

## DEVELOPING STRATEGIES FOR JUNIOR DESIGNERS TO MANAGE THEIR DESIGN AND EMOTIONS

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**Abstract.** Junior designers may encounter difficulties when considering customers from a distinct generation who possess dissimilar physical and physiological requirements compared to their own. The understanding of the sensory and physical sensations of design is crucial as younger designers cater to the needs of future generations of users and consumers. Understanding includes both the factual and emotional components of the users' and the audience's genuine experiences. Together, these tools help junior designers consider user safety. Techniques for simulation, have been effectively used by the design industries, that combine cognitive thinking abilities with knowledge outputs to better understand users and their needs. It is essential to explore possible approaches to help junior designers improve cognitive and affective skills (including emotional changes). The effectiveness of simulation guidelines on teaching junior designers about human emotion management abilities and limitations was examined, as well as how affective skill development was influenced.

**Keywords:** *Creative art and design education, higher education, cognition, creativity, emotion.*

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### 1. Introduction

Designers have always investigated various approaches to improve design outcomes and the design business' growth through applying strategic, tactical and new technology. With rapid economic and technological development, designers have sought more humane and effective design solutions. While scholars investigate the issues involving human factors and effectiveness more closely the subtle changes in human thought and emotion are beyond our grasp (Ho, 2020). With the lack of comprehensive understanding of the users' needs in the past, designers and customers were unable to communicate effectively. Some junior designers (Dorst, 2011; Fitch & Tarbutt, 2016; Goldschmidt, 2001) are heavily dependent on the customers' feedback on the questionnaires. However, the customer's feedback on their design experience cannot truly represent their preference. Until some designers investigated the influence of human factors on design in the past twenty years, design disciplines extended their understanding to human factors instead of solely considering logical function-directed factors. Designers started to obtain brief concepts of empathy and emotion and their considerations and motivations for design problem investigation were enhanced. After years of debate, design practitioners realised that their understanding of complex empathy and emotion was insufficient.

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These findings point to a rising focus on the subjective experiences involved in production, purchase and consumption. These factors, however, are still a potential niche to fully explore and integrate into education and practice. The primary aim of this research is to investigate the strategies used in instructing novice designers on the management of their emotions throughout the creative process (Kim, 2020). Junior designers should be able to use practical techniques to detect the emotional components covered in these criteria. The practical techniques were designed to assist junior designers in recognising their emotional changes, design problems as well and the users' feedback (Ho, 2021). Therefore, according to the prescribed principles of practical methodologies will augment individuals' motivation and self-regulatory abilities throughout the design process. The primary aim of this research is to investigate the strategies used in instructing novice designers on the management of their emotions throughout the creative process. The research approach and participant dialogues reveal the limitations of combining design and emotion principles into design learning.

## **2. Management in the Design Process**

To investigate the emotional influence on the management in the Design Process (Madaio *et al.*, 2020), a thorough comprehension of the idea of emotions is necessary. Scherer and Ekman (2014) pointed out that the definition of emotion was broad. they started to conduct a sequence to describe emotion in some relatively systemic approaches. For example, arousal levels were employed to describe the organism's way of interacting through emotional responses. The organism always communicates with the environment's components as conditions and occurrences are altered. Their interaction influences the person's behavioural responses. In other words, emotional responses are transmittable and influence human decisions and reactions. Examining the impact of emotion on the design process, Bongiovanni & Louis (2006) suggested a design technique based on state-transition theories. Lesser-known talents, such as intuition, perception, creative thinking and others, were used to simulate the design process. Bongiovanni & Louis propose user feedback techniques for improving the product's quality and design process. User feedback suggested comprehensive design output characteristics and redefinable design requirements. The research team also pointed out that appearance influenced user emotions. The dazzling look of design output was not the sole component in producing a valued user experience; utility and commercial placement also contributed. As a result, design outputs influenced users' experience of emotional connection with goods (Sebestyen, 2021). Considering the aesthetic, semantic and symbolic elements of the reaction would help designers better understand how customers react to design outputs.

### ***2.1. The Design Process and the Role of Emotions***

According to the research studies research in marketing, design and social science, Norman (2017) noticed that humans enjoy emotional recollections and keep their feelings with their physical senses through various stimulations. The stimulations of the design outputs include visual and touching stimulations but are not limited to them. However, it was difficult to standardise the stimulation approaches through design experience for evoking emotions and recognising emotional changes. It is essential for design scholars to further investigate accurate approaches to recognising emotional changes through cross-disciplinary research. Emo-tracking and click-stream data under bio-science studies

are examples of more specific stimulation approaches that might indicate emotional changes. Thus, more design scholars further investigate tangible approaches for measuring and examining the stimulation approaches; these would reflect the emotional changes through cross-disciplinary research. Tzvetanova studied how users' and designers' emotions affect design outcomes (Tzvetanova *et al.*, 2007). A way of analysing end-user/audience emotional responses to design was established. The data help us understand how the industry assesses the impact of emotional changes between users/customers and designers. However, it does not reflect the emotional impact of the designer's end-users/audience on the design process or the impact of user experience on issue definition during development (Badran & Al-Haddad, 2018). Emotions have several purposes in design, according to activism theories from psychology studies. Badran and his colleagues claimed that some businesses are currently trying to undertake more systematic research to better pinpoint issues early in the development process. The design process model strived to improve by criticising the effect of emotion on following design stages, such as idea generation, design definition and evaluation. Five main factors of user experience were demonstrated. These five main factors included utility, usability, aesthetics, identification and value.

In light of the research study conducted by Badran and his colleagues, Wang and Zhou (2020) studied emotional product design concepts. Consumer tastes have become increasingly individualised and diversified, as have consumption levels and aesthetic ideals. The development of the industrial and technological sectors has enabled people to experience practical results while addressing their emotional needs (Wang & Zhou, 2020). Wang and Zhou (2020)'s research proposes a method for determining design decisions based on the user's Kansei description. This project employs EGM expert interviews to construct a database of user images and product form attributes. The perceptual picture variables that offered the highest level of user satisfaction were retrieved and employed. The programme then computed the adaptive value of evolutionary individuals, based on user evaluation. This approach not only reduced the stress of user decision-making during product evolution but also improved user evaluation accuracy. Also, the manufacturing development process took consumer preferences into account. By applying the fuzzy Kano model (Wang & Zhou, 2020), the scope of product modelling evaluation was increased. Violante *et al.* (2019) examined the use of emotional design and virtual reality to design results. A future consumer may engage with such a product and offer comments on its appeal, texture, function and emotional response (Violante *et al.*, 2019). The development of new methodologies in user-centred experience design, namely the 'emotional design' process, is occurring within this particular environment. To further examine the user-centred experience, the studies of facial expressions appear to be the most trustworthy and appealing. In many industries, information technology innovations are now entrenched in numerous sectors and applications. One of the examples demonstrated the information technology innovation is virtual reality and related products, which are becoming increasingly popular. Product creation and evolution request more efficient management when a product is available in virtual form. In terms of resource usage and sustainable development, the major benefit of virtual products is that early product production was allowed, even during the conceptualisation phase. It would be a great opportunity for designers to examine the approaches of user-centred experience design boundaries.

Friedman (2010) emphasises the emotional components of product design. A brief history of emotion, emotional design principles and design thinking were reviewed. His

findings show that customers' emotional reactions to products shape how they are perceived, approached and used. Designers' attention has been drawn to emotional components in product design. Emotions and emotional components of product design are essential for designers (Friedman, 2010). Designers may learn to categorise emotions, extract emotional components and apply emotional theories to their work. Based on pioneers' expertise and successes in the area, systematic emotional design approaches and procedures should be further discussed in full. There are so few goods and services that are personalised to each individual, even while it is critical to design for end-user needs. There is an increased risk of mistakes and misinterpretation (Marin-Alvarez *et al.*, 2020).

Some design experts found that instructions for designs that are not understandable could cause aggravation, confusion and unnecessary fatigue in those who are forced to follow them. For a designer to grasp what type of direction is required, complete with all necessary features and specs, it is essential to first understand the person who will be using the design outcomes. To categorise users properly, it is necessary to consider their particular preferences, limitations and needs. Contrary to the literature, there are still relatively few goods and services that are based on the needs of a single user, raising the danger of errors and misunderstanding. Formosa (2007) focused on improving the user experience with tangible influence and measurement. By taking references from clinical products, most uncertificated designs included some instructions that caused many customers to struggle to understand. Other users, such as patients and/or family members, were not considered by the designers, leading to a misunderstanding of the information supplied to them (Formosa, 2019). It is necessary to provide a classification system for the multiple users that engage with clinical products to create solutions that meet their cognitive demands. Formosa's study revealed how designers' goals, their chances of achieving them and their degree of effort are all essential components of their motivation in a given situation (i.e., the concept is developed as self-motivation). To respond to the findings from Formosa, the study conducted by Boess *et al.* (2009) examined the comprehension of target customers' demands and the role of these needs in elucidating the issue and enhancing the design process. The approaches of designers used product usage data to produce items that meet consumers' needs as well as how designers design empathically and evaluate their designs throughout the design process were investigated (Boess *et al.*, 2009). Their study revealed that customers expect products and services to work based on their various background factors such as geography, buyer type and gender statistically and tracked. Hence, the study of Boess *et al.* (2009) inspired to investigate the concept of empathy to understand customers comprehensively and then designers need to introduce empathic understanding with their emotional intelligence abilities.

