"EMOTIONAL PROBES" AS A USER-CENTRED METHODOLOGY FOR DESIGNING EMOTIONALLY-ENGAGED WEB INTERACTION

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ABSTRACT:

Exploring the balance of aesthetics and usability in Web design to enhance user experience, we use an effective, intimidate method to understand user emotions in Web site interaction. "Emotional Probes" (EPs), combining rapid ethnographic surveys with the Cultural Probes (CPs) approach, can enhance designers' understanding of user emotional engagement with web design.

The dominant user experience research paradigm in Computer Mediated Communications (CMC), influenced by Human Computer Interaction (HCI) methodologies, focuses on usability. Usability engineering understands user experiences primarily in cognitive or behaviourist terms. Recent years, however, have seen growing interest in alternative perspectives on human emotional experiences through design, using ethnographic methods to understand users' needs, perspectives, and preferences. We employ CPs and rapid ethnography to develop a hybrid contextual strategy and explore users' emotional experiences in Web-based visual communication.

Extending the application of "EPs" to design processes provides Web designers with more creative inspiration and insight in their efforts to enhance users' visual and emotional experiences.

Key word: emotional experience, user-centred design, cultural probes

1. Introduction

This research paper has evolved from the author's 2006 doctoral research (Chang, 2006) and focuses on evolving an appropriate research strategy—termed "Emotional Probes" (EPs)—to look into users' experiences and understand their needs and feelings when they use Web interfaces. "Emotional Probes" is a practical tool for integrating more emotionally-engaged Web interaction into interface usability. This paper will show the methodological rationale and inspiration for the research in order to explain the reason for developing research methodology to approach users' emotional experience.

2. Literature review

As websites have evolved, the graphic interface has become perhaps the most common and immediate communication platform because it offers users fundamental tools to control their navigation. In order to offer a satisfying user experience, the interface's visual expression integrates both functional and aesthetic considerations which are tailored to interact with human emotions through visual stimuli and cognitive experience. A well-designed graphic interface allows users pleasurable experiences in which physical, emotional, and cognitive actions converge harmoniously. However, most design guidelines tend to overlook the importance of Web aesthetics by overemphasising interface usability based on utilitarian concerns (e.g. Dix, Finlay, Abowd, Belle, 2004; Nielsen, 2000a; Preece,

Rogers & Sharp, 2002; Shneiderman, 1998). This reflects the fact that the Human-Computer Interaction (HCI) community is little interested in aesthetics (Badre, 2002) and users' emotional experiences.

The emotional aspect of Internet use is currently emerging in user interface research, under headings such as "user pleasure" (e.g. Douglas & Hargadon, 2000; Green & Jordan, 2002), "user satisfaction" (e.g. Lindgaard & Dudek, 2002a), and "emotional usability" (e.g. Kim, Lee, & Choi, 2003), and in consideration of the relationships between visual impact, aesthetics and usability (e.g. Badre, 2002; Schmidt, Bauerly, Liu, & Sridaran, 2003; Thielsch, 2005; Thorlacius, 2002). Even though different terms are used to describe user experience, all these authors have indicated that aesthetic influence does affect users' emotional experiences when they navigate to a particular site.

When considering how to improve user experience, usability analysts address methodological issues through two classic approaches: 1) Usability evaluation (for Human Factors Engineering) and 2) Ethnographic studies (to test utility) (Schiano & Nardi, 2003). However, we still know little about users' emotional reactions and perceptions, and visual impact of interface communication is secondary to Web usability evaluations.

The primary aim of this research is therefore to develop a methodology for an intuitive, intimate approach to probe users' emotional experiences with the Web instead of highly controlled laboratory testing of Web usability. Owing to increasingly shorter cycles of product realisation in design processes,

time-efficient usability assessments are extremely important. Thus, a rapid

ethnographical strategy was put together because of its one significant advantage:

greater time-flexibility over conventional ethnographic research.

On the other hand, this research experiments with different methods in order

to approach the ongoing phenomena of user experience from different angles. The

"Cultural Probes" (CPs) approach is a design-led approach to understanding user

experience (Gaver, Dunne, & Pacent, 1999); for this study we adapted and refined

the cultural probe with the rapid ethnographic strategy. The "Emotional Probes"

(EPs) approach has been developed to visualise users' emotional responses and

engage with user experience in order to give designers more creative inspiration.

This research is interdisciplinary, moving between Web technology and

visual aesthetics, user perception and designer intention to provide accessible

approaches that rectify misunderstanding of emotional design and usability in

terms of user Web experience. Emotional probes—including a diary survey,

participant observations, interviews, think-aloud techniques, drawing exercises,

and mood board exercises—facilitate future design research into understanding

user experience. The development of EPs originated in three issues: 1) Emerging

concerns about Web visual aesthetics and users' emotional needs; 2) The

increasing need to develop design with an awareness of emotional interactions

with users; and 3) Developing alternative methods to investigate user experience.

EPs were expected to assist researchers to discover more evidence of emerging

demands and questions in the field of user research in order to respond to user

needs of design quality, interface functionality, and experiential reactions.

3. Emotional Probes—combining rapid ethnography and cultural Probes

3.1 Definition of Emotional Probes (EPs)

Emotional Probes (EPs) were generated through a combination of rapid ethnography and the cultural probes approach as a new experimental method for studying user emotional experience. By comparing the analytical outcomes of conventional and alternative HCI techniques, we generalised a framework for understanding users' emotional experience when interacting with Web interfaces. The development of EPs was based on the goal of embedding and understanding user emotional experience, and thus providing creative inspiration for designers. It is difficult to put the inherently subjective process of creative design on a scientific basis. Therefore, rather than offering a fixed resolution, this study attempts to develop tools to generate new knowledge about the reality of user experience.

