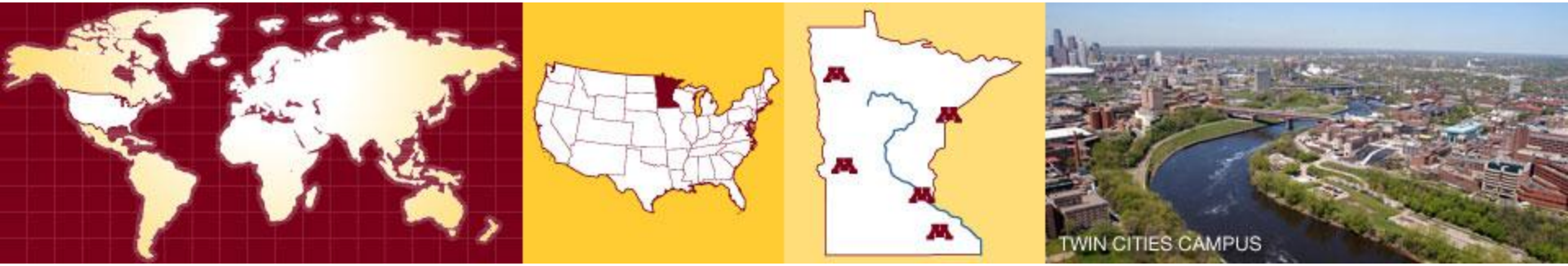
# LSC Webinar:

## The University of Minnesota Experience with Active Learning Classrooms




## Presenters:

**Jeremy Todd**, Director, Office of Classroom Management

**J.D. Walker**, Manager, Research and Evaluation, Office of Information Technology

**Robin Wright**, Associate Dean, Department of Genetics, Cell Biology and Development

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# STSS

47percent

33percent

17classrooms

10ALCs

1639students

Classroom

115000GSF

Active

Learning

# Prototype Classroom Development

- What prompted the UMN to explore this specific alternative style of classroom?

**Review of inventory**

**Feedback from faculty and students**

**Benchmarking:**

**SCALE-UP, NCSU**
**TEAL, MIT**

# LSR Comparison Studies: Summary

**Controlled studies have shown that new learning spaces:**

- Help students to outperform final grade expectations.
- Affect teaching-learning activities, even when the instructor attempts to hold these activities constant
- Do not conduce to a lecture-based approach; student performance improves when instructors move to active, student-centered teaching methods.

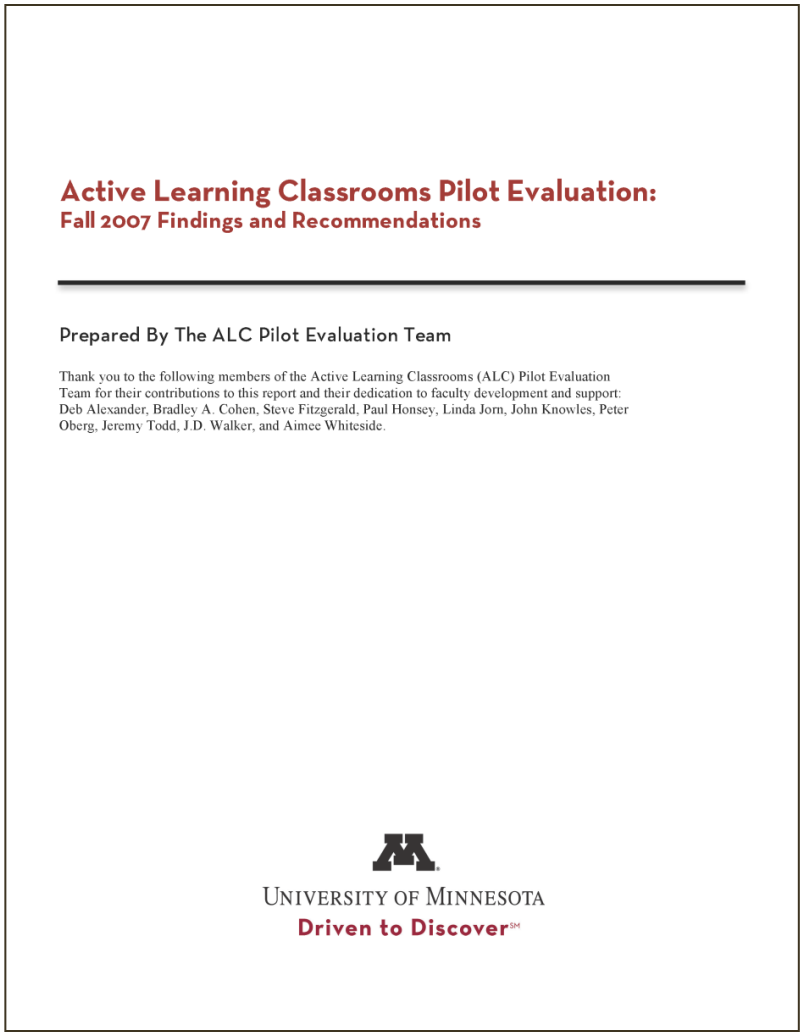
# Active Learning Classroom

## Pilot Initiative

- Student-centered, flexible, innovative design
- Observation, evaluation and research of space

# Prototype Classroom Evaluation

- Academic & Administrative ALC coordination
- Instructor and student expectations in ALCs
- Faculty development and support services for pedagogical and technical support and technology needs



**Active Learning Classrooms Pilot Evaluation:**
**Fall 2007 Findings and Recommendations**

Prepared By The ALC Pilot Evaluation Team

Thank you to the following members of the Active Learning Classrooms (ALC) Pilot Evaluation Team for their contributions to this report and their dedication to faculty development and support: Deb Alexander, Bradley A. Cohen, Steve Fitzgerald, Paul Honsey, Linda Jorn, John Knowles, Peter Oberg, Jeremy Todd, J.D. Walker, and Aimee Whiteside.

