of the design process, or undertake formal research themselves, design educators will have to be more assertive if they wish to achieve greater autonomy.

They will have to accept responsibility for defining and arguing for an appropriate field of study, selecting suitable methodology and initiating relevant research projects. To succeed they will have to cultivate an informed critical awareness of South African conditions, become familiar with the concepts and schemata of scientific thinking, and develop a repertory of communication techniques which allow disciplinary boundary crossing.

A broader vision of and for the discipline by design practitioners, through a better understanding of the role of research and theory, will have to be encouraged. The tendency by design practitioners in South Africa to dismiss the importance of research and the necessity of higher academic qualifications, is often used by students and educators to justify not undertaking research. Greater cooperation and commitment, and a wider exchange of ideas through open forums which assist the development of mutual support for research, should become a priority in the design community. ■

DESIGN EDUCATION FOR DEVELOPING COUNTRIES

A conference and workshops focusing on themes and issues pertinent to design education in developing countries, has been scheduled for 28 June to 1 July, 1993.

The conference, organised by the Design Institute of the South African Bureau of Standards, under the auspices of the Design Education Forum of Southern Africa, will be hosted by the ML Sultan Technikon, Durban.

Information may be obtained from the convenor, Ms Adrienne Viljoen, Design Institute, SABS, Private Bag X191, Pretoria 0001.

ED BENGUIAT TO VISIT SOUTH AFRICA

One of the most prolific American type designers of the twentieth century, Ed Benguiat will be visiting South Africa in February, 1993, to conduct workshops and deliver a series of lectures on type, type design and typography.

Ed Benguiat has designed over six hundred typefaces, and many typographic logos including those for the *New York Times, Playboy, Coronet, Sports Illustrated, Esquire* and *McCall's*. He has been the recipient of many awards for graphic design and is continually invited to lecture and exhibit his work internationally and in the United States.

Mr Benguiat is currently Typographic Design Director for Photo Lettering, Inc. and teaches at the School of Visual Arts in New York. His tour will be sponsored by RT Sparhams and First Paper House.