

RGC Ref. No.: UGC/FDS16/E06/19 <hr/> (please insert ref. above)
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**RESEARCH GRANTS COUNCIL  
COMPETITIVE RESEARCH FUNDING SCHEMES FOR  
THE LOCAL SELF-FINANCING DEGREE SECTOR**

**FACULTY DEVELOPMENT SCHEME (FDS)**

**Completion Report**

*(for completed projects only)*

<p><b><u>Submission Deadlines:</u></b></p> <ol style="list-style-type: none"> <li>1. Auditor's report with unspent balance, if any: within <b>six</b> months of the approved project completion date.</li> <li>2. Completion report: within <b>12</b> months of the approved project completion date.</li> </ol>
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**Part A: The Project and Investigators (S)**

**1. Project Title**

Guiding Emotion: Constructing New Approach for Design Studies

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**2. Investigator(s) and Academic Department(s) / Unit(s) Involved**

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr Ho Amic Garfield/ Assistant Professor	Department of Creative Arts, School of Arts & Social Sciences, Hong Kong Metropolitan University
Co-Investigator(s)		
Others		

**3. Project Duration**

	Original	Revised	Date of RGC / Institution Approval <i>(must be quoted)</i>
Project Start Date	1 Jan 2020	N/A	
Project Completion Date	31 Dec 2021	N/A	
Duration <i>(in month)</i>	24 months	N/A	
Deadline for Submission of Completion Report	31 Dec 2022	N/A	

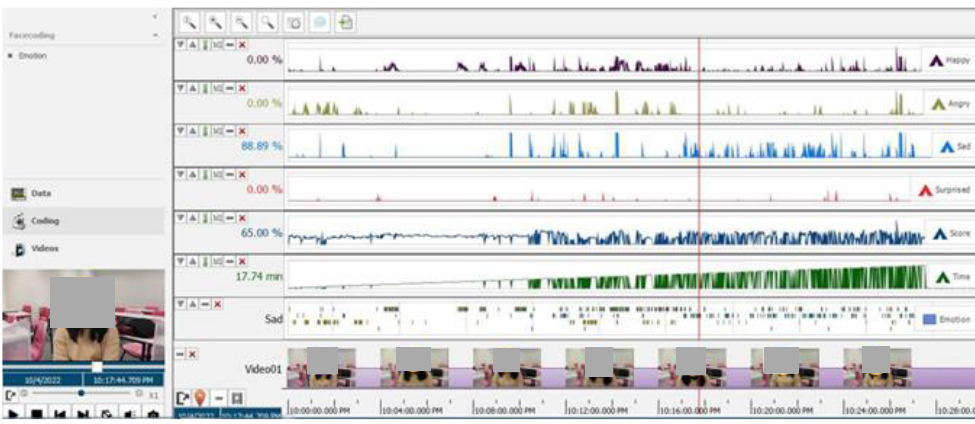
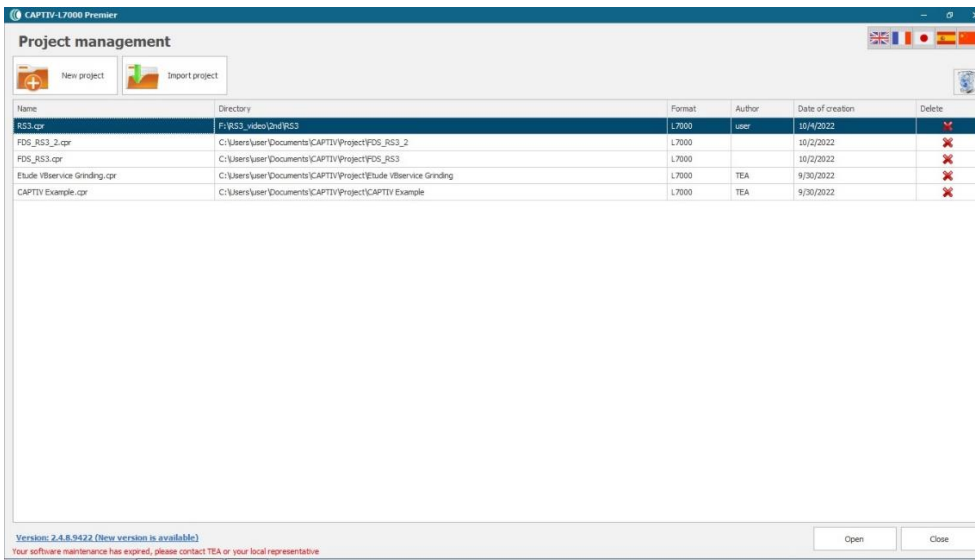
4.3 Please attach photo(s) of acknowledgement of RGC-funded facilities / equipment.