## ***2.2. Designers' Considerations Involved Emotions***

To further investigate the system to record the emotional changes, it is essential to construct the enhanced fundamental of the design-emotion connection. After understanding the concepts of emotion including both emotional and behavioural traits, Desmet (2015) proposed that the design outcomes evoked five emotions: utilitarian, aesthetic, social, surprise and curiosity. These emotions were shown to be effective in describing complex and often personal design outcomes. The five emotions revealed the linkages of thinking and information interpretation (i.e. the concept is developed as self-regulation) (Martinez, 2010). The design and emotion idea also aided designers in designing for emotion. Desmet conducted a comprehensive analysis of existing scholarly

literature and determined that the connection between users and emotions extends to other domains such as business, products and services and marketing. In order to facilitate the design process with a focus on emotional aspects, several research methodologies were used that included users' emotional connections, with the utilisation of supporting technologies (Parker & Wang, 2016; Salminen *et al.*, 2021). The design and emotion studies into user-centred, designer-centred, research-centred and theory-centred were divided. The user-centred studies emphasised users' emotions and experiences as a driving force for innovation, they closely linked with the social tactics individuals applied in their relationships with users (i.e. the concept is developed as empathy). Theory-based methods focused on research that generated insights from users/consumers to improve designs. They are closely linked with interpersonal communication that relies on verbal or nonverbal language (i.e., the concept is developed as design and emotional intelligence abilities). The research-centred revealed the investigation of designers as authoritative, conveying views on design experience. They are closely linked with the communication frequency, quality and impact and are all strongly reliant on the designers themselves (i.e., the concept is developed as self-awareness). The analysis of the design and emotion research demonstrated the advanced and intricate evolution of the design and emotion ideas.

The research-centre approach provided the foundation for Alaniz and Biazzo (2019) to investigate further how emotion influences the creative process and investigate emotion-centric design. It was challenging to create things with relatively subtle emotional qualities that are not dependent on the appeals and functions of the design outcomes (Alaniz & Biazzo, 2019). Alaniz and Biazzo proposed that product designers and manufacturers may need to learn how to understand and express emotions through their products to address this issue more successfully. Their study describes the invention of an emotion-driven innovation method to help product design teams visualise new product concepts. The research team utilised Platts' research approach, which includes four key components: a state-of-the-art study, process design, development and validation. Thus, an experimental survey (Shadle *et al.*, 2017) was conducted among a worldwide designer community to assess the three key ideas (emotional framework, emotional occupations and human-product emotional interactions). The design community (Borrego *et al.*, 2010) was polled using a crowdsourcing platform. The participants were given instructions to submit a photograph of the object that evoked their intended feeling, along with a concise explanation. However, current studies mainly focus on the appeals and functions of design outcomes. Few studies on design and emotion examine how emotion influences the creative process, design experience and interactions between designers and users/consumers.

### **3. Design & Emotion Concept**

#### ***3.1. Development of the Design and Emotion Concept***

The prevalence of emotions throughout the transition into the new century prompted the establishment of the Design and Emotion Society in 1999. That year, major papers predicted the current extensive interest in emotion. In light of the Experience Economy studies, Pine and Gilmore (1999) predicted the rise of an experience-based economy and the collapse of goods and services. They stressed that organisations must build engaging experiences to succeed. In The Dream Society, Jensen (1999) anticipated the commercialization of emotions. He believes people will buy experiences rather than



stuff. Schmitt (1999) introduced experiential marketing to emphasise sensory responses and emotions instead of features and benefits. Schmitt stressed the relevance of emotions in product development, consumer engagement and business relationships.

Some visionary design articles showed a developing grasp of user emotions. Oughton (2022) convincingly argued that poorly designed user interfaces made most technological equipment (devices like VCRs, car alarms, computer apps, etc.) make users feel inept and unhappy. Picard (1997) suggested in *Affective Computing* that emotional competencies benefit computerised systems. In *Hertzian Tales*, Dunne (1999) suggests that electronic gadget junior designers should broaden their aesthetic considerations. He advised using industrial design to improve our relationship with artificial technology. He stressed that industrial design might improve our lives more than current designs. Gaver, Dunne and Pacenti (1999) help junior designers understand the experiences of hard-to-reach user groups and encourage these changes. According to Jordan (2000), conventional design techniques that focus just on usability fail to acknowledge the significance of enjoyable goods and tend to undermine individuals by solely addressing their physiological and cognitive abilities (Borrego *et al.*, 2010). The author posited a framework centred on hedonic principles within the field of human factors, which thoroughly investigates the interplay between people and goods and evaluates the quality of design by considering the broader associations among products and their consumers.

These studies indicate an increasing inclination towards examining the emotional dimensions associated with the processes of creating, purchasing and consuming goods. Nevertheless, education and practice have not yet fully incorporated these characteristics. Junior designers possess little knowledge to adequately assess the experience ramifications of their ideas. Some junior designers try to understand the significance of emotions, but many view them as their intuition and elusive to analyse or predict. It could be difficult for Junior designers to manipulate the design process. Junior designers may potentially exhibit a deficiency in handling emotional fluctuations and demonstrating initiative throughout the design process, as well as acquiring the skills necessary to effectively manage design variables via logical reasoning. Additionally, since they have no emotional concerns, they are unable to recognise their emotional changes. They thus find it difficult to practise design and need instruction to improve their motivation, assessment and decision-making skills. Instead of evaluating design skill and craftsmanship, it is essential to create tools, methodologies or insights to help junior designers manipulate their design process more effectively by understanding and resolving design's emotional consequences.

### ***3.2. Emotion-Related Experience in the Design Studies***

Furthermore, to the previously described pedagogical approaches for design instruction and learning, some scholars have conducted investigations into the emergence and evolution of novel trends in design education (Kaygan *et al.*, 2020). Lim, Giacomini & Nickpour (2021) proposed that before problem-solving, junior designers must comprehend the nature of the issue. This awareness is considered self-awareness and is a necessary skill for a designer to have a successful start to their design work. Regarding the significance of junior designers knowing the nature of an issue, Brewer and Devnew (2022) had a similar viewpoint. They broadened this view by asserting that social characteristics are no longer a solution to a design issue, but rather strategic communication instruments. Bixler (2014) observed the movement of authority in teaching and learning from the instructor to the student. As a consequence of this change,

planning, monitoring and evaluating instructional efficacy in the teaching and learning process places a significant emphasis on student motivation. Lage et al. (2022) showed that self-awareness and self-control are conflict management skills for junior designers. However, junior designers often do not successfully manage design. According to De Garrido (2021), junior designers must address and react to the issue of designing an environment that supports, enhances and celebrates human activity. This invention is the consequence of a convergence of social, cultural and economic requirements. These requirements necessitate that junior designers take obligations and then make judgments based on these duties.

The study conducted by Denton et al. (2004) examined several strategies aimed at effectively communicating the significance of emotion in the field of design to novice designers. The 'emotional domain' included a range of mental states. Both internal and external forces influenced them. However, the effect was very individual, indicating that different people may feel various emotions in reaction to the same stimuli. The research team found that junior designers were not encouraged to communicate their emotions throughout project work and they addressed this with instructors and among themselves. The emotional concern which may have affected the design process was thus disregarded. In addition, they discovered that junior designers did not seem to understand the full relevance and potential of emotion in design work. Besides, Endres et al. (2020) explored how emotional design may promote learning throughout the same time frame. According to the cognitive-engagement hypothesis, it was anticipated that modifying the emotional design would result in heightened positive affect and engagement, hence leading to an improvement in performance.

