

TITLE: CONSTRUCTION OF DIDACTIC MODELS FOR SCIENCE TEACHING: BIOMOLECULES

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ABSTRACT:

The involvement of students in modeling activities emerges as an essential part of a dynamic teaching-learning approach, which is aligned with the current guidelines for science teaching. Models built by students can play an important role as mediators of the scientific concepts construction process. However, evaluating how modeling activities can contribute to the learning process is still a challenge. The comprehension of some topics of Organic Chemistry and Biology, especially the topic “biomolecules” by high school students is still a great challenge to teachers. Considering this, modeling activities may arise as an alternative to increase the comprehension of this subject by students. In order to investigate students' learning in this work, a modeling activity was conducted with an explanation of the elements that allowed the development of the structure of the DNA molecule in three dimensions. This work aimed to present relevant aspects of this teaching strategy, gathered from the observation of the behavior of 60 students from high school in a modeling activity that had biomolecules as its topic, in particular the structure of the DNA molecule. The activity was developed in four meetings that aimed to expose theoretical concepts about the composition and structure of the DNA molecule, as well as the main chemical bonds and intermolecular interactions present in this chemical structure. Then, students were divided into groups of three so that modeling activity could be started. In the first step, students were asked to model the DNA molecule in two dimensions (2D), and in the second stage they were asked to built three-dimensional models (3D). The results showed that the activity was essentially influenced by the students' previous knowledge of the DNA structure, diverging from the investigative focus on the chemical interactions present in this molecule, which were well assimilated by most students when they modeled the DNA molecule in two dimensions. The practice of modeling produced learning gains in terms of content fixation, serving as a good representation of the students' mental model and, consequently, their level of abstraction and knowledge of the content.

Keywords: modeling, science teaching, biomolecules, DNA molecule

Development Agency: Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig)