PATHWAY ASSEMBLY ASSISTED BY COMPUTER: TEACHING ANAEROBIC GLYCOLYSIS.

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The knowledge on metabolic pathways is required in the higher education courses on biological field. This work presents a computer assisted approach for metabolic pathways self study, based on their assembly, reaction-by-reaction. Anaerobic glycolysis was used as a model. The software was designed to users who have basic knowledge on enzymatic catalysis, and to be used with or without teacher's help. Every reaction is detailed, and the student can move forward only after having assembled each reaction correctly. The software contains a tutorial to help users both on its use, and on the correct assembly of each reaction. The software was field tested in the basics biochemistry disciplines to the students of Physical Education, Nursing, Medicine and Biology from the State University of Campinas – UNICAMP, and in the physiology discipline to the students of Physical Education from the Institute Adventist Sao Paulo – IASP. A database using MySQL was structured to collect data on the software using. Every action taken by the students were recorded. The statistical analysis showed that the number of tries decreases as the students move forward on the pathway assembly. The most difficult reaction besides the first one, were the ones that presented pattern changes, for example, the sixth reaction was the first oxidation-reduction reaction. In the first reaction the most frequent mistakes were using the phosphohexose isomerase as enzyme or having forgotten to include ATP among the substrates. In the sixth reaction the most frequent mistakes was having forgotten to include NAD⁺ among the substrates. The recorded data analysis can be used by the teachers to give in their lectures, special attention to the reactions were the students made more mistakes.