**Using Bloom’s Taxonomy for an In-depth Comparison of an Online and F2F Chemistry Course**

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**Abstract**

*While online and face-to-face (F2F) courses have been compared in numerous studies, there has been a lack of focus on online chemistry courses. This study was conducted to compare the success of students instructed in an online or F2F general chemistry course for non-majors. One hundred forty six exam questions were categorized according to Bloom’s revised taxonomy and student success on each problem was analyzed. Comparison of online and F2F courses showed significant differences at the lowest order of thinking, “remember,” with online students performing better than F2F students. A similar result was seen with the next order of thinking, “understand,” but there were no significant differences observed between online and F2F students for exam questions at the “analyze” level. The observed advantage for online students may be because online instruction promotes better memorization of facts or because students good at memorization gravitate towards online courses. No significant differences were seen between online and F2F courses when comparing the various chemistry topics covered in the exams. Online instruction appears to be as effective as F2F instruction when teaching introductory chemistry topics.*

**Keywords**

Bloom’s taxonomy, Chemistry education, Online courses, Face-to-Face courses,