

THE ROLE OF AFFECTIVE CONCERNS IN USER EXPERIENCE DESIGN

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Abstract. The majority of contemporary design outputs are geared towards achieving market success. The design business, as a whole, aims at producing design outputs that establish an emotional connection with users. Unfortunately, not every design succeeds in developing meaningful connections with consumers or creating worthwhile design experiences. As a result, experts in the topic of user experience design are progressively delving into the applications underlying affective concerns, including the involvement of humans, affective concerns, ideas and behaviours. Research shows that the aural and visual senses influence design consumption experience – so does. Experiences and design outputs play a vital role in enhancing customer satisfaction. This discovery may lead to a shift in existing design trends from functionality to enjoyment. Affective considerations have also been shown to improve the impact of design experience on memory. Affective issues, thus, play an essential role in the design experience. Studies on design and affective concerns have explored ways to purposefully evoke consumers' emotive behaviours through design solutions. Consequently, this study has employed tools to assist designers incorporate affective issues into design outputs. A critique of the design and emotion literature was also performed to assess the latest advances in user experience and to evaluate and expand the current understanding. The study found that recognising affective alterations is one of the essential variables influencing design experience evaluation. Such insights are critical to customising the user experience. Guidelines have been suggested to design an affective user experience, which will help designers shape design experiences that address users' emotional needs.

Keywords: *User experience design, affective concerns, designers.*

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1. Introduction

In an effort to help customers better connect with one another, researchers have attempted to achieve design outputs that can establish a link with people (Arhippainen & Tahti, 2003; McCarthy & Wright, 2004). Connecting sensual, utilitarian and symbolic functions at the moment involves using approaches that employ more than one of these functionalities. Nevertheless, these approaches typically concentrate on the design role in design consumption and, thus, constitute the design industry's key developmental direction (Mahlke & Thuring, 2007; Hekkert & Schifferstein, 2008; Kelly, 2009). Therefore, it is insufficient to analyse user experience by focusing primarily on design functions. By adopting a design methodology that ignores customer experience, designers fail to discover innovative design solutions and fulfil customers' demands through this practical viewpoint. A prior study found that the entire design experience provided more satisfaction to customers than the roles specific design outputs played. This result motivated researchers to investigate the user experience and design approaches for designing strategic solutions for customers. Emotion and Design Process concepts have suggested that user experience processes should include the

functions of individual wants, feelings, thoughts and behaviours (Tromp *et al.*, 2011). Specific situations, such as perceptual abilities in the auditory and visual domains, affected the users' experience in design consumption. However, there has been limited research exploring the strategies for introducing affective focus into the design of experiences. The purpose of this study was to evaluate the interconnection between users and design results and understand their impact on design experiences. This research examined techniques for optimising experience design through the lens of affective considerations. According to the literature review, a new user experience framework has been introduced herein. This framework shows how users and designers communicate. In an empirical study, the concept of this framework was applied to elucidate the role of emotional concerns in the framework of personal experience. Users were enlisted to report the emotional worries they experienced. The ability to improve on their concerns in affective aspects was examined. A design method was suggested as a guide for creating the experience. This strategy assisted designers to create a positive impact on people because they were able to have an affective impact on them. The findings of this study include a roadmap to improve the user experience, which will highlight concerns in affective aspects. This should encourage more design research in this area.

2. Exploring interactions between humans and design in experience design

Experiences refer to how a human, a gadget or an activity is interpreted by a user or an audience. Some of the methods of engagement include visiting a website, clicking on an adorable video and ordering an item using a cell phone app. Experts have studied the concepts of interactions between humans and design. User interaction was the focus of Nielsen's (1994) research, which looked at the interaction between customers, experiences and tasks. The research team evaluated both the experiences of customers participating in design consumption and the number of interactive activities needed to create a pleasant user experience. A series of empirical metrics were developed in Green's (2008) research to assess a user's order fulfilment with the interface. The research identified quantitative usability criteria and included, but was not limited to, the number of customers who used the interconnection system. The performance of the users when they adopted the framework was assessed, and their failures were recorded.

