

PROFESSIONAL ENGINEERS VIEW ON UNIVERSITY MATHEMATICS AND MATHEMATICS EDUCATION

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This paper reports on a qualitative study focusing on engineers' point of view in regard to university mathematics and mathematics education. An individual interview was conducted with three electrical and two mechanical engineers between the ages of 25-40, all engaged in successful careers. The subjects were requested to reflect upon themselves as learners of mathematics in the past and as consumers of mathematics in the present. With this purpose we have asked following questions: How do the engineers view their mathematical experience at university? What are their views on mathematics and mathematical activities? What are their views on the usage of mathematics, in the light of their maturity modified retrospection? What is analytical thinking? Finally, how should the mathematics education be for engineers?

We chose to work with professional engineers because of our thought that they were the students of past so, they are the most suitable people to give right and objective information. We believe that our study of engineering practice will provide valuable information about the adequacy of the application metaphor as a basis for understanding how professional engineers use and learn, mathematics, and that our findings will be of use to teachers of undergraduate engineers in developing revisions to service mathematics curricula.

The interviews were analyzed within a framework designed during the research. Framework was grouped into three types: teaching mathematics, analytical thinking and mathematics is an essential and powerful discipline for an engineer's life.

In teaching mathematics schema, we get the following common ideas: The content of mathematics courses, which were taught to them at university, is necessary and sufficient. Mathematics is important both conceptually and procedurally. Students should know why and when a mathematical idea is going to be relevant to their engineering discipline. Engineers must be taught to use mathematics mainly to make physical interpretations not to do a lot of calculations. Computer must be used to make work easy, not to render some mathematical concepts.

In analytical thinking scheme, we deal with the definition of a term "analytical thinking" which we encountered frequently when we talked to engineers about mathematics. All of them stated that they value their mathematics education because it improves their analytical thinking which is so important for engineering. Because of that we asked what was the meaning of analytical thinking according to them. That time we get a common definition with different explanations: Analytical thinking is a tool, which makes engineers to understand the nature by analyzing.

In the mathematics is an essential and powerful discipline for an engineer's life schema, we can serve the ideas of engineers as follows: Mathematics is a language for engineers. It is a necessary tool for engineering as if it was a pen for a mathematician. It is a source in order to state a life view not only for engineers but also for all people. It is also defined as a gained thinking way. Engineers cannot do anything without knowing mathematics.