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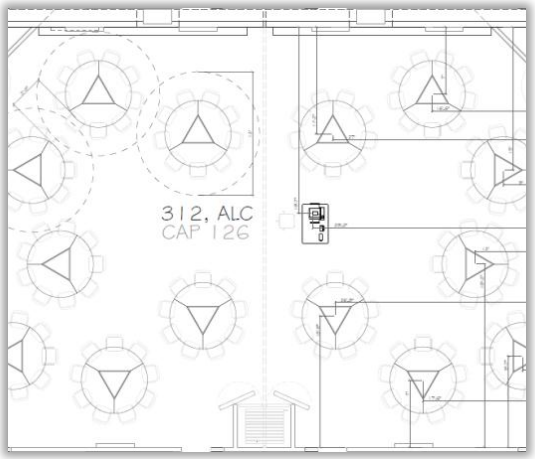
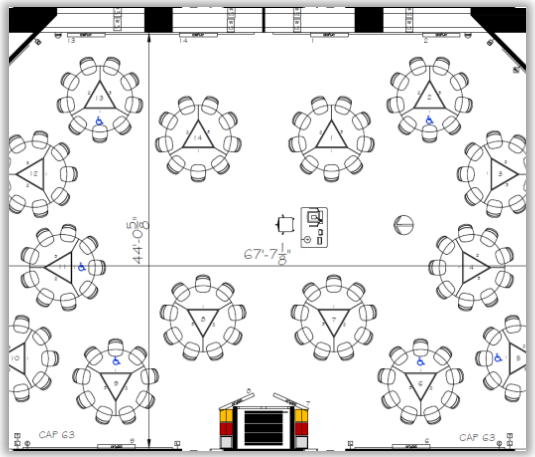
# ALC physical space

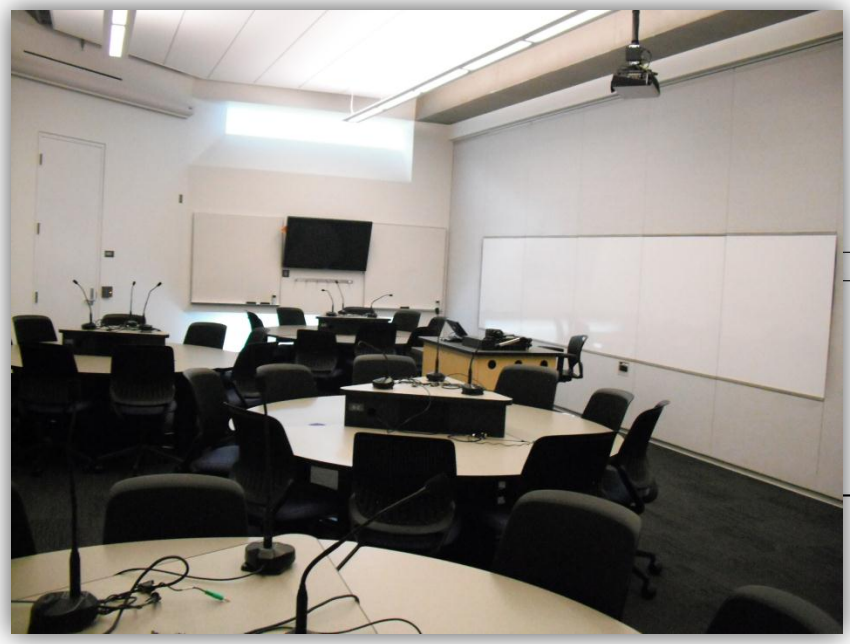
- Room, furniture and group size
  - Room: 2800ASF, 126 students = 22-23ASF/student
  - Furniture shape and size?