The concept of iterative design was investigated by Green (2008). After identifying the end-users and activities, following a series of analytical measurements and constructing the user interface, the experienced designer implemented an iterative design process. To begin with, designers contributed their effort to the conception of the user interface. A series of tests were then conducted to ensure that the UI design was both logical and easy to use (Green, 2008). Many experiences do not demand direct intervention but stimulate the customers' affective concerns. Experience design can be defined as follows:

- It is a coordinated exchange of information.
- It is a directed interconnection that corresponds to the designers' expectations.

An effective experience designer obtains a sound understanding of the target customers. A thorough understanding of the target demographic and users' needs are the core criteria for creating a great design experience. The experience should not be limited to the qualities of usability, aesthetic features and physical forms to be considered complete. Experience designers are required to choreograph an immersive experience

that considers affective concerns. The experience should also be physically and emotionally engaging.

3. The importance of emotive issues in one's experience

It is essential to understand the importance of past emotional worries when exploring strategies for incorporating affective concerns into experience design. When examining the topic from a psychological standpoint, Freud (1937) conducted a study indicating that there are different types of memory involved in learning. Working memory and long-term memory are the two types of memory. Additionally, it was discovered that working memory, which holds knowledge, interacts with the long-term memory, covering many areas, such as a person's personal experiences, thoughts, knowledge and abilities. Together, these make up the memory, which the participants use in making decisions. At the same time, long-term memory directs a person's judgment (Craik & Lockhart, 1972), responses and reactions (Longueville *et al.*, 2003). A person evaluates events and the related sequences based on their fundamental affective concerns and goal relevance (Scherer, 1997). This strategy is the first step during the evaluation process because it allows individuals to attribute their responses, thereby affecting their ability to manage their responses. The primary level of appraisal involves a person's cultural standards or norms. This is the first step in evaluating a person's responses, which affects their capacity to control their replies. The primary level of assessment involves a person's cultural expectations or norms.

Designers' decision-making abilities and their evaluation skills are impacted by changes in customer preferences (Bandler et al., 2005). Selection, distortion and generalisation were identified as the three universals of human modelling that humans use to codify their experiences. A person's beliefs are formed through selection, distortion and generalisation. It is through these processes that affective concerns in experiences can be applied.

4. Exploring how affective concerns influence human perception through visual and auditory stimulation

The link between emotional concerns, understanding and motivation must be clarified before we begin investigating the impact of affective concerns on visual communication. Evolutionary experts hold that affective considerations are emergent and evaluative thinking patterns that assist people to react swiftly to the external environment (Nielsen, 1994). Until the influence of affective considerations on visual communication is investigated, it is necessary to have a firm grasp of the relationships between affective considerations, comprehension and motivation. Some researchers who have investigated affective considerations have embraced the notion of evolutionary psychology, which outlines those emotional concerns evolve patterns of evaluation that enable a person to react swiftly and effectively to an external circumstance. A response to affective difficulties (Rosenberg, 1998) can be viewed as the preceding judgment and action process. One possible outcome of this process would be that a person would categorise important information from the outside world or occurrences. Rosenberg (1998) expanded on this idea further by proposing that a reaction to affective issues may be viewed as a previous judgment and action process. This process may result in a person's perception and categorisation of vital data obtained

from the external surroundings or occurrences. The procedure is referred to as appraisal procedure, which is mainly of two types: bodily appraisal and cognitive appraisal. Appraisal processes entail comprehending, communicating with and influencing perceptions. Since these processes involve understanding the external environment and forming perceptions, it involves communication (Gratch & Marsella, 2005). Affective difficulties were also examined by Faiola and Matei (2005), who adopted an online platform that was developed by designers from different cultural backgrounds. Based on the participants' personal biases and affective concerns, the study team requested people to participate in an online presentation about communication preferences. When the participants examined the online platforms, their prejudices and affective concerns formed seventy comical procedures and instinctive evaluations (Faiola & Matei, 2005). According to the findings, the users' evaluations of web-based sites and aesthetic features were intricately linked to affective concerns. After recognising the importance of affective concerns in motivation, the ensuing hypotheses may act as guidelines for the supplemental study that examines the role of affective consideration in interaction design, including its role in boosting end users' interactions.

