



TEXAS TECH UNIVERSITY

Office of the Provost: Division of Undergraduate Education & Student Affairs

Teaching, Learning & Professional Development Center

The Teaching, Learning & Professional Development Center (TLPDC) at Texas Tech University (TTU) has been testing a pilot program called: the **STEM Teaching, Engagement & Pedagogy (STEP) Program** since Fall 2016. To scale up this program as a transferrable model to affect institutional transformation, the TLPDC is partnering with the TTU Office of the President, Office of the Provost, the STEM Center for Outreach, Research & Education (STEM CORE), and the Center for the Integration of STEM Education & Research (CISER). It is our belief that this approach to train and support STEM faculty who adopt and implement empirically validated, evidence-based practices (EBIPs) will emerge as a transferrable model for the institutional transformation of STEM instruction to improve undergraduate student persistence and achievement in STEM. Positioning STEP within the TLPDC highlights the effectiveness of building on existing Center for Teaching and Learning (CTL) networks and utilizing the institution's key resources by taking advantage of professional development events and programs already hosted by the center. The goals of this project are to:

1. Scale and test the STEP Program as a model to accelerate institutional transformation of student-centered STEM instruction.
2. Assess the quantitative and qualitative implementation of EBIPs among STEP Faculty Fellows through qualitative feedback and validated quantitative measures, such as *Instructional Diagnoses (ID)* and *Classroom Observation Protocol for Undergraduate STEM (COPUS)*.
3. Promote student success through implementation of the *Transparency in Learning and Teaching (TILT)* model into the STEP Program curriculum.
4. Educate STEM undergraduates on the practice and importance of EBIPs and follow these students to gather data on course selection, program of study and persistence to graduation.
5. Quantitatively determine STEM student achievement and persistence through institutional data collection and assess student perceptions of faculty EBIPs implementation.

In the first two years, the TLPDC-funded STEP Program accepted 16 STEM Faculty Fellows and 16 Faculty Pedagogical Specialists. We plan an increase to the total, annual cohort from 16 to a maximum of 36 participants each year, over the next five years. Over 3000 undergraduates were enrolled in courses from the sixteen faculty-member cohort in the STEP Program's 2016-2017 pilot year. Each STEP fellow reported implementation of at least one active learning strategy and most fellows fully integrated EBIPs. First year data analysis and student evaluations, identified that the average increase in student perception of instructor effectiveness pre/post-STEP was 6.5%. The other compelling effect of the STEP Program is with regard to distribution of grades with an average 8.2% increase in the number of As after the STEP experience. It is estimated that greater than one-third of STEM faculty and an additional 500 instructional faculty will be directly impacted by the STEP Program over the next five years. Thus, it is estimated that the STEP Program will have established *at least* one point person within each of the 30 STEM departments within 1-2 years.

As the developmental phase of the STEP program model progresses, program administrators will continue to assess the existing framework. In the near future, TTU will begin plans to host a national STEM Summit, as well as, create a digital hub to share program data, provide design and cost analyses to organizations that include, but are not limited to: Network of STEM Education Centers, Professional Organizational Development, Gordon Research Conferences and Discipline-based Education Research groups. We look forward to sharing a scalable model that is transforming STEM education at Texas Tech and will help other institutions do the same.