



Exploring the critical influential factors of creativity for college students: A multiple criteria decision-making approach



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ABSTRACT

This study aims to explore the key factors affecting the creativity development of college students. The multiple criteria decision-making (MCDM) approach was adopted to construct an objective and effective analytical model of critical factors influencing college students' creativity. The fuzzy Delphi method (FDM) was first employed to screen the critical influential factors (criteria/sub-criteria) categorized by four dimensions: "Individual qualities," "Family background," "School element," and "Community", which are synthesized from the literature review and in consultation with experts from relevant fields in Taiwan. Then, the fuzzy analytic hierarchy process (FAHP) method was applied to calculate the relative weights of the selected critical criteria/sub-criteria that impact creativity for college students. Through expert consensus, the analysis results indicate the "Community" dimension, including two criteria, "Social education environment" and "Social cultural environment," has the most impact on creativity development for college students. And the top three critical influential sub-criteria are "Oppressive of environmental behavior," "Respect for intellectual property," and "Integration of creative education." Therefore, based on the findings, it implies that an enhanced social environment, which can create an adequate stimulus from the external environment, construct a protective domain of knowledge and creativity suitable for knowledge-based economic era, and instill diverse creativity education into daily life, is considered as the most important factor affecting college students' creativity development by the experts. The prioritized weights analyzed by the proposed model can not only serve as a useful self-assessment tool for college students to better understand key influential factors on their own creative abilities for developing their potential creativity, but also can provide an important reference for educational units and/or interested parties in policy making and strategies to help effectively promote college students' creativity development.

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1. Introduction

In today's knowledge-based economy, creativity plays an important role in obtaining global competitive advantage because it is the manifestation of wisdom and knowledge of the human brain, which can transform creativity into economic value and offer people and organizations a sustained competitive advantage. Thus, creativity is also deemed an invaluable asset of the human brain, a necessary human resource in the 21st century, and a powerful means to improve the quality of life (Williamson, 2001). Given the phenomenon that high-tech development is growing speedily and civil society is improving significantly, it has been a critical mission for schools to foster creative talent that addresses the needs of each nation, especially in higher education (Chen & Chen, 2010a).

However, with pressures like dropping birth rates, economic depression, World Trade Organization (WTO) accession, interaction with China, and the number of universities/colleges increasing year after year (Ministry of Education, 2003), unlike 20 years ago, students in Taiwan confront pressures from both their parents and school and compete with global students, resulting in a decrease in the basic creative nature of Taiwanese students (Chen & Chen, 2010c). Therefore, rather than knowledge-learning, for university/college students today, the development of creative knowledge is highly underscored by practitioners and researchers (Gardner, 1993; Williamson, 2001).

Based on the White Paper on Creative Education—Establishing a Republic of Creativity (ROC) for Taiwan published by Ministry of Education (2003), creative talent is the basis of a nation's competitive advantage, and the university is a major core for fostering such talent (Wu, Chen, & Chen, 2010). The Taiwanese government, therefore, expects to make itself an island of creativity by thoroughly nurturing creative talent within each university (Ministry of Education, 2003). Although the development and fostering of creativity has been one of a crucial educational trend and constructive educational goal, whether the higher education environment can successfully inspire creativity in students is still a debatable issue (Cheung, Rudowicz, Yue, & Kwan, 2003). In this regard, the aim of this study is to construct critical criteria of creativity for college students in order to provide a precise reference for creativity-related policy improvements for the higher education system and to assist college students themselves toward self-evaluation for understanding and further enhancing a self-centered creative orientation.

Relevant research on creativity is numerous and various, as are the research methods and assessment models (Almeida, Prieto, Ferrando, Oliveira, & Ferrándiz, 2008; Burke & Williams, 2008; Tierney & Farmer, 2002; Torrance, 1966). Most of the previous studies have utilized basic statistical analysis and placed great emphasis on the relationships between creativity and other factors, sampling either firm employees or students. That is, a large number of influential, reliable and valid creativity dimensions and variables have been developed; the main emphases, however, have been on the examination of the relationships of inter-dimensions. More recently, some of related research has focused on creativity performance (e.g., thinking skills). For instance, Wang (2012) investigated the relationship of creative thinking ability to reading and writing taking 196 university students as a sample group. Burke and Williams (2012) presented the development and potential uses of two thinking skills assessment tools (Burke & Williams, 2008) with a focus group of children (11/12 years) to make these measures (for creativity performance) available for other researchers. Studies that highlight the relative importance of critical and influential creativity dimensions and their related variables (criteria) are scarce (Wolfradt & Pretz, 2001). Consequently, different from the previous research, the study makes an attempt to construct an analytical model to help identify the relative importance of critical influential criteria of college students' creativity. The result is believed to make certain contributions to today's research and practice.

Additionally, taking into account numerous influential factors of creativity, this study can thus be conducted by employing the multiple criteria decision-making (MCDM) model. Moreover, to precisely reflect the reality of problems and fit the thinking logic of human, Zadeh (1965) proposed a fuzzy set theory as an alternative to crisp set logic. In this study, a combined MCDM approach based on fuzzy theory was utilized to explore the aim. Therefore, in addition to fuzzy Delphi method (FDM) that was used to acquire experts' consensus to select the critical factors (Ishikawa et al., 1993), the fuzzy analytic hierarchy process (FAHP) method was adopted to prioritize the relative importance of selected factors. This is because that FAHP has widely been used for MCDM (Mikhailov, 2003; Saaty, 1980; Zadeh, 1965), and the practical applications reported in the literature have shown advantages in handling unquantifiable/qualitative criteria and have obtained quite reliable results (Hsieh, Lu, & Tzeng, 2004).

2. Creativity and its relationship with higher education

This section briefly reviews the underlying concepts adopted by this research, such as the definitions of creativity, the relationships between creativity and higher education, and critical influential factors for college students.

2.1. Creativity: definition and theory

Creativity is a very important and complicated concept. Experts and scholars have mixed opinions as to what creativity is. As a result, experts and scholars have failed to reach a consensus on the definition and importance of creativity (Furnham, Batey, Anand, & Manfield, 2008). Over 60 types of creativity are defined in the field of psychology alone (Mayer, 1999; Taylor, 1988). As indicated by Mumford and Gustafson (1988), the definitions of creativity can be traced to Ghiselin (1963), who argued that creativity is not only an innovative and valuable idea but also the generation of a problem-solving strategy

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