Several researchers have looked into methods for stimulating users' aesthetic aspects to provoke a response from them through visual communication. Experts have proposed that individuals who absorbed information linked to aesthetic aspects were successful in eliciting their emotional concerns. In the past ten years, various elements concerning aesthetic aspects have been uncovered through research studies. According to research on aesthetic appeal and interests in online-based media, the placement of design features has an effect on how participants perceive the design of web pages. For example, legibility and comprehension are key design elements (Schenkman & Jonsson, 2000). The conclusion of this study reflects that users preferred a design that combined aesthetics and visual images, implying that users' preferences for design components were influenced by their perception of the beauty of the pictures (design element). Nevertheless, according to Gobé (2001), no investigation was conducted into the influence of particular design elements on affective concerns. The first study to evaluate this impact was carried out on colour (Gobé, 2001). Gobé hypothesised that colour acted as part of aesthetics to foster aesthetic reactions by stimulating neurons in the brain.

Zettl (1990) observed that colour schemes that take into account an individual's response to specific colours might be used to generate specific emotions. The study also looked at the impact of colour on audiences and hinted that changing colour parameters from cold to warm might influence an individual's mood. Apart from colour, research has looked into the influence of different design elements on the affective concerns of users or audiences. As obtained from user feedback (Watzman, 2003), typefaces are one of the major contributing factors to visual attractions (Zettl, 1990) that impact how people feel. Considering these findings, a typographic style was designed that was both bold and forceful (Watzman, 2003). It elicited recognisable replies from the audience members in attendance. Affective considerations impacting audience reactions have been employed by some design experts in visual communication design. The individual coding of visual and auditory aspects was also examined (McCartney & McCartney, 2014; Lockner & Bonnardel, 2014). According to research, people remember how they felt during an event by remembering the visual and aural elements they experienced. Individuals exposed to vivid visuals and audible sounds might be engaging in internal dialogues, where they learn and store events in their long-term memories. These ideas

will become accepted and standardised when people start speaking to one another. The sender (another person) will recognise the material created in terms of sight and sound. Due to this procedure, users will be prompted to participate in interpretive processes.

5. An effect model that describes how affective stimulation affects the overall experience

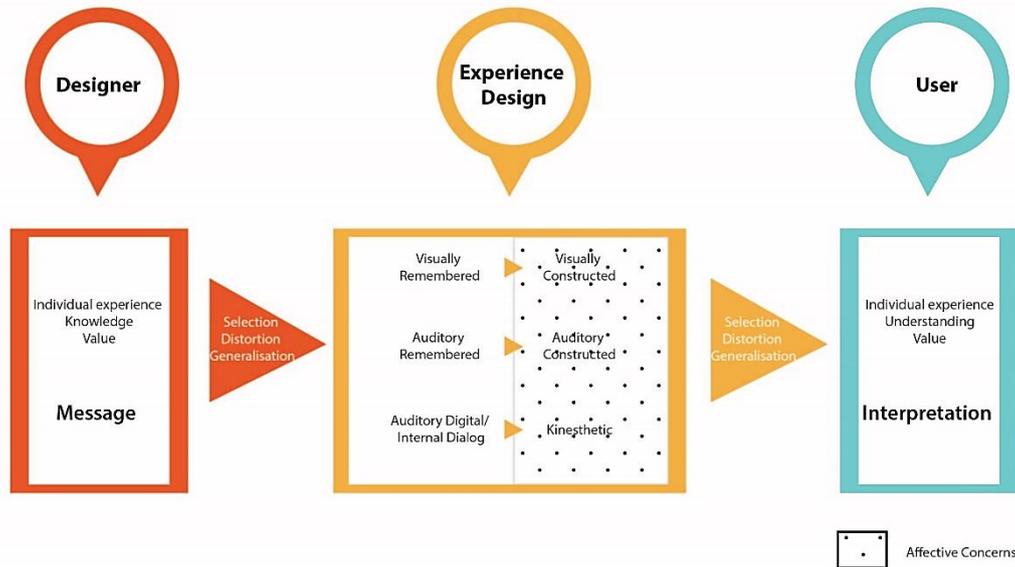


Figure 1. A model that elucidates how an emotional concern stimulus generates an impactful experience

Figure 1 displays a model illustrating the approach of how affective stimulation impacts the overall experience based on previous explanations of the link between affective considerations and design of experiences. Designers communicated a message based on their personal experiences and knowledge. To recreate elements retrieved from their long-term memory, designers processed the selection, distortion and generalisation stages. Subsequently, they began coding the visual, aural and internal dialogues they recalled. Users acquired all of the aspects that had been created visually, aurally and physically when they enjoyed the experience design. The user interpretation was determined by the selection, distortion and generalisation functions of the encoding process.

