

Student generated quality-analytics as a tool for enhance learning

Pågående arbete

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This “work in progress” will present our process of implementing software’s and changes in the lab curriculum to stimulate and help the students in there conceptual learning of organic chemistry.

Language: English

Target group: Course responsible in Chemistry and other courses wherein theoretical and laboratory work is combined in the curriculum.

Methods and results: implementation of software’s and interactive work sheets.

Most organic chemistry curricula are more or less the same as when I took my first courses in organic chemistry in the mid 80’s. To explain chemical reaction mechanisms with arrows, so called electron pushing, and highlight of several reagents for defined chemical reactions are still the main content of organic chemistry textbooks. At the same time, research on student learning in organic chemistry have shown that many students have trouble with the electron pushing formalism and the use of mechanistic reasoning to predict the outcome of a reaction. One reason to the difficulties are claimed to be due to that organic chemistry is learnt by memorize and recognition giving a heuristic and not structure-property relationship aspect. This does not only affect the results and joy for organic chemistry, it also inhibits their skills to explain and draw correct conclusions on real-world chemical questions out in the industry.

As a consequence, there is needs for tools and complementary resources and views that the ones described in the textbook.

Software’s are used in the course for calculating molecular descriptors. The last years this has been a tool for the student to discover structure-property relationships, SPR, by themselves. The forced adaption to distance education during 2020 has inspired us to start developing this task into an online student generated SPR, where the students submit their individual result into a main file. The Covid-19 situation also forced us to change the lab curriculum quite dramatically. This stimulated us to take a new pedagogical approach on the lab course. Traditionally all students are doing the same reaction. During 2020/2021 it was implemented that the students where using different types of reagents. For 2022 this will be expanded into variation in reagents, temperature, and solvent for the reaction and their results will submitted into a common file from which the students, by using software’s, can find how different reaction parameters affect reaction outcome. Their analysis will be discussed in “flipped-class room. With the implementation of SPR and design of experiment approach, we hope that the students will stimulate and help the students to change from recognizing knowledge to using structural concepts and solvent-molecule interaction concepts.