

IMAGINATION PROCESSING AND MEDIA RECOGNITION OF 'ARCHITECTURAL DESIGN' E-LEARNING MATERIAL

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ABSTRACT:

This study aimed to investigate the digital media learning cognitive and imagination relationship. In the design education, imagination is important on the basic skill. Therefore, this study direction includes digital media learning's memory, fluency, flexibility and originality. However, Design knowledge includes declarative knowledge and procedural knowledge, Declarative knowledge is concretized, and Procedural knowledge is abstract. Therefore, this study teaching material design use three encoding include image encoding, image with text encoding and text encoding to test students' cognitive processes of digital media learning.

Keywords: Imagination, teaching material encode, media recognition, E-Learning

1. INTRODUCTION

Imagination is helping us to create anything. When we think up an idea it is the first step in creation of anything. In the design education, the roots of design education profession, its key areas of expertise includes perception, imagination, visualization, geometry, knowledge of materials, sense of touch, and sense of detail (walker, 1995). Therefore, imagination is an important design skill of design educational foundation. In Taiwan's design education has not importance that student's imagination in the design process creative thinking stage. Therefore, in the foreseeable future, development the stimulate students' imagination's education materials design will quite important in the design education.

1. DESIGN PROCESS

Design Knowledge promotes the progressive practice of applied design. In the design process, selection of design knowledge is one of the design constraints. This design process includes five basic steps in the Figure 1. The first step of the design process is select design knowledge. In this stage student has yet to create anything wholly new. However, the cognitive process has sequenced from basic recognition and memory skills to those tools needed for abstract thought and creation. The second step, inspiration design contains design thinking of imagination. The third step is to produce a more focused idea. The fourth step is the design of reasonable solution. The final step is the design of production. Therefore, different students selected knowledge of the design will affect the design thinking and design innovation diversity.

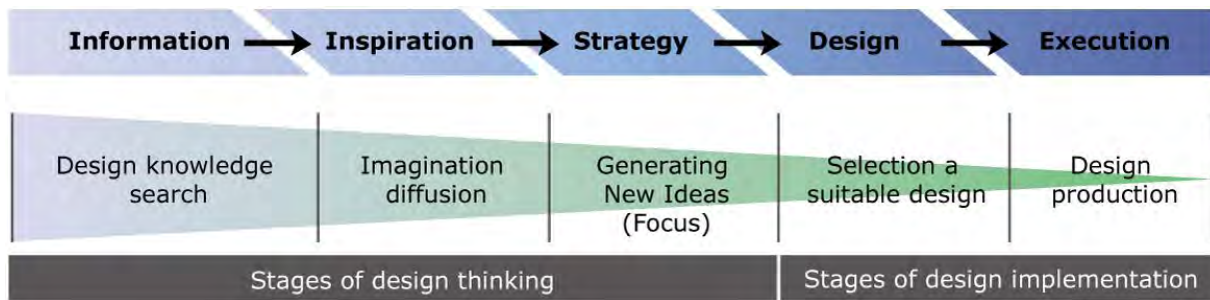


Figure 1: design process

1. 2. DIGITAL LEARNING MATERIALS DESIGN

Information technologies have caused the accumulation and interaction of knowledge to be increasingly reshaped with significant ramifications affecting the processes of acquisition, communication and dissemination of knowledge in almost all societies. Therefore, e-learning readiness – is of paramount importance for the goals of the national higher education to be achieved. (Darab & Montazer, 2011) Digital learning materials to stimulate the senses of learners receiving, improve the learners' interest and attention. Such as TED, it's a global foundation devoted to Ideas worth spreading. It started out in 1984 as a conference bringing together people from three worlds: Technology, Entertainment, and Design. TED video platform raises the interest of learners and effective dissemination of information. Therefore, in the concentrated information through the video transmission teaching, stimulate learners' thinking and motivation to explore, including audio and video content configuration is also an important key of design considerations. (Berkowitz, 2008)

2. KEY LITERATURE REVIEW

This study explored students' thinking processes of imagination and differences between different knowledge and learning in the "Architectural Design" digital media on learning. Analysis and understand the status of research in related fields of the literature and find the development of "Architectural Design" digital multimedia teaching materials' encoding.

