Women in mechanical engineering at vocational high school

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Abstract. The purpose of this research was to knowing why in recent years there has been an increase in the number of students who choose to continue their education to a technical vocational high school. The low involvement of women in the field of engineering technology and mathematics caused by a gender gap, the influence of negative stereotypes, culture, and character where the engineering field is more intended for men who are masculine and not by women. The research was conducted by interviewing participants who were randomly selected from female students in vocational high schools. The results showed that the reason of the participant to enter the engineering school because of economic factors with the assumption that graduates from the engineering higher employment opportunities.

1. Introduction

The low involvement of women in the field of saint technology and engineering is the impact of education inherited from colonialism, the colonial government trains women to breastfeed to teach household and trade science, while men are trained to enter the Science of Engineering Mathematics (STEM) Technology [1] where the gender gap in the STEM field is a complex and diverse social problem [2] lack of representation of women in the STEM field and more or less in the STEM organizational leadership ladder [3] stereotypical scientists and engineers is male [4] negative stereotypes of social threats and lack of representation of women a barrier to the interest of women's STEM [5] concerns that there is a lack of scientific innovation for economic competitiveness, due to a lack of involvement of women in the STEM field Women's population continues to increase compared to men [6] uncomfortable environment for women in the stem sector, influenced by stereotypes that impose bias and unfair treatment of women in the field of STEM [7] the inhibition of women to work primarily in science and technology is influenced by the role of women incompatibility for doing family work. Concerning the structure of the modern family of women being the type of double earner, but problems related to the demands of work and family demands will always appear and become obstacles for women working in the STEM field [8].

The survey shows that only a few women who have survived STEM education in their fields [9] in engineering or learning in the field of gender sometimes have less influence, but clearly have a significant impact on their careers [10] in reality women and men have comparable performance scores, but women have lower scientific and mathematical efficiency than men [11] economic changes and patriarchal norms, based on western examples to These eastern countries show that there are increasing numbers of female engineers [12] that in recent years there has been an increase in the number of female
students who choose to continue their education to technical vocational high schools, which is the reason for the author to do research on female students, influencing factors to enter the technical field, responses of students when entering the field technique, orientation after completing education at a technical vocational high school.

2. Method
Conducting interviews with five female students in one of the public vocational high schools in the province of West Java. Selected five people randomly and representing each class, with different ages from sixteen to eighteen years old, consisting of two students majoring in motorcycle engineering and three female students majoring in welding techniques, each from a different junior high school, different interviews conducted in groups and privately with five informants. Group interviews are conducted once, personal interviews are conducted once a week for approximately thirty minutes for one month for each person. Interviews were conducted in the school environment by use time off and after finishing learning, using a cellphone as a medium to record the results of the interview.

Interviews were conducted to find out aspects or reason’s students chose the technique. Education in vocational high schools, because there is an increase in the number of students who continue their education in the engineering department from 2014 to 2018. Interview data are analyzed using a thematic approach that allows to find out participants’ perceptions regarding environmental influences, the reality of their social circumstances [13].

3. Results
On the theme of women in the technical field, especially female vocational high school students describe how students decide to enter the scope of engineering, an overview of the scope of the technique and learning when entering the scope of the technique. The participants did not really understand the technical field before entering vocational high school, but some students had a general picture that was obtained from conversations with teachers in junior high schools, families and friends in their neighborhood.

Four of the five participants did not receive guidance to continue teacher education during junior high school before finally entering vocational high school. From the character of participants who entered the technical vocational high school this is not too feminine and in their environment, they are used to activities both in learning and playing with men. In learning at the technical vocational high school the participants did not know that mathematics physics and other exact lessons were the basis of learning in the field of engineering, almost all participants preferred to avoid learning, some participants hoped to do more work practices than do learning theories in the field technique. The participants hoped that by completing their education at the technical vocational high school they had a greater chance of being able to directly work and earn income on the basis of the family's economic background as well as those in the lower class.

4. Discussion
Women in engineering always face obstacles in social and professional regulations. The choices influenced by the community environment are represented by their family and friends. There is always discrimination, including sexual harassment, which is a problem for women in the technical field at work or internships [14]. Cultural stereotypes about male-dominated, masculine and feminine technical fields that are the benchmarks in the selection of technical fields with minimal education or information on the field of engineering for women do not affect the decline in the number of students entering technical vocational high schools by factors the economy obtained from interviews as facto has a greater influence on the selection of students decisions to continue their education in technical vocational high schools [5].

In taking action from this research with increasing involvement of women in technical vocational secondary schools the need to be carried out, 1) Educating students in junior secondary schools before choosing to enter vocational schools, 2) the role of parents in directing, giving an illustration and
becoming a figure for students, they do not choose vocational schools based on faster work and can improve the standard of family life, the majority of which are middle to lower class, 3) really provide guidance to students in technical vocational high schools so that after completing their education students have the thinking, ability and can work according to their chosen field.

5. Conclusion
There is no guidance or direction for continuing vocational high school education, influencing the ability of students to deal with learning in technical vocational high schools. The character of the students who are in vocational high school is not too feminine. Which affects the learning activities especially the practical learning which can be more quickly understood by the students.

The majority of the students interviewed chose the technical vocational high school to be able to work immediately after completing their education. Based on an assessment of relatives and friends in the environment who had already studied in the technical vocational high school.

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