

Women Learning in Creative Project Based Learning of Engineering Education

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Abstract : Engineering education in the higher education is always male dominated. Therefore, women learning in this environment is an important research topic for feminists, gender researchers and engineering education researchers, especially in the era of gender mainstreaming. The research topics are from the dialectical discussion of feminism and science development history, gender issues of science education, to the subject choice of female students. These researches enrich the field of gender study in engineering education but lack of describing the detailed images of women in engineering education, including their learning, obstacles, needs or feelings. Otherwise, in order to keep up with the industrial trends of emphasizing group collaboration, engineering education turns from traditional lecture to creative group inquiry pedagogy in recent years. Creative project based learning is one of the creative group inquiry pedagogy which the engineering education in higher education adopts often, and it is seen as a gender-inclusive pedagogy in engineering education. Therefore, in order to understand the real situation of women learning in engineering education, this study took place in a course (Introduction to Engineering) offered by the school of engineering of a university in Taiwan. This course is designed for freshman students to establish basic understanding engineering from four departments (Chemical Engineering, Power Mechanical Engineering, Materials Science, Industrial Engineering and Engineering Management). One section of this course is to build a Hydraulic Robot designed by the Department of Power Mechanical Engineering. 321 students in the school of engineering took this course and all had the reflection questionnaire. These students are divided into groups of 5 members to work on this project. The videos of process of discussion of five volunteered groups with different gender composition are analyzed, and six women of these five groups are interviewed. We are still on the process of coding and analyzing videos and the qualitative data, but several tentative findings have already emerged. (1) The activity models of groups of both genders are gender segregation, and not like women; men never be the 'assistants'. (2) The culture of the group is developed by the major gender, but men always dominate the process of practice in all kinds of gender composition groups. (3) Project based learning is supposed to be a gender-inclusive learning model in creative engineering education, but communication obstacles between men and women make it less women friendly. (4) Gender identity, not professional identity, is adopted by these women while they interact with men in their groups. (5) Gender composition and project-based learning pedagogy are not the key factors for women learning in engineering education, but the gender conscience awareness is.

Keywords : engineering education, gender education, creative project based learning, women learning

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