

Chemistry as a building block for scientific literacy?

July 5 2022, by Christine Calvo



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Taking chemistry before biology can actually better prepare students for their biology courses, according to a new research study.

A team of researchers led by Sonia Underwood, an assistant professor in the Department of Chemistry & Biochemistry and STEM Transformation Institute, and Zahilyn Roche Allred, a distinguished postdoctoral researcher in FIU's College of Arts, Sciences & Education, interviewed students at Michigan State University who had taken general chemistry and introductory [biology](#).

The responses indicated that chemistry before biology may lend a better knowledge framework of understanding so the students could apply their chemistry knowledge in the biology courses. The reverse was not necessarily true—meaning their biology knowledge did not necessarily help them in their chemistry course—according to the responses.

There is a lot of research in chemistry education on what students can do when presented with different tasks, problems and assessments on a specific topic. But Roche Allred's research looks at what students perceive as having learned in their courses. Both the chemistry course and biology course at Michigan State are transformed for evidence-based curriculum, which made for a more fair comparison.

Findings showed for both courses, students provided a very long list of topics they had learned but only a small number of students highlighted the core ideas. Students identified productive common ideas when asked to make explicit connections between their chemistry and biology courses.

Roche Allred said the results weren't surprising but rather more of an aha moment.

"To actually get evidence or at least students recognizing that chemistry is a fundamental level, I think it was very insightful from the students' point of view," Roche Allred said. "As experts, we know how chemistry and biology are related, but as a novice, they won't know how to unless

we ask them or train them to.

Existing research done by some researchers from this study including Sonia Underwood showed there was a misaligning in the way students were thinking about [chemistry](#) and biology.

"This study highlights how students view their courses as related, or lack thereof," Underwood said. "The findings should be used as a starting place for future faculty discussions between disciplines—and even sub-disciplines within a single department—to have conversations about what do we really want students to learn in our courses and how do we want them to use the knowledge from our courses. The goal of using this approach to transform curriculum development and implementation is to help [students](#) create a larger network of knowledge that they can use appropriately when needed to address complex and unfamiliar situations."

The study was published in *CBE—Life Sciences Education*.

Provided by Florida International University

Citation: Chemistry as a building block for scientific literacy? (2022, July 5) retrieved 23 June 2024 from <https://phys.org/news/2022-07-chemistry-block-scientific-literacy.html>

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