CAPTIV – Software & Hardware:

- Web Cam
- 2 USB dongles



- Software of the equipment



**Part B: The Final Report**

**5. Project Objectives**

5.1 Objectives as per original application

1. To explore the approaches for the junior design students to introduce emotions into their design processes.
2. To investigate the emotional elements that would enhance junior design students' abilities to manipulate their design process.
3. To propose some principles for guiding junior design students to adjust their emotional changes in the design process.
4. To examine the effectiveness of principles for guiding junior design students to control their emotional changes in the design process.
5. To investigate how to motivate junior design students to manipulate their design process with managed emotional elements.

5.2 Revised objectives

Date of approval from the RGC: N/A

Reasons for the change:

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### 5.3 Realisation of the objectives

*(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)*

All research objectives outlined in the initial submissions have been achieved. The project commenced in January 2020 and was completed in December 2021. The Principal Investigator and Research Assistant conducted the literature review, questionnaire, emotion-tracking, focus group, data analysis, conference paper and journal article writing during the research period.

Reviewing previous theories and approaches in various disciplines, including Design Management, Design education, Design & Emotion, and Psychological Studies in the Literature Review, the theoretical background of the approaches for the junior design students to introduce emotions into their design processes was organised. After understanding the relationships between decision-making and emotional changes in the Design process involved Design and Emotion, various approaches of the emotion-tracking methods (for example, facial expression, etc.) were compared. The emotion-tracking mobile application was employed to track how the emotional elements work in the design process (Objective 1) and thus was conducted in Research Study 1: Phase 1. While the first design project with an emotion-tracking mobile application was applied, the dataset for an emotion-tracking mobile application was collected.

The previous theories and approaches related to emotions and emotional elements in Design & Emotion and Psychological Studies were clarified through the Literature Review as the investigation background. The concepts supported investigating the emotional elements in the design process in Research Study 1: Phase 1. To determine the ideal emotional responses of junior design students that would enhance their abilities to manipulate their design process (Objective 2). A Questionnaire for reviewing participants' design process was conducted in Research Study 1: Phase 3.

Based on the fundamental framework investigated in the above phases, certain emotional management guidelines have been developed to help junior design students control their emotional changes throughout the design process were suggested, as demonstrated (Objective 3). Lecture slide introducing participants controlling emotions in design. They worked as a tool for invited participants to introduce emotions into their design processes.

The emotion-tracking mobile application in the Second design project examined the effectiveness of the proposed emotional management guidelines (Objective 4). A questionnaire for reviewing participants' design process was conducted to compare the effectiveness of the general design process and a design process that introduces the proposed emotional management guideline. To collect scientific data for individually examining proposed emotional management guideline effectiveness in different stages of the design process.

After understanding the relationships between the motivation, judgment, evaluation, emotions, and emotional elements of junior design students, the influence of emotional changes in design processes and their knowledge about emotions and emotional elements in design was determined through the Individual interview with the reflective review in lablog: Reflective review in participants' lablog in Research Study 2: Phase 3. The effectiveness of the proposed principles of collaboratively applying design knowledge and emotion was examined. Data collected from the facial expression tracker of CAPTIV L7000-Premier and the interview transcript and archive of participants' lablog were submitted. These findings reflected that Junior design students perform better on manipulation, judgment, and evaluation after recognising and managing emotional changes. Hence, the junior design students thus were motivated to manipulate their design process with managed emotional elements (Objective 5).

Please refer to the Research Objectives & Activities matching chart:  
<https://docs.google.com/spreadsheets/d/1kHt-wI0cK1Qzw0s8r1Q0y-3VnnqJrTYM3BBTGpdzX8k/edit?usp=sharing>

#### 5.4 Summary of objectives addressed to date

<b>Objectives</b> <i>(as per 5.1/5.2 above)</i>	<b>Addressed</b> <i>(please tick)</i>	<b>Percentage Achieved</b> <i>(please estimate)</i>
1. To explore the approaches for the junior design students to introduce emotions into their design processes.	✓	100%
2. To investigate the emotional elements that would enhance junior design students' abilities to manipulate their design process.	✓	100%
3. To propose some principles for guiding junior design students to adjust their emotional changes in the design process.	✓	100%
4. To examine the effectiveness of principles for guiding junior design students to control their emotional changes in the design process.	✓	100%
5. To investigate how to motivate junior design students to manipulate their design process with managed emotional elements.	✓	100%

## 6. Research Outcome

### 6.1 Major findings and research outcome

*(Maximum 1 page; please make reference to Part C where necessary)*

This study explored the possible approaches for junior design students to manage and introduce emotions into their design processes with emotional management guidelines. Those emotional changes' positive and negative effects were explored to propose guidelines for junior design students. Forty typical emotions that work in junior design students' design process were identified. The identification of the emotions was scientifically collected and proved by capturing frames of participants' facial expressions with the software CAPTIV L7000-Premier. Emotional management guidelines monitoring emotions in the design process were also proposed; hence, the significance of introducing emotion in design studies was examined.