### ***3.2. Introducing Emotional Concerns into Junior Designers' Design Process***

While taking into account the theories of emotion from the junior designers' perspective, emotion has a big impact on the design process (Ho & Siu, 2012). Some scholars explored whether emotional knowledge would be educated or trained. Mattingly & Kraiger (2019) examined the most likely method for boosting emotional intelligence training. The findings of this meta-analysis provide a valuable contribution to the existing body of knowledge on emotional intelligence by elucidating the potential for the acquisition of emotional intelligence via educational interventions. The training of emotional intelligence has been shown to have a modest and positive influence, which suggests that this notion is malleable. This finding allows design experts to make inferences about the potential for training to enhance emotional intelligence. Junior designers must be taught how emotion may influence judgment and even the results of a design. In the design process's decision-making and cognitive thinking stages, some typical emotions are pretty involved. Information processing and decision-making are the major variables affecting these typical emotions. These two elements have more of an impact than an emotion or feeling since they can motivate people and influence their decisions and actions in the future. There are five ways to categorise these basic emotions: neutral, externally positive, internally positive, externally negative and internally negative (Oliver, 1993). Some external domination in the design process, such as material allocation, emphasises external stimulation more than the junior designers' deliberation. Internal factors, like the creators' personal preferences, prioritise human consideration over external stimuli. Reactions to neutral emotions are reasonably even-handed interactions between internal and external stimuli. Positive emotions, while they are

different from pleasurable sensations and general positive feelings, comprise a range of pleasant or desirable responses to specific situations. These reactions may vary from feelings of curiosity and contentment to emotions such as love and pleasure. It is possible for junior designers to feel uncomfortable or depressed by negative emotions. Junior designers who experience these emotions lose their sense of confidence and self-worth, start to despise themselves and other people and generally feel bad about themselves. The typical emotions that occur during the design process may change or fluctuate depending on the designer's experience, the information they have researched and their observations of themselves and their target audience. For instance, after being digested, curiosity, as a component of positive internal sentiments, can take the place of excitement as a component of pleasant external feelings. Junior designers would thus develop a strong curiosity for the mysterious and the nature of things. Additionally, the negative emotion known as anxiety, a part of the neutral emotions, would be broken down and transformed into tranquillity, a calm mental state. When junior designers' minds are overloaded with worry and to-do lists, it may be beneficial to move to calmer concepts. Changes may result in stronger or weaker design outcomes. In the design process, both emotion and reason play significant roles. Balanced approaches to significant issues lead to balanced conclusions and design methodologies. Research into design processes is influenced by junior designers' experiences with the tools that promote analytical thinking and emotional control in design processes.

Junior designers should be able to recognise the emotional elements covered by these criteria using practical methodologies. The practical methods were created to help junior designers identify their emotional changes, design flaws and user feedback. Therefore, according to the recommendations of practical strategies would improve their motivation and self-control when designing. The constraints of incorporating design and emotion concepts into design learning are made clear by the study methodology and participant discussions. Therefore, the purpose of this research is to examine the methodologies used in teaching younger designers how to manage their emotions throughout the creative process.

#### **4. New model: Five major stages of emotional management during the design process**

Scholars have conducted investigations on the development of the emotional information process in the design process, drawing upon the research-centred method. Several topics were identified, separated from the psychologists' point of view. Learning the theories of emotion across disciplines including psychological and design studies, there are some key phases such as the foundation of introducing emotional concerns into design thinking during the design process (Oliver, 1993; Mattingly & Kraiger, 2019): self-awareness, self-regulation, self-motivation, empathy, innovation and emotional intelligence abilities.

##### **Self-awareness**

In interpersonal communication, humans not only transmit information but also portray themselves: how they view themselves, how they feel others see them and how they value that image. Communication frequency, quality and impact are all strongly reliant on the junior designers' self-awareness. Their self-awareness is also impacted by how they value their performance in the role of the designer. The designer's prior



academic or professional performance may have influenced their perspective of their current employment. The proposed first step in the model helps junior designers to set goals and develop strategies to achieve them. The strategies would be done in the design studio to improve the performance and self-esteem training of the designer.

### **Self-regulation**

Self-regulation is linked to cognitive capacities that receive and interpret information. Humans interact with the world in ways that match their views. Perception of objects, events, people and symbols is required for interpersonal communication (words and non-verbal indications). Humans' perception of things affects how they communicate about them and how they communicate affects how they perceive ideas and our social reality. Perception is selective and may either hinder or improve communication. Perception is selective and may either hinder or improve communication. It would be an effective tool for communication. To introduce the understanding of the design study, junior designers should be taught the knowledge of perception and communication theories related to the design processes, our perceptual limits and how to improve them; that is, what the mind does with information after it has been received by the senses. This collection of information encompasses the foundational aspects of decision-making and problem-solving abilities. The use of individual and collective problem-solving methodologies, in conjunction with implementing a case study methodology, may effectively contribute to enhancing and refining these abilities. Junior designers have to know that interpersonal communication requires cognition and emotion. They are necessitated in many decisions during the design process.

### **Self-motivation**

Motivation is vital to one's self-esteem (Topçu & Leana-Taşçılar, 2018), involved chances of achieving the objectives of the design projects or tasks and our degree of effort are all essential components of our motivations in any given situation. Junior Designers have thus understood their goals and limitations and how to overcome them by using their innate skills. For this reason, junior designers' role performances must be transferable to real-world practice situations and classroom self-esteem must translate to the workplace. The classroom's false nature allows participants to explore and experiment while knowing that the conclusion will not have a significant influence on the company or their career. A non-evaluative educational environment that allows for the examination of strengths and weaknesses and the setting of appropriate goals is thus required to improve interpersonal performance (Al-Jedaia & Mehrez, 2020).

### **Empathy**

The social tactics individuals apply in their relationships with others may help them perform better (Weilenmann *et al.*, 2018). Communication skills or styles can be taught in the classroom. Junior designers would know how to analyse and apply assertive and empathic components in their performances through trained communication skills. They might also work on building rapport and resolving conflicts. Social skills are vital to our interpersonal interactions.

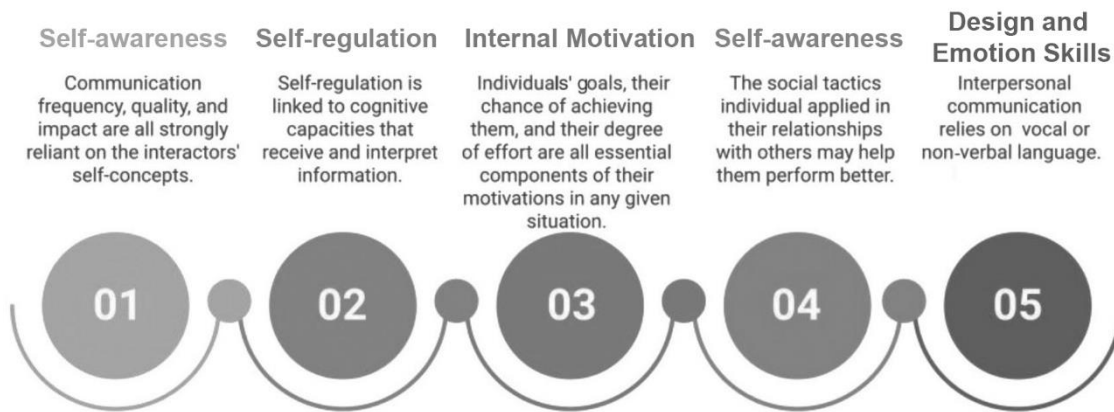
### **Design and emotional intelligence abilities**

Abilities to apply languages and design elements are essential to delivering messages and describing the methods involved (Soto Hormazába, 2021). Designers must

learn to use both verbal language and non-verbal design elements to express themselves and achieve their aims with others. By understating the theories of design and emotion, junior designers should grasp which kind of presentation is capable of doing and the repercussions it may have, as well as how various variables in our lives impact the language we use (Rangel-Rodríguez *et al.*, 2021).

Drawing upon the aforementioned theoretical frameworks, the subsequent Design and Emotion Model delineates the components that should be included within the context of interpersonal communication training (as seen in Figure 1).

## Five Stages of Emotion Management during the Design Process



**Figure 1.** Five major stages of emotional management during the design process (Ho, 2024)

## 5. Research Methods

The participants were encouraged to better regulate their emotions by applying the proposed model with emotion management. During the design process, they participated in the four activities that were recommended for emotion management.

### 5.1. Research Participants

Second-year undergraduates majoring in design studies were asked to participate in this experiment. The participants exhibited a deficiency in their fundamental comprehension of the significance of emotions within the design process. By studying design principles for two years, these participants made up an optimal sample group for bolstering the generalisability of research results (Hartley *et al.*, 2020). Through the design processes, they were exposed to certain fundamentals of design research (e.g., design thinking, user experience and design outcomes). Additionally, they quickly learned the fundamentals of the design procedure (Ma *et al.*, 2022). However, they lacked established ideas about design (Luckman, 1967) and established methods for influencing the design process (McLennan, 2004). Although initially uninitiated by the ideas of “design and emotion”, the participants eventually incorporated them into their creative workflows. That's why they may adequately convey their emotional transformation drive by manipulating thoughts on the creative process. There were 60 people in the study. Participants were mostly of Cantonese ancestry. They were able to acquire a solid grounding in Western thought and a command of the English language because of the

predominance of the latter in their academic education. They were divided into 2 groups T01 (obtain workshop for learning emotional management in the design process) and T02 (as a control group without any knowledge about emotional management in the design process). When examining the demographic composition of both groups, it is essential to thoroughly analyse numerous criteria in order to achieve a comprehensive picture of the study's participants. Moreover, it is imperative to consider their familiarity with design principles and their level of emotional comprehension. The demographic composition of both groups of participants was thoroughly analysed to obtain a comprehensive picture of the study's participants. Initially, the participants' comparable age range would provide a more effective comparison. The individual's cognitive development and maturity levels, which may have had an impact on their emotional comprehension, were at their optimal stages. Additionally, the expression and comprehension of emotions might be influenced by gender. In order to mitigate the impact of gender differences on the research study, the gender ratio of the participants was equitably matched. There is a lack of evidence to suggest potential variations in emotional reactions. Furthermore, it is important to evaluate the degree to which the participants have been exposed to design concepts and have developed an awareness of emotions based on their academic and practical experiences. The recruitment process involved the selection of participants exclusively from the pool of second-year undergraduate students enrolled in design studies. In addition, an evaluation of language proficiency was considered among the individuals who were native speakers of Cantonese from Hong Kong, had received education in English and had shown fluency in the English language. The comprehension of language nuances by the participants is crucial in understanding their connection to emotional expressiveness and empathy.

