Implementation of soft grading systems for chemistry in a Moodle plugin.

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Drawing chemical structures and reactions is central to chemistry. We are developing a set of tools that aims to facilitate teaching and chemistry learning with MOODLE. We introduce tools to introduce chemical drawings in all text editors of the platform and new types of quiz questions specifically designed to assess chemical drawings. We provide a solution to automatically grade such questions, allowing for tolerance when comparing the expected drawing and the student's answer. This solution differs from a common automated assessment practice, which usually fails to provide a nuanced evaluation of the answers. The grading workflow proposed here relies on computing the similarity between the chemical drawings. It is implemented as a Moodle plugin, utilizing the Chemdoodle engine to draw structures, and communicates with a REST server -that can be installed and managed locally- to compute the similarity using ISIDA descriptors and Tanimoto coefficient (figure 1). All those tools are open source and distributed as part of the ChemMoodle project.
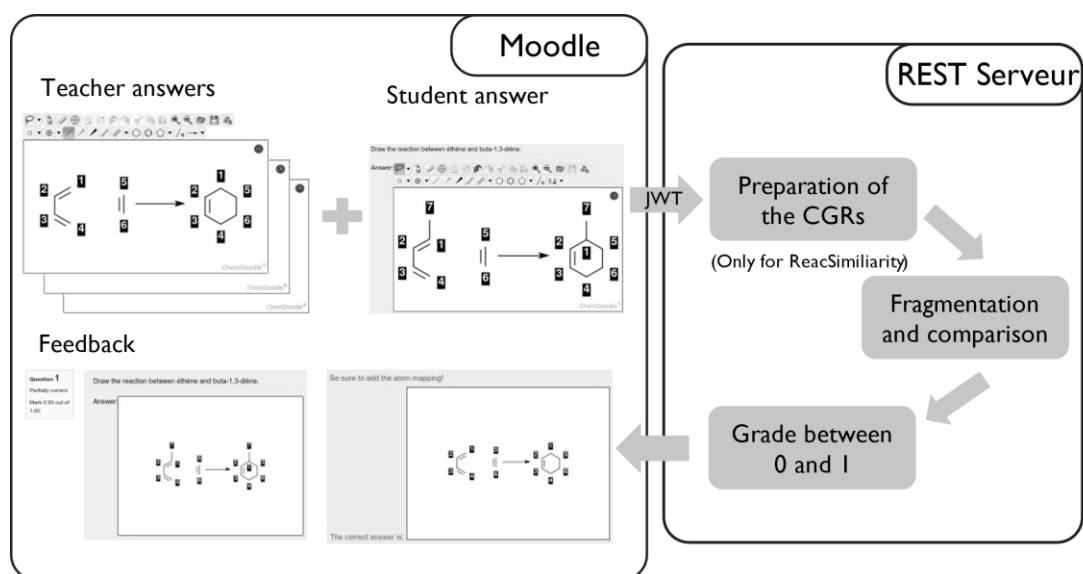
figure 1. Processing a MolSimilarity/ReacSimilarity quiz question.