#### 1. Forty typical types of emotions were identified in the design process

Not many junior design students can notice emotional changes during their design process. Most of them emphasised they conduct logical thinking for investigating design outcomes rather than considering the emotional elements. Before understanding the role of emotional changes during the design process, it is essential to know which types of emotion work in the design process. Based on the Literature Review, forty typical types of emotions, including loneliness, contempt, humiliation, inferiority, rage, and anxiety, were identified based on participant responses. The participants were asked to track their emotional changes in the design projects in Research Study 1: Phase 1 and Phase 2. Their experience of emotional changes through the conversation with the participants is in further detail. The information was compiled and transcribed. The focus group found that calmness was the most often reported feeling, followed by worry, touchedness, commitment, healing, curiosity, enthusiasm, and pleasure. The next commonly found emotions were hatred, regret, discouragement, fear, yearning, compassion, peace, interest, pleasantness, pleasure, happiness, courage, relief, and energy. Finally, the least often expressed feelings were envy, resentment, melancholy, loneliness, disgust, inferiority, stress, attachment, satisfaction, affinity, pride, anticipation, respect, gratitude, and superiority.

#### 2. Facial expressions capturing tool CAPTIV L7000-Premier applied and reflected the emotional changes in the design process

There is a shortage of structured training that offers a broad grasp of emotion, particularly in the design process. Thus, a scientific emotion measurement is needed. Since facial expressions of individuals were found to represent emotion accurately, facial expressions capturing tool (i.e., CAPTIV L7000-Premier) was implemented to detect participants' faces. The CAPTIV L7000-Premier generated data source is used for facial expression analysis. This method overcame typical difficulties in emotion recognition in a focus group, including the need for appropriate database settings and the difficulty of standardising results. The facial expressions of the participants were captured and identified as types of emotions that would occur in the design process and these discussed issues inspired the design of Emotional management guidelines.

#### 3. The function of emotional management in the design process

With the emotion-tracking mobile application of eMoods Bipolar Mood Tracker, the emotional changes of participants during the design process were tracked. Based on the collected data from participants, their adjustment speeds in different emotions were recorded and compared. Reflected by the statistical data collected during the Research study phase 3, participants' reaction time in the design process with positive emotions was more effective than participants with negative emotions. Hence, negative emotions must be concerned, particularly in the design process.

#### 4. Emotional management guidelines monitor emotions in the design process

Both positive and negative emotions would influence the participants' ability to manipulate the

design process. It is essential to help junior design students to manage their emotions. Hence, the emotional management guidelines were developed in this study. It provides practical approaches to those who would like to settle emotion in their design processes, in contrast to previous scholarly research that has mostly focused on the theoretical level. Consequently, these practical approaches also provide guidance to junior design students through the process of adapting to the emotional changes that may occur throughout the design process during their design studies.

## **5. Examined the Significance of Introducing Emotion in Design Studies**

Based on the findings from Research Study 1: Phase 1 and Phase 2 design projects, the significance of introducing Emotion in Design Studies was examined. Participants' responses revealed they had not previously been exposed to any ideas about emotion control and self-awareness. While working on the allotted design assignment, several of them were unsure of the emotions they were experiencing. While including the emotion theories from the designers' point of view, the design process is significantly influenced by emotion. Junior design students should be introduced to how emotion may affect decision-making and even final design outcomes. Some common emotions are quite visibly involved in the decision-making and cognitive thinking processes in the design process.

### **6.2 Potential for further development of the research and the proposed course of action** *(Maximum half a page)*

By completing this research project, the function of emotion in the design process was classified and exposed with scientific emotional measurement tools with an unbiased benchmark for experiments on facial expression tracking. This research investigated how junior design students manage and incorporate emotions into their design processes. The discovery of forty basic forms of emotions that operate in the creative process of junior design revealed the roles and functions of emotion in the decision-making, judgment, and evaluation of junior design students. Apart from this, it is found that the use of proposed Emotional management guidelines would enhance their motivation of them in the design process manipulation. These findings inspired the investigation of applying the teaching of Emotional management in the design studies as a supplementary design & emotion training.

Further study would investigate how emotional concerns and managing emotional changes would benefit junior design students' academic performance. The participants' decision-making and reflective thinking in different design studies will be recorded for observation. As a result, their academic performance would be a reference of how managing emotional changes would benefit Junior design students in the long run. Their performance of decision-making, evaluation, judgment, and motivation under emotional changes would be further revealed with a more comprehensive understanding. By exploring the influence of emotion on designers and design outcomes, the PI plans to conduct a research project with a tentative title of "Applying emotion management in the design process" as mentioned, the PI is considering another research grant proposal to continue with this study.