6. Guidelines for delivering an emotive reaction to help generate user experience

The proposed model, guided by the literature review, generated guidelines for affective considerations in the user experience:

- Conveyed the major emotional element to be formed that was relevant to the user experience.
- Discovered whether other users had ever experienced an emotive concern like this.
- Evaluated whether the people who experienced this emotive concern were able

- to make any visual recollection.
- Enumerated all of the auditory memory associated with this affective consideration.
- Evaluated the discourse that was created by the visual and auditory memory connected to this affective consideration.

7. Affective user experience guidelines

7.1. Aim and methodology

During this research, a series of ground observations and conversations with designers and consumers were undertaken to determine whether the suggested model was correct and whether the advised recommendations were effective or not. It was an organised field observation. Participants included designers from Hong Kong's design sector who had less than a year of practical experience and were chosen at random. They were divided into two groups and presented with a design challenge.

In this stage of the study, 200 volunteers from Hong Kong's local community were recruited to take part. Each participant was requested to gather 10 print samples that they thought were typical experience designs. Collecting feedback from a diverse demographic was critical to understand people's perceptions on many parts of experience design. Consequently, the generalisation of study participation was vital. Participants from different educational backgrounds and ages were enlisted. The following is a summary of the profiles of the 200 participants:

- Fifty participants were undergraduate design students, 18–23 years of age.
- Fifty individuals were from the working class and were randomly invited, 23–33 years of age.
- Fifty individuals were from the working class and were randomly invited, 33–43 years of age.
- Thirty professionals were randomly invited, 23–33 years of age.
- Twenty professionals were randomly invited, 43–53 years of age.

7.2. Procedure

The research was carried out in two core stages. Stage one comprised field observations that explored how the experience design process can be manipulated under and without the recommended criteria for incorporating affective issues. Through videotaped interviews, the field observers assessed the work of 50 designers and 150 users in the field. There were two groups of designers: designer group A and designer group B. Designer group A followed the suggested guidelines for incorporating affective issues, and designer group B did not follow the suggested guidelines for incorporating affective issues (details of the guidelines have been mentioned above).

Users were requested to rate the experience design that had been generated, and their responses were recorded. Subsequently, their comments were analysed to determine whether the experts' affective considerations were effectively expressed through the experience of the design consumption process. Following stage one of the design processes, the designers were asked the following questions:

1. What is the project's design purpose in terms of functionality?
2. What do you hope the team will be able to achieve?
3. What is the approximate portion of the design aim that has been achieved so far?

4. On a scale of 1 to 10, how close was the ultimate conclusion compared to what you had anticipated at the outset?

To evaluate the outcomes of the experience design process, the users were asked the following questions about their experiences during stage 2:

1. Do you have a clear understanding of the project's design objectives?
2. Second, what was your expectation of the design?
3. What is the approximate percentage of the design aim that has been achieved so far?
4. On a scale of 1 to 10, how close was the ultimate conclusion compared to what you had anticipated at the outset?

Table 1. Research agenda

Stage	Objective	Research Method
Stage 1: Field observations	The goal of this experiment was to study how experience design processes are manipulated with and without the guidelines for including affective considerations.	Designer group A – 25 designers worked with the directive of incorporating affective considerations into their designs. <hr/> Designer group B – 25 designers worked without the guidance of incorporating affective considerations into their designs.
Stage 2: Measuring the experience of design consumption	To determine whether the experience design was successful in addressing the considerations of the participating designers.	A total of 150 invited users rated their experience of design consumption. The feedback received from users about the design results of the two distinct designer groups were compared.

7.3. Results

A total of 100 users who were recruited assimilated the 10 experience design results and gave each one a score. (The highest possible score was 10 points while the lowest possible score was one point.) The experience design outputs that followed the requirements for introducing affective considerations (designer group A) received an average score of 8.5 points, whereas the experience design outputs that did not follow the guidelines for introducing affective considerations (designer group B) received a score of 5.4 points. The following are some of the highlights from the user feedback. The users stated that the human-centred solutions developed within the affective considerations criteria were much more pleasurable since the visible and audible components were presented more effectively. Furthermore, field observations of the participants' processes demonstrated that designer group A, which followed the standards for adding emotional issues, was far more productive than team B in developing unique experience design outputs.

