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A STUDY ON INNOVATIVENESS AMONG ENGINEERING AND NON_ENGINEERING STUDENTS

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Abstract:
This paper aims to empirically compare the innovativeness between students of engineering background and non-engineering students studying entrepreneurship subjects. A total of 998 students from universities in Hong Kong were involved in this study. This study attempts to investigate the innovativeness in association with the disciplines of study, especially engineering education. Knowing what to do to become an entrepreneur is not enough to foster entrepreneurial intention, attitudes toward entrepreneurship, innovativeness and self efficacy are affecting the intention. From the study, engineering students are found to be of higher level of innovativeness, attitudes, self efficacy and intention, while students from other disciplines may need 'strengthened' educational measures and facilitation. The results have shown important implications for entrepreneurship education. Entrepreneurship programs and courses to be constructive and facilitate entrepreneurial potential of students should consider the entrepreneurial attitudes and intentions. This study thus contributes to developing appropriate education measures for entrepreneurship education among engineering students.

It has been noted that the perception of engineering and non-engineering students about innovativeness and creativity are different (Gupta et al., 2005). This paper attempts to explore the associations of innovativeness of students with engineering or non-engineering background. The research question posed in this paper is: *What are the exact differences between engineering and non-engineering students in innovativeness*? The result will contribute to developing appropriate education measures to facilitate students, to achieve their innovation potential in the context of engineering education.

Entrepreneurship education influences entrepreneurial intentions to engage in entrepreneurship (Dickson et al, 2008; Dutta et al, 2010; Sanchez, 2011). Despite the popularity of entrepreneurship education, generally accepted teaching materials are still lacking (Matlay, 2005). Some researchers concentrated on the theoretical content of entrepreneurship courses/programs (Fiet, 2001), while others emphasized the adoption of a more practically focused and activity-based approach (Mbaziira and Oyedokun, 2007).

Research on entrepreneurship education appears not mature and it is challenging for educators to develop quality entrepreneurship courses/programs by designing appropriate education strategies (Matlay, 2005). Addressing the differences between engineering and non-engineering students regarding their entrepreneurial attitudes and intentions will help to clarify the needs and factors influencing the startup intentions of the groups with different backgrounds. Many factors influence the emergence of entrepreneurial activities, such as economic environment and personalities (Arenius and Minniti, 2005), whilst individual intention to start up plays a decisive role (Ajzen, 2005; Krueger, et al, 2000). Entrepreneurship education intervention seems to have a critical position in enhancing entrepreneurial intention (Fayolle et al, 2006; Souitaris et al, 2007; Dutta et al, 2010).

It is hypothesized there exists difference between engineering students and non engineering students with reference to the level of innovativeness.

H: Engineering students are of different level of innovativeness when compared to non-engineering students

Questionnaires were administered to 400 engineering students who took an entrepreneurship course in their classes and randomly to 800 non-engineering students (Business and Science backgrounds). A total of 998 valid questionnaires were collected including 251 (25.2%) from the engineering group and 747 (74.8%) from the control group.

This study has important implications for entrepreneurship education. Entrepreneurship programs and courses to be constructive and facilitate entrepreneurial potential of students should consider the entrepreneurial attitudes and intentions.

Knowing what to do to become an entrepreneur is not enough to foster entrepreneurial intention, attitudes toward entrepreneurship, innovativeness and self efficacy are affecting the intention. Engineering students are found to be of higher level of innovativeness, attitudes, self efficacy and intention, while students from other disciplines may need 'strengthened' educational measures and facilitation. The comparatively higher level innovativeness of engineering students maybe due to the nature of engineering, in which, students are encouraged to design, develop, experiment and create. However, how to enhance the non-engineering students' innovativeness level may need further research.

Keywords: innovativeness, engineering students, entrepreneurship education, entrepreneurship