## ***5.2. Research Procedures***

Before participating in the research study, T01 participants are invited to attend a workshop that assists them in making better judgments during the design process. Some learning activities (shown in Task 1-5, which will be explained below) enabled participants to grasp specific design and emotion principles and ways for integrating design and emotion into their design processes. The aims of this stage include the following: invigorating the workshop, enhancing the comprehension of design and emotion among T01 participants and instructing them on the process of recognising their own feelings. After understanding the suggested design principles for managing emotions, the T01 participants employed the approaches to manage their emotions. Then, both T01 and T02 participants were asked to present their feedback to understand their performance in their design studies. The comparison among the T01 and T02 participants' feedback would reflect the effectiveness of managing emotions during the design process.

### ***Task 1: Filling the 'personal attribute list' for enhancing Self-awareness***

The personal attribute list was intended to assist the participant in identifying his or her self-motivation in the design process as well as how they would like to improve it. The participants were asked to identify three of their strengths as well as three elements of their personal development that they would like to improve. While the participants selected characteristics that needed to be improved, they were asked to think about and describe the methods he or she would use to try to improve those characteristics.

***Task 2: Conducting the ‘Put on a new pair of shoes’ exercise for enhancing Self-regulation***

It is necessary to improve one's ability to comprehend the views of another individual. The participants were divided into groups of two. The chosen topic was discussed by the partners. After five minutes, the research team decided to call a halt to the discussion. Each participant was required to write a detailed account of the other person's points of view, as well as any examples or illustrations that were provided in support of those points. Participants were invited to swap accounts with their partners and to review the correctness of their stories with one another, as instructed by the study team.

***Task 3: Conducting a ‘Get Motivated’ exercise to enhance Self-motivation***

The purpose of this task was to research viable design solutions for each important function in the design project and to provide those findings to the client. This activity established goals to empower people to break through these limitations and look at challenges in a new way, which will ultimately lead to problem solutions.

***Task 4: Attending the ‘Adjusting Responses’ exercise for enhancing Empathy***

The purpose of this task was to identify the evoked emotions and objectives and then adjust the follow-up responses and reactions. The participants were invited to offer prospective design solutions for each important function in the design project, with the most creative alternatives receiving the most points. They then went over the list with their partnered teammates and discussed it. After that, a note of their remarks was created. Their comments served as a guide to revising their design aims and results as a result of their comments. Paraphrasing is a technique that is used in interpersonal interaction to ensure that the other person's ideas are understood. In the paired groups, the first participant made a statement about the nature of the relationship between the two participants. After that, the second participant sought to rephrase the original sentence. This process was performed twice more, after which the roles were switched. Instead of merely repeating what the other person has said, the significance declares what the other person's thoughts have for the speaker or listener. A shared understanding would be constructed possible because it allowed the first person to double-check that their message was understood by the other.

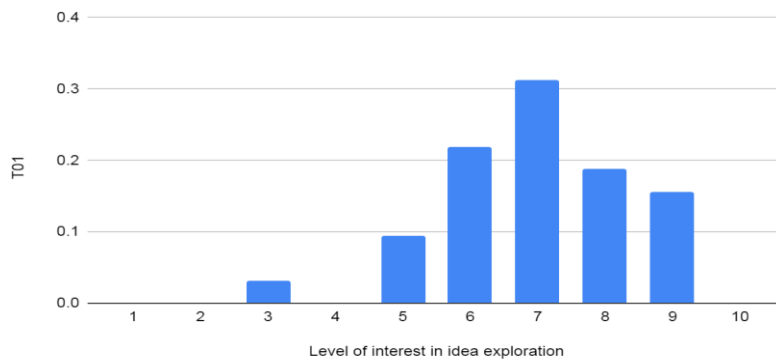
***Task 5: Processing ‘Merely Quoting’ exercise for enhancing Design and emotional intelligence abilities***

The goal of this exercise was to gain knowledge of a strategy for establishing a shared understanding of meaning with others. This step served as a declaration to present the value they place on the other person's opinions. When two people have a common understanding, the first person ensures their communication is heard and understood by the other. After explaining from their point of view from alternative words, participants paraphrased what they heard.

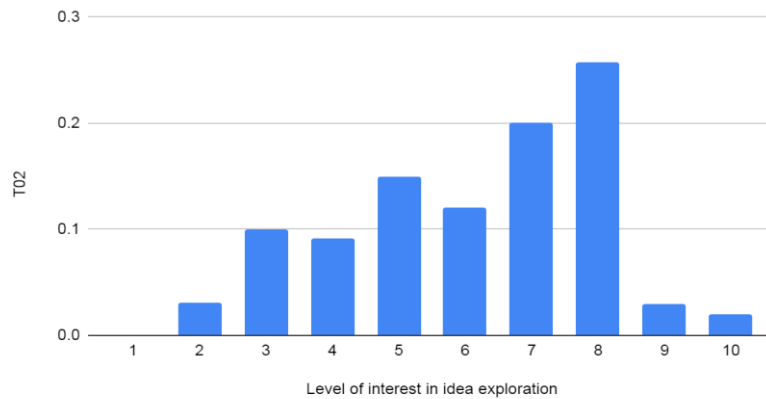
## 6. Research findings from the survey for examining the effectiveness of managing emotions during the design process

### 6.1. Level of interest in idea exploration

The level of interest in idea exploration reflected the motivation of the design process. Over 65.7% of T01 participants rated their interest in the issues and ideas they explored as 7 or higher. 31.3% of T01 participants rated their interest between 5 and 6. Only 3.1% of T01 participants rated their interest level as 3. 50.7% of T02 participants rated their interest in the issues and ideas they explored as 7 or higher. 36.2% of T02 participants rated their interest between 5 and 6. 13.1% of T02 participants rated their interest level as 3.



**Figure 2.** T01 Participants' ratings of their interest in idea exploration



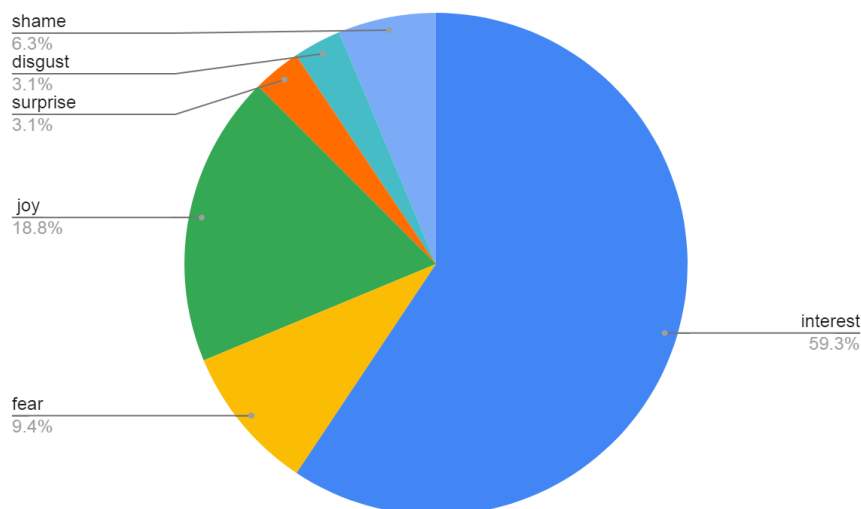
**Figure 3.** T02 Participants' ratings of their interest in idea exploration

The participants were asked to present which kind of emotion they evoked by understanding the key concepts of the project. 59.4% of T01 participants said that they evoked interest, including 'acceptance, friendliness, trust, kindness, affection, love and devotion'. 0% of T01 participants presented that they evoked anger, including 'fury, outrage, wrath, irritability, hostility, resentment and violence'. 9.4% of T01 participants presented that they evoked fear, including 'anxiety, apprehension, nervousness, dread, fright and panic'. 18.8% of T01 participants presented that they evoked joy, including 'enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy'. 3.1% of T01