Hutchinson et al. (2003) indicate, "A *probe is an instrument that is deployed to find out about the unknown—to hopefully return with useful or interesting data. There is an element of risk in deploying probes; they might fail or bring unexpected results.*" On the design research side, seeking problem-resolution is not the only goal; design inspiration can be an additional benefit. Unexpected

results might disrupt data collection and analysis, but could encourage designers to seek deep meanings of user experience beyond product manufacture and increase the intrinsic worth of design.

In exploring emotional interaction between users and Web interfaces, the Cultural Probes (CPs) approach can be considered as a technique that closely engages with users' real experience. Since they were pioneered by Bill Gaver in 1999, cultural probes have been utilised to gain a better understanding of design issues. CPs were initially designed to *provoke inspirational responses* in the lives and thoughts of elderly people in various local communities (Gaver et al., 2004: 53). CPs have been adapted into different forms with specific questions for design solutions, e.g. "Domestic Probes" (Hemmings, 2002), "Empathy Probes" (Mattelmäki and Battarbee, 2002), and "Technology Probes" (Hutchinson et al., 2003). Past examples of research with cultural probes used creative methods to garner images, notes, audio, and video about individuals. Even though those image fragments were loosely structured, the point was to institute non-verbal values—feelings, thoughts, interactive relationship, aesthetics, and different emotional engagements—within the fieldwork. The purpose of CPs was not to gain demographic information about individuals but significant clues about lived experiences. The cultural probes approach uses observable techniques to identify differences in people's *emotional reactions* (Gaver et al., 2004: 55).

The EPs approach inherited the concept of cultural probes in conjunction with rapid ethnographic methods to develop a hybrid contextual strategy. Owing to time

constraints and the short product cycle of Web design, "Rapid Ethnography" (Irons, 2003; Millen, 2000) has provided "Quick and Dirty" approaches to decrease the time needed for commercial development of interactive system design (Hughes, King, Rodden, & Andersen, 1995).

EPs were developed as a series of methods combining rapid ethnography and the cultural probes approach in a *self-record booklet* format containing inquiries, drawings, and collages (as shown in Figure1). Along with these methods, interviews and observation were also used for data collection. The use of emotional probes implies a hybrid of methods combining the particular strengths of each method to reinforce the whole.
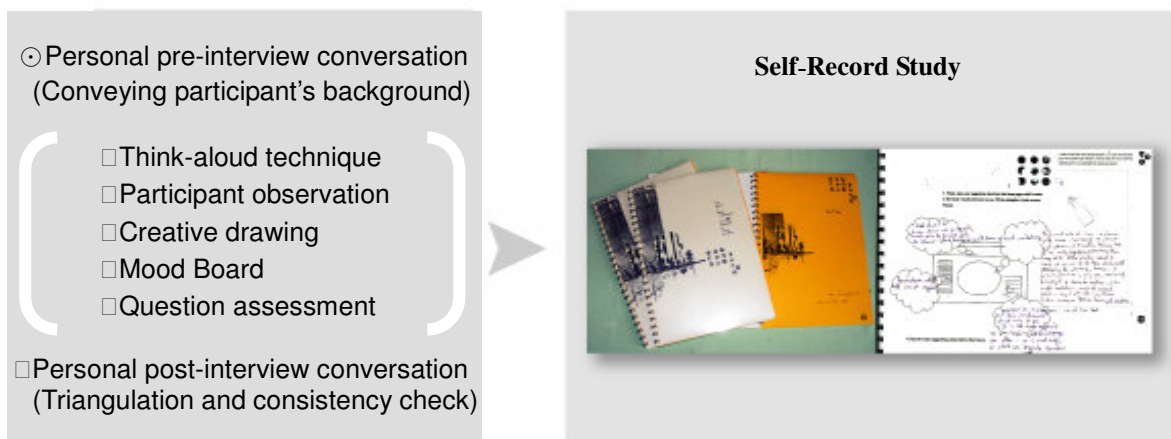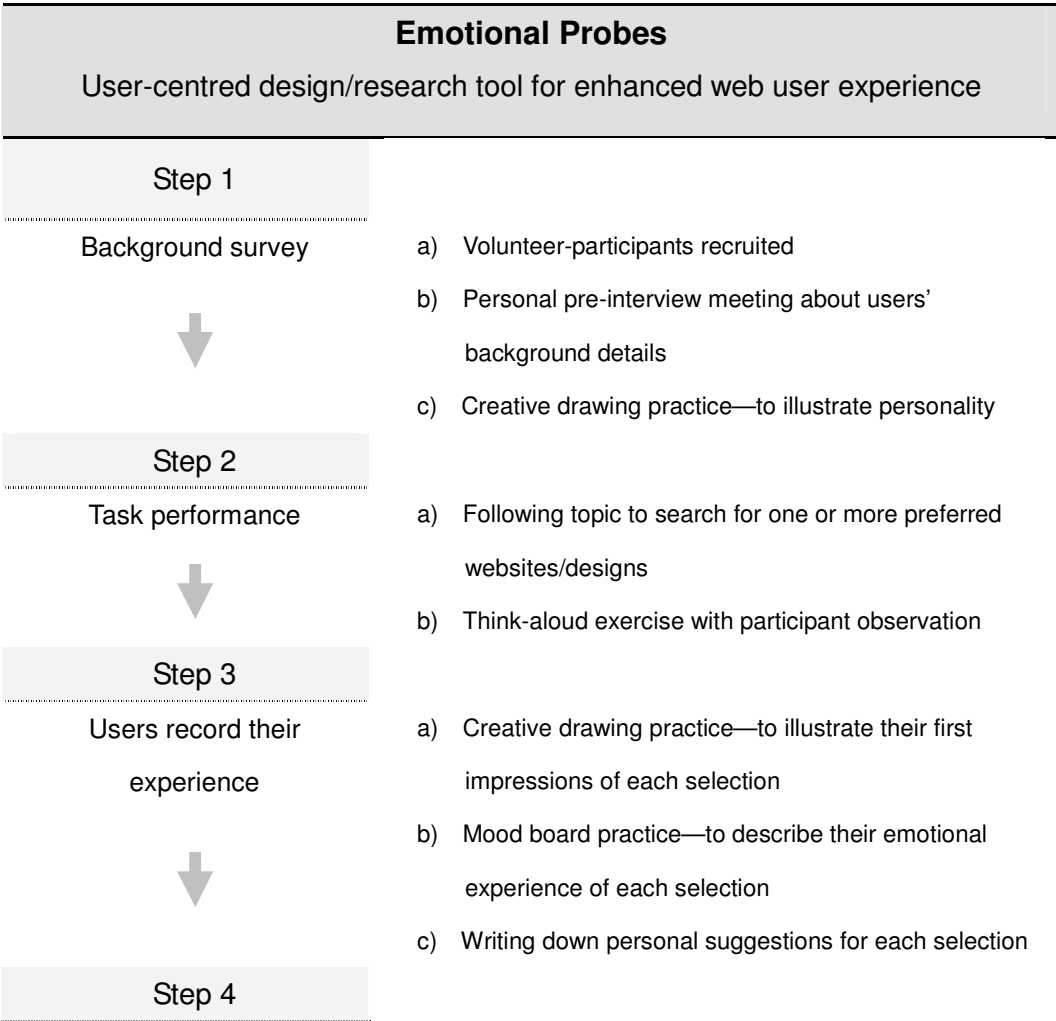

