Culture-orientated product design

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Abstract There is little in-depth research that can assist designers to use culture as a catalyst for designing innovative products within Botswana's context. The concept of culture and design are intertwined, thus modifications stemming from cultural evolution both reflect and determine developments in design. The paper discusses an experimental design approach conducted at the University of Botswana and participants challenge was to transform and encode socio-cultural factors into product design features. The paper concludes by discussing a model which has shown one way concerning how to consciously specify, analyse and integrate socio-cultural factors in the design process.

Keywords Culture · Culture-orientated design model · Product design · Socio-cultural factors · Botswana

There is a lack of in-depth research and appropriate methods to assist designers on how culture can be consciously integrated in product design (Onibere et al. 2001; Hugo 2002; Kotro and Pantzar 2002; Aykin 2005). It is argued that the current design approaches with their standards, rules and guidelines fall short with respect to issues relating to the cultural context. There is no solid theoretical framework linking design and culture (Saha

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1998; Kersten et al. 2000). Such a framework is required and needs to go beyond the consideration of the surface manifestations of culture that have been widely accepted in design methodologies and it must address how the core components of culture can be embedded in designing products. This challenges designers to gain a deeper understanding of users' culture but embodying of cultural factors in new product development is not a straight forward subject and it is still an under-researched area (Taylor et al. 1999). However, Lee (2004) observes that in the design field, major topics in cultural design are still only limited to identifying aesthetic stereotypes such as the national shape or colour. These manifestations show that there isn't a well defined framework from a Botswana's perspective that can assist designers to respond to many unanswered questions and problems with regard to the integration of culture in design. Therefore, this paper defines culture as a shared set of basic assumptions and values with the resultant behavioural norms, attitudes and beliefs which manifest themselves in systems and institutions as well as material and non-material elements. The paper aims at discussing how culture can be integrated in designing innovative products in the early stages of the design process.

Culture's influence on design

Early links between culture and design became apparent in the domain of social anthropology, where civilisation was evaluated through the evolution of objects, and was traced through the cultural characteristics embodied in those objects. Culture generates diversity and it is naturally revealed in all human action, including the products that people design. Moreover, it is argued that design shapes the culture and lifestyle of modern society. Observing the design of artefacts produced and consumed in a society often reveals the cultural situation and the people's lives, education, needs, wishes and fears.

The relationship between design and culture has taken many twists and turns throughout the last centuries, as design is seen both as a mirror and an agent of change (Moalosi et al. 2005). It is observed that modifications in the former's evolution both reflect and determine developments in the latter. Design changes culture and at the same time is shaped by it (Röse 2004). For example, it is argued that cultural beliefs and social practices create and reinforce frames of meaning which determine ways of relating to a product. These cultural framings affect ways in which people use or do not use a particular product. It is culture that gives products meaning and provides the rituals within which artefacts are used and the values that are often reflected in their form and function (Press and Cooper 2003).

Design can be linked to culture through the incorporation of cultural values in products. Cultural values shape the way people behave within their community. The embodied values in products also play a part in regulating people's attitudes within the society. The values integrated in products give users their cultural identity. Cultural values can be incorporated in products by designing appropriate signs or features which represent those values. Cultural values provide designers with a rich and varied set of materials that inspire new design ideas (Gaver 2001), and which are a way of finding connections with users' traditions. Gaver claims that they are specifically concerned with exploring how future technologies can support the traditional values that motivate and drive the adoption and use of new technology. It is argued that designers need to recognise that cultural values assist in moulding users' behaviours and attitudes, and the products they design are likely to be uninteresting if they fail to consider users' values.

Incorporation of culture in design

In product design, the goal of cultural respect can be achieved by incorporating the historical and aesthetic values of users (Moalosi et al. 2005). The challenge is to understand what and how cultural norms and values can be integrated in product design. The primary objective is to develop an understanding of users' values and behaviours that can be translated into viable, powerful visual design, information architecture and design ideas. "Technology is not a good traveller unless it is culturally calibrated" (Kaplan 2004, p. xiv). This means designers need to take into consideration the technological, aesthetic, anthropological and socio-cultural factors of their intended users. Design is an agent of change and it is important for designers to know how they can either undermine or support the indigenous cultural systems of the society (Popovic 2002). It is through artefacts that cultural values are communicated. Design is, therefore, an important medium of communication which expresses the values of the system within which it functions.

