University of Texas at El Paso

Integrated Science, Teaching, and Retention (I STAR) Project

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Peer-Led Team Learning for Precalculus

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Overview

- Introduction
- Summer Activities: Accuplacer
- Precalculus at UTEP
- Modular Course Delivery
- Peer-Led Team Learning in Precalculus
- Challenges

UTEP Main challenges

- Incoming students not well prepared for the study of STEM disciplines
- Low retention rates
- Low graduation rates
- Long time to graduation



Summer intervention: Math review

- Students take a Mathematics placement examination ("Accuplacer") before coming to summer orientation.
- During summer orientation students participate in a six hour "Math Review" where:
 - Students solve practice problems in small groups.
 - Sessions are led by advanced undergraduates.
- Students then retake the placement test at the end of orientation.

Summer invention: Math review for STEM students



Precalculus Set-up I

- 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.
 - Content: Functions and their graphical representation; polynomial and rational, exponential and logarithmic, trigonometric functions.

Precalculus Set-up II



- The Precalculcus course (and the Calculus I course) is offered in a **modular format** in classes of about 50 students.
- Since Fall 2008 the Precalculus course incorporates **Peer-Led Team Learning (PLTL)**.

Modular delivery for Precalculus I

- Designed by long-time course coordinator Nancy Marcus.
- The semester is divided in three time segments. The course is divided into three modules.
- When students complete a module in a time segment successfully, they move on to the next module (or Calculus I).
- When students successfully complete all three modules, they pass the course. The course grade is the average of the grade in each of the three successfully completed modules.

Modular delivery format for Precalculus II

- Students can attempt each module three times. When they fail a particular module for the third time, they fail the course.
- Students who do not complete the course in one semester, must register for the course again next semester to complete the remaining module(s). They are assigned an "in-progress" grade (P) for the past semester.
- Students can also "test-out" of modules, especially in between semesters.



Modular delivery format for Precalculus



This semester: Spring 2009

- About 600 students enrolled in Precalculus
- 12 daytime sections = 12 instructors and 12 peer leaders (+2 evening sections: no modularization, no PLTL)
- Students attend the instructor's lecture 4 hours per week, and attend PLTL sessions 2 hours per week.





This semester: Spring 2009





Sessions are following the PLTL principles

- \checkmark 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.

PLTL in Precalculus

- Peer leaders major mostly in mathematics and engineering.
- Each peer leader is assigned to one instructor.
- The instructor and the peer leader decide on the content of the PLTL sessions.
- The PLTL coordinator coordinates activities and is responsible for the training of the peer leaders.
- Peer leaders have a shared office in the *Math Resource Center for Students (MaRCS)* housed in the Library.

A peer leader's work week

TOTAL	19	hours
Preparation, training, etc.	4	hours
Meeting with instructor	1	hours
Office hours	4	hours
PLTL sessions	6	hours
Attending lectures	4	hours



Challenge I: Hiring

SPRING 2009 BLOCK 2 (Afternoon)						
HOURS	MON	TUE	WED	THU	FRI	
10:30						
11:00						
11:30						
12:00				2 COURSE 12:00-13:20		
12:30	1 COURSE 12:30-13:20	2 COURSE 12:00-13:20	3 LAB		3 LAB 12:30-13:20	
13:00			12:30-13:20			
13:30			4 LAB		4 LAB	
14:00			13:30-14:20		13:30-14:20	
14:30			5 LAB		5 LAB	
15:00			14:30-15:20		14:30-15:20	
15:30						
16:00						

Being a peer leader takes a considerable fixed chunk out of a student's time.

Challenge II: Faculty buy-in

Q: "Why do you replace qualified instructors by unqualified instructors?"

A: "Peer leaders do not teach they facilitate student learning!"



Challenge III: Student salaries



- Current pay for peer leaders: \$7.50 per hour.
- Minimum wage (currently \$6.55) will increase to \$7.25 on July 24, 2009.

All Questions Answered,

All Answers Questioned*



* Borrowed from Donald Knuth



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