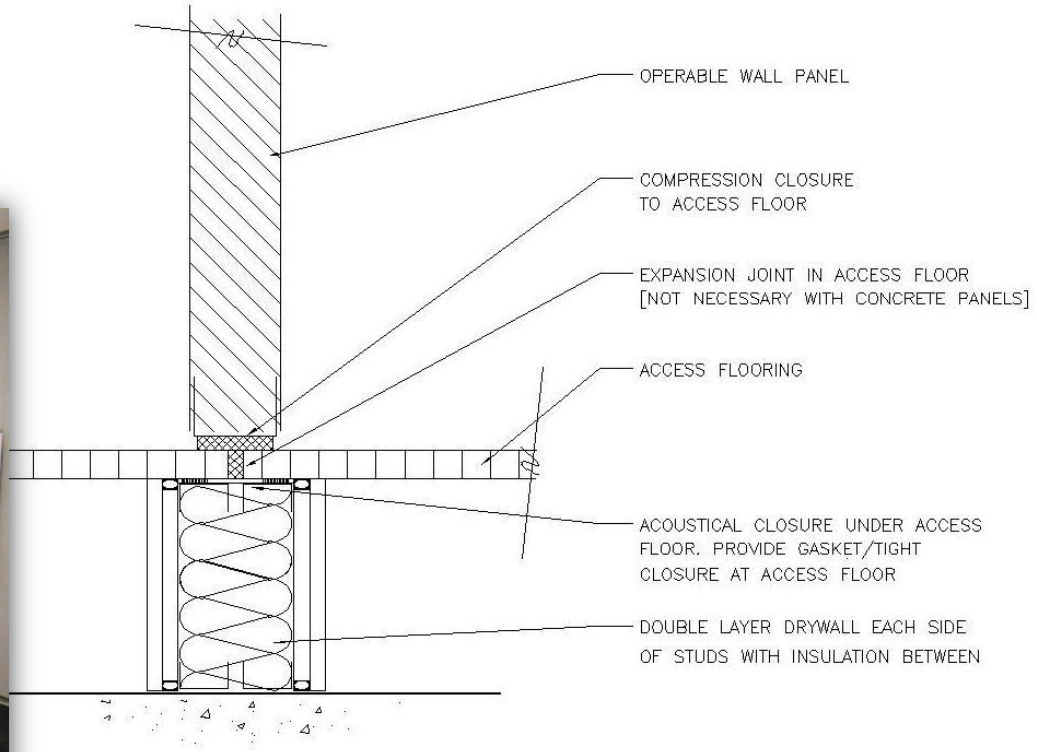



# STSS Acoustics

- Acoustical isolation maintained while using raised floors and operable partitions
- Provides enhanced:
  - Flexibility
  - Privacy





# Teaching & Technology in ALC

- Physical classroom setting: ALC vs. traditional
- Student collaboration using technology to collect and analyze information on demand
- Audio/video to further the shared learning process

# Questions?

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# *The Impact of Space: New Empirical Research in Active Learning Classrooms*

***J.D. Walker, Ph.D.***
*Research Fellow*
*Office of Information Technology*

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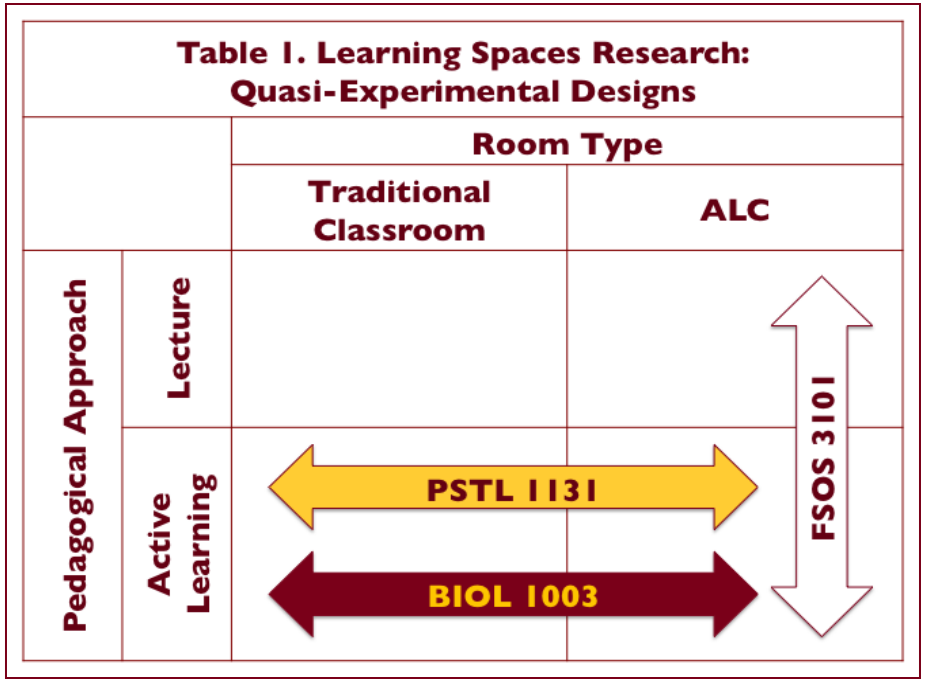
# Learning Spaces Research (LSR): Pilot Phase

- Began in fall 2007, OIT & OCM
- **Methods:** Interviews, surveys of instructors and students using Active Learning Classrooms (ALCs)
- N = 169

*Active Learning Classroom at the U of M (BioSci 64)*

# LSR: Comparison Studies

- Traditional classroom vs ALC
  - Post-Secondary Teaching & Learning 1131
  - Biology 1003
- ALC vs ALC: Adapting instruction
  - Family Social Science 3101

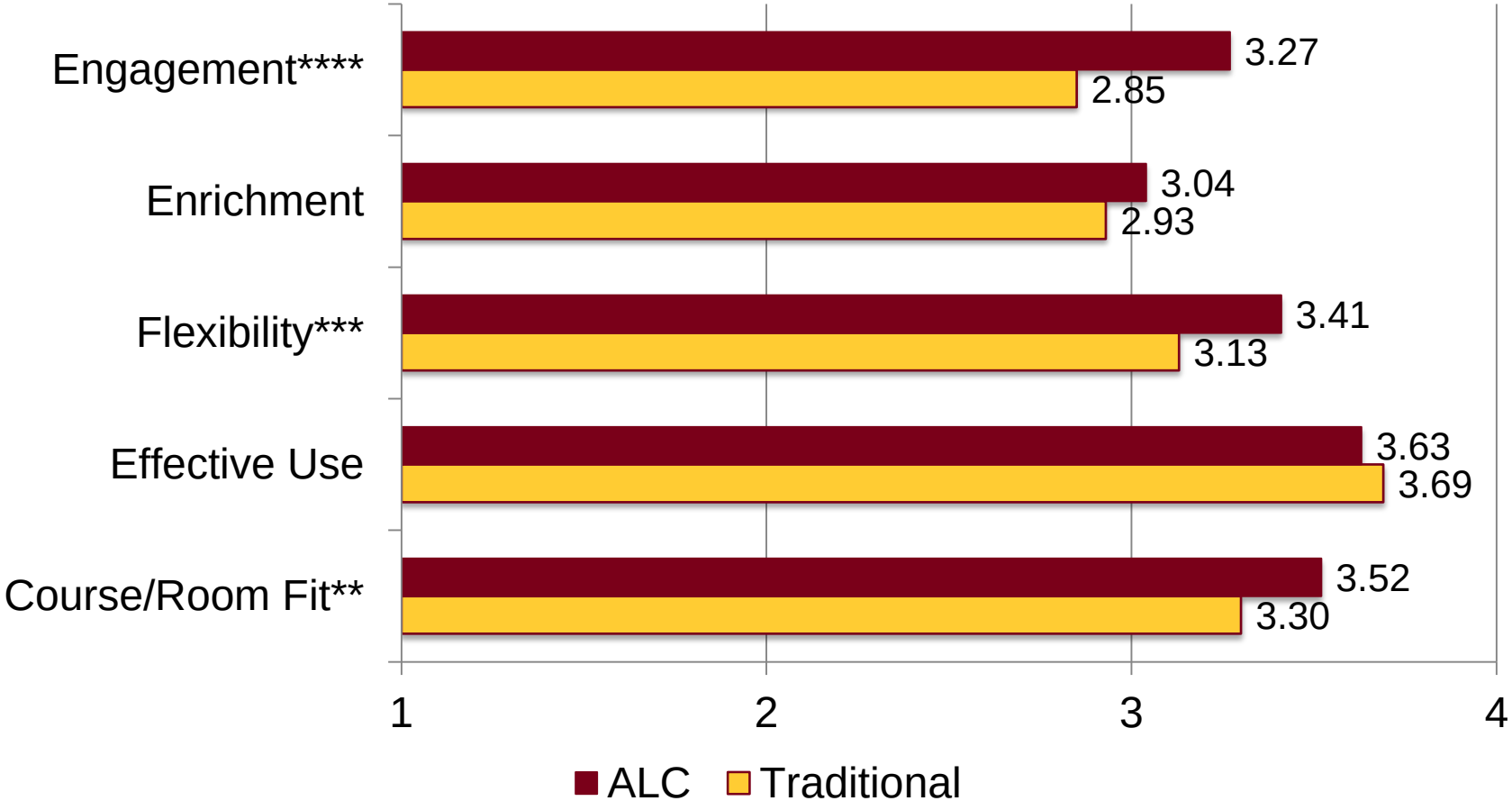


# LSR Comparison Studies: Biol 1003


- N = 263
- Compared two sections (ALC & traditional), both in STSS
- Replication of 2008 study

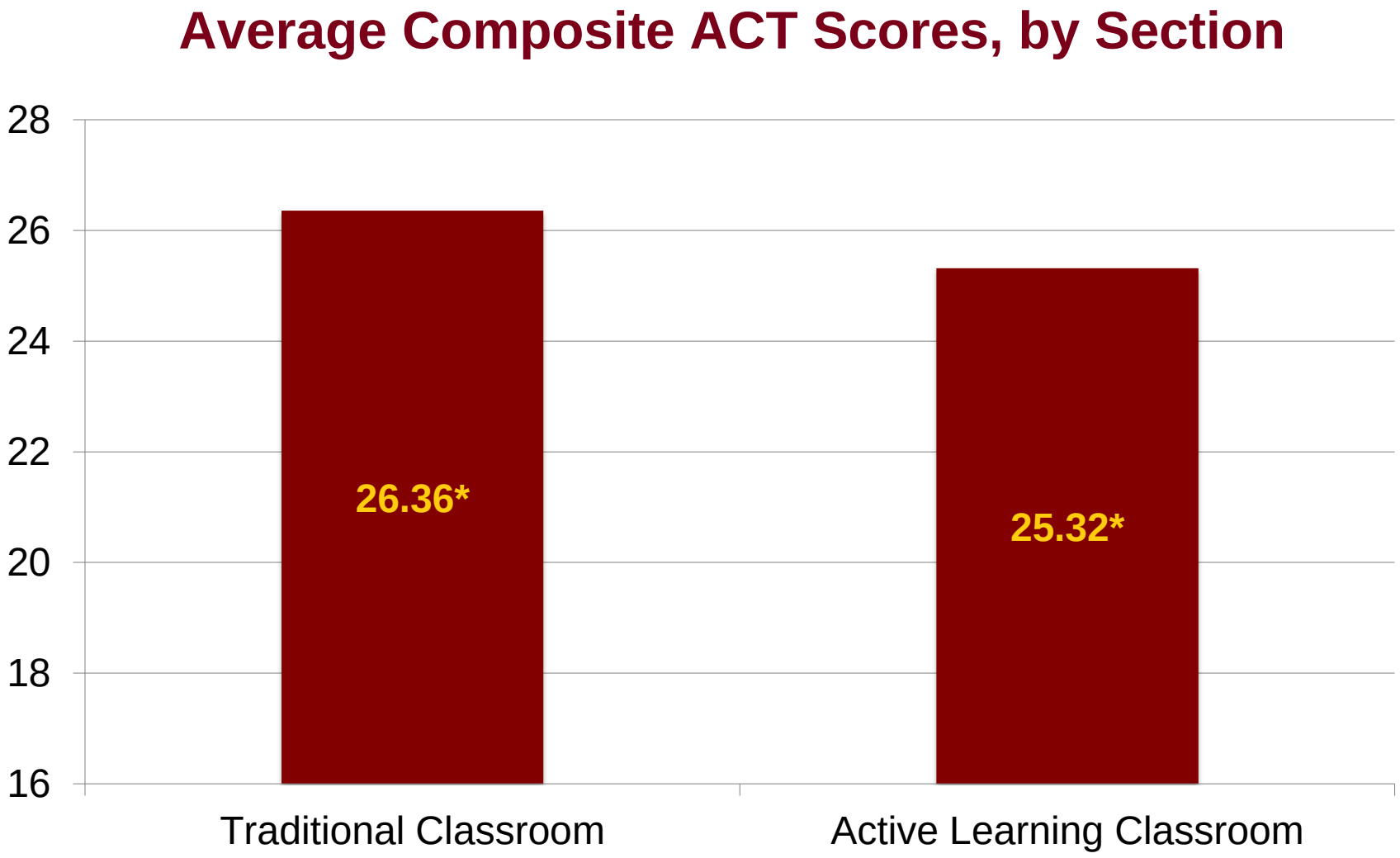
# LSR Comparison Studies: Biol 1003

## Student Perceptions, Aggregated Survey Items




**NOTE:** $^{**}p < .01$; $^{***}p < .001$; $^{****}p < .0001$

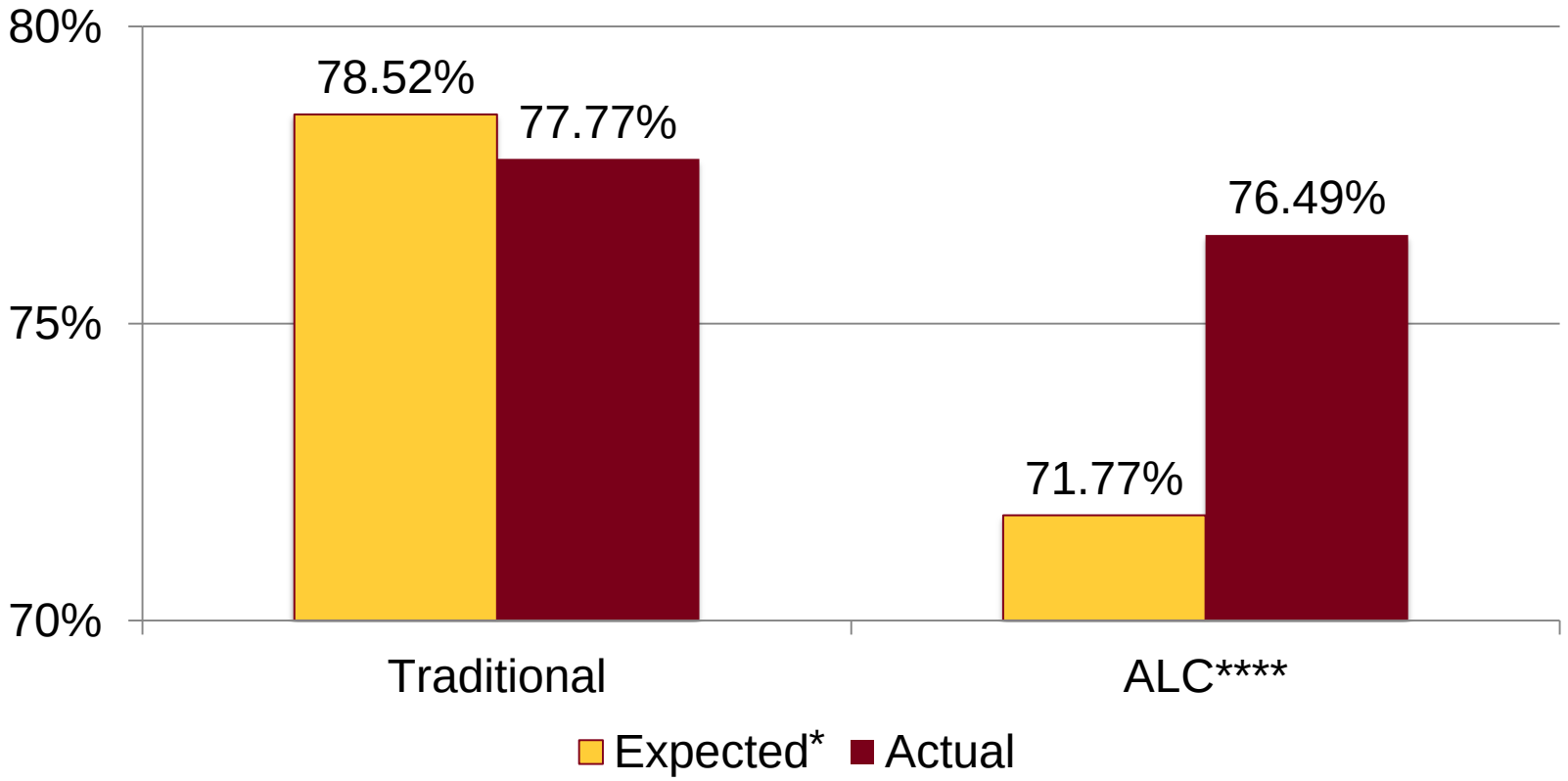