Figure 1: Left: diagram showing techniques applied in the EPs record booklet. Right: picture showing the record booklet and some of the entries from a participant's diary.

3.2 Procedures using Emotional Probes (EPs)

Based on iterative evaluations refining suggestions made by designers and users, we propose a "simplified version" of EPs for Web developers, as efficiency is vital

in rapid product development. This model provides creative techniques for catching snapshots of user experience to convey different messages concerning feelings, thoughts, interactive relationships, and personal aesthetics. Duration is adjustable according to designers' needs. Application of EPs can be extended through various designs in order to increase understanding of different forms of user emotional engagement and interaction with designs. The EP model is introduced in Figure 2 below.
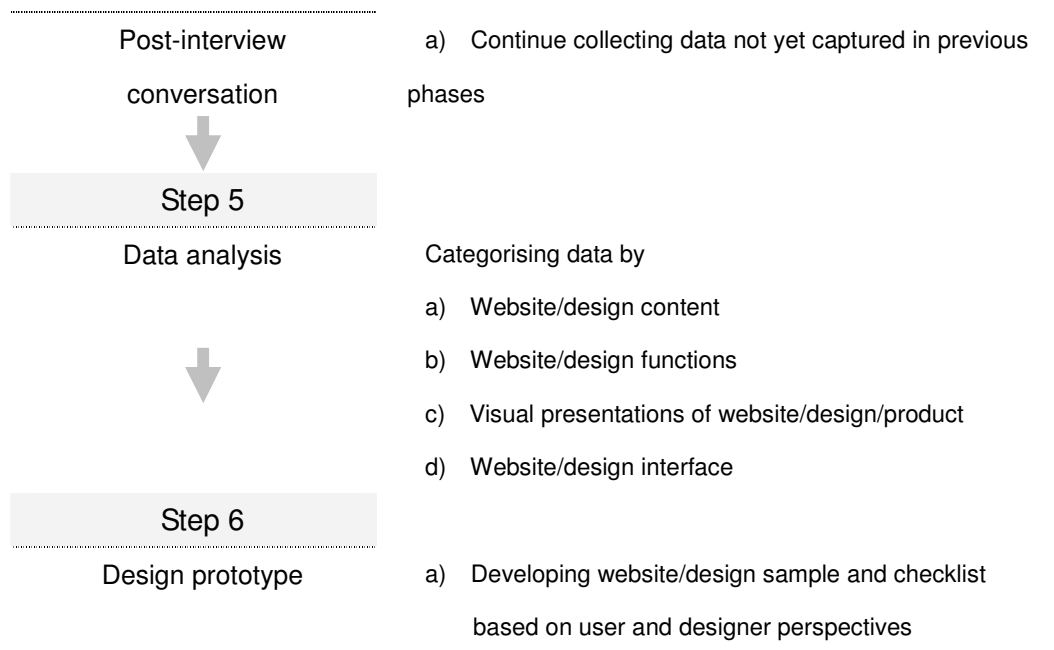
Emotional Probes	
User-centred design/research tool for enhanced web user experience	
Step 1	
Background survey	a) Volunteer-participants recruited
	b) Personal pre-interview meeting about users' background details
	c) Creative drawing practice—to illustrate personality
Step 2	
Task performance	a) Following topic to search for one or more preferred websites/designs
	b) Think-aloud exercise with participant observation
Step 3	
Users record their experience	a) Creative drawing practice—to illustrate their first impressions of each selection
	b) Mood board practice—to describe their emotional experience of each selection
	c) Writing down personal suggestions for each selection
Step 4	

Post-interview conversation	a) Continue collecting data not yet captured in previous phases
Step 5	
Data analysis	Categorising data by
	a) Website/design content
	b) Website/design functions
	c) Visual presentations of website/design/product
	d) Website/design interface
Step 6	
Design prototype	a) Developing website/design sample and checklist based on user and designer perspectives

Figure 2: Revised model of the "Emotional Probes." Once the design prototype has been made, the designers/researchers can reuse this procedure to test user experience of the design. This procedure can be used at any stage of design development process.

3.2.1 Background survey

To study user experience with website/design, first it is essential to recruit enthusiastic volunteer-participants and conduct pre-interviews with them to have a basic understanding of each participant. The researcher/designer can also use drawing practice to test the participants' personality and probe their preferences for website/design interfaces.