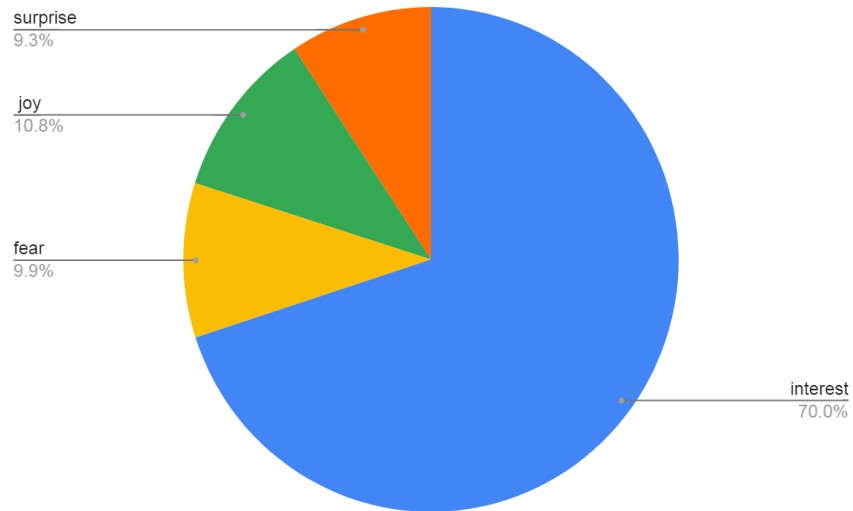


participants presented that they evoked surprise, including ‘shock, astonishment, amazement, astound and wonder’. 3.1% of T01 participants presented that they evoked disgust, including ‘contempt, disdain, scorn, aversion, distaste and revulsion’. 6.3% of T01 participants presented that they evoked ‘shame, including guilt, embarrassment, chagrin, remorse, regret and contrition’. 0% of T01 participants presented that they evoked sadness, including ‘grief, sorrow, gloom, melancholy, despair, loneliness and depression’.

70% of T02 participants said that they evoked interest, including ‘acceptance, friendliness, trust, kindness, affection, love and devotion’. 0% of T02 participants presented that they evoked anger, including ‘fury, outrage, wrath, irritability, hostility, resentment and violence’. 9.9% of T02 participants presented that they evoked fear, including ‘anxiety, apprehension, nervousness, dread, fright and panic’. 10.8% of T02 participants presented that they evoked joy, including ‘enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy’. 1.3% of T02 participants presented that they evoked surprise, including ‘shock, astonishment, amazement, astound and wonder’. 0% of T02 participants presented that they evoked disgust, including ‘contempt, disdain, scorn, aversion, distaste and revulsion’. 0% of T02 participants presented that they evoked shame, including ‘guilt, embarrassment, chagrin, remorse, regret and contrition’. 0% of T02 participants presented that they evoked sadness, including ‘grief, sorrow, gloom, melancholy, despair, loneliness and depression’. Based on these comparisons, it emerges that T01 participants showed a higher overall level of interest in idea exploration compared to T02 participants. The majority of T01 participants rated their interest as 7 or higher, indicating a strong motivation and engagement. Additionally, T01 had a smaller percentage of participants with lower interest levels (rated as 3). Conversely, although the majority of T02 participants also rated their interest as 7 or higher, T02 had a slightly higher percentage of participants with a moderate level of interest and a significantly higher percentage of participants with lower interest levels. Further analysis and exploration would be needed to determine the underlying factors influencing these differences in interest levels between T01 and T02 participants, such as variations in the design tasks, the novelty of the topics explored or potential differences in baseline motivation levels among the two groups.



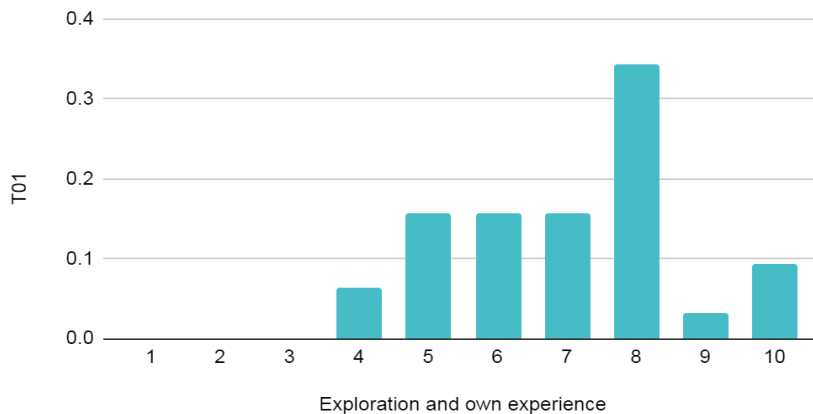
**Figure 4.** T01 Participants’ emotions were evoked by their interest in idea exploration



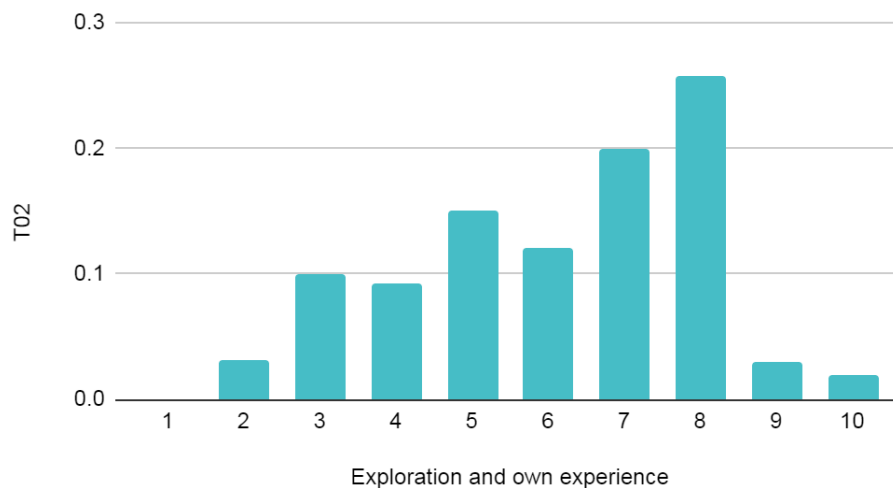
**Figure 5.** T02 Participants' emotions were evoked by their interest in idea exploration

### 6.2. Exploration and Own Experience

The exploration and experience of participants influenced the purposes and significance of the design process. 46.9% of T01 participants strongly agreed that they explored parts of the subject by themselves participants as 7 or higher. 46.8% of T01 participants rated their interest between 5 and 6. 0% of T01 participants rated their interest level as 62.7% of T02 participants strongly agreed that they explored parts of the subject by themselves. 36.2% of T02 participants rated their interest between 5 and 7. 13.1% of T02 participants rated their interest level as 3.



**Figure 6.** T01 Participant's comments about their level of 'exploration and own experience'

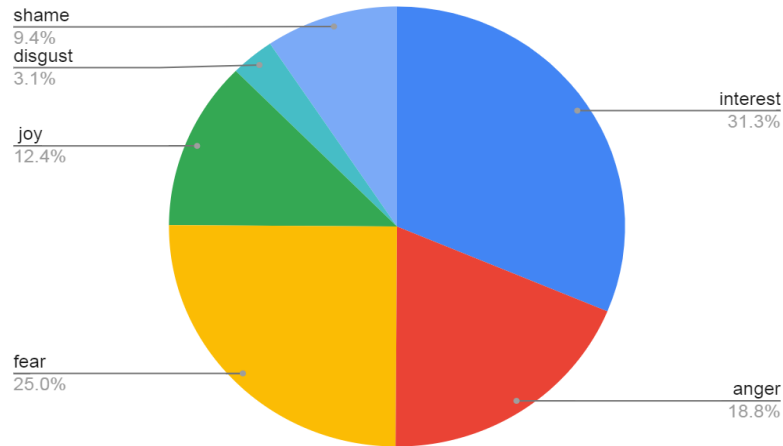


**Figure 7.** T02 Participant's comments about their level of 'exploration and own experience'

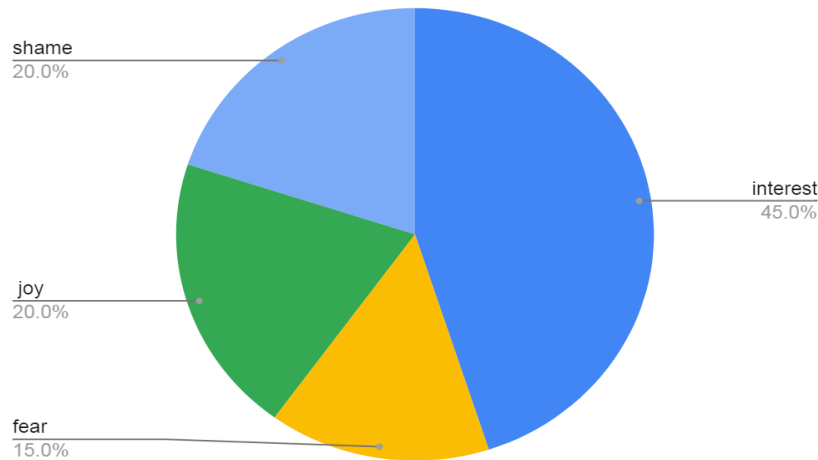
The participants were asked to present which kind of emotion they evoked by the exploration and their own experience within the design project. 31.3% of T01 participants presented that they evoked interest, including 'acceptance, friendliness, trust, kindness, affection, love and devotion'. 18.8% of T01 participants presented that they evoked anger, including 'fury, outrage, wrath, irritability, hostility, resentment and violence'. 25% of T01 participants presented that they evoked fear, including 'anxiety, apprehension, nervousness, dread, fright and panic'. 12.4% of T01 participants presented that they evoked joy, including 'enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy'. 0% of T01 participants presented that they evoked surprise, including 'shock, astonishment, amazement, astound and wonder'. 3.1% of T01 participants presented that they evoked disgust, including 'contempt, disdain, scorn, aversion, distaste and revulsion'. 9.4% of T01 participants presented that they evoked shame, including 'guilt, embarrassment, chagrin, remorse, regret and contrition'. 0% of T01 participants presented that they evoked sadness, including 'grief, sorrow, gloom, melancholy, despair, loneliness and depression'.

