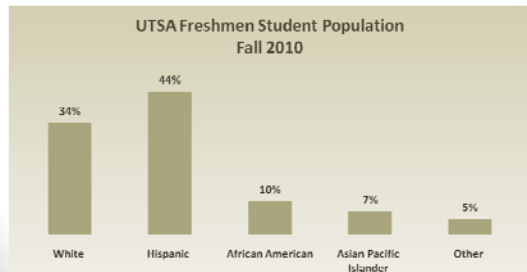


# Assessing Quantitative Reasoning: What do Freshmen Know?

## Outline

- The University of Texas at San Antonio (UTSA) has developed a plan to enhance student learning.
- The program is "Quantitative Scholarship: From Literacy to Mastery".
- The goals of the program are to increase the quantitative reasoning and communication skills of the undergraduate student population.
- These skills will be integrated into courses in the general education curriculum.
- To assess the effectiveness of the program, a test was designed to measure baseline QR skills.
- This talk presents an overview of the program, the test, and student performance.

The University of Texas at San Antonio  
 UTSA student population approximately 30,000  
 Fall 2010 Freshmen Class about 5,000  
 Large number of historically underserved students (first generation college student)



National Data: In 2006, the American Institutes for Research (AIR) published a report based on the National Survey of America's college Students (NSACS).

Key findings from the AIR study revealed that college students struggled most with quantitative literacy. The study found that 20% of U.S. college students completing four-year degrees, and 30% of students earning two-year degrees possessed only basic quantitative literacy skills.

UTSA has Developed a Comprehensive Plan to Integrate Quantitative Reasoning Across the Core Curriculum

- Eight Q-courses are selected for the first phase of the plan
- |              |                      |
|--------------|----------------------|
| Anthropology | Contemporary Biology |
| Archeology   | Geology              |
| Astronomy    | Economics            |
| Biosciences  | Sociology            |

The Fall 2011 Semester Will Impact Over 4,000 Students and 60 Course Sections

The Instrument:

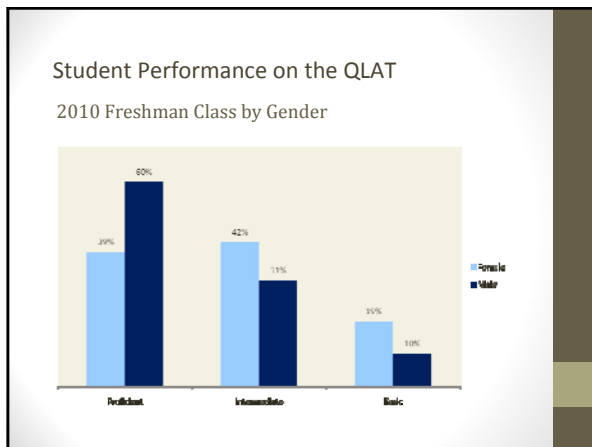
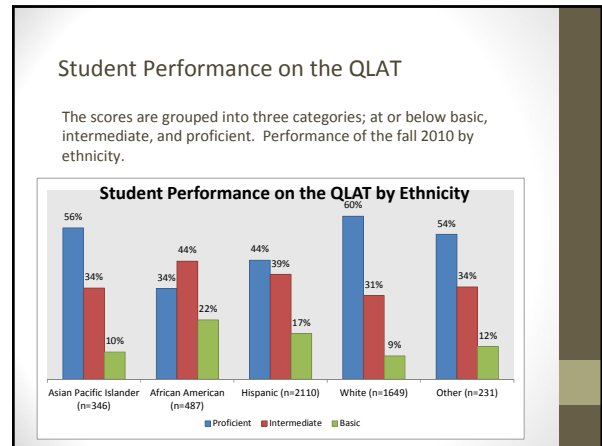
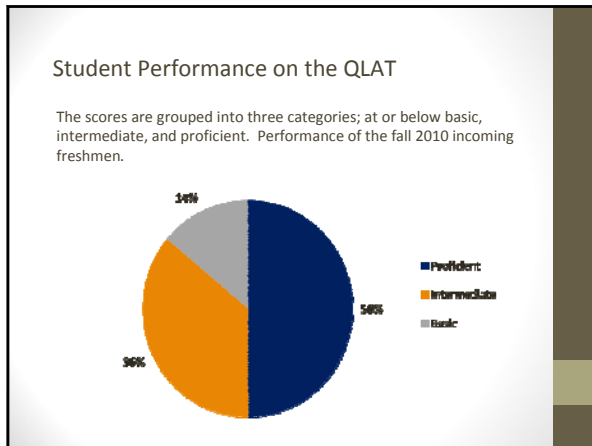
### Quantitative Literacy Assessment Test (QLAT)

Developed to assess the baseline quantitative literacy levels of incoming freshmen.

- Administered during freshmen orientation
- 20 questions / 30 minute test
- Assesses student learning outcomes

### EVALUATE

Reading and interpreting graphs and charts, calculating simple probabilities, means and variances, and understanding basic ideas of sampling and bias



### Results

Principal Component and Factor Analyses were run on the test data. Composite scores were created based on the specific learning outcome tested.

Factor Analysis showed one dominant factor, indicating a measure of "overall quantitative ability".

A second factor contrasted performance on the visualize dimension (graphs, charts) to performance on the other three outcomes.

### Results of the Instrument

Students scored well on questions that required direct calculations, reading numbers of charts.

However, performance on items that required students to compare two sets of data or two graphs was poor.

Students struggled with items that required them to read and critically evaluate statements about data

The results from the instrument will provide item level data which will allow for longitudinal assessment during the student's program of study.

### Why Integrate QR Skills in the Core Curriculum?

- Research show students retain well when it is taught in context
- Repeated learning is achieved through integrating QR in multiple courses

#### Longitudinal Data Analysis

- Assessment data will be collected from the different courses
- Data will be collected at the learning outcome level for each student
- The data will be analyzed to measure improvement relative to the baseline.

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Questions?