3.2.2 Task performance

At this stage, each participant must follow the topic independently to search for one or more preferred websites/designs. Next comes a think-aloud exercise where each user-participant is asked to relate what they think and feel about their

experiences. Once found, information about the participant's favourite websites/designs provides the researcher/designer with concrete ideas about their preferences.

3.2.3 Users record their experience

When the task is complete, each participant is asked to make a drawing of their first impression of the website/design and then make a mood board for each selection to reflect their feelings and thoughts after using the Web. Lastly, they write down suggestions for how designers may improve the website/design.

3.2.4 Post-interview conversation

After the self-recording task, the researcher/designer conducts an individual interview with each participant to collect data that was not captured during previous phases. The participant can also further discuss their creations and explain their meanings to the researcher/designer.

3.2.5 Data analysis

The data may be categorised according to different design/research purposes, such as 1) website/design content; 2) website/design functions; 3) visual presentations of website/design; and 4) website/design interface. Here, the researcher/designer refines the findings to develop design concepts.

3.2.6 Design prototype

Using data analysis, a potential design sample emerges from the data categories to reflect participants' likes and needs. The researcher/designer uses these findings to develop a design checklist to generate a design idea and prototype for

the early stages of the design process or to examine user reactions at any stage of usability testing.

4. Multi-Probe Methods

Emotional Probes (EPs) offer techniques that allow for the collection of information about users' emotional experiences and open up a new perspective for user interface designers working within the graphic design field. EPs use multiple methods and allow participants to describe their emotions and opinions individually. The objective in developing these research methods was not to define new design disciplines, but to find ways of seeking an in-depth understanding of user feelings and needs, thus creating new inspiration for design and bridging the gap between user and designer expectations. In the following sections we shall illustrate the methods at work in EPs.

4.1 Pre- and post-interview conversation

These interviews were often conducted using quick and dirty ethnography to gain an initial insight. The interviews were conducted to back up the diary survey by continuing to collect data possibly lacking in the participants' diaries.

Pre-interview conversation: Before the diary survey, the researcher had a conversation with each participant and explained the activity would proceed. The conversation served first to give instructions to participants and ensure they

understood how to continue with the survey on their own. Since each participant had different levels of experience of Web services, the researcher talked with each participant and made notes.

Post-interview conversation: This final conversation, as Corti (1993) states, basically aims to identify and resolve any problems that may have arisen in the course of the research. However, in this case, discussion tended to turn more towards how participants undertook the activity and what they thought about the creative drawing and mood board practices. In this way, it was possible to evaluate the practicability of these methods, and the researcher continued to collect data which had not been captured in the completed self-record or diary. These data were also necessary for the research. The final conversations were conducted to encourage participants to clarify, elaborate on, and reflect on the materials they had recorded and composed during the research period (Kuniavsky, 2003). So these conversations made the study more complete by providing an in-depth understanding of participants' various responses in the self-records and diaries.

4.2 Self-completion diary study

The diary survey is a way of investigating the thoughts, emotions and prejudices that characterise people's experiences (Tedlock, 2003: 178). It tends not to be used in large-scale consumer spending surveys.

In user experience research, the diary survey is sometimes adopted instead of direct observations and personal interviews, as the latter have the disadvantage of being time-consuming and raising issues about the evaluator's

presence affecting the survey (Kuniavsky, 2003; Preece et al., 2002). In human-computer interaction studies, diaries offer a track of personal, sensitive, emotional and experiential records of "what users did, when they did it, and what they thought about their interactions with the technology" (Preece et al., 2002: 377).

With respect to the requirements of this research strategy, the diary surveys have four advantages over other methods: they 1) are relatively low-cost; 2) are easy to use without special training; 3) can record personal reflections and interpretations of happenings, personal feelings, and emotions surrounding the event described; and 4) represent one of the most flexible approaches to collecting information—diaries may be completed over a period ranging from one day to two weeks (Denscombe, 2003; Hakim, 2000; Preece et al., 2002). These advantages satisfy the demand for efficiency and intimacy of the rapid ethnography and cultural probes approaches.

Diaries can be made in an open-ended, highly structured or semi-structured format, for different research purposes (Corti, 1993). The present research project was designed as a semi-structured diary survey including three types of inquiry: 1) creative drawing; 2) mood board practice; 3) open questions, participants interviewed one-by-one over a week (Chang, 2006). The diary format can be adjusted to last a few hours (as a self-record booklet), up to a month (diary).

4.3 Think-aloud technique with participant observation

The think-aloud technique is useful for providing a convenient and inexpensive way of obtaining immediate feedback from users while they perform certain actions and do a usability test. In this study, the technique is applied to ensure participants understand how to perform their tasks and to observe how they proceed. Using the think-aloud technique, the researcher can monitor users' browsing habits and ascertain whether they understand how to complete their diaries by recording their feelings and suggestions for interesting websites.

With participant observation, the think-aloud technique could be extended to gather more opinions about individual users' experience and online behaviour. Data on the relevant actions and reactions on the part of participants could be collected to contrast with their diary recordings. Through this observation process, the researcher can have an interactive relationship with the participants. Through conversation, the researcher gains a better understanding of their thoughts and feelings which can give further evidence for interpreting participants' emotional reactions. This application of the think-aloud technique with participant observation backs up the validity of the study.

4.4 Creative drawing

Drawing, put simply, is "the manual skill of generating signs to represent what one sees" (Massironi, 2002:1). It is also a visual metaphor that can "show a person's emotional state of mind much better than verbal definition or description" (Diem-Wille, 2001:119).

We used drawing as a way for users to describe their feelings. It is not always easy to use written or oral language to describe one's emotion. Drawing provides people with a communicative method that works on both conscious and unconscious levels. Lines, positions, and structures give communicative meaning to drawing. In this survey, the drawing practice was employed in two ways: 1) to illustrate personality and 2) to illustrate feelings. According to Goatman's (2004) classification, sketching a landscape can free the relationship between graphic exercise, recognised personality, and preferred forms of interface.