45% of T02 participants presented that they evoked interest, including acceptance, friendliness, trust, kindness, affection, love and devotion'. 0% of T02 participants presented that they evoked anger, including 'fury, outrage, wrath, irritability, hostility, resentment and violence'. 15% of T02 participants presented that they evoked fear, including 'anxiety, apprehension, nervousness, dread, fright and panic'. 20% of T02 participants presented that they evoked joy, including 'enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy'. 0% of T02 participants presented that they evoked surprise, including 'shock, astonishment, amazement, astound and wonder'. 0% of T02 participants presented that they evoked disgust, including 'contempt, disdain, scorn, aversion, distaste and revulsion'. 20% of T02 participants presented that they evoked shame, including 'guilt, embarrassment, chagrin, remorse, regret and contrition'. 0% of T02 participants presented that they evoked sadness, including 'grief, sorrow, gloom, melancholy, despair, loneliness and depression'. When comparing the participants of T01 and T02, certain distinctions may be discerned. The individuals in T01 reported experiencing a broader spectrum of emotions, such as anger, surprise, disgust and sadness. In contrast, the people in T02 did not report eliciting these particular emotions.

Furthermore, participants in T02 exhibited a greater proportion of interest and terror in comparison to participants in T01. The observed differences indicate the possibility of variability in emotional responses and experiences across participants in the design project, specifically those in T01 and T02. Additional examination is necessary in order to comprehend the fundamental elements that contribute to these disparities, such as changes in design assignments, human attributes or the design methodology itself.



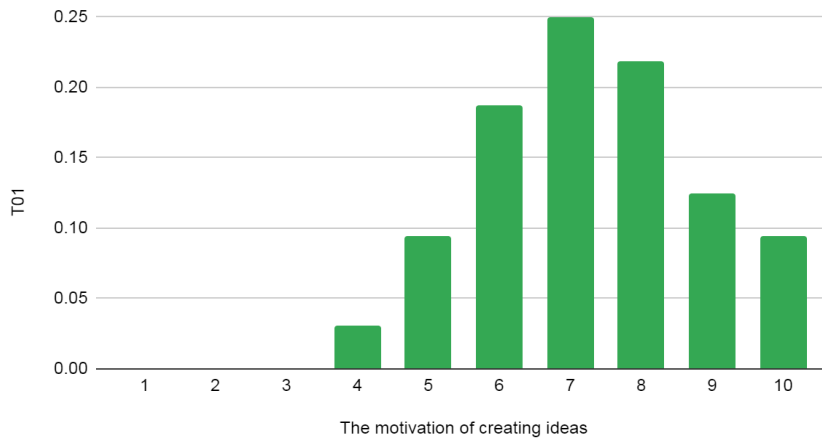
**Figure 8.** T01 Participant's emotion evoked by exploration and own experience



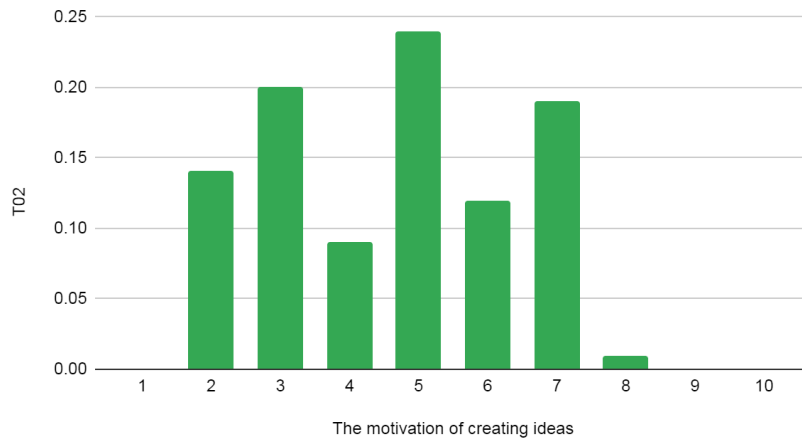
**Figure 9.** T02 Participant's emotion evoked by exploration and own experience

### 6.3. *The motivation for creating ideas*

The ability to learn and try out participants influenced their motivation to create ideas. 43.8% of T01 participants strongly agreed that they explored parts of the subject by themselves as 7 or higher. 53.2% of T01 participants rated their interest between 5 and 6. 0% of T01 participants rated their interest level as 3. 20% of T02 participants strongly agreed that they explored parts of the subject by themselves. 45% of T02 participants rated their interest between 5 and 7. 43.1% of T02 participants rated their interest level as 3.



**Figure 10.** T01Participant’s feedback about the motivation for creating ideas

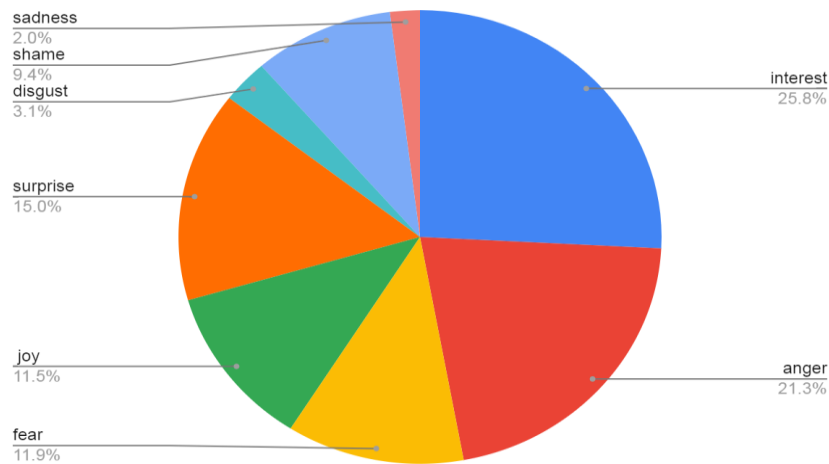


**Figure 11.** T02Participant’s feedback about the motivation of creating ideas

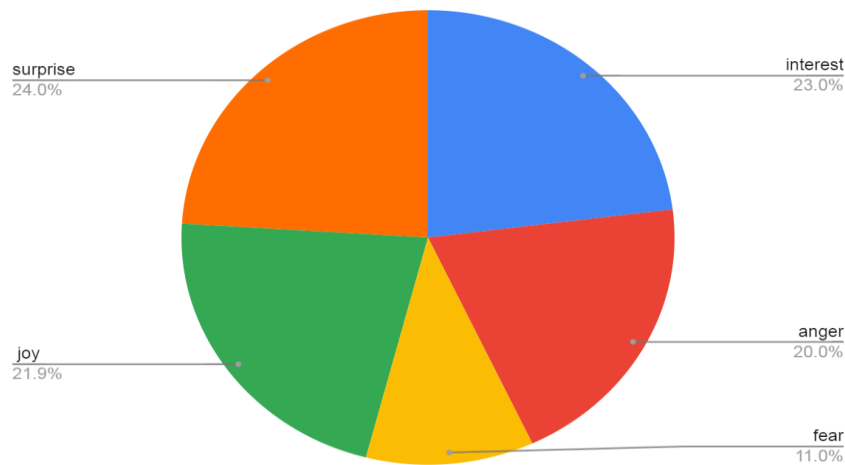
The self-created ideas of participants influenced the purposes and significance of the design process. The T01 participants were asked to present which kind of emotion they evoked by the self-created ideas within the design project. 25.8% of T01 participants presented that they evoked interest, including acceptance, friendliness, trust, kindness, affection, love and devotion. 21.3% of T01 participants presented that they evoked anger, including fury, outrage, wrath, irritability, hostility, resentment and violence. 11.9% of T01 participants presented that they evoked fear, including anxiety, apprehension, nervousness, dread, fright and panic. 11.5% of T01 participants presented that they evoked joy, including enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy. 15% of T01 participants presented that they evoked surprise, including shock, astonishment, amazement, astound and wonder. 3.1% of T01 participants presented that they evoked disgust, including contempt, disdain, scorn, aversion, distaste and revulsion. 9.4% of T01 participants presented that they evoked shame, including guilt, embarrassment, chagrin, remorse, regret and contrition. 2% of T01 participants presented that they evoked sadness, including grief, sorrow, gloom, melancholy, despair, loneliness and depression. 23% of T02 participants presented that they evoked interest, including acceptance, friendliness, trust, kindness, affection, love and devotion. 20% of T02 participants presented that they evoked anger, including fury, outrage, wrath, irritability, hostility, resentment and violence. 11% of T02 participants presented that they evoked



fear, including anxiety, apprehension, nervousness, dread, fright and panic. 21.9% of T02 participants presented that they evoked joy, including enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy. 8% of T02 participants presented that they evoked surprise, including shock, astonishment, amazement, astound and wonder. 0% of T02 participants presented that they evoked disgust, including contempt, disdain, scorn, aversion, distaste and revulsion. 0% of T02 participants presented that they evoked shame, including guilt, embarrassment, chagrin, remorse, regret and contrition. 0% of T02 participants presented that they evoked sadness, including grief, sorrow, gloom, melancholy, despair, loneliness and depression. In general, the aforementioned data underscore significant disparities between T01 and T02 about motivation, exploration and emotional reactions. The individuals in the T01 group exhibited elevated levels of self-directed inquiry and a wider array of emotional reactions towards their self-generated ideas in comparison to the participants in the T02 group. The aforementioned contrasts are of utmost importance in comprehending the effects of participant engagement and emotional experiences on the objectives and significance of the design process within the two groups.