2. 1. IMAGINATION

In "Embodied imagination: A hybrid method of designing for intimacy Digital Creativity", this study exploratory paper introduces the embodied imagination method and explains how it can contribute to the design process by creating an elastic space of performance that incorporates daily life and personal imagination into the design process(Hansen & Kozel, 2007). The main purpose of design education is to cultivate future designers (Cahalan, 2011). Different students have different forms of imagination. This paper studies four different of imagination students, including memory, fluency, flexibility and originality. Different imagination type students have different application of design knowledge and understanding.

2. 2. DUAL CODING THEORY

Dual coding theory (DCT) explains human behavior and experience in terms of dynamic associative processes that operate on a rich network of modality-specific verbal and nonverbal (or imagery) representations (James & Allan, 1993). The message handling's key is Encoding. Encoding process can directly affect memory's storage and retrieval, the correct coding knowledge can help student learning. (Anderson, Krathwohl & Bloom, 2008). This study teaching material design use three encoding include image encoding, image with text encoding and text encoding to test students' cognitive processes of digital media learning.

2. 3. THE ENCODING OF DIGITAL MULTIMEDIA TEACHING MATERIALS

Wu, et al. (2010) Digital learning can be a hybrid digital learning type (Blended e-learning system). This approach to learning have combines three elements, namely, course content, and between teaching the learner's communication and the perception of the environment (Kerres & Witt, 2003). This study teaching material design use three encoding and the five kinds of architectural design themes (environment, technology, function & aesthetics, user) is divided into declarative knowledge and procedural knowledge.

3. RESEARCH FRAMEWORK AND METHODS

This study aims to construct architectural design knowledge to digital video and learning materials for students to learn. Explore the different types of imagination students under different coding implications for learning and correlation.

3. 1. FRAMEWORK

These study teaching materials have five Architectural Design content in Figure 2. Design knowledge includes declarative knowledge and procedural knowledge. And explore different Imagination types of student selected differences of design knowledge.