# LSR Comparison Studies: Biol 1003




* Mean difference $p < .05$

# LSR Comparison Studies: Biol 1003

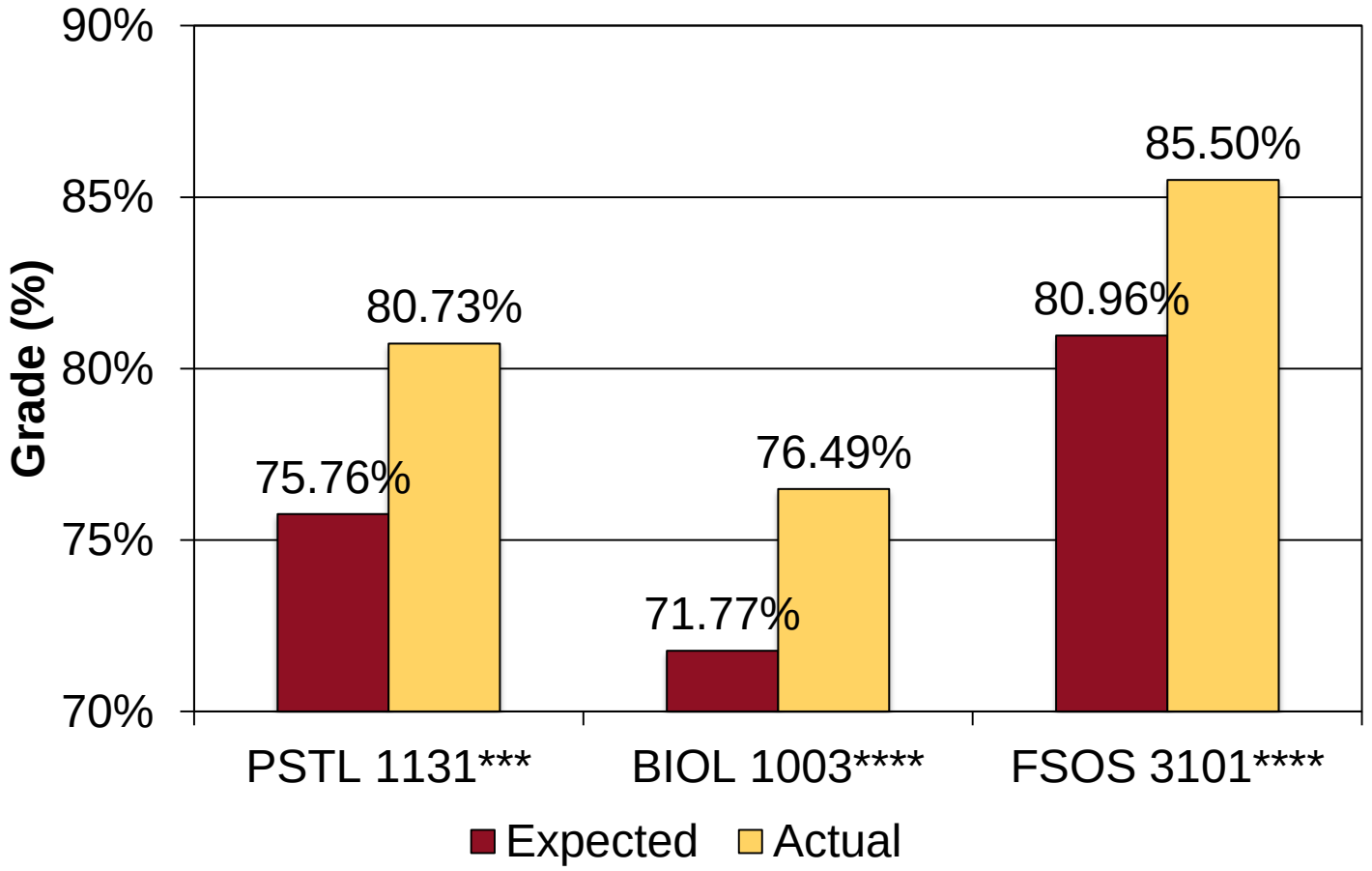
## Expected vs. Actual Average Course Grades, Traditional vs. ALC