In terms of product design, identities will never dissolve completely, even in the global world. To expand on this argument, when products are exported, a glimpse into the cultural identity of their country of origin is embedded in them. However, Zec (2002) argues that with increasing globalisation of markets and competition, there are growing multicultural influences on national identities. That is, globalisation is leading to greater similarity of perception and lifestyle and in some cases identity. It is observed that this occurs whenever global trade leads to a greater uniformity of product culture. It is apparent that as users surround themselves with products, they change their way of living. Wherever users familiarise themselves with and use the same products, their lifestyles become more similar (Zec 2002). This implies that cultural differences seem to become less important as users grow towards a universal, global and homogeneous culture. However, Zec's claims are not sustainable, as his notion undermines users' cultural preferences and is largely misleading. "Cultural differences are here to stay and they will force designers to adapt and to differentiate their products for different cultures" (Van Raaij 2005, p. 269). No matter how hard people try, it is impossible for them to divest themselves of their own culture, for culture is the medium through which they interact. The set of norms, values, opinions and behaviours constitute everyday life and users' culture. It could be argued that if values and norms differ, designers have to make sure that the product characteristics and benefits are adapted to these values.

Globalisation and local identities

In the field of design, many of the effects of a neo-liberal form of globalisation should be strongly contested (De Souza and Dejean 1999; ICSID 2002). This form of globalisation is seen as a force that must be opposed because it results in homogenisation of people's culture through standardisation of products. In reaction to the homogenising drive of globalisation, it is noted that an opposite trend is emerging within approaches to design which promote local identity and highlights cultural values and traditions. Therefore, globalisation has sparked off a new awareness of local identity. Designers are challenged to foster cultural diversity through localisation of products in the face of globalisation. Variations in terms of national culture remain strong and the process of globalisation is in fact imposed on users. This argument can be expanded by observing that as international contacts and exchanges increase, there is an outburst of attitudes in defence of national and regional identities, and manifestations of the fear of mixing of races, religions, customs and

habits (Van Raaij 2005). It is apparent that contacts do not necessarily generate a cultural standardisation. Rather, they often provoke an exacerbation of differences.

Universality is a value that is reminiscent of the industrial era, but is no longer meaningful in a post-industrial world (Krippendorff 2006). There are voices within design lamenting the loss of culture, traditions and ethnicity. For example, in a study conducted by Samsung Design, it is revealed that "users around the world are no longer willing to simply settle for one-size-fits-all products with standardised designs" (Delaney et al. 2002, p. 46). They argue that individual users are demanding a wide range of sizes, shapes, colours, materials and features, and these have become important factors for creating successful products. That is, designers have to balance core shared values with local empowerment to best satisfy individual wants and needs. This means that users are demanding that specific needs be satisfied with more localised solutions (Aula et al. 2003). Electrolux and Whirlpool in their designs have started to show sensitivity to certain cultural specifics, demonstrating an understanding of the cultural diversity of their global users (Ono 2002). It is posited that localisation of products must be viewed as a counter-balancing force for the maintenance and durability of national cultures facing globalisation as well as its potential capacity for holding, preserving and presenting cultural values to the respective product users. This can be translated as an act of globalisation starting to soften its approach towards the standardisation of products and services.

Most of the current research on the relationship between design and culture is European, American and Asian-based and there is relatively little in-depth research on Africa, let alone Botswana. Botswana should recognise the rapid international developments in science and technology that are re-shaping the societies of the world (*A framework for a long term vision for Botswana 2016* 1996). While much can be borrowed from other countries, Batswana (people of Botswana) will need to look within their own resources and culture to find the sources of innovation that will allow them to shape their own future. The country will need to harness all of its resources of social and cultural diversity to achieve this challenging aim.

Research method

The study adopted a qualitative research approach which relies on the subjective verbal and written expressions of meaning given by individuals studied, as windows into the inner lives of these persons filtered through the lenses of language, gender, social class, race and ethnicity. Therefore, qualitative research suits this study because Botswana's socio-cultural factors must be interpreted from the perspective of the participants being studied. As Bryman (2001) puts it, the researcher should 'see through the eyes of people being studied.' This predilection for seeing through the eyes of the participants studied in the course of qualitative research is often accompanied by the closely related goal of seeking to probe beneath the surface appearance. Moreover, the researcher must have a process which involves 'talking to insiders to help make the basic assumptions and values explicit' (Schein 1999). This provides detailed information about how socio-cultural factors can be transformed into cultural-orientated product design features. The process enables one to assess how different layers of culture (basic assumptions, values, beliefs, attitudes, rituals and behaviour) interconnect in designing products.

