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RESEARCH ARTICLE

Search for design intelligence: A field study on the role of emotional intelligence in architectural design studios

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Abstract
The design studio is the core of the architecture curriculum. Interpersonal interactions have a key role during the processes of design and critique. The influence of emotional intelligence (EQ) on interpersonal communication skills has been widely proven. This study examines the correlation between EQ and architectural design competence. To achieve this, 78 architecture students were selected via a simple random sampling method and tested using an EQ test questionnaire developed by Bradbury and Greaves (2006). The scores of five architectural design studio courses (ADS-1, ADS-2, ADS-3, ADS-4, and ADS-5) were used as indicators of the progress in design of the students. Descriptive and inferential statistics methods were both employed to analyze the research data. The methods included correlation analysis, mean comparison *t*-test for independent samples, and single sample *t*-test. Findings showed no significant relationship between EQ and any of the indicators.

1. Introduction

Architecture education is a design studio-based curriculum (Schön, 1983). Many researchers have described the design studio as the center (Schön, 1985) and the heart (Kuhn, 2001; Oh et al., 2013) of design education. Design studio models focus

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on learning by doing. All processes of solving open-ended problems in the studio are accomplished in lecture and critique sessions. Schön (1983) defines the architectural studio as a context wherein an active process of learning occurs through individual or group problem-based projects. Challenges include recognizing a problem, understanding its constraints, and using creativity, reasoned judgment, interpersonal abilities, and "reflection-in-action" to solve the problem. All these factors are present in the foundation of the architecture curriculum.

Most of the works on design studio (Ochsner, 2000; Demirbaş and Demirkan, 2003) claimed that interpersonal interactions, including those between tutor–students or students–students, have a key role in the design process. Previous studies have discussed various factors and skills, including oral communication, changing an implicit understanding to an explicit one (Morton and O'Brien, 2005), oral presentation (Greusel, 2002), design social aspects (Cross and Clayburn, 1995), decision making (Fallon et al., 2014), and reduction of conflicts between students (Ghiabi and Besharat, 2011). The importance of the following factors to professional design projects has also been discussed: negotiation (Chen et al., 2014); leadership (Lee and Cassidy, 2007); presenting designs to clients in a convincing manner (Dias et al., 1999; Cross, 2008); and the relationship between communication among team members and the quality of their final product (Busseri and Palmer, 2000).

Design critique is a crucial part of the design process in design studios and is related to tutor-to-student and student-to-student interaction and communication. In terms of the kinds of dialog that transpire among people in the critique process, architectural design studios (ADS) have developed their own pedagogies, including desk critique (i.e., individual critique held on the desks of students, involving just a tutor and a student), design reviews, and design juries. In all these activities, interpersonal skills have a key role (Çıkış and Çil, 2009). Collaborative or cooperative design has also attracted considerable research interest (Peng, 1994). For example, Lu et al. (2000) emphasized the role of interpersonal skills in solving frequently occurring conflicts among collaborators of design and proposed negotiations to solve such problems.

However, research on effective and predictive factors and tools that influence communication among designers, students, and tutors remains limited despite the reiterated importance of communication in design studios. Emotional intelligence (EQ) can serve as a tool to measure the communication rate among actors involved in the design process. A common feature in the numerous various definitions of EQ is that it includes a set of emotions, social knowledge, and abilities that guide and reinforce the overall capability of an individual in responding appropriately to environmental factors and pressures. EQ also fosters optimal performance in four areas, namely consciousness, social awareness, relationship management, and self-management (Goleman et al., 2002). EQ is generally responsible for optimizing communication with others, self-control, compliance, and motivation for living. It improves intrapersonal and interpersonal skills, adaptability, flexibility, stress management, and public mood management; it can also increase the performance levels of people in academic and professional fields (Damasio, 2008).

This study aims to contribute to the literature on the correlation between, on one hand, EQ and architectural design competence and, on the other hand, the academic achievement of university students. A literature review is presented in the first part of the article to study the theoretical bases of the issue and to arrive at a reasonable hypothesis. The theoretical bases include ADS, collaborative design, the social and interpersonal aspects of design, EQ, the skills required in design, and the role of critique. After the hypotheses are developed, statistical analyses are performed with the software SPSS® in the second part of the article. The research variables include architectural design skills, academic achievement, and EQ score. The correlation among the variables is tested, and simple random sampling is used to select the sample population.

2. Theoretical foundations

2.1. ADS

Design studio-based courses are central to architectural education programs in most universities. Relative to other courses, studio-based courses are equivalent to many academic hours every week of every semester. Other theoretical and technological courses have a supporting role in the design studio. The main goal of the design studio is to prepare architectural students to deal with open-ended questions and find creative and innovative solutions to these questions (Ibrahim and Utaberta, 2012).

ADS is a revised American version of the atelier training system in the École des Beaux-Arts in the 19th century Paris (Kuhn, 2001). Kuhn (2001) noted that the main characteristics of ADS include (a) finding solutions to open-ended and complex problems related to a project, (b) incredibly fast iterations in achieved solutions during the design stage, (c) frequency of informal and formal critiques, (d) heterogeneity of issues handled and the use of previous ideas and holistic thinking, and (e) the use of constraints in a creative manner. By presenting their works in the design studio, students receive comments and feedback from their tutors and other students, and they can revise their work step by step. This process is called "critique" (Oh et al., 2013).

The pedagogy of the design studio system has a long history (Boyer and Mitgang, 1996) and can function as model for other disciplines (Boyer and Mitgang, 1996). Schön (1983) noted that the studio-based system can be generalized and applied in the professional education of other disciplines. A model that employs the design studio was proposed by Shaffer (1997) in the field of mathematics.

Schön (1985) emphasized that the learning process in the design studio begin with encountering open-ended problems. He also believed that learning is developed through a "reflection-in-action" process. The design studio should function as both a learning space and a complex social organization (Deasy and Laswell, 1985) in which design students can communicate with one another and receive effective comments from their tutors (Kvan and Jia, 2005). Kvan and Jia (2005) pointed out that a wide range of learning methods can be employed in the design studio if the program begins with open-ended problems and consists of a collection of communication media.

According to Demirbaş and Demirkan (2003), aside from beginning with open-ended problems, design studios should also be centered around the contents and relations of design education at a sociological level and its relations with other