UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

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FYEER
First Year Engineering Education Research Group

Student Communities Can Support Inclusive First-year Engineering Education Research

Context

Funded by the Faculty of Applied Science and Engineering ($35k/yr, 3 years).

Supports 8 undergraduate, 3 graduate students.

Learning is not a linear process.

Referencing Piaget, it builds progressive behaviours which form from accommodations made **due to contradictions** in previous understandings.

FYEER students **use their existing understanding** of First-year Engineering Education.

Conducted using several **collaborative, non-linear, scaffolded** ways to meet at a common node: peer-reviewed publication presented at a Canadian Engineering Education Association Conference.

Key Terms

Structuralism means that there are objective structures, independent of the agents' consciousness and will; human relations constitute a structure (Blackburn, 2008).

Constructivism suggests that learning is an active, contextualized process of constructing knowledge rather than acquiring it.

Nature of the Learner supports the uniqueness of the learner, and encourages, utilizes, and rewards it as an integral part of the learning process.

Importance of **Background and Culture** of the learner, and its affect on social interaction during learning.

Von Glasersfeld (1989) emphasized that **learners construct their own understanding** and that they do not simply mirror and reflect what they read.

By experiencing the successful completion of challenging tasks, learners **gain confidence and motivation** to embark on more complex challenges; zone of proximal development. (Vygotsky, 1978).

References

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Von Glasersfeld, E. (1998). "Cognition, Construction of Knowledge, and Teaching". *Constructivism in Science Education*. Springer, Dordrecht. pp. 11–30.

Vygotsky, L. S.; and Cole, M. (1978). Mind in Society: Development of Higher Psychological Processes. Harvard University Press.

K. Bowyer. (2012). "A Model of Student Workload," *Journal of Higher Education Policy and Management,* vol. 34, no. 3, pp. 239-258.

Q1: "What words describe your mindset about Engineering Education research before you began this work?

Q2: "What words describe your mindset about Engineering Education research now?

Q3: "What words describe the FYEER community?

Q4: "How has the FYEER community helped you in your Engineering Education research?

"Provided many different lenses through which to look at our problems, helped unstick us when we were unsure, and kept us motivated to do the work!"

"Bouncing ideas off each other, support for anything necessary!"

"It was great having a group of like minded individuals to work with, who are just as excited as you are about the future of engineering education. The variety of experiences within the team allowed me to see different perspectives on engineering education and I was able to develop my research and communication skills"