**NOTE:** *$p < .05$; ****$p < .0001$

# LSR Comparison Studies

## Expected versus Actual Grades in Three ALC Courses

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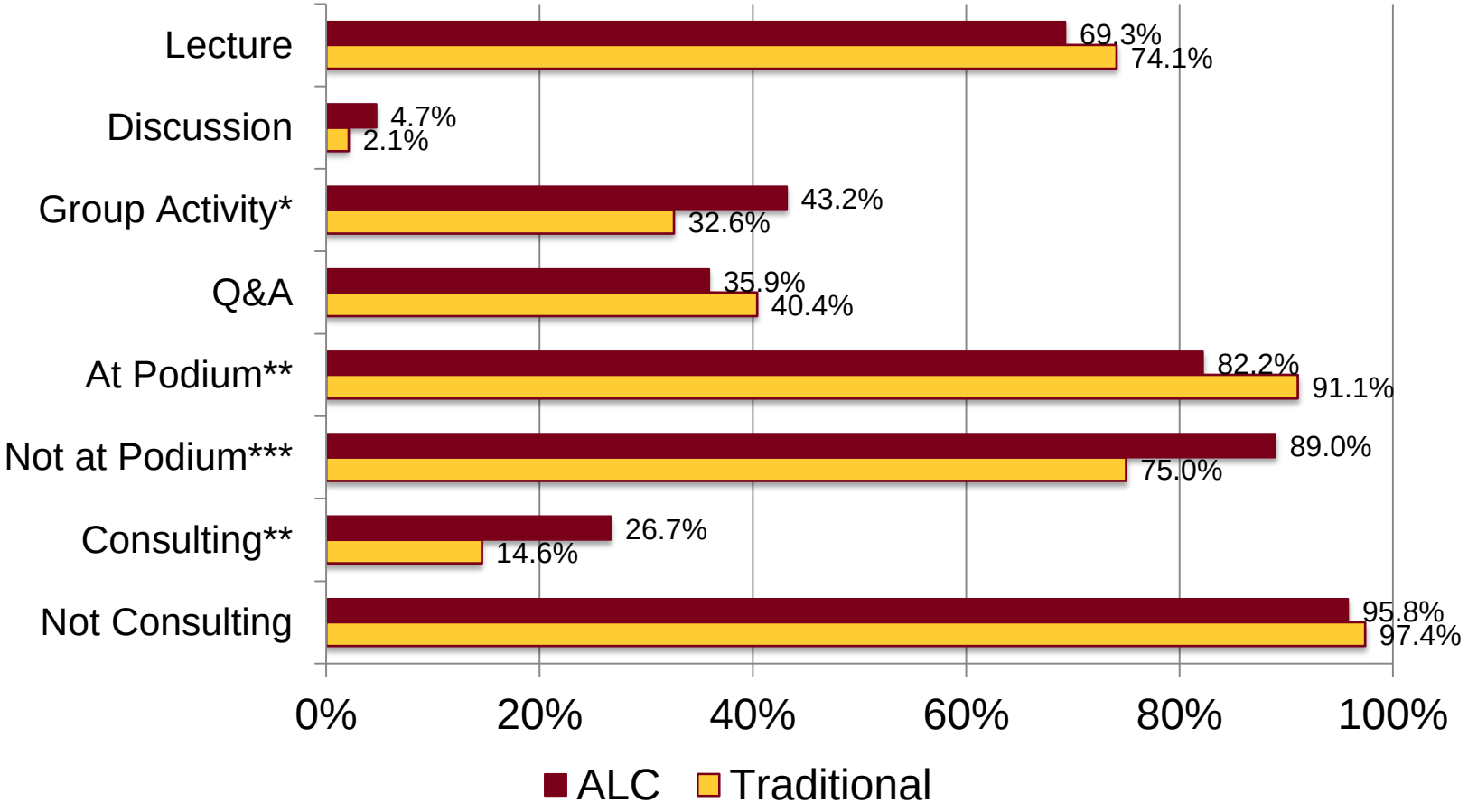
# LSR Comparison Studies: Biol 1003

## Mechanisms: Classroom Activities and Instructor Behaviors




**NOTE:** *$p < .05$; **$p < .01$; ***$p < .001$

# LSR Comparison Studies: Biol 1003

## Mechanisms: Social Context and Alliance

**Alliance =**

- Respect
- Responsibility
- Cooperation
- Communication
- Security

(Billson & Tiberius, 1991; Meyers, 2008)

- Alliance linked to engagement, improved outcomes.

# LSR Comparison Studies: Biol 1003

## Mechanisms: Social Context and Alliance

**Evidence of alliance:**

- *Faculty focus groups and interviews:*
  - "they do ask questions that I don't know the answer to and… it feels much more comfortable to say, that is a really good, probing question."

- *Student focus groups and surveys:*
  - "It was awesome having a group of nine kids to whom I could always utilize in my time of need/to bounce ideas off of."

