ALAMO COLLEGES
SAN ANTONIO COLLEGE

San Antonio College

Presentation to the
National Engineering Math Consortium
2nd Annual Meeting – 22 Jun 2010

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SAC Background

(Fall, 2009 figures except where indicated)

- Founded in 1925
- Largest single-campus community/technical college in TX
- One of five community colleges in Alamo Colleges
- Student Enrollment: 24,135 (63% part time)
- Student Demographics: 58% female; 42% male
  - Ethnicity: Hispanic: 48% White: 44%
    Black or "Other": 8%
  - First generation in college: 59 % (fall, 2008)
  - 93% of freshmen academically disadvantaged (spring, 2009)
  - 58% economically disadvantaged (spring, 2009)
  - 46% receive financial aid (fall, 2008)
  - 40% work full time; 31% work part time (fall, 2008)

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Engineering Program

- Engineering Majors: 508 (fall, 2009)
  - 252 Engineering freshmen
    - **103 Engineering freshmen (41%) enrolled in remedial math**
- SAC offers Associate of Science in Engineering (ASE)
  - Requires 65 credit hours of college level courses
  - Requires math up through Calculus II
- SAC engineering course transfer agreements with 4-year institutions
  - Examples: UTSA, St Mary's University, Texas A&M

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Initiative to Align Texas Engineering Curriculum

- Tuning Oversight Council for Engineering
  - Initiative chaired by Texas Higher Education Coordinating Board
    - Representatives from 28 Texas 2 and 4-year institutions
    - SAC is active participant
  - Goal: standardize engineering student learning outcomes and competencies for engineering degree programs at Texas 2 and 4-year institutions to improve transferability of courses between schools
  - Mechanical, electrical, chemical, and industrial engineering transfer compacts being developed
    - ME compact in final form
  - Engineering math course not currently part of discussions

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Motivation for NSF CCLI Phase 3

- Allow engineering students to enroll in select engineering and physics courses prior to completing required math sequence/prerequisite
- Increase interest/motivation of engineering students
- Increase retention in Engineering Program
- Improve performance in Math & Engineering Courses
- Increase Associate of Science in Engineering completion rate

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1st Year Activities (8/08 – 8/09)

- WSU course materials used with some revisions
  - Revised Lab Manual to use Excel vs. MATLAB for tables/graphs
  - Course notes based on UTSA's typed version done in Excel
- Marketed course using flyers, website, student counselors, word-of-mouth, and instructors
- Initial course offering in spring, 2009
  - ENGR 1377 – *Introductory Math for Engineering Applications*
  - Taught by adjunct faculty (engineering/math instructor)
  - Math prerequisite waived
  - Five students (2 completed/passed course; 3 dropped)

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2nd Year Activities (8/09 – 8/10)

- Offered course in fall, 2009 and spring, 2010
  - Math 0303 (intermediate algebra) prerequisite
  - Opened up to students at other community colleges in the Alamo Colleges system (none enrolled)
  - Low student enrollment continued – 4 students/class
    - Not an approved, for credit course
    - Not transferable to any 4-year institution
    - Cannot substitute for math prerequisites in physics or engineering courses
  - Fall, 2009: one completed (failed); 3 dropped
  - Spring, 2010: one completed (passed); 3 dropped

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Course Results – 3 Semesters

Semester	Students Initially Enrolled	Students Completing Course	Students Passing Course (Grades)
Spring, 2009	5	2	2 (B and C)
Fall, 2009	4	1	0
Spring, 2010	4	1	1 (A)
Totals:	13	4	3 (A, B, C)

- 9 of 13 (69%) dropped
  - Inadequate time to devote to challenging course or too "weak" in math
  - Free, noncredit course, not required for degree – no "penalty" for dropping
- 3 of 4 (75%) who completed course passed
  - Strong, positive survey feedback from students that completed course
    - Course was very valuable
    - Increased ability to use math to solve engineering and physics problems
    - Increased motivation to study math and engineering
    - Hands-on labs favorite part of course
  - Math placement test score increase (pre to post course) significant in 1 case

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2nd Year Activities (8/09 – 8/10)

- Revision of course materials continues
  - PDF files converted to Excel or Word (labs, homework)
  - Hand drawn figures converted to graphics (ongoing)
  - Increased number of tests from 2 to 4 (2 sections/test)
  - Revising some labs using Univ. of Toledo procedures
  - Additional equipment and supplies purchased for labs
- Hired Teaching Assistant/Tutor in April, 2010
  - Lab and Recitation assistant
  - Implementing revisions to course documents

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2nd Year Activities (8/09 – 8/10)

- Requested articulation/transfer agreements from Texas 4-year institutions in May, 2010
  - TAMUK course transfer support letter received 14 Jun 10
    - Accepts SAC's ENGR 1377, *Introductory Math for Engineering Applications*, as substitute for **proposed** TAMUK GEEN 12xx, *Engineering Mathematics Laboratory*
  - UTEP course transfer support letter received 18 Jun 10
    - Accepts SAC's ENGR 1377, *Introductory Math for Engineering Applications*, as substitute for UTEP UNIV 1301, *Seminar in Critical Enquiry – Foundations of Engineering*
  - UTSA coordination ongoing

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3rd Year Activities (8/10 – 8/11)

- Finalize articulation/transfer agreements with 4-year Texas institutions by Sep, 2010
- Obtain SAC Curriculum Committee approval to offer course for credit in spring, 2010
- Promulgate engineering math course at other Alamo (Community) Colleges with engineering programs
  - Palo Alto and Northwest Vista Colleges
- Coordinate with Alamo Colleges to allow engineering math course to substitute for math prerequisites in select physics & engineering courses
- Change math prerequisite to college algebra (consider waivers)
  - Should increase course completion rate, but could decrease enrollment
  - Weak math abilities of incoming students is systemic problem
- Assess program metrics at other institutions for use at SAC