Connecting user interfaces and drawing practice, this study aims to develop an alternative tool to approach user needs in interface design. Given the limitations of Goatman's experiment, we decided to modify and extend his prototype "garden" into a series of creative exercises by drawing a garden layout, a library landscape layout, and a personal homepage (see Figure 3). Different personal impressions of gardens (more emotive content), libraries (more logical content), and personal home pages (more personal content) allowed participants to use their imagination to draw their own design. The point of this activity was for each participant to draw a picture in response to their impression of and feeling about their favourite Web interfaces, instead of describing them in written words.

The results support this study by proving the relationship between personality and visual responses to graphic layouts. The preliminary findings have been published in Chang, Press, & Polovina (2004) and Chang & Press (2005). It was expected the three kinds of layout drawings would 1) reveal more connections

between interfaces and user experience; 2) show the effectiveness of the drawing

tool in mapping user experience; 3) support participants' verbal statements; and 4)

inspire designers with users' creations. The drawing practice is straightforward to

conduct and easily generates rich data. It was used in this research project to

create a flexible way to engage with participants and broaden the range of
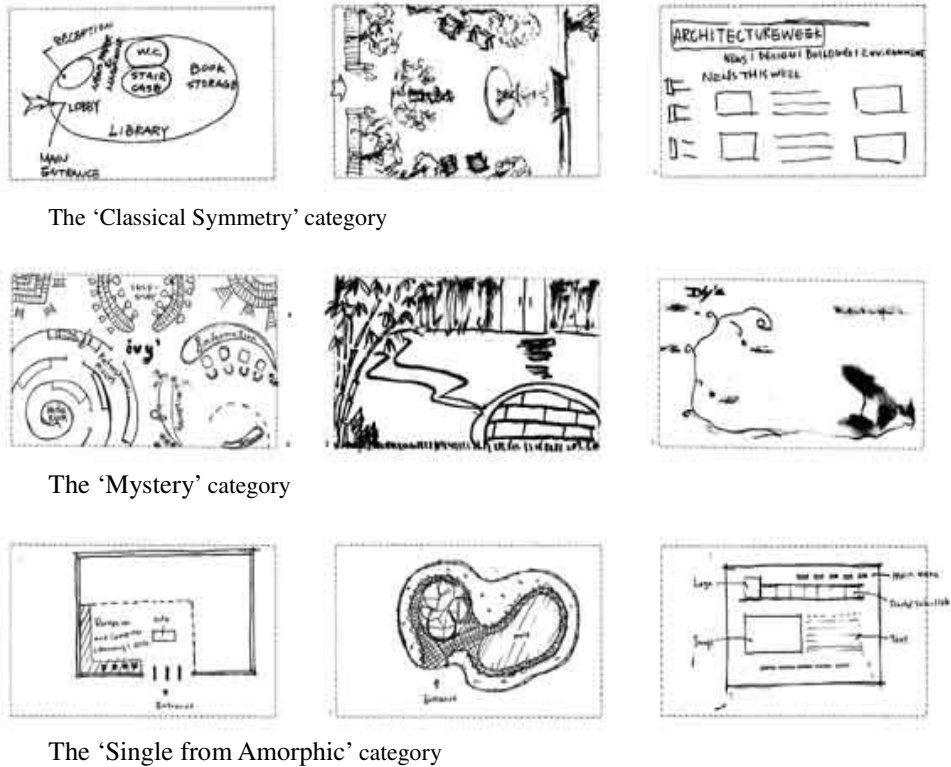
available data.

The 'Classical Symmetry' category

The 'Mystery' category

The 'Single from Amorphic' category

Figure 3:Series of creative drawings of the garden, library, and personal home page by three user-participants. (For information on the "categories", see Goatman, 2004).

4.5 Mood board

The "mood board"—a collage exercise—is often used by designers to translate

their target market data into a visualised representation for product design, interior design, architecture, and other design-related activities. In product design, collage exercises are habitually employed to visualise the "value" of design, such as being cold, gentle, joyful, peaceful, or in other ways emotionally descriptive (e.g. Boess & Durling, 2002).

A mood board is created by combining images, text and fonts, colour schemes and other graphic elements to structure an overall *look and feel* for a design. In order to develop affective techniques to map user experience, the mood board was used as a *fun tool* to involve participants in a playful activity. The completed image collage is supposed, through interactive practice, to indicate their thoughts, emotions, and creative urges, through images.

As Mattelmäki and Battarbee (2002: 4) state, the collage is an "emotionally expressive and dynamic" exercise for explaining one's personal character or way of life or illustrating one's feelings toward certain subjects and events. Such a form of playful interaction with people's experience is as valuable as other research techniques in data collection. Mattelmäki and Battarbee (2002: 3) comment that, "Collages are sometimes used in the beginning of design process to find the spirit for the design and in user research and participatory design exercises to reveal dreams and emotions". Therefore, the use of collage not only provides a playful tool for gathering design ideas and user perspectives in the early stages of the design process, but also generates practice evaluating user experience through visual and emotional description (see Figure 4). Mood board practice thus became