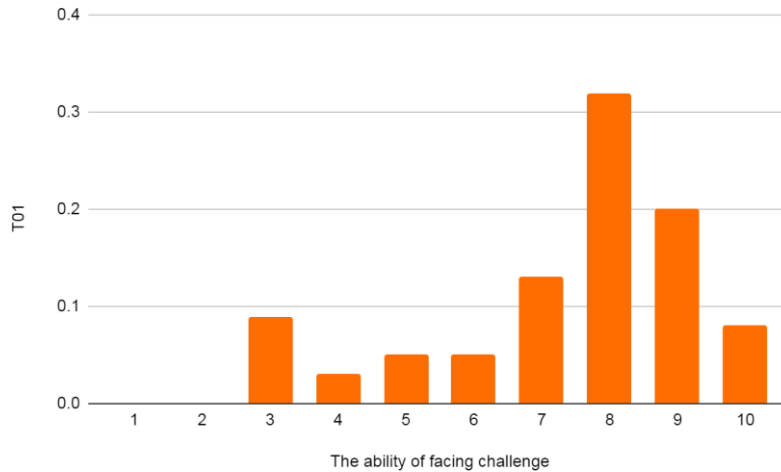
**Figure 12.** T01 Participant's emotion evoked by the motivation of creating ideas



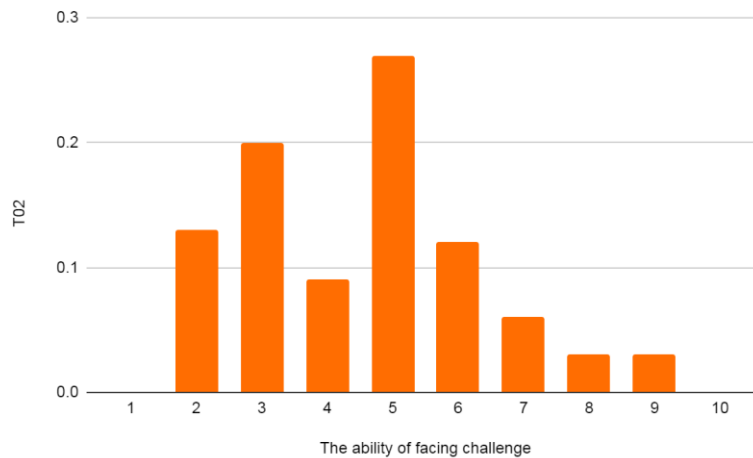
**Figure 13.** T02 Participant's emotion evoked by the motivation of creating ideas

#### 6.4. The ability to face the challenge

The challenge level during the idea exploration phase affects the enjoyment and fulfilment of the design process. 73% of T01 participants strongly agreed that they explored parts of the subject by themselves as 7 or higher. 10% of T01 participants rated their interest between 5 and 6. 8.9% of T01 participants rated their interest level as 3. 12% of T02 participants strongly agreed that they explored parts of the subject by themselves as 7 or higher. 48% of T02 participants rated their interest between 5 and 6. 43% of T02 participants rated their interest level as 3.



**Figure 14.** T01 Participants' comments about the ability to face challenges



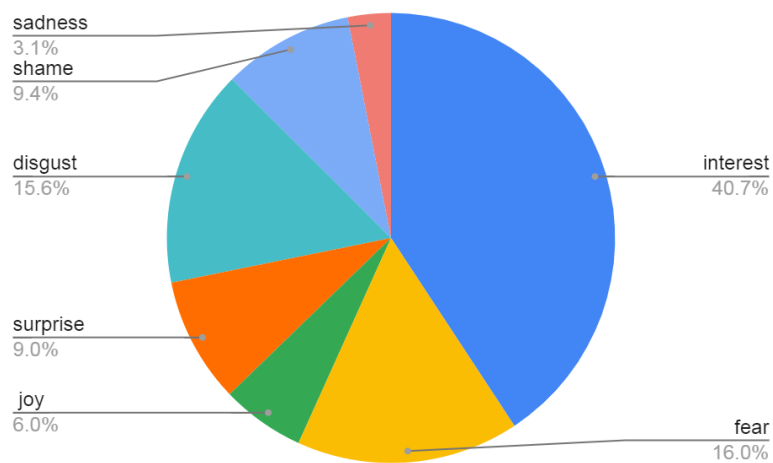
**Figure 15.** T02 Participants' comments about the ability to face the challenge

The participants were asked to present which kind of emotion they evoked when they recognised that the course was challenging in a stimulating way. 40.6% of T01 participants presented that they evoked interest, including 'acceptance, friendliness, trust, kindness, affection, love and devotion'. 0% of T01 participants presented that they evoked anger, including 'fury, outrage, wrath, irritability, hostility, resentment and violence'. 16% of T01 participants presented that they evoked fear, including 'anxiety, apprehension, nervousness, dread, fright and panic'. 6% of T01 participants presented that they evoked joy, including 'enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy'. 9% of T01 participants presented that they evoked surprise, including 'shock, astonishment, amazement, astound, and wonder'. 15% of the participants

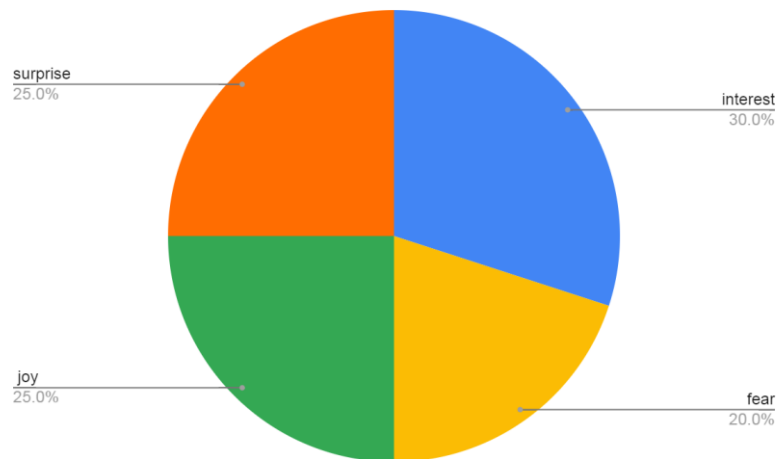
presented that they evoked disgust, including ‘contempt, disdain, scorn, aversion, distaste and revulsion’. 9.4% of T01 participants presented that they evoked shame, including ‘guilt, embarrassment, chagrin, remorse, regret and contrition’. 3.1% of T01 participants presented they evoked sadness, including ‘grief, sorrow, gloom, melancholy, despair, loneliness and depression’.

30% of T02 participants presented that they evoked interest, including ‘acceptance, friendliness, trust, kindness, affection, love and devotion’. 0% of T02 participants presented that they evoked anger, including ‘fury, outrage, wrath, irritability, hostility, resentment and violence’. 20% of T02 participants presented that they evoked fear, including ‘anxiety, apprehension, nervousness, dread, fright and panic’. 25% of T02 participants presented that they evoked joy, including ‘enjoyment, happiness, relief, bliss, delight, pride, thrill and ecstasy’. 25% of T02 participants presented that they evoked surprise, including ‘shock, astonishment, amazement, astound and wonder’. 0% of participants presented that they evoked disgust, including ‘contempt, disdain, scorn, aversion, distaste and revulsion’. 0 % of T02 participants presented that they evoked shame, including ‘guilt, embarrassment, chagrin, remorse, regret and contrition’. 0% of T02 participants presented they evoked sadness, including ‘grief, sorrow, gloom, melancholy, despair, loneliness and depression’. In general, the results indicate significant disparities between T01 and T02 with regard to self-initiated investigation, levels of engagement and emotional reactions to the demanding elements of the design procedure. The participants in T01 exhibited a greater inclination towards self-directed investigation, whereas the participants in T02 displayed a slightly elevated level of interest. Regarding emotional responses, individuals in T01 demonstrated a broader spectrum of emotions, whereas participants in T02 predominantly expressed interest, fear, delight and surprise.