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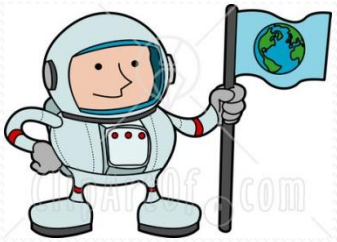
Summary

- Strong advocacy of program at SAC continues
- Student feedback of course benefits encouraging
  - Small sample size to date
- Low enrollment & course completion rates disappointing
  - No significant improvement expected until course is transferable to 4-year universities and is approved for credit
- **Success of program at SAC is contingent on course transferability**



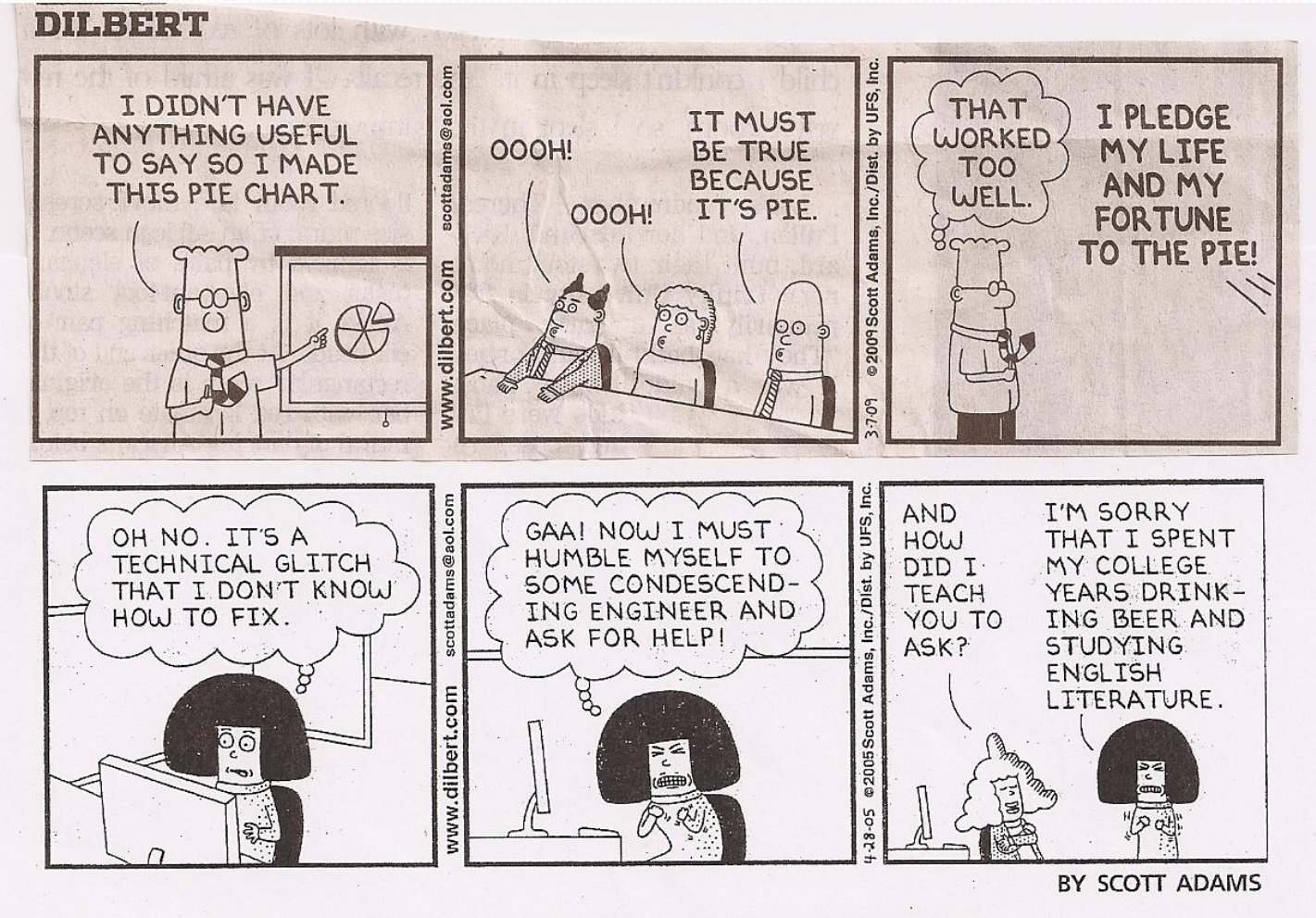
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Questions?


DILBERT
I DIDN'T HAVE ANYTHING USEFUL TO SAY SO I MADE THIS PIE CHART.
OOOH!
OOOH!
IT MUST BE TRUE BECAUSE IT'S PIE.
THAT WORKED TOO WELL.
I PLEDGE MY LIFE AND MY FORTUNE TO THE PIE!
OH NO. IT'S A TECHNICAL GLITCH THAT I DON'T KNOW HOW TO FIX.
GAA! NOW I MUST HUMBLE MYSELF TO SOME CONDESCENDING ENGINEER AND ASK FOR HELP!
AND HOW DID I TEACH YOU TO ASK?
I'M SORRY THAT I SPENT MY COLLEGE YEARS DRINKING BEER AND STUDYING ENGLISH LITERATURE.
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