This study was based on a single-case experimental design conducted with 23 fourth-year design students of the University of Botswana. The experimental approach has been widely used in similar situations in product design research (Cross et al. 1996; Dorst 1996;

Akin and Lin 1996; Popovic 1996; Tyan-Yu et al. 2004). The research seeks to investigate how participants transformed socio-cultural factors characteristic of Botswana into product design features. This involved developing an understanding of the research problem by collecting multiple forms of verbal, visual and textual data from participants. During the design experiment, participants were investigated in their natural environment in order to reflect on the process they used. This approach assisted in gaining an understanding of the participants' behaviours, values, and beliefs within the experimental design context in which the research was conducted.

The research was divided into two phases. The first phase dealt with extracting traditional socio-cultural factors from folktales and other contemporary sources, whilst the second investigates how socio-cultural factors can be integrated into the human-centred design process. For this study, socio-cultural factors are variables that regulate the conduct of the society in a given context.

Phase one: identification of socio-cultural factors

Botswana's traditional socio-cultural factors were identified and selected by extracting them from folktales. Folktales, rather than other forms of oral traditions, were selected because they contain rich data on the subject area. The importance and power of folktales lie in their ability to make sense of events, call up memories, teach lessons, inspire empathy and enthusiasm and suspend disbelief. Therefore, folktales are powerful cultural tools. "Storytelling is rarely thought of as a design tool" (DeLarge 2004, p. 6). According to DeLarge, design might be viewed as a simple conveyance of a story, so that a good design is really just good storytelling. If this is the case, then it is suggested that designers are storytellers. Moreover, there are common characteristics between the act of storytelling and the design process. For example, during storytelling the audience frequently laughs, exclaims, makes comments and does various other things to participate fully in the narrative experience. In this context, storytelling becomes a cyclic process of continual feedback and feed-forward (Chapman 2005). The same cyclic and narrative experience also takes place in the design process. It must be noted that the goal is not to restore a bygone past, but to draw upon the past and create a new future in terms of designing new products. Contemporary socio-cultural factors (many of which are influenced by Western values) were extracted from the *National Policy on Culture* (2002) and *A framework for a long term vision for Botswana 2016* (1996). These documents were chosen because they were readily available and dealt not only with past and present cultures, but also projected the society's future aspirations and expectations. The aim of combining folktales and contemporary factors was to blend tradition and modernity.

The method of content analysis was found to be appropriate for the task of extracting socio-cultural factors from Botswana's traditional and contemporary cultural sources. Content analysis allows closeness to text which can alternate between (a) specific categories and relationships and (b) statistical analyses of the coded form of the text. It is an unobtrusive means of analysing social interactions.

The traditional and contemporary socio-cultural factors were then combined and from these, a set of common factors applicable to product design in Botswana was developed (Table 1). Traditional factors assist designers to draw on a foundation for extending to new experiences; in other words, the past informs the present and the future. Some of the main characteristic of a society is a willingly accepted coexistence of new technology and old social forms (Miller 2002). Eight tales were purposefully selected for analysis, and this

Table 1 Sample Botswana socio-cultural factors

Property	Socio-cultural factor
Material possessions	Baskets, cattle, flutes, ornaments, thumb piano, traditional chairs, traditional hut, traditional stools, walking sticks and water
Social practices	Assistance, cooperation, family, farming, Identity, marriage, peace, playing music, respect, self-reliance, sitting around the fire, storytelling and trust
Emotional	Attractiveness, beauty, discomfort, excitement, friendliness, frustration, fatigue, fun, happiness, joy, kindness, love, sadness, satisfaction, gratitude, ugliness and unpleasant
Technology/design	Cognitive fitness, cultural fitness, electronics, ergonomics, functional constraints, hydraulics, mechanisms, pneumatics, product innovation, product quality sustainability and technophobia

number was found to be suitable because it comprised two adventure stories, one history, three myths, one nature story and two stories dealing with love. According to Jason, (1997) ten tales or 9,000 words seem to be a fair sample of a society's oral literature. In this case the folktales provided 10,272 words.