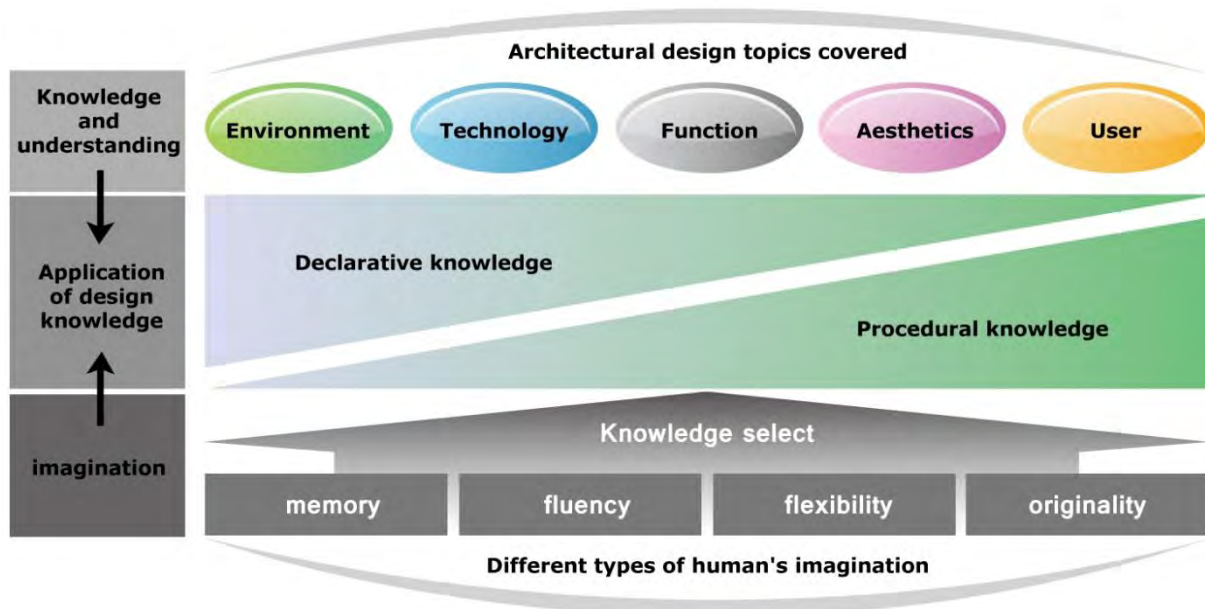


Figure 2: Research framework

3. 2. SAMPLE

The study sample use Taipei Municipal Da-An Vocational High School 41 students (Department of Architecture, first year). Imagination questionnaire test use the development of an imaginative thinking scale questionnaire (Lin & Tsau,2012). Figure 3

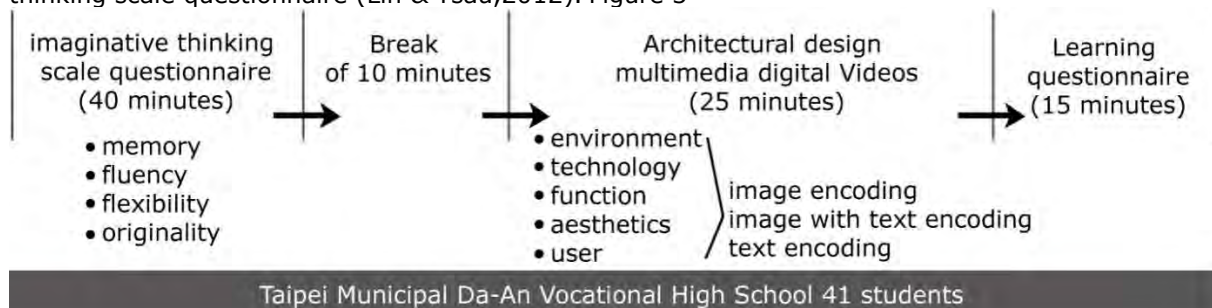


Figure 3: Experimental procedure

4. DISCUSSION

The results show in Table1 :

- (1) High memory students have High learning effect of declarative knowledge and procedural knowledge.
- (2) High fluency students have High learning effect of declarative knowledge, Low learning effect of procedural knowledge.
- (3) High flexibility students have High learning effect of declarative knowledge and procedural knowledge.
- (4) High originality students have Low learning effect of declarative knowledge and procedural knowledge.

	memory	fluency	flexibility	originality
declarative knowledge	High >Low	High >Low	High >Low	High< Low
procedural knowledge	High >Low	High< Low	High >Low	High< Low

Table1: Imagination and knowledge attributes learning effect

The results show in Table2 :

- (1) Environment unit uses text encoding have 95.12% correct rate.
- (2) Technology unit uses text encoding have 80.49% correct rate.
- (3) Function unit uses text encoding have 85.37% correct rate.
- (4) Aesthetics unit uses the image with text encoding have 85.37% correct rate.
- (5) User unit uses image encoding have 53.66% correct rate.

	environment	technology	function	aesthetics	user
image encoding	85.37%	56.1%	42.51%	48.78%	53.66%
image with text encoding	87.8%	65.85%	58.05%	85.37%	51.22%
text encoding	95.12%	80.49%	85.37%	51.22%	12.2%

Table2: The different coding each unit correct rate

5. CONCLUSION

The results showed that the more figurative knowledge, teaching on the composition supplemented with more text encoding, students learning was better. The more abstract knowledge, on the composition supplemented with more Image Coding, students learning was better. When materials includes including figurative and abstract knowledge, the two attributes mixing ratio will affect the students' learning.

Memory is not only the main element of accumulated experience, but also the basis for future imagination and creativity. High memory students are easy to extract the two kind of knowledge. Fluency is kind of same type of association. Figurative knowledge is easier to form memories of visual images. Flexibility is kind of different types of conversion capability. Therefore, both the absorption of knowledge is higher. Originality is the student's own element, and is therefore independent of the study of knowledge.

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