

Martin Rudd
Department of Chemistry,
University of Wisconsin – Fox Valley,
WTF 2005-06

Abstract:

Traditionally, organic chemistry is taught from a “functional groups” standpoint whereby the various classes of organic molecules and their reactions are studied (e.g. carbon carbon double bonds in alkenes; the carbon oxygen double bonds in ketones, aldehydes and related species). I don’t have anything against this approach except for the fact that instead of instilling a strong background in chemical structure, it relies on students learning about the structural characteristics of the molecules through each chapter. Modern organic chemistry incorporates a large element of spectroscopy, used for identifying molecules, and for the most part, this involves a heavy dose of chemical structure.

My year long SoTL project focused on how students learned organic chemistry using a “structures first” approach. In this, no changes were made to the actual content of the two semester course but just to the order in which topics were taught. A significant amount of new computer based analysis was introduced.

My goal was that this would greatly re-enforce the integrated approach to spectroscopy and structure that we currently have in our laboratory class.

Twelve students took part in the “structure and bonding” pre-test immediately following the introduction of spectroscopy in the class in the second week of the semester. I graded the tests and then set up a time for a “think aloud” exercise with the students, which were given by a former organic student. Each interview lasted about 25 minutes and was recorded along with copies of the diagrams that were made on the white board. At the end of the semester, the test was given again and a brief interview was conducted to assess students’ learning of concepts.