The Use of PDB database as a Tool for Biochemistry Active Learning of Undergraduate Students

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Introduction: Traditional Biochemistry teaching-learning is still an ongoing practice at UFSC. There are few published reports about innovative pedagogical practices of this discipline at this University. To ensure motivation through active learning of Basic Biochemistry we started to apply new methodologies back to 2005. This approach intended to stimulate undergraduate students in learning Biochemistry proactively. Objectives: Use PDB as a tool to improve skills related to Biochemistry education, while using specific information available; provide virtual data in order to stimulate student autonomy in active teaching-learning processes through methodologies based on the use of safe and suitable scientific information. Material and Methods: At the beginning, students were exposed to Biochemistry of Proteins content through traditional lectures. On the following stage, an introduction to PDB was made at the digital environment (http://www.rcsb.org/pdb/home/home.do) depicting scientific information. Students received a model-instruction describing myoglobin characteristics at PDB (https://pdb101.rcsb.org/motm/1). This Powerpoint™ presentation gave clues on how the work was to be done. A lottery was made and each pair of students was allowed to select a protein and then developed Powerpoint™ presentations. Proteins were chosen from the PDB categories and obtained from the academic educational plan for Basic Biochemistry related to the Nutrition-Course. The Moodle plataform provided virtual materials, allowing full interactivity to all student presentations. Results and Discussion: There was total adherence to the pedagogical proposal. The student presentations in Powerpoint™ were adequate and made available to the attendees in the Moodle platform. Items surveyed in the presented script with the highest hit rates (grade ten) were: biological importance (100%), amino acid composition (92.30%), structural information (89.75%), occurrence (89.74%), URL cited (79.50%) and 66.60% also referred others databases. Surprisingly, PDB number was less mentioned (12.83%). Conclusions: Scientific curated information on PDB is an excellent digital resource, with tools capable to improve Biochemistry skills through the active learning process. Keywords: active learning, Biochemistry education, PDB database, teaching strategy.