Phase two: investigating how socio-cultural factors can be transformed into product design features

Participants were selected by a purposeful sampling method. The University of Botswana fourth-year undergraduate design students were intentionally selected because they had been together as a group for the previous 4 years and, therefore, had a common social interaction and shared similar behaviours, values, beliefs and the same language. The experiment involved 23 participants. It is worth noting that the study did not compare the output produced by participants in terms of gender, age or experience. Rather, the focus was on investigating how participants transformed socio-cultural factors into product design features.

In order to address the research problem, participants were presented with a design brief which contained the common socio-cultural factors (Table 1). The challenge for participants was to transform these factors into product design features that would acknowledge Botswana's culture. However, participants were not limited to using only the socio-cultural factors provided in the design brief. They were meant for guidance only, and participants utilised some of their own analysis of socio-cultural factors to improve the design of traditional products in their society. For example, some socio-cultural factors were drawn from interviews and observations that they had themselves conducted. The collection of data involved using multiple instruments comprising verbal (retrospective interviews), textual (design reports) and visual forms (sketch books and photographs, design models).

Coding framework

The first step in content analysis is to define the samples of analysis. In order to analyse raw data, a coding system was developed (Table 2). The development of the coding system involved naming and grouping data into themes. That is, similar properties were grouped together to form a theme. "The crucial requirement is that the themes are sufficiently

Table 2 Sample coding framework

Theme	Property	Code	Example	Description	Interpretation parameters
Identification of socio-cultural factors	Social practices	SPF	"… in our culture, the element of collective use or sharing is very prominent"	Traditional or contemporary practices	Activities that are habitually or customarily followed
	Emotional factors	EMF	"The instrument was mostly played for fun, entertainment …"	Factors related to having and expressing a strong feeling about designed products	A mental state that arises spontaneously and is often accompanied by changes in the state of mind
Integration of socio-cultural factors into product design	Aesthetics	AST	"… this could lead to products that are attractive and appealing to their users"	An expression of beauty or aesthetic value by the product design	Emotional factors that induce appreciation of beauty within the same socio-cultural context
	Gender	GND	"The use of a stool is gender biased because you find that old men in social gatherings are the ones who sit on them and women sit on mats"	Expression of the product target users in terms of gender	Design features that differentiate users by gender
Novel design concepts	Novel design concepts	NDC	"… mechanism for folding and unfolding for easy carrying"	New concept, different, distinct style and image that meets user's needs	Product design that uses socio-cultural factors to inspire new design concepts

Key: SPF—Social practices; EMF—Emotional factors; AST—Aesthetics; GND—Gender; NDC—Novel design concepts

precise to enable different coders to arrive at the same results when the same body of material is examined'' (Silverman 2001, p. 123). This resulted in the following three broad interrelated themes: (i) identification of socio-cultural factors, (ii) integration to product design and (iii) generation of novel design concepts. From these three themes, eleven codes were generated: material factors, social practices, emotional factors, technology/design factors, function, mediation, knowledge, gender, signification, aesthetics and novel design concepts. Each code has a description, interpretation parameters and an illustrative example of the text (Table 2).

Coding textual data

Sentences in texts as well as written and verbal responses from participants were used as the basis for identifying socio-cultural factors. A sentence, broken down into segments, was used as the unit of analysis. A segment is defined as a specific thought unit that conveys an idea or theme (Weber 1990). Each segment was in the form of a clause, phrase or word referring to the specific theme (Table 2). In instances where sentences in an interview, folktale or cultural document related to any cultural factor, that sentence would carry the number of codes within that sentence. For example, a sentence such as "*I incorporated the socio-cultural factors of social gathering and happiness*" was coded twice. The first was based on "social gathering", which is a "social practice factor" and was coded (SPF). The second was on "happiness" so was coded (EMF), an "emotional factor". Atlas.ti software was used to assist in the coding process.

Coding visual data

Visual data (sketches, images) were used to back up textual data. All design images from participants were coded using the same coding system. The information from visual data assisted in analysing (a) which socio-cultural factors were chosen and used by participants in their design models, (b) how participants transformed socio-cultural factors into product design features and (c) whether the use of socio-cultural factors could be used to generate novel design concepts. Figure 1 demonstrates how images were coded using the Atlas.ti software.

Data analysis

Data analysis for this study was divided into two sections. The first section adopted a conceptual analysis technique in order to identify the appropriate socio-cultural factors that impact upon design. This procedure for data analysis comprises three steps as suggested by Krippendorff (1980) and Weber (1990): (i) aggregation of the coder's ratings, (ii) totalling the overall counts of socio-cultural factors coded in each property and (iii) the analysis of the socio-cultural factors. The themes were represented by words, phrases or paragraphs in texts, and design features in images. In this case, a theme was chosen for examination, and the analysis involved quantifying and tallying its presence. The focus was on looking at the occurrence of selected explicit or implicit socio-cultural factors within the folktale, cultural document, interview scripts, design reports and images (Table 1). For example, there are several socio-cultural factors contained in the statement: "A rose is associated with cultural factors of love, joy, family and perhaps marriage." In this statement, "love" and "joy" are emotional factors and were coded (EMF); "family" and "marriage" are social practice

Fig. 1 Traditional chair

factors (SPF). Occurrence of the socio-cultural factors in each theme was analysed to determine their relative importance. A higher relative count reflects the strength and significance of that particular socio-cultural factor within the specific theme.

The second section of data analysis involved a relational analysis approach that goes one step further by examining and identifying the relationships among themes present in a given text or set of texts. Individual concepts in and of themselves are viewed as having no inherent meaning; rather, the meaning is a product of the relationships among concepts in a text (Carley 1990). Therefore, this part was concerned with reflecting participants' points of views on how socio-cultural factors could be integrated in designing products and whether the same could be used to generate novel design concepts. The themes have been used "to identify patterns" (Reinharz 1992, p. 155) and to place them within an interpretive context. This focussed coding approach allows for the clarification and building of key concepts and theories.

Findings

In order to consciously integrate culture at a conceptual design stage, a culture-orientated design (COD) model has been proposed. For example, culture can be integrated in product design by assessing the users' needs and their activities, incorporating advances in technology or evaluating existing designs. The COD model has been developed into three interrelated phases: categorisation of socio-cultural factors (user domain), integration (designer domain) and cherishable culturally orientated products (product domain) (Fig. 2).

Socio-cultural factors

The first phase involves the categorisation of socio-cultural factors. This is the users' domain because it contains their social and cultural needs (Fig. 2). Traditional and

