

TEACHING AND LEARNING MATHEMATICS BASED ON COMPETENCIES²

Assoc. Prof. Ion Mierlus-Mazilu, PhD

Department of Mathematics and Computer Science
Faculty of Civil, Industrial and Agricultural Buildings
Technical University of Civil Engineering Bucharest, Romania
Phone: +40 212 421 208
E-mail: ion.mierlusmazilu@utcb.ro

Assoc. Prof. Emilia Velikova, PhD

Department of Mathematics
Faculty of Natural Sciences and Education
"Angel Kanchev" University of Ruse
Phone: +359-885 635 874
E-mail: evelikova@uni-ruse.bg

Abstract: *Mathematics plays one of the most important roles in developments of our modern and technology-centered society. In fact, good mathematical skills are crucial for science and economy. Unfortunately, various studies have shown that mathematical competence in Europe has weakened in recent decades. The lack of mathematical proficiency is already causing problems in engineering mathematics' and other courses in European HEIs. In fact, this seems to be a global problem, and e.g. the learning outcomes of Eastern European countries have been weaker than expected, especially in mathematics, after they moved to the Western European model of education (e.g. SEFI 2002).*

As we all know, Mathematics is an essential part of any engineering degrees. Mathematics is a tool that engineers still use throughout his or her life. It is therefore important that this knowledge and competencies have to be properly seated. Thinking about this, we proposed the 'New Rules for assessing Mathematical Competencies' project to change the educational paradigm and to get a common European teaching and learning system based on competencies rather than contents.

Additionally, in recent years the study groups have been increasing and becoming even more heterogeneous. This naturally causes problems for organization of mathematics' teaching as for example the entry level of competence in mathematics (RulesMath project study this problem) varies greatly depending on the background studies. Under these circumstances, taking into account individual needs or organizing dynamic and creative activities becomes almost impossible during the classroom sessions. As a sum of many factors, it has been reported that the drop-out rates are high in the field of technology

In this paper, we will present how we can teach, how students can learn mathematics based on competences, how materials developed within this project are used by students in our universities and their positive influence in the process of teaching and learning mathematics.

Keywords: *Innovative teaching and learning Methods, Competences, Engineering Mathematics Education.*

REFERENCES

European project Rules Math – New Rules for Assessing Mathematical Competencies URL:
<https://rules-math.com/> [viewed 09.09.2019]

² Reports Awarded with "Best Paper" Crystal Prize - 58th Science Conference of Ruse University, Bulgaria, 2019, ISBN 978-954-712-793-7.