



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

# Students as Key Stakeholders: Exploring Undergraduates' Perceptions of Teaching and Learning in an Introductory Organic Chemistry Course

Ashley J. Welsh, Department of Curriculum & Pedagogy, Faculty of Education  
Jackie Stewart, Department of Chemistry, Faculty of Science

## Background

### Student Learning & Organic Chemistry

Organic chemistry is a *challenging, cumulative* course where students often struggle to develop meaningful learning strategies and easily fall behind (Grove & Bretz, 2012; Lynch & Trujillo, 2010).

Students often lack the metacognitive skills and self-efficacy to effectively monitor, evaluate, and plan their learning (Ambrose et al., 2010; Zhao et al., 2014).

### Purpose & Methods

This poster will examine undergraduate students' perceptions of their learning strategies and experiences in a second year introductory organic chemistry course that encouraged active learning strategies.



Student surveys, classroom observations, and 26 one-on-one interviews revealed a raw and complex array of factors students perceived as influencing their learning in CHEM 233.

### References

- Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., Norman, M. K., & Mayer, R. E. (2010). *How learning works: Seven research-based principles for smart teaching*. San Francisco, CA: John Wiley & Sons, Inc.
- Grove, N. P., & Bretz, S. L. (2012). A continuum of learning: from rote memorization to meaningful learning in organic chemistry. *Chemistry Education Research and Practice*, 13, 201-208.
- Lynch, D. J., & Trujillo, H. (2011). Motivational beliefs and learning strategies in organic chemistry. *International Journal of Science and Mathematics Education*, 9(1351- 1365).
- Zhao, N., Wardeska, J.G., McGuire, S.Y., & Cook, E. (2014). Metacognition: An effective tool to promote success in college science learning. *Journal of College Science Teaching*, 43(4), 48-54.

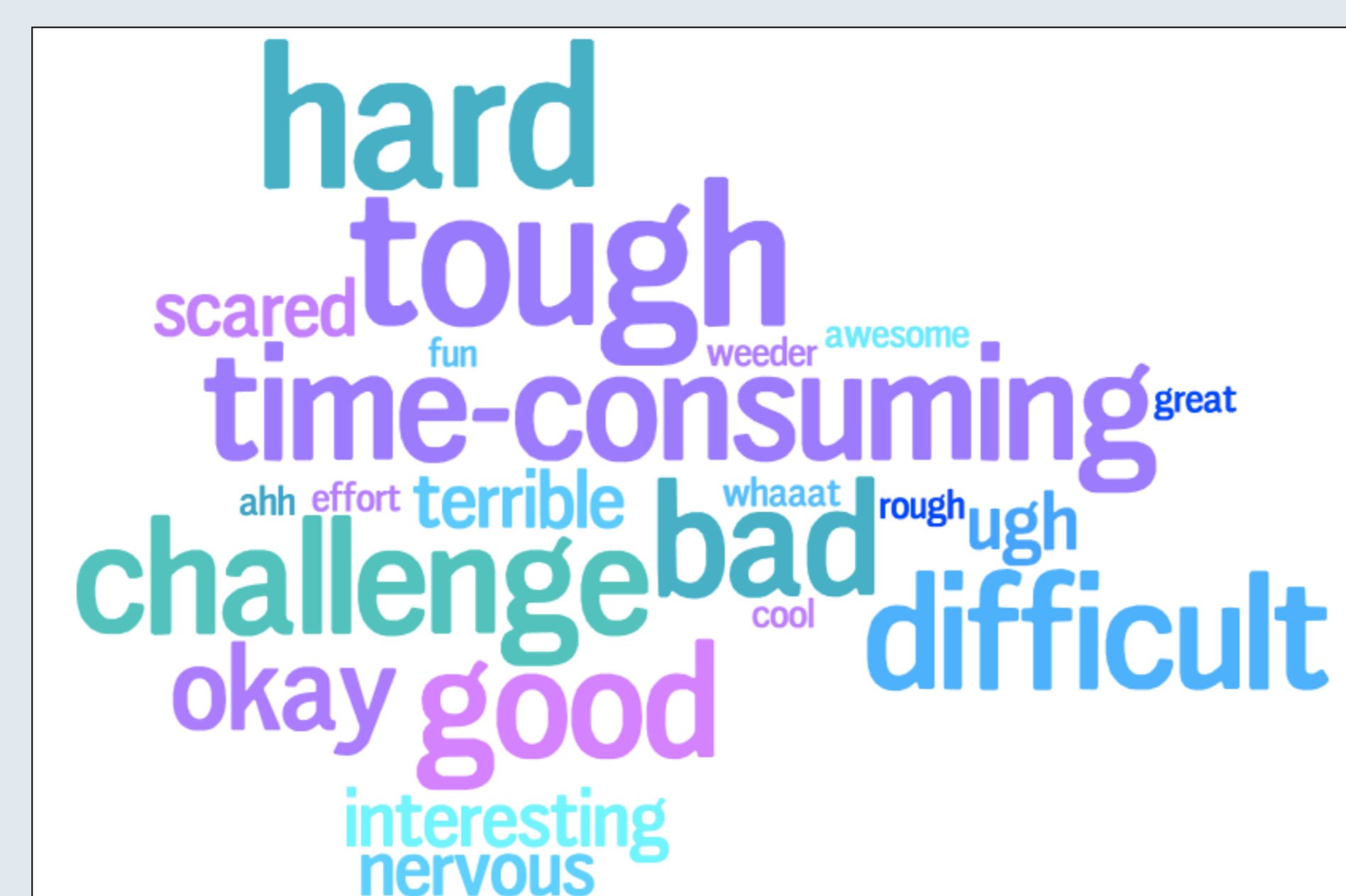
## CHEM 233 @ UBC

### Context

- This study focused on two sections of CHEM 233 (~500 students)
- Majority of students in second year of a biological science degree
- Course recently adopted "flipped classroom" format