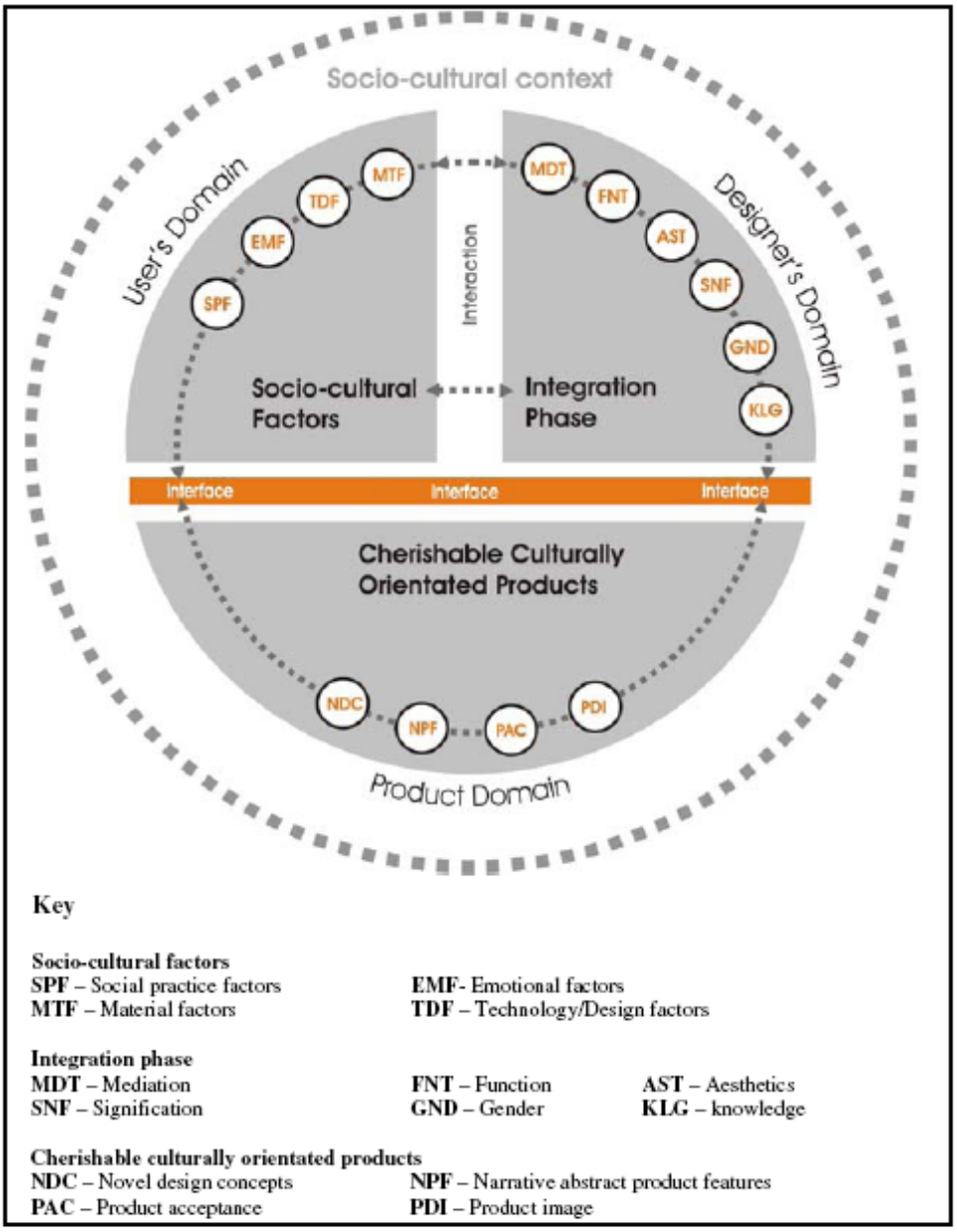

Fig. 2 Culture-orientated design model

contemporary socio-cultural factors were combined and broken down into material, emotional, social practice and technology/design factors (Fig. 2). These factors cover the inner core layers of culture. In analysing folktales, Leedy and Ormrod (2001) underscore the view that traditional socio-cultural factors help people to understand what was previously observed, and this provides a foundation for extending to new experiences. Traditional socio-cultural factors are important because evidence from data analysis indicates that some cultural practices which are valuable to the society are disappearing and need to be revived and preserved. This model depicts the approach of bringing together traditional and contemporary areas of knowledge in design. The focus is on how the output can be practically linked and integrated successfully in a product design environment to stimulate the creation of cultural-orientated novel concepts.

Socio-cultural factors were used as a way of uncovering—or at least shedding light on—users' social, emotional and aesthetic values and habits. Extracting socio-cultural factors from secondary sources will be incomplete without conducting user research into their socio-cultural context. The user research assists in gathering and determining user requirements in terms of their cultural behaviour and attitudes. This process assists in creating products that have a deeper local user experience. "User research has to be conducted iteratively throughout the design cycle to ensure a design that is easy to use, cultural-orientated and meets user requirements" (Chong 2004, p. 301). Different data collection methods can be used to gather information about users; such methods include conducting interviews, focus groups, user observations, and ethnographic research. Feedback from users should be incorporated at each phase of the model, which helps to ensure that the concept maintains a focus on real users' needs throughout the design process. Evidence from the data analysis suggests that the involvement of users in the design process helps to capture their interest and needs at an early stage. This process builds trust between the designer and users.

Integration phase

The second phase investigates how socio-cultural factors can be integrated in product design. This is the designer's domain because he/she needs to interact with users to draw from their experiences and feedback in order to transform socio-cultural factors into culturally acceptable product features. A focus on the sensations, feelings, aspirations and social relations that arise through users' interactions with products inevitably strengthens the humanness in the design. It is through different modes of social interaction that users and designers explore the properties of products. Socio-cultural factors can be transformed into functional features, signification, knowledge, mediation, gender, and aesthetics features (Fig. 2). A product will deliver to users more than one of these properties, and at different levels.

For example, if the product's outcome is to promote relationships among users, then more emphasis has to be paid to mediation. Products act as mediators of users' culture. The concept of product mediation and its theoretical construct has been transferred to products being mediators of knowledge (Kuutti 1999). Product mediation is a way of transmitting cultural knowledge (Kaptelinin 1996). Artefacts carry meaning and a designer's task is to match the expressive qualities of the products to the receptive characteristics of the user's culture. Such products offer a better connection between individuals and their lifestyles. This leads to immersive experiences which play a role in forging strong attachments between users and products.