integrated into the emotional probes approach to reflect users' emotional associations.
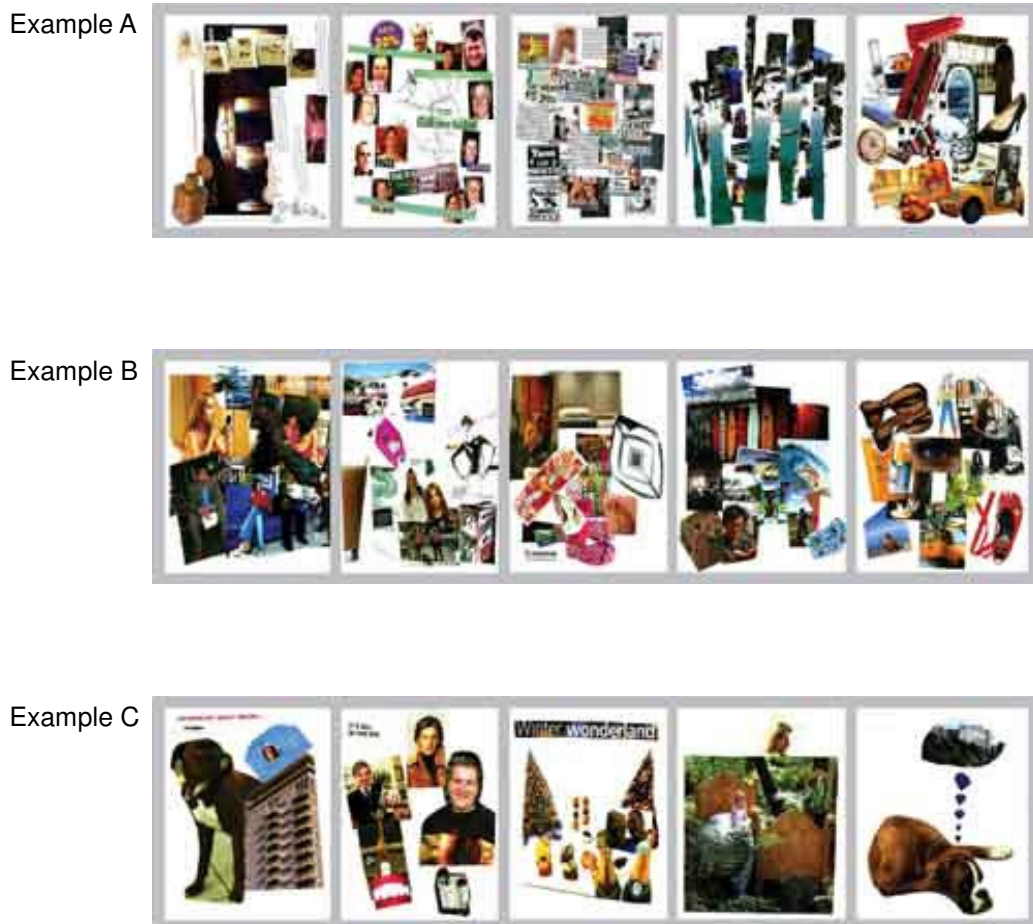
Example A

Example B

Example C

Figure 4: Three different participants completed Mood Boards during the week-long experiment.

5. Method triangulation

Each method has its own theoretical strengths and weaknesses because it contains its own set of assumptions about the nature of the social world (Denscombe, 2003). So the present study approached user emotional experience

through interviews, observations, question-based inquiries, and documentary data (e.g. diaries, letters, essays, personal notes, biographies and photos) to create an intersecting set of different methods and data types employed to inquire into a single subject (Punch, 1998: 190). The idea of combining multiple methods within a research program to increase the knowledge produced by a study has been termed: "methodological triangulation" (Denscombe, 2003; Hakim, 2000, see Figure 5).
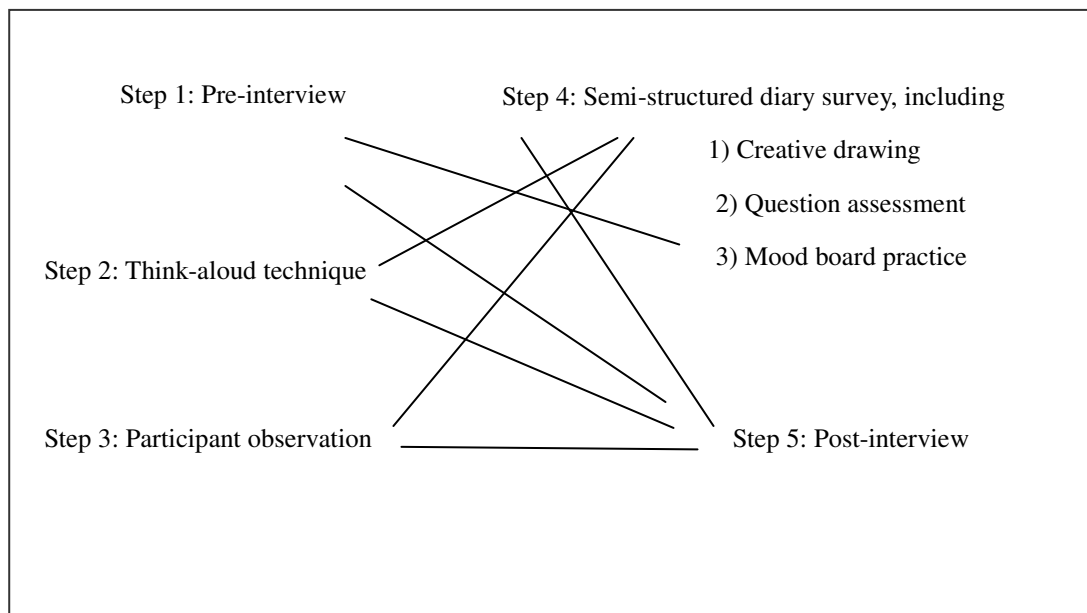

Figure 5: The conceptual map represents the concept of methodological triangulation as applied in this study (modified from Denscombe, 2003: 133).

