Teaching and learning of differential equations with graphical, numerical and analytical approach: an experience in engineering courses. (Ensino e aprendizagem de equações diferenciais com abordagem gráfica, numérica e analítica: uma experiência em cursos de engenharia.)


Summary: Differential equation instruction is predominately limited to teaching students to use analytical solution techniques. Computational resources, though largely absent in the teaching of differential equations, can help instructors go beyond teaching students mere mathematical technique. Exposing students to problem solving situations involving differential equations using computational resources, we investigated student learning and the effects of content contextualization in the students’ motivation to learn. In this paper we detail the computer-based method and its implementation in engineering and industrial chemistry courses. Results indicate that the methodology proposed leads students toward meaningful learning of differential equations. However, students reported dissatisfaction and resistance to non-traditional methods of differential equation instruction.

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