

A Personalized Learning Model for STEM Graduate Education: A Pilot in Chemical Engineering

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Motivation

Most U.S. graduate engineering programs follow a "one-size-fits-all" approach:

- focus on research skills
- slow to incorporate industry trends
- default to training students for careers as university professors
- assume that all students start at the same level of knowledge

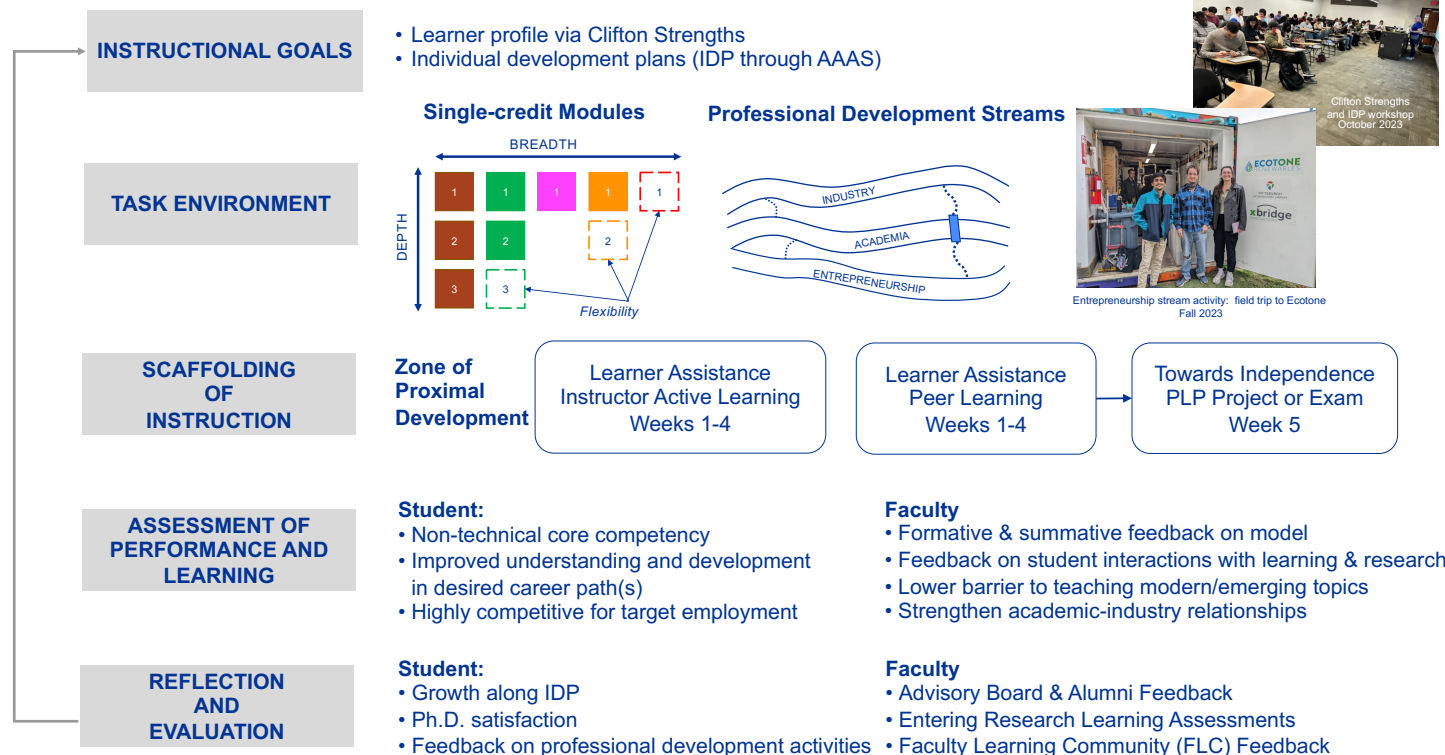
Goal

This innovation in graduate education will:

- (1) break the traditional one-size-fits-all approach to graduate STEM education by creating and validating an integrated personalized learning model (PLM) that is inclusive to all students, and
- (2) propagate this education research into widespread practice by generating the knowledge to extend this innovation to other STEM graduate programs at the University of Pittsburgh and beyond.

The approach is being piloted in Chemical Engineering.

Personalized Learning Model (PLM)



Initial Observations

SMART Goals for IDPs

Specific, Measurable, Achievable, Relevant, Timely

- First year students wrote career, skills development (right) and project management goals with fewer SMART elements

Question: Do first year students need more practice writing SMART goals, or do they need more PhD experiences?

- 9/12 faculty regard this as a valuable experience that helped frame discussions about progress towards goals

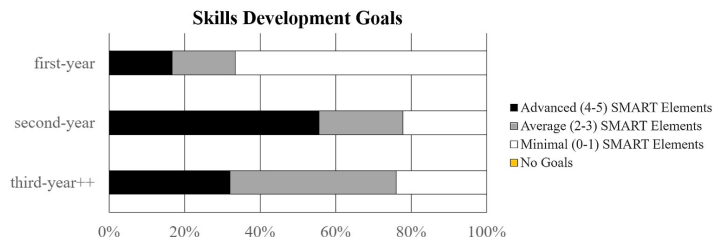


Figure: Distribution of SMART elements within skills development goals comparing first, second and third year PhD students

Current and Future work

- Body of Knowledge development underway with ~30 subject matter experts in academia, industry and entrepreneurship using the software, Group Wisdom.
- Faculty Learning Communities to start summer 2024
- External evaluation ongoing by Quality Evaluation Designs

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