The use of methodological triangulation has some distinct advantages over enquiries based on a single method, such as 1) producing more valid and reliable data, 2) understanding the phenomena from different perspectives and gaining an

opportunity to corroborate findings to enhance the validity of the data, and finally 3) diminishing the inherent weakness in applying methods singly, particularly in small-scale projects where no single method is perfect (Denscombe, 2003; Sarantakos, 1993). EPs are intended to reduce misunderstanding and increase the number of different perspectives on specific questions in order to filter out the truth. Figure 6 shows how the different studies continually refine the concepts and knowledge in use through subsequent research phases.
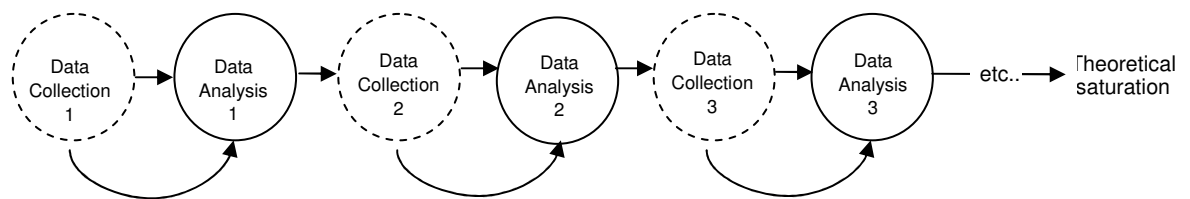

Figure 6: Theoretical sampling: data-collection/data-analysis relationship (source: Punch, 1998: 167).

6. Conclusion

Through the different phases of data collection, data analysis and discussion of existing publications, this research develops a methodological framework for approaching user emotional experience of Web design. The whole process involves designers' professional perspectives and user participation in order to gain real experiential responses to user research. Through a series of evaluations, we arrived at three ways in which the present research contributes to the field: 1) providing new methodological thinking for designers; 2) using "Emotional Probes"

as a design/ research toolkit to study user experience; and 3) EPs providing more

emotionally-engaged communication for designers and users.

6.1 Providing new methodological thinking for designers

This research centres on examining how methodologies based on cultural probes

can be developed and applied as tools in user research. It adapts the concept of

cultural probes in conjunction with rapid ethnographic methods to develop a hybrid

contextual strategy termed "Emotional Probes" (EPs), which is used to explore

users' emotional experiences with Web-based interactions. The concept of EPs is

applied to creative practices which can engage with users' expression of their

feelings, thoughts, interactive relationships, and personal aesthetics.

EPs have been developed to reflect end-users' browsing experiences when

interacting with Web interfaces. The method uses a diary and interview to records

fragments of users' thoughts and feelings that might relate to their personalities,

preferences, behaviour and habits. The process generates a workable structure

for discussing the individual's experience, instead of a quantitative exploration of

the average user's needs. Each method used during the exploration—mood

boards, creative drawings, diary surveys and think-aloud techniques—is based on

respect for the user's experience, to allow the respondent to relate their thoughts,

feelings and preferences. Emotional experience is complicated and indeterminate,

and the ethnographic nature of EPs renders them capable of revealing the

on-going phenomena of Web interactions through interactive interviews and

participant observations.

The flexibility and openness of EPs allows each respondent to select their favourite websites and present their individual feelings and thinking in verbal or graphic form. The central concern of EP methodology is always rooted in a focus on the importance of understanding user experience in order to complete user-centred design.

6.2 "Emotional Probes" as a design/research toolkit for studying user experience

The ultimate goal of this study is to encourage respect for user experience in the design processes. The initial intention of the research was to develop a relatively low-cost and effective research technique for gathering information about user preferences. In order to reflect users' ongoing experience, the methods employed in the data collection were developed in as natural a setting as possible, instead of the heavily controlled environment of laboratory-like conditions.

In order to understand how to improve the quality of user experience in the Web environment, we were careful not to limit the subjects of questions to any particular types of websites or prototypes. Instead of the researcher selecting websites, users were enabled to present their individual thoughts on specific subjects. The EPs survey produced a variety of samples indicating user preferences. EPs should be viewed as a brainstorming tool for surveying users' perspectives to build user experience into Web design.

To use this approach to explore Web user experience, designers can start by

recruiting approximately ten participants. If each of them offers five examples of their preferred websites, using existing websites that are similar in theme to the one under development, this will give the designers 10×5=50 samples reflecting users' preferences. From these samples, at least 50 ideas could be generated which might engage with users' preferences, habits, interests, feelings, criticisms and experiences.
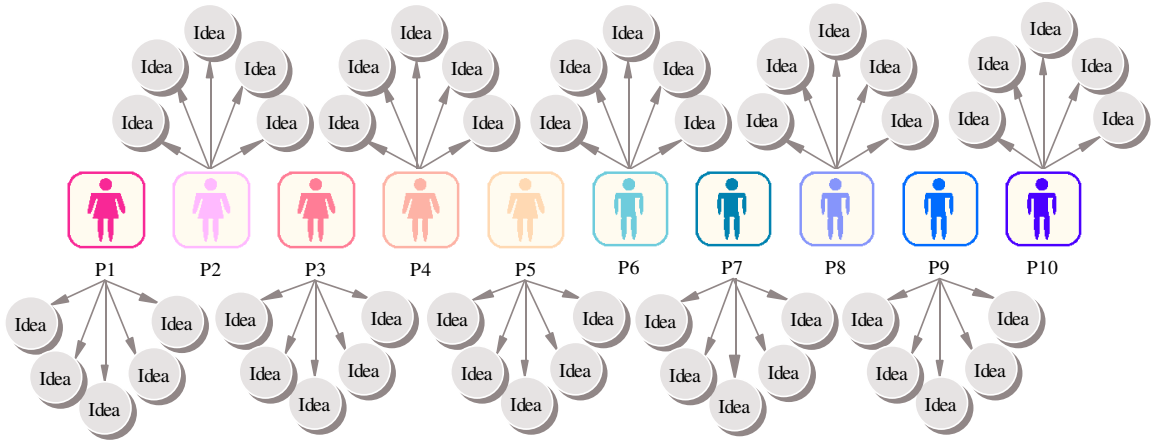

Figure 7: EP application—a brainstorming process for collecting design ideas.

As Figure 7 shows, the process resembles a brainstorming session. Designers can use this tool as needed, whether in a focus group discussion or through individual interviews with participants.

