# Peer-Led Team Learning in Precalculus



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**UTEP** Campus

#### Overview

- A Personal Note
- UTEP Profile
- Peer Leaders in Pre-Calculus
- Peer Leader Training

### **Studying Mathematics**

Freshman in 1974:

 Both Analysis and Linear Algebra were taught using (undergraduate) peer leaders

Junior in 1976:

 Peer leader for *Analysis* (4 hours per week)



University of Bielefeld (Germany)



### Students in Science and Engineering at UTEP

Engineering:	3,149
Science:	<u>2,601</u>
Total:	5,750

**Total at UTEP:** (UG 84%, GR 16%)

22,600





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THE UNIVERSITY OF TEXAS AT EL PASO

#### **UTEP Student Population Profile**

- 24 years of age (undergraduate average)
- 77% Hispanic
- 54% female
- 84% from El Paso County commuting daily
- 63% full-time students
- 84% employed
- 50% first generation university students





#### UTEP's Main Challenges

- Incoming students are not well-prepared for studying STEM disciplines
- Low retention rates
- Low graduation rates
- Long time to graduation



#### **Precalculus Setup**

- UTEP has **no** College Algebra course.
  - Non-Stem majors take the *Mathematics for Social Science* course or the terminal course *Mathematics in the Modern World*.
- STEM majors take a 5-hour Precalculus course.
  - The course is a combination of College Algebra and Trigonometry.
- The Precalculus course is offered in four formats:
  - Four hours lecture plus two hours PLTL (about 50 students) [450-750 students total]
  - 2. Five hours lecture (evening classes, about 50 students) [100]
  - 3. Online (using ALEKS, large class-size) [100-300]
  - 4. Engineering learning community sections (with a peer leader, class size about 30 students) [75]



#### Peer-Led Team Learning at UTEP

- Supported by an NSF-STEP Grant\*
- Used in all introductory Chemistry, Physics and Mathematics classes
- Delivery format in Precalculus since Fall 2008 changed to four hours of lecture and two hours of PLTL sessions per week
- PLTL sessions (3 sections per course, 15-17 students per session) led by an advanced undergraduate student

\* PI: James Becvar, Co-PIs:, Benjamin Flores , Helmut Knaust, Jorge Lopez, and Josefina Tinajero

#### **PLTL** Principles

- PLTL leaders have successfully completed the course.
- PLTL leaders work closely with the instructor of the course.
- PLTL leaders are trained and supervised before and during the semester.
- The PLTL sessions are integral to the course, cover challenging problems, strive to develop student thinking and encourage active student learning.





### Why Peer Leaders?

- Team Learning is student centered.
- Peer leaders are approachable.
- Peer leaders act as role models.
- Peer leaders are highly likely to attend graduate school and/or choose a teaching profession.

"Peer leaders don't teach, but help the students learn."



### **Selection Procedure**

- Selection Process
  - Minimum GPA requirement
  - Application Form
  - Interview
- Selection Criteria
  - Leadership Potential
  - Mathematical Competency



# Peer Leader Training

- Before the semester About six hours
  - Difference between learning and teaching Mathematics
    - College readiness
    - What is good teaching in a Mathematics classroom? (Internet videos)
    - The role of definitions in Mathematics
    - Questions in the Mathematics classroom
    - Bloom's Taxonomy
    - What works? What doesn't? (Lessons learned)
    - "Nuts and bolts" of being a peer leader



# Peer Leader Training

- During the semester
  - Peer leaders meet with the course instructor one hour per week.
  - Peer leaders meet as a group with the supervisor about once every two weeks.
    - Cookies or chips
    - Troubleshooting
    - Enrichment (Logarithmic tables, trigonometry and complex numbers, etc.)

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