Measuring students’ mindsets in the undergraduate chemistry laboratory: Developing an assessment of beliefs about intelligence

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Prior Literature
- Students’ performance in organic chemistry is shaped by their mindset.1,2
- students’ mindsets can be changed by their beliefs of success, and challenges.1,2
- Mindset is context-dependent, not well characterized in the laboratory.3

Research Question
- What mindsets do students have about learning in the chemistry laboratory?

Theoretical Framework
- Dweck’s Implicit Theories of Intelligence4,5

Student beliefs
- intelligence arises from natural ability rather than effort
- Intelligence Mindset in the Chemistry Laboratory (IMCL) Results

Student actions
- Create performance (grade) goals
- Demonstrate competence to others
- Avoid challenging tasks
- Engages in helpless strategies
- Prefers effortless success

Intelligence Mindset in the Chemistry Laboratory (IMCL) Results

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<thead>
<tr>
<th>Course</th>
<th>IMCL</th>
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Conclusions, Limitations & Future Work
- IMCL captured a wide range of students’ ideas about mindset within the context of the general chemistry laboratory.
- Students more strongly agreed with growth items than with fixed items (internal consistency).
- Response process interviews highlighted an important limitation of data collection during the COVID pandemic. Students in the hybrid laboratory courses performed fewer experiments, while students in the online course performed no experiments as data sets were provided to them.
- Item analyses (changes in pre to post) and student analyses (mindsets at the ends of the growth-fixed continuum) are planned.

References

Acknowledgments
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