Mar 9th, 3:00 PM - 3:20 PM

# Assessing the Impact of Tutorial Services

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Georgia Scholarship of STEM Teaching & Learning Conference

March 9, 2012

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# Purpose

**Goal:** Document the impact of tutoring on student success

**Challenges**
- Documenting visits appropriately
- Intangible factors
- Selection biases
  - At risk of failure
  - Over achievers

# Background

## MSLC sign-in



### Data pulled from Banner

Demographic data

Course grade information

## Data students provide

- Name
- ID #
- Reason
- Informed consent

# Reports Produced

## Usage report

- Produced any time
- Match schedule with demand
- Number of visits
- Reasons for visits
- Courses enrolled in that term
- Demographic data

## Summary report

- After term completion
- Total # visits logged
- Course grades earned
- GPA

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# Our Model

## Concordance tables

- Convert SAT, ACT scores
- Range 0-30
- Developed at Fairmont University
- Research at CSU on correlation

http://www.fairmontstate.edu/gearup/students/testprep/acttosat

## Segment into quartiles

- 0-17
- 18-20
- 21-23
- 24-30

*Quartiles are based on score distribution in the student body: ~25% of the students at CSU are in each quartile.*

# Courses Counted in the Study

**Astronomy**:  Descriptive

**Biology**:  Contemporary Issues, Principles

**Chemistry**:  Survey, Principles

**Environmental Studies**

**Geology**:  Natural Disasters, Weather, Phys. Geol., Hist. Geol., Fossil Record

**Math**:  Modeling, Coll. Alg., Pre-calc, Applied Calc, Calc, Lin. Alg., _and_ remedial math courses

**Physics**:  Intro., Principles, Color & Sound

**Statistics**:  Intro.

**Not labs**

# Treatment of Course Grades

**Productive**:  A, B, C, D

**Non-productive**:  F, WF

**Excluded**:  W

# Categorizing MSLC Visitors

**Visitor**:  Tutoring, quiet place to study, computers, other

**Courses served**

**Example**:  Taking ENGL 1102, HIST 2111, MATH 1113, CHEM 1211, CHEM 1211L, PHYS 1111

- Tutored in MATH 1113
- Quiet place to study CHEM 1211

# Findings:  Productivity by Visitor Status

| Adj. Test Score | Non-Visitors | Visitors | Chi-Statistics |
|---|---|---|---|
| 0-17 | 606 | 235 | 5.96 |
| 18-20 | 905 | 278 | 8.67 |
| 21-23 | 1229 | 267 | 9.53 |
| 24-30 | 1119 | 164 | 4.15 |
| TOTAL | 3895 | 944 | 14.72 |

Each chi-square statistic is significant at the $p < 0.05$ level.

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# Findings:  Grade Dist, Courses Served

| Grade | A | B | C | D | F, WF |
|---|---|---|---|---|---|
| Observed proportions | 17% | 20% | 28% | 19% | 17% |
| Expected proportions | 22% | 26% | 23% | 12% | 17% |
| Contrib. to statistic | 6.13 | 5.76 | 4.10 | 18.15 | 0.02 |

Chi-sqare statistic:  34.16
Significant at the $p < 0.001$ level

# The trend persists with black students

| Grade | A | B | C | D | F, WF |
|-------|-----|-----|-----|-----|-------|
| Observed proportions | 9% | 18% | 31% | 18% | 20% |
| Expected proportions | 10% | 21% | 25% | 15% | 25% |
| Contrib. to statistic | 0.30 | 1.63 | 2.97 | 2.41 | 1.83 |

Chi-sqare statistic: 9.14
Significant at the $p < 0.01$ level

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# Why we suspect linear based regression isn't appropriate

Non-uniform affects due to selection biases

- Over achievers – little gain from tutoring
- Those imperiled, who may include
  - Students with abnormally large gains because they start with a deficit
  - Students with insufficient backgrounds coming into their courses, who may gain a lot, but not enough to reflect in the course grade

# Comments and Suggestions?

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