Significantly, the users' selected website samples can provide designers with concrete examples of their preferences. Looking at the samples, designers may discover other, competing websites. In addition, the results of the creative practices (e.g. mood boards and drawing practice) will probably indicate the visual

languages with which users are familiar, and which are created through association and imagination. So the data collection process function may be used as a brainstorming process to gather different ideas from users' suggestions. The information collected could help designers to consider users' comprehension of visual metaphors. If the sampling were extended on a larger scale, a user-experience database could be developed. For example, if a website is to promote a feeling of *happiness*, the designer can take examples in the database of participants' creative practices as support materials, searching appropriate visual materials to find elements that promote happiness.

On the other hand, a database of participants' creative practices would also provide different cultural, visual languages on the basis of participants' selections of websites and their drawing or collage creations, which could inspire designers to develop innovative designs (Figure 8). With in-depth interpretation of visual language, designers could also gain a greater understanding into users' communication cultures. In this way, design activity might be connected with user perspectives to incorporate their cultural differences. We believe that these elements could be further explored in future research into user experience studies.
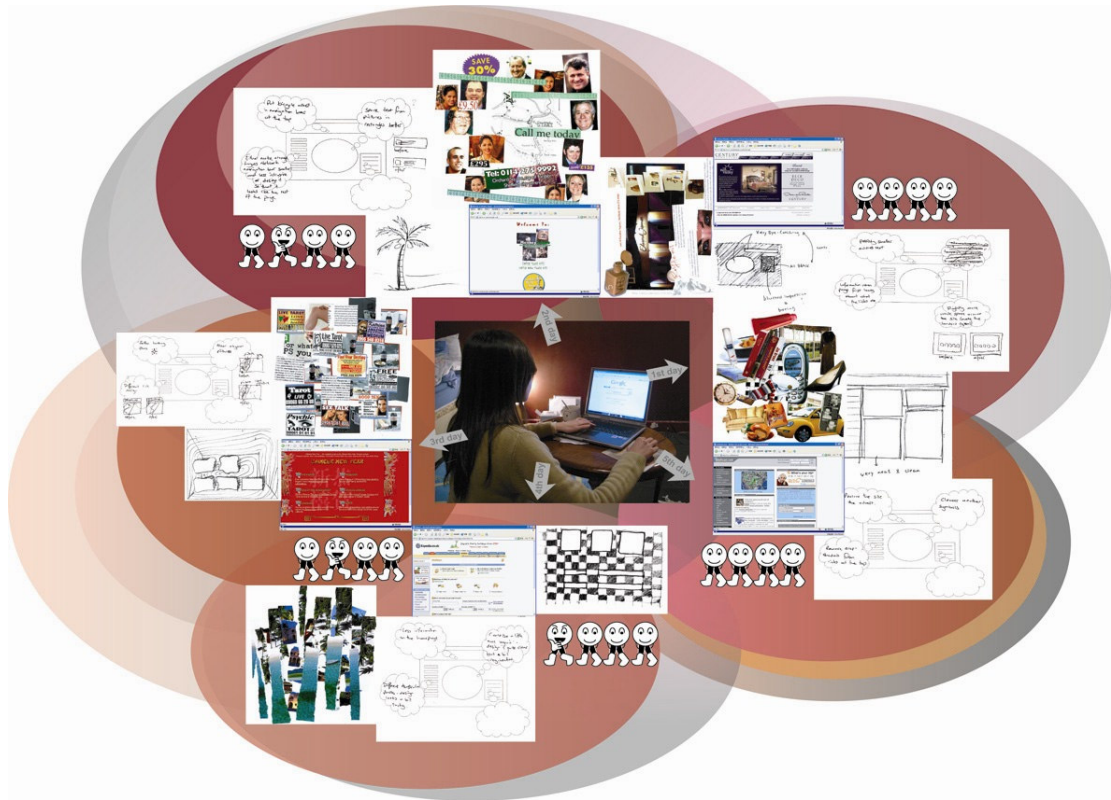
Figure 8: The EPs approach is like a data mechanism for explicating different visual materials to present users' emotional responses. (Above pictures taken from one user-participant's diary recording five different search tasks.)

6.3 EPs can provide designers and users with more emotionally-engaged communication

This research focuses on the complexity of the Web phenomenon in relation to users' emotional experiences and visual interaction. It is not easy to use a single way to deal with the complexity and ambiguity of social phenomena and gain an accurate understanding of real-life happenings. As Yvonna rightly observes in Darlington and Scott (2002: 132), "life is always more messy than tick boxes". This is why we developed Emotional Probes to collect qualitative data and

conduct analysis, instead of relying on quantitative methods.

In order to incorporate emotional values into a design, the probes can be implemented in many specific commitment, e.g. in relation to the interpreter's engagement, senses, and subjective experiences. We were able to review participants' responses in different dimensions, through different approaches, using observation, interview and a cooperative brainstorming process including drawings and collages.

EPs are a set of alternative methods for providing in-depth understanding of users' emotional associations, enabling designers to gain inspiration from users' experiences and solve design problems. When users' thoughts and feelings are involved in the design process, they generate emotionally-engaged interaction between design production and user experience, which is also one of the objectives of emotional design.

First of all, this research made a communicative bridge between the perspectives of graphic designers and usability analysts in order to develop their previously limited mutual understanding. Secondly, we offer designers a framework of research methods for approaching users' emotional experiences, and also a possible solution to methodological problems—particularly the lack of concern regarding emotional evaluation. Therefore, this research develops a practical methodology for designers to explore intangible emotional values and visualise users' emotional responses.

Finally, this research offers insight into the theoretical and practical knowledge about sources of inspiration in future emotional design. In this way, we recommend an increased awareness of emotional design development in the hope of enriching user experience and making the Web more pleasing and enjoyable to use.

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