# LSR Comparison Studies: Summary

**Controlled studies have shown that new learning spaces:**

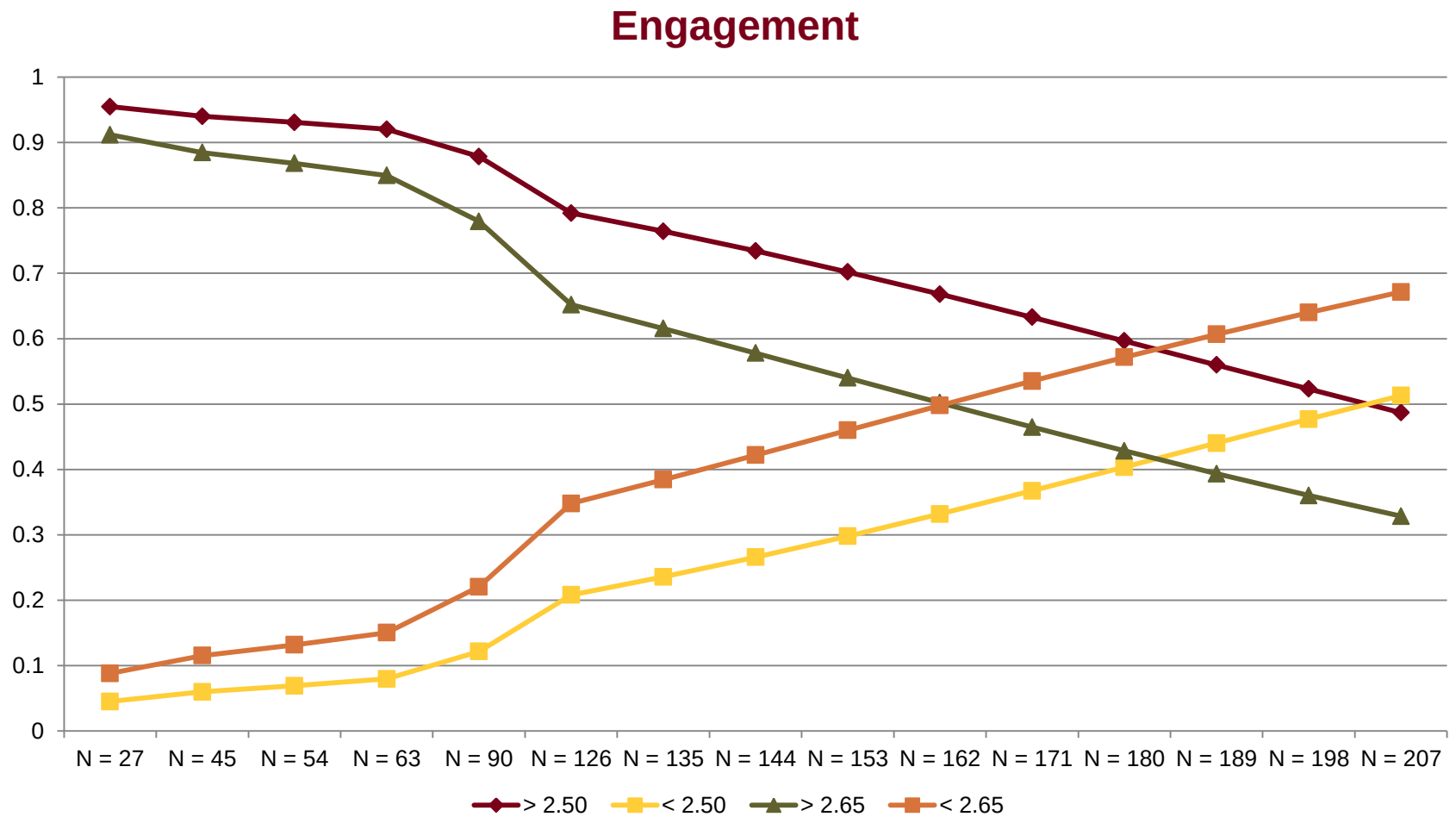
- Help students to outperform final grade expectations.
- Affect teaching-learning activities, even when the instructor attempts to hold these activities constant
- Do not conduce to a lecture-based approach; student performance improves when instructors move to active, student-centered teaching methods.

# ALC Research: New Directions

**New research, fall 2012:**

- **Innovative teaching in ALCs:** What are best practices in new learning spaces?
- **Hybrid learning in ALCs:** Can student-faculty contact hours be radically reduced, while maintaining good outcomes?
- **Room size analysis:** How large can ALCs become, while keeping good effects on student engagement?

# ALC Research: New Directions



# Questions?

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how active learning classrooms create learning environments that

# APPLY THE BIOLOGY OF LEARNING

COLLEGE OF Biological Sciences
UNIVERSITY OF MINNESOTA

Robin Wright
wrightr@umn.edu

# Leveraging an active learning class: an active learning course

Biology 2002 – Foundations of Biology

Teaching Goals:

- Apply the biology of learning
- Focus on higher order skills
- Represent authentic work of biologists

# What is learning?

# What is learning?

## Psychology

Information, ideas, & skills that a person can

- **Use** after a significant period of disuse
- **Apply** to a new problem

http://bjorklab.psych.ucla.edu/research.html

