A person with long hair smiling

Description automatically generated with low confidence

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Research interests: Chemistry Education, assessment, foundational chemistry concepts

Education

Postdoctoral Fellow, Chemistry Education

University of Nebraska – Lincoln

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Ph.D., Physical Chemistry

University of Wyoming

Laramie, WY

July 2018

B.S., Chemistry

Creighton University

Omaha, NE

May 2013

Recent Publications

**Balabanoff, M.**; al Fulaiti, H.; DeKorver, B.; Mack, M.; Moon, A. Development of the Water Instrument: A Comprehensive Measure of Students’ Knowledge of Fundamental Concepts in General Chemistry. *Chemistry Education Research and Practice* **2022**. <https://doi.org/10.1039/D1RP00270H>.

Lazenby, K.; **Balabanoff, M.**; Becker, N.; Moon, A.; Barbera, J. From Ideas to Items: A Primer on the Development of Ordered Multiple-Choice Items for Investigating the Progression of Learning in Higher Education STEM. *Journal of Chemical Education* **2021** *98* (3), 714–729. <https://doi.org/10.1021/acs.jchemed.0c01121>.

**Balabanoff, M. E.**; al Fulaiti, H.; Bhusal, S.; Harrold, A.; Moon, A. C. An Exploration of Chemistry Students’ Conceptions of Light and Light-Matter Interactions in the Context of the Photoelectric Effect. *Int. J. Sci. Educ.* **2020**, *42* (6), 861.

Bio

Our research group is focused on developing assessment instruments to measure students’ understanding of chemistry concepts. Currently, we are working on an assessment for the year-long sequence of general chemistry. General Chemistry serves many students across a variety of disciplines each year and few resources exist to assess students’ understanding or measure the efficacy of curricular reform. This assessment is unique in two ways: (1) it is entirely contextualized in water for accessibility and, (2) the singular context allows us to investigate students’ deep conceptual understanding.

In addition, our group is using qualitative methods to investigate students’ understanding of atomic structure. Atomic structure is a foundational concept often introduced in General Chemistry and further built upon in upper-level chemistry courses. One unique aspect of atomic structure is the use of models to depict and convey key features of the atom. Modeling is outlined by the Next Generation Science Standards as an essential science practice. Investigating this science practice in the context of atomic structure is particularly appropriate in order to best support students as they continue to build their atomic structure model throughout their science courses.

Check out our group website for more information: <https://balabanoffcer.wordpress.com>