Material products are increasingly becoming communicators of socio-cultural values. The model shows that decoding of common values, norms and opinions that exist in the users' culture can be reproduced in material forms that embody the appropriate symbolic meaning. This establishes in a cultural way, a vast array of different possibilities, constituting symbolic signs that remind users of past events, emotions and experiences, and bring forth meaning to social relations as well as reference to users' identities. Product meaning provides the uniqueness, continuity and consistency that is vital to the formation of users' identity.

Cherishable culturally orientated products

The last phase consists of the output described as 'cherishability' in culturally orientated products (product domain). The focus of this model has two elements: the first is to

generate novel design concepts that are linked to users' social and cultural needs; the second is to design concepts with a recognisable product image embedded with intangible narratives that can facilitate users' acceptance (Fig. 2). A product should have a specific product image based upon symbolic personal and social values. It should project a slightly different metaphor and meaning for everyone who uses it. Related to this is that a product's interface is essential to understanding the product, and that products act as expressions of a user's identity and aspirations. In summary, a culture-orientated design model should provide tactile quality, symbolism and a story that gives products value and meaning. In this context, it is argued that designers should act as culture builders as well as catalysts for change.

To create cherishable user experience, designers need to study users' concerns in the social context in which they interact with products. By interacting with users in their natural habitant, designers can uncover and gain insight into users' beliefs, behaviours, needs, perceptions, desires and values. When a product appeals to a user, it does so relative to his or her cultural framework, worldview and daily experiences. Consideration of these factors may result in the generation of design concepts with deeper local values combined with symbolic, semantic and functional attributes that resonate with their users.

Discussion

There has been little in-depth research conducted on this topic, except for a few related studies which acknowledge the importance of culture to product design (Manzini and Susani 1995; De Souza and Dejean 1999; Gaver 2001; Yang 2003; Norman 2004). The study has attempted to raise pertinent issues facing product design in Botswana and other new emerging economies. Such issues, to name but a few, include lack of a concrete theoretical design and cultural framework which has been taken for granted for so long, and this has resulted in emulating the Western design concept without much due regard to the local context. The socio-cultural framework developed in this paper defines the key elements of culture and how they can be made applicable in designing cultural-orientated products. The culture-orientated design model (Fig. 2) develops knowledge and confidence to challenge the dominant Western culture in Botswana's design practice and advance local thought, content and solutions. The model strives to personalise products in the vicinity of the user's culture and making it less foreign. The paper has addressed the gap in the literature because it proposes one way of specifying, analysing and integrating socio-cultural factors in the early stages of the design process. The culture-orientated design model is offered as a view that is complementary to, rather than an opposing view of, existing design methodologies. The model enables one to assess how different elements of culture interconnect in the conceptualisation of products with local relevance. Such products may appeal to users at an emotional level and facilitate product acceptance. It was difficult to devise some kind of instrument to measure the degree of cultural engagement, but the engagement was observable.

There is an increasing amount of research going on in the area of emotional design. However, researchers in the area make there is little reference to culture. Emotions are culture specific and emotional attributes integration in design should be cultural-orientated as well. Evidence from the research shows that emotional socio-cultural are one of the corner stones of cultural design. It is therefore, argued that for emotional design to gain significant recognition, it has to recognise the importance played by culture in product design.

The integration phase in the findings plays a pivotal role in the proposed design model. Humanity is faced with a serious problem of the culture of waste or throw-away society. Users consume products that they do not actually need and end up throwing them away. Waste in this sense could be viewed as a sign of a failed relationship between users and the product. The integration phase should be applied in such a way that it adds value to products that would resonate with users identity, provide them with relevant cultural meaning and forge a strong attachment between users and products. All these can be achieved only if there is a well grounded user research on the specific areas of functionality, knowledge, mediation, gender and aesthetics.

The phase on cherisable culturally orientated products adds a lot of value to the proposed design model. The whole purpose of investigating users socio-cultural factors and how they can best be integrated in product design is to gain user acceptance. If these phases do not contribute to cherisable products which are accepted by users, then this would lead to the culture of waste. This proposed model intact is to design products that take into consideration users input as much as possible during the early stages of the design process when design concept are still relatively fluid. Such product concepts should portray users cultural identity and thus increasing the chance of product acceptance. This in one way elevates designers role to be creators of pleasurable cultural experience and identity.

Papanek (1984, p. 227) argues that "large scale design in developing countries by outsiders has never worked." Moreover, "design strategies that go against the ecological wisdom of a culture are likely to fail" (Krippendorff 2006, p. 205). The observations made by these eminent authors demand a new approach to design education, theory, research and practice, especially from new emerging economies such as Botswana's. Therefore, the culture-orientated design model has provided a point of departure for new design knowledge and new strategies in design thinking. Cultural knowledge could enrich contemporary design theory and underpin creativity and innovation in design practice. The design model serves as a design tool that connects users' heritage and an unfolding future.