The aforementioned distinctions underscore the possible influence of participants' level of involvement, curiosity and affective encounters on the satisfaction and gratification derived from the design process. Gaining a comprehensive understanding of these distinctions can contribute to the enhancement of future design processes and the establishment of an atmosphere that effectively fosters participants' motivation and emotional well-being.



**Figure 16.** T01 Participant’s emotions were evoked by the ability to face the challenge



**Figure 17.** T02 Participant's emotions were evoked by the ability to face the challenge

## 7. Discussion

This study aimed to investigate strategies for teaching young designers how to manage their emotions throughout the creative process. Junior designers should be able to recognise the emotional components covered by these criteria using applicable methodologies. The practical strategies were created to aid younger designers in recognising their emotional fluctuations, design issues and user input. Consequently, the principles of practical procedures will boost their motivation and self-control throughout the design process. The constraints of introducing design and emotion principles in design learning are shown by the study methodology and participant discussions.

### *7.1. Strengthen recognition of emotional changes through the guideline*

By applying the guidance, T01 participants obtained a stronger ability to identify their emotions. Self-recognition of emotions, which was conducted and presented through the guideline, helped the T01 participants to understand the different types of emotions.

Hence, the T01 participants obtained a higher ability to recognise emotions. They would identify more different types of emotions. T02 participants did not understand the different types of emotions clearly. On average, T01 participants could identify five to six types of emotion, but T02 participants could identify three to four types of emotions only. As shown in the literature study, some emotions have a substantial influence on the stages of deliberation and analysis within the design process. These common feelings are mostly influenced by how well one processes information and makes choices. These two components are more consequential than an emotion or sensation since they may drive people's future behaviour.

### *7.2. Participants' prominent changes in emotion and strengthened interest in idea exploration through the guideline*

The guidelines enabled participants to document their potential and challenges in relation to design practices. Given the information acquired by T01 participants about emotional notions, they possess an understanding that positive and negative emotions serve distinct purposes within the design process. The evaluation of strengthening the interest in idea exploration of T01 (46.9%) is much higher than T02 (23.2%). According

to the findings from the literature review, T01 participants' feedback reflected that they had relatively less stress on facing negative emotions or more consideration when under positive emotions. Their thinking direction would be more diversified. Hence, their interest in idea exploration would be enhanced.

### ***7.3. Stronger ability of own experience exploration***

The design approach unveiled psychological fluctuations while enhancing experiential inquiry capacity. The T01 participants utilised guidelines to discern the significant fluctuations in mood experienced by the participants throughout the design process. They modulated the emotional changes evoked during the design factors and personal experience in their design process. T02 participants were unable to present emotional changes as a set of continuous changes accurately. The evaluation of the ability of own experience exploration of T01 (60%) is stronger than T02 (12%). A similar concept was revealed by Denton and his research group (2004), the emotional concerns included a range of mental states. They were influenced by both internal and external forces. However, the effect is linked to the designers' own experience closely. Different people may feel various emotions in reaction to the same stimuli.

### ***7.4. Enhanced motivation for creating ideas***

Emotional changes may impact designers' perceptions, decision-making and design manipulation. The proposed guidelines mentioned above may be used and praised techniques for documenting, reporting and graphing emotional changes to monitor them. With the recorded emotional changes, the evaluation of motivation to create ideas of T01 (43.8%) is higher than T02 (3.8%). The results are consistent with existing findings and expand them by indicating that the degree of emotional changes may influence designers' personal perceptions, decision-making and the manipulation of the design process. As investigated in the literature review, the junior design (such as T01 participants) who gained more knowledge and insight from their study and direct observation of both themselves and their intended audience, the normal range of feelings they experience during this time may expand or contract. Curiosity, for instance, as a component of good internal emotions might replace excitement as a component of pleasant exterior sensations after it has been processed. As a result, the feedback of the T01 participants reflected that they would acquire a healthy fascination with the unknown and the way things work.

### ***7.5. Stronger ability to face challenges***

Junior designers can be rational about the situation that they face and make proper decisions during the design process, they are more capable of manipulating different effective approaches and strategies. Hence, conducting more thorough learning and pinpointing the optimal emotional reactions of junior designers would improve their ability to make decisions throughout the design process. Referring to the above-conducted study, emotional changes of both T01 and T02 impacted designers' perceptions in decision-making and design manipulation. T01 participants would have stronger performance in working out the design process. The self-evaluation of their own ability of T01 (60%) is much higher than T02 (12%). As also realised from the literature review, there may be some difficulty in managing the design process for junior designers. Junior designers may not have sufficient practice dealing with emotional changes and initiative



aspects throughout the design process while knowing how to manage the design variables with rational thought. Possibly having little empathy and thus may be difficult for junior designers to recognise when their mood has shifted. Because of this, individuals in T02 reflected that they have more difficulties in putting design principles into reality and might benefit from instruction in the areas of decision-making, assessment, judgment and motivation. Emotional changes were modulated for the optimised design process and design outcomes.

## **8. Conclusion**

The persistent issue of junior designers' inability to effectively incorporate the information acquired from design projects focused on human-centred concerns into problem-solving inside design studio programmes has been a consistent concern over an extended period. Despite receiving a comprehensive semester of lecture-based instruction on the concept of design thinking, junior designers often feel overwhelmed, displaying difficulties in identifying crucial elements of design issue identification and struggling to generate satisfactory solutions throughout problem-solving sessions. For decades, junior designers and educators from a variety of disciplines have expressed dissatisfaction with the difficulties of efficiently and reliably training junior designers. The objective of their study was to ascertain the most accurate and successful methods for educating younger designers on matters pertaining to visual and physiological issues. We are not the only ones on this journey. Several scholars have highlighted the discontent over the perceived deficiency in cognitive information transfer between lectures and studio problem-solving, as well as the process of creating creative solutions for communities. Consequently, this research aims to investigate several strategies aimed at aiding younger designers in effectively managing their emotional state throughout the design process. Practical recommendations are viable instruments to assist them and the parts that make up these guidelines must be recognised to be effective. It is necessary to investigate effective methods of encouraging junior designers to understand these standards. Consequently, an empirical investigation was conducted to gather quantitative data for further analysis through a survey. Sixty junior undergraduate participants in creative arts (design) programs were asked to participate in the study. Using an emotion-tracking smartphone application, participants were asked to participate in a few design processes and their performance was tracked throughout the process. A comparison of their performance and data relating to their emotional changes was made to assess their ability to manipulate the creative process while also regulating their emotional responses. According to the findings of the empirical investigation, junior designers may incorporate emotion into the design process. The analysis of T01 and T02 individuals indicates notable disparities in terms of degrees of curiosity, emotional reactions and self-initiated inquiry. The participants of T01 exhibited a greater degree of interest in the exploration of ideas, as seen by the majority of them displaying high levels of motivation and engagement. In contrast, it was observed that participants in the T02 group had a marginally greater proportion of moderate interest levels and a statistically significant increase in the number of participants with lower interest levels. Regarding emotional reactions, individuals in T01 indicated a broader spectrum of emotions, encompassing anger, surprise, disgust and grief. On the other hand, participants in the T02 group did not report the presence of these specific emotions. However, their primary emotions were mostly characterised by expressions of interest, fear, joy and surprise. The observed disparities indicate a

divergence in emotional encounters and responses among individuals belonging to the respective cohorts. Additional investigation is necessary to ascertain the fundamental elements that are leading to these discrepancies. Various factors, such as variances in the nature of design tasks, the novelty of the topics being studied or differences in participants' baseline motivation levels, can potentially alter their degrees of interest and emotional responses. The comprehension of the findings in the research study has the potential to contribute to the enhancement of forthcoming design processes and establish a conducive setting that fosters the motivation and emotional well-being of participants. Designers may boost their creativity and decision-making throughout the design process by acknowledging the significance of self-directed inquiry, sustaining elevated levels of interest and effectively managing emotional responses.

Furthermore, the research emphasises the importance of acknowledging and effectively addressing emotional fluctuations throughout the design process, with a specific focus on novice designers. The application of rules and procedures to document and monitor emotional swings can assist designers in the recognition of their emotions, exploration of personal experiences, sustenance of motivation and successful management of problems. Designers can enhance their design outcomes by cultivating emotional intelligence and promoting active interaction with emotions. In its entirety, this study illuminates the significant interaction among motivation, emotional encounters and design procedures. This statement underscores the importance for designers to cultivate a more profound comprehension of their own self and their emotional reactions, as this level of awareness can have a beneficial influence on their ability to make informed decisions, foster engagement and ultimately achieve success within the realm of design.

### **Acknowledgement**

We would like to express our gratitude to the participants who took part in this study. This research was conducted by following the ethical guidelines outlined. All participants provided informed consent and their privacy and confidentiality were strictly maintained throughout the study. We are grateful for their valuable contributions, which made this research possible.

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