Brandi, A. C. and R. E. Garcia. 2017. Motivating engineering students to math classes: Practical experience teaching ordinary differential equations. *IEEE Frontiers in Education Conference*.

See https://ieeexplore.ieee.org/document/8190489 . Accessed 28 March 2023.

Abstract: Teaching mathematics for engineering students is very important. New undergraduate students are aware that they will need mathematical concepts in professional activities. It is still usual to observe not only the difficulty of students in mathematical disciplines, but also the lack of motivation for those disciplines. Motivate and keep motivated the engineering students to mathematical disciplines are a challenge for the teacher. In the literature, it is possible to observe the use of modeling tools of mathematical problems, some of them able to simulate models. Those tools have been used to try to motivate students, but with a technological bias that may introduce difficulties. In this paper we propose an approach to teaching-learning process of mathematical concepts to engineering students with a motivational factor: a practical problem to be modeled in which students must apply concepts seen in class, in particular using the Ordinary Differential Equations (ODE). Each student can choose a problem of his/her interest, which increases motivation. The problem chosen must be explored to create mathematical models involving multiple concepts, which allows the comparison of results. Students must create models using existing computational tools, preferably of free use, supported by instructor. So, the students are allowed to apply the concepts acquired to develop projects with transversal themes aiming to verify the capability and the use of these tools in learning mathematical concepts. Also, this paper presents an application of the approach proposed in Numerical Methods for Differential Equations course. We observed that the use of computer tool to model a real problem chosen by students has improved the interest and, consequently, facilitated the teaching-learning process. Also, it may develop in students a new vision on how they can build their knowledge. We also discuss ways in which the computational resources and everyday problems can help in math classes and arouse creativity, motivation and mathematical logical reasoning in engineering students.

Keywords: motivation, engineering students, computational tools, project, modeling