Course-embedded Undergraduate Research Experiences: a 4-year model for closing the performance gap in under-prepared and under-represented groups in STEM fields.

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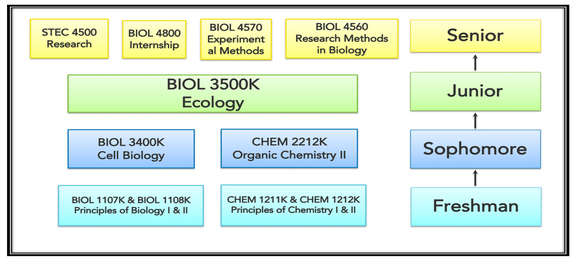
STEM Education Initiative

- **All STEM majors get scaffolded research experiences in each year of a 4-year degree program**

Example 4-year CURE-Course Sequence for General Biology



- **CUREs emphasize development of STEM skills**
- **Competitive mini-grant program to incentivize faculty to redesign courses with CUREs**

Phase 1: Focus on all courses in 4-year sequence

Phase 1 Impact: Fall 2011 to Spring 2017

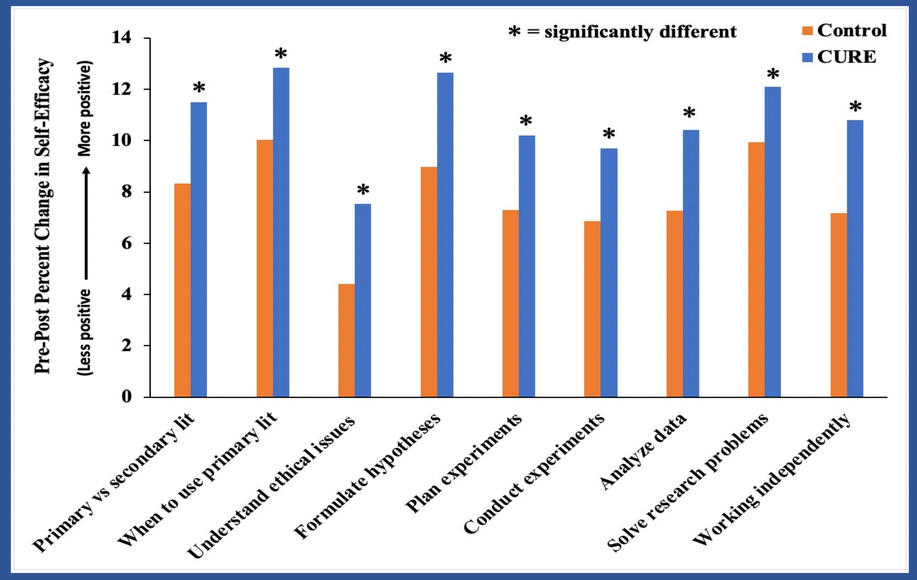
Number of Mini-Grants Funded	**138**
CUREs (Freshmen to Senior level courses)	**87**
Scholarship of Teaching & Learning (SoTL)	**20**
Capstone Undergraduate Research	**28**
Number of courses impacted (duplicated)	**54**
Number of students impacted via CUREs *Unduplicated head count	**12,298***

Phase 2: Focus on Gateway courses only

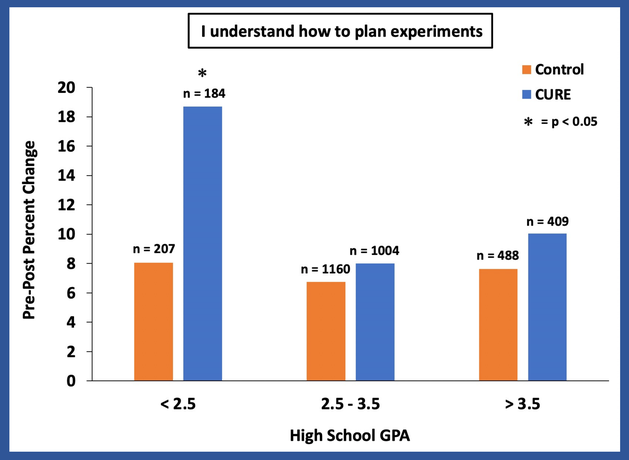
Phase 2 Impact: Fall 2017 to Spring 2020
Data includes only currently funded CUREs

Number of Mini-Grants Funded	**60**
CUREs (Freshmen & Sophomore courses)	**36**
Faculty Learning Communities (FLCs)	**13**
CURE Toolboxes	**11**
Number of courses impacted by CUREs	**26**
Number of students impacted via CUREs *Unduplicated head count	**4,075***

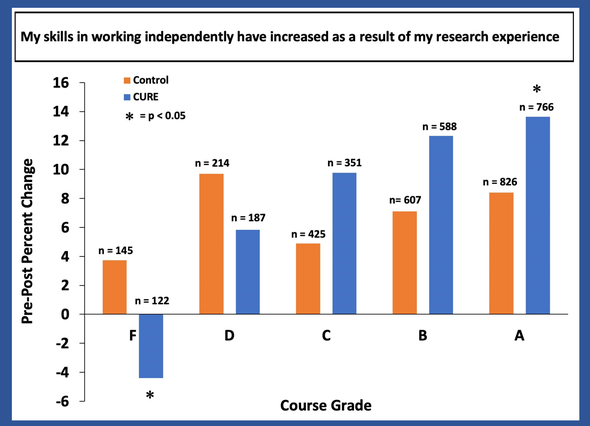
1) Pre/post student attitudinal surveys in **gateway** STEM courses from Spring 2017–Fall 2019 showed **CUREs** led to a significantly **more positive belief** in self-efficacy



2) **Under-prepared** students (<2.5 high school GPA) had a more **positive increase** in their belief in **their ability to plan experiments**



3) Belief in ability to **work independently showed a more positive trend** for students in **CURE** sections that earned a grade of **C or better**



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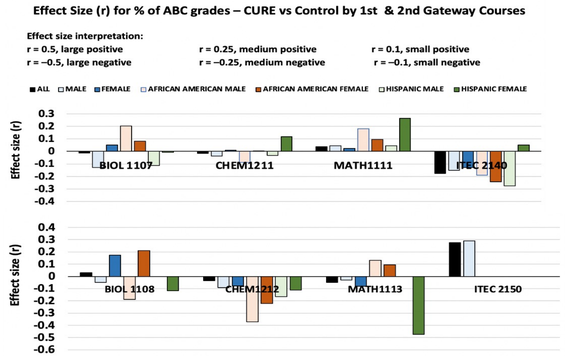
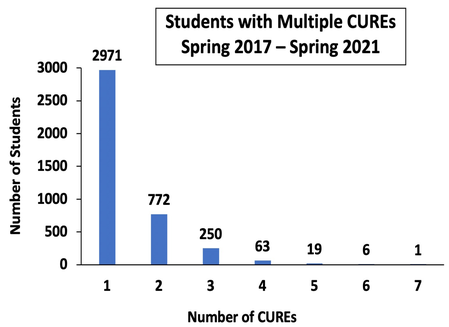
4) CUREs in general **had little effect on ABC/DFW percentages** in gateway courses for any demographic



5) African American students and **Hispanic female** students generally showed **small to medium positive effects of CUREs** on ABC/DFW percentages, **especially for Math**



6) CUREs are **inclusive** and allow for **repeated opportunities** for students to develop STEM skills