The proposed culture-orientated design model (Fig. 2) provides a way of consciously incorporating socio-cultural factors and at the same time humanising technology. It serves to contextualise design not for academic purposes alone but also to allow designers themselves to see their task in perspective and to question some of the narrow assumptions they have inherited about their cultural role in the educational system and the society at large. The challenge facing Botswana designers is not to be just aesthetic stylists or problem solvers, but creators of cultural experiences that enrich the fundamental human experiences of being alive. It is through a better understanding of users' sensorial perceptions and cultural values that designers will be able to move into a new design paradigm of quality where products have added value, meeting user's true needs and making their experience more meaningful (Marzano 2000).

Culture-oriented products provide users with artefacts that have narratives and fantasies around them, as well as benefits (Moalosi et al. 2005). This notion may give Botswana a new dimension of product competitiveness in the global market thus value addition to products. It may enable local designers to exploit their cultural and geographical uniqueness in response to a global demand for more differentiated products. The global process of homogenisation may provoke people to be more aware of their national and cultural identities (Fernandes 1995). That is, globalisation has sparked off a new awareness of local identity. In support of this, Fernandes (1995), Manzini and Susani (1995) argue that when society and individuals are increasingly realising what it means to live in a limited and interconnected world, what is emerging is not a unified global society but an exasperated search for identity, both individual and collective.

The paper strives not only to create design concepts that combine tradition with contemporary technology to satisfy the needs of the users, but also to achieve a new way of approaching the development of design concepts from the perspective of culture. The products that users own and employ daily are more than just objects; they are also a reflection of a microcosm of the users' broader culture. The ultimate aim is to create a framework under which modern Botswana products and ideas can be developed in the long term. This is one way of improving, unifying and rearranging the image of traditional Botswana into positive and progressive ways. In the process, indigenous subject matter can be developed.

From the academic perspective, the study can be used as a vital design resource for strengthening the design programme at the University of Botswana and other design programmes in newly emerging economies. It fosters an appreciation of the local culture in problem-solving. Academics, designers and design students will recognise and acknowledge the role played by culture as a point of difference in design and a source of design innovation at an early stage in the design process. This might improve or deepen practice, because academics will be assisted in understanding how to integrate culture in product design through the proposed theoretical design and cultural framework. Furthermore, the design model will act as a theoretical frame for new research on improving it in different cultures or cross-cultural studies. Guiding and nurturing students' abilities to tap into the user experience are important steps in teaching them to create products and systems to which users can become attached on emotional and cultural levels. This is one way of decolonising design education from the current predominately Western values, and recognising the indigenous voices in the formation of postcolonial culture.

Conclusion

Products succeed only when they resonate with users' values, attitudes and behaviours, even if they result in changes to the same values and behaviours. This consideration should occur at the very early stages of conceptual development when the concept is still relatively fluid. The input from socio-cultural factors (Fig. 2) is insufficient to generate culturally innovative and acceptable solutions; one also needs to incorporate data from physical, cognitive and emotional human factors. The challenge is to create designs that users will want to keep, maintain and use for longer periods of time. Such products should be designed with empathy, and created in an artful way that engenders powerful emotional attachments, provides rich narratives, and excites intense user experiences.

The paper proposes that, to design cultural-orientated products that attract users, the answer lies in a carefully managed design process that cultivates a useful, usable and cherishable user experience from the perspective of users in their local context. A culture-orientated design process ensures that products meet users' needs and expectations by iteratively studying and actively involving users throughout the design life cycle. This ensures a deeper and more locally relevant user experience. Such a design model allows cultural identity, meaning, values and tradition to be truly integrated and conveyed.

Based on the application of the culture-orientated design model, designed products may satisfy users' needs beyond the merely functional requirements; they may include users' aspirations, emotions, aesthetics and socio-cultural needs, and be environmentally appropriate. This enables designers to create cultural content that provides users with lasting gratification, entertainment and information, while also involving them intensively, emotionally and intellectually. Users' involvement in the design process establishes a

symbiotic relationship with designers. The culture-orientated design model challenges the way products are designed for different cultures and supports the use of local content for design and development of new products.

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