Table 2. The percentage of matching designer and user assessments was calculated based on the experience of design consumption

The portion of reviews on the experience design was consistent between designers and users.	Designer group A's design outcomes were presented (produced under the supervision of incorporating affective considerations)	Designer group B's design outcomes were presented (produced without the supervision of incorporating affective considerations)
Average scores	8.5	5.4

Table 3. The portion of the design aim that was achieved

The portion of the design aim achieved	Designer group A's design outcomes were presented (produced under the supervision of incorporating affective considerations)	Designer group B's design outcomes were presented (produced without the supervision of incorporating affective considerations)
Average scores	8.4	5.5

Table 4. 'Users' opinions about how the end outcome differed from their initial expectations were collected

Users' views of the end outcome concerning their initial expectations were collected	Designer group A's design outcomes were presented (produced under the supervision of incorporating affective considerations)	Designer group B's design outcomes were presented (produced without the supervision of incorporating affective considerations)
Average scores	7.5	4.2

7.4. Discussion

According to the participants' feedback, the design experience connected the designers and users. The meaning perceived by the designers and users, at that particular temporal juncture, worked and elicited affective considerations. The participants characterised their feelings in terms of the affective process that was outlined in the literature. Their responses supported the idea that emotional experience is a critical component for configuring a situation in the design process. As they entered a crisis situation, the participants responded to the affective concerns that developed. The affective aspects were the humans' responses to their emotions, which impacted their design decisions and behaviours. Individuals then categorised their affective experiences, which generated further affective activity, creating a long-term memory based on the initial experiences. When the recommended concepts and feedback received from the participants were compared, it was discovered that both had comparable flows that led to making judgements and different responses that shaped the responses offered by the participants in stage two. As a result, the participants' responses demonstrated the efficacy of the precision and correctness of the developed framework, including the effectiveness of the guidelines provided.

8. Conclusion

Commercial success is the primary goal of the vast majority of current design outputs. The design industry, on the other hand, is concerned with the production of design outputs that appeal to their target audiences. Therefore, research has looked into the design consumption experience based on users' memories of the designs they have consumed in the past. The perception of design invention, in particular, is a critical aspect in forming connections and bonds. However, not all design outputs successfully create meaningful user engagement and enjoyable design experiences. It was revealed that both the models mentioned above had equivalent flows, which led to making judgments and differing responses. Therefore, user experience researchers hypothesised that human–design interactions could result in forming design connections. Further studies have been carried out to explore the mechanics of user experience in the areas of social needs, affective consideration, thinking patterns, and behaviours.

Users' experiences during design consumption are influenced by many senses. Users' satisfaction with design outputs is typically controlled by such experiences. The result could be a more user-centred alternative to existing design techniques, which tends to be more concerned with achieving design functions while ignoring the user experience. It has been suggested that the design focus be shifted from function to experience. Affective concerns have emerged as a potential part of the experience and, according to prior studies, have increased the impact of experience on personal memory. Affective concerns play a major role in perceived experiences. Design and emotional issues were examined in this study to explore how planned solutions could be used to evoke consumers' experiences. This study performed a critical literature analysis to comprehend the most recent approaches in user experience design. A framework for designing user experiences that considers affective concerns was developed.

Rather than creating for aesthetics, the emphasis was on delivering appropriate design solutions to meet customers' needs, thereby contributing to the structuring of experience. Designers have to deal with more challenges than ever before. This is the first study to take affective considerations into account and apply them to experience design. According to the findings, affective concerns are becoming a primary consideration in experience design, which is a significant step forward. The model proposed in the study was a rough sketch of how users' responses were influenced by affective concerns. More research is needed in experience design to determine the extent to which emotive factors influence users' decisions and bodily reactions. Due to cultural differences, it was difficult to extend the study's findings to a global audience because most participants were Asian. Further research is needed to explore more global and diverse users' emotive concerns during the experience design consumption process.

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