國立雲林科技大學

98學年度博士班入學招生考試試題

系所：設計學研究所

科目：設計研究方法

說明：本試題共有四大題，請依序並標明題號，詳答於答案卷上，可以不用抄題。

一、何謂「概念性研究(conceptual research)」與「實徵性研究(empirical research)」(12%)？請說明並比較分析兩者的共同點與差異點。 (13%)

二、何謂迴歸分析? 何謂口語分析? 分別用在何種情況? 請各舉一例說明之。(25%)

三、請簡述「內容分析法」與「KJ 法」的使用目的、主要執行方式的共同點與差異點。 (25%)

四、Please give your professional opinions on a specific issue of design research and discuss the methodology. In the meantime, please provide two related references on the specific issue. (25%, 中文回答)

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98學年度博士班入學招生考試試題

系所：設計學研究所

科目：設計理論與文獻

說明：本試題共有四大題，請依序並標明題號，詳答於答案卷上，可以不用抄題。

一、請說明 Ron Mace 爲「通用設計（universal design）」訂定的七大原則內容？（15%）
並舉一個案例說明如何應用這七大原則檢視設計作品？（10%）

二、依您的觀點，請申論"設計"論文與工程論文、醫學論文、及教育論文有何異同之處？
"設計"論文能否成爲 SCI 之論文？ 理由何在？ (25%)

三、請按下列生活型態趨勢之提示，說明設計與生活型態發展趨勢之關係，並提出未來設計發展的重點。(25%)

（1）科技與資訊　（2）運動與休閒　（3）自然與環保
（4）文化與生活　（5）生物醫療科技

四、請試就下列提供的內容，描述其研究的目的、方法與進行步驟，以及結果。 (25%)

How sketching can affect the idea generation process in design group meetings

--Remko van der Lugt,

This study consists of four experimental idea generation meetings, which explore whether functions of sketching in design activity are also valid for idea generation meetings. The relevant functions of sketching found in theory are: 1) supporting a re-interpretive cycle in the individual thinking process, 2) supporting reinterpretation of each other's ideas in group activity, and 3) enhancing access to earlier ideas. To examine these three possible functions of sketching activity in a group, a model is introduced that considers sketching activities as interactions with the group's external memory. In each meeting both a technique that includes sketching and a technique that includes writing as the primary mode of communication was applied. Differences in the participants' linking behavior for these two techniques were compared. The results provide some support for the first and the third functions of sketching. No support was found for the second function.

Idea generation techniques, like brainstorming, are commonly applied by designers as a means to come up with original design ideas. In the existing body of idea generation techniques, the primary mode of expressing ideas is in written language. Usually, during idea generation meetings, brief descriptions of ideas are listed on a flipchart. In contrast, when involved in unstructured design meetings, designers tend to make

extensive use of sketching when generating design ideas. Design thinking researchers regard this activity of sketching as a means to spur creative thought. Many lines drawn in a sketch are incomplete and can be interpreted in different ways. This is referred to as 'ambiguity' or 'indeterminacy' (Goel, 1995), which enables designers to re-interpret what they have just drawn, and to proceed designing with the newly acquired insights. The interaction that designers have with their sketches is seen as essential to creativity in design activity (Purcell and Gero, 1998).

In the creative problem solving literature, these creative qualities of using sketching are much less emphasized. In his categorization of active ingredients in idea generation techniques, Smith (1998) presents the use of making graphic representations of the ideas as a 'display stimulation tactic'. He mentions: 'Presumably, when visually depicted, ideas are more able to inspire new ones' (visually depicted). Granted that this may also be a valid function of a designer's sketching, it does not cover the creative functioning of sketching as found in the design thinking research literature.

The objective of this paper is to explore whether the functions of sketching as proposed in design thinking research can also be relevant for idea generation meetings. If this is the case, utilizing these functions may enrich creative problem solving activity. First, we will describe the functions of sketching in design activity and how they may be applicable for idea generation meetings(functions of sketching).To examine these three possible functions of sketching activity in a group, a model is introduced that considers sketching activities as interactions with the group's external memory. Then we will describe the research method used, called 'linkography', with which we take a process perspective: investigating the qualities of the connections between the ideas, rather than the qualities of the resulting ideas themselves. Next, we will discuss the results of an experimental study, which consists of four idea generation meetings in which both graphic and written language are used as a means for idea notation. In the final remarks, we will address some limitations to this research, suggestions for further research and suggestions for developing idea generation techniques that involve sketching.

Keywords: collaborative design, creativity, design cognition, drawings, problem solving