Outside of Class	In-class
• Pre-class videos & quizzes	• Group worksheets
• Graded online homework	• Clicker questions
• Ungraded problem sets	• Practice
	• Bi-weekly quizzes

### Students' Descriptions and Sentiments of Organic Chemistry

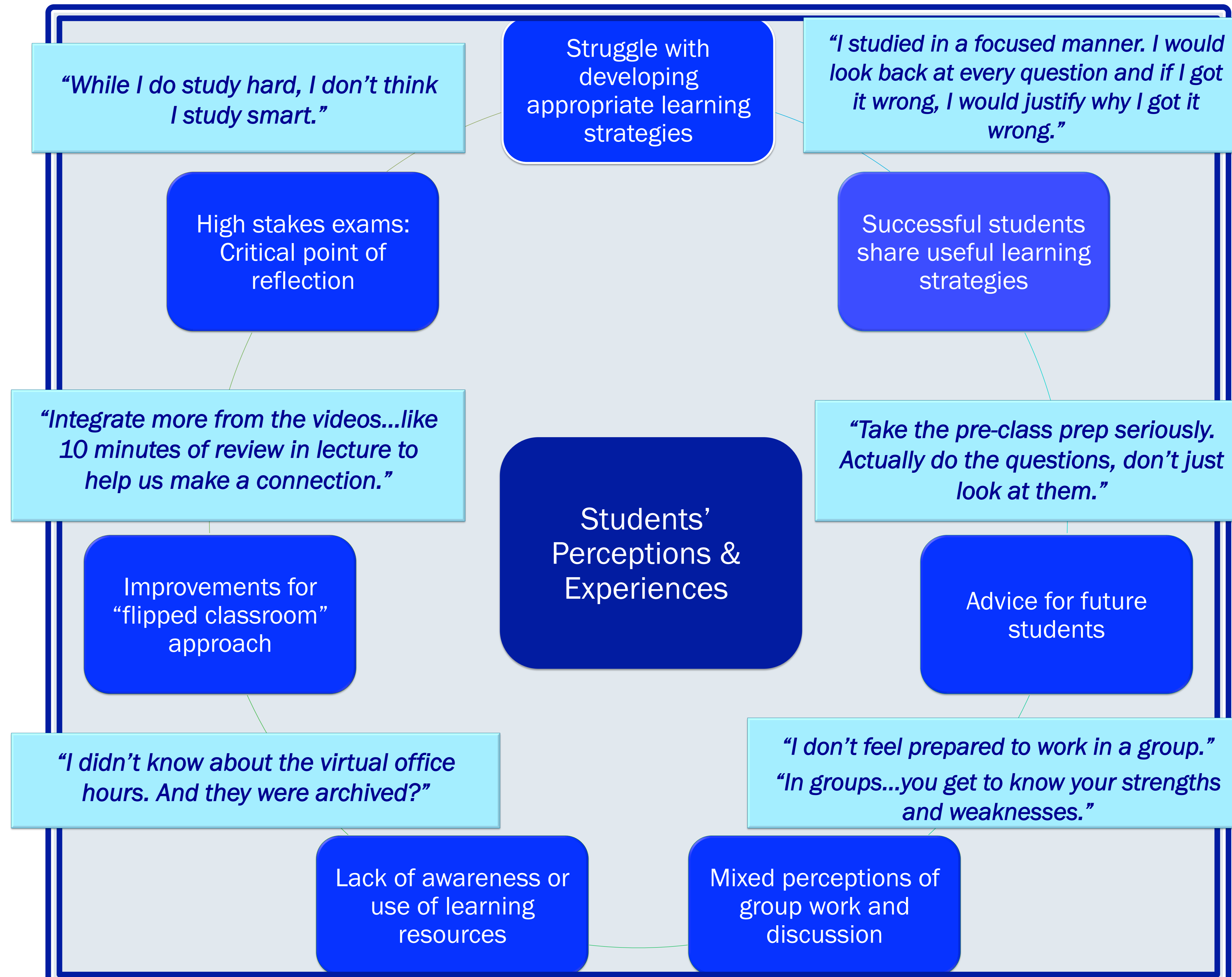


Students' responses to the question: What were/are your impressions of organic chemistry?

### Additional Resources for Students

- Face-to-face and virtual office hours
- Study strategy intervention workshops
- Reaction summary templates
- Online Piazza Forum
- Documents/readings about deliberate practice and effective studying

## Results



## Future Considerations

- The results of this study will be compiled as a report for CHEM 233 faculty, staff and students to outline: how successful students study; students' perceived barriers to learning; students' feedback regarding the course curriculum & pedagogy; and advice for future students.
- Students' perceptions will help faculty and staff to consider how we may refine the course curriculum & pedagogy to best support students' learning strategies and experiences.

**Acknowledgements:** We would like to acknowledge the contributions and feedback from CHEM 233 students and our colleagues who have provided support throughout our research/teaching.