## 7. Other Layman 's Summary

*(Describe in layman 's language the nature, significance and value of the research project, in no more than 200 words)*

For junior design students, manipulating the design process could be challenging. Besides understanding the approaches to managing the design factors with logical thinking, junior design students lack experience in handling emotional changes and initiative factors during the design process. They also lack emotional concerns and cannot notice their emotional changes appropriately. As a result, they struggle to practice design and need guidance for enhancing their decision-making, evaluation, judgment, and motivation.

Before understanding the role of emotional changes during the design process, it is essential to know which types of emotion work in the design process. Therefore, forty basic emotions that particularly appear in the design process were identified through Literature Review. To confirm these forty identified emotions that appeared in the design process, a scientific facial expressions capturing tool have been applied to investigate the emotional changes in the design process. During the process of facial expressions analysing, it was found that the reaction time of participants with positive emotions was more effective than participants with negative emotions, which is closely related to their abilities in design management, judgment, and evaluation. This provides need to introduce emotional management guidelines for monitoring emotions throughout the design process for junior design students.

## Part C: Research Output

### 8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s) (denote the correspond -ing author with an asterisk*)	Title and Journal / Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowl edged the Support of RGC (Yes or No)	Accessible from the Institution al Repository (Yes or No)
Year of Publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
Apr 2024	Dec 2023	-	-	HO A. G.*	Developing Strategies for Junior Designers to Manage Their Design and Emotions/  <i>New Design Ideas (Journal) Vol.8, No.1</i>  (Scopus indexed)	Yes	Yes [Attachment 1]	Yes	Yes
-	-	Yes	-	HO A. G.*	Understanding Typical Emotions in the Design Process/  <i>Convergences - Journal of Research and Arts Education</i>	No	Yes [Attachment 2]	Yes	Yes
-	-	Yes	-	HO A. G.*	Application of Facial Expression Tracking for Emotion Recognition in the Design Process/  <i>Journal of Design Research</i>	No	Yes [Attachment 3]	Yes	Yes

May 2024	Oct 2023	-	-	HO A. G.*	Emotion Guideline Workbook: Managing the Design Process/  <i>Authored Book, published by Tylor &amp; Francis CRC Press</i>  (Scopus indexed)	Yes	Yes [Attachment 4]	Yes	Yes
-	-	Yes	-	HO A. G.*	Guiding Emotion: Constructing New Approach for Design Studies/  <i>Authored Book, Tylor &amp; Francis CRC Press</i>	No	Yes [Attachment 5]	Yes	Yes

### 9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered

(Please attach a copy of each conference abstract)

Month / Year / Place	Title	Conference Name	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No)	Acknowledged the Support of RGC (Yes or No)	Accessible from the Institutional Repository (Yes or No)
07/2021 Online* (Hong Kong)	Understanding Junior Design Students' Emotion During the Creative Process	7 <sup>th</sup> International Conference on Human Factors in Training, Education, and Learning Sciences  (Scopus indexed)	Yes	Yes (Attachment 6)	Yes	Yes
11/2020 Online* (USA)	Emotion from Creativity: Principles of Manipulating Emotional Management in Design Learning	IASDR 2021 [ ] With Design: Reinventing Design Modes  (Scopus indexed)	Yes	Yes (Attachment 7)	Yes	Yes

02/2023 (Gangwon -do, Korea)	Connecting Emotion with Design Learning	HCI Korea 2023	Yes	Yes (Attachment 8)	Yes	Yes
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\*The Conferences attended had been changed to online due to the COVID-19 pandemic.

#### 10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning

*(Please elaborate)*

During the study of this project in 2021/22, the PI taught the course IDDA A200F Foundation of Visual Communication in BFA (Hons) in Imaging Design & Digital Art Year 1 Autumn semester and successfully transferred the research findings of the role and functions of emotion in the design process. In the course, the students have introduced the relationship between emotion and visual communication with a lecture and learning experience on how emotional changes would influence their decision-making in their design process.

#### 11. Student(s) Trained

*(Please attach a copy of the title page of the thesis)*

Name	Degree Registered for	Date of Registration	Date of Thesis Submission / Graduation
N/A			

#### 12. Other Impact

*(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)*

N/A

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**13. Statistics on Research Outputs**

	<b>Peer-reviewed Journal Publications</b>	<b>Conference Papers</b>	<b>Scholarly Books, Monographs and Chapters</b>	<b>Patents Awarded</b>	<b>Other Research Outputs (please specify)</b>	
<b>No. of outputs arising directly from this research project</b>	3	3	2	N/A	Type	No.
					N/A	N/A

**14. Public Access Of Completion Report**

*(Please specify the information, if any, that cannot be provided for public access and give the reasons.)*

<b>Information that Cannot Be Provided for Public Access</b>	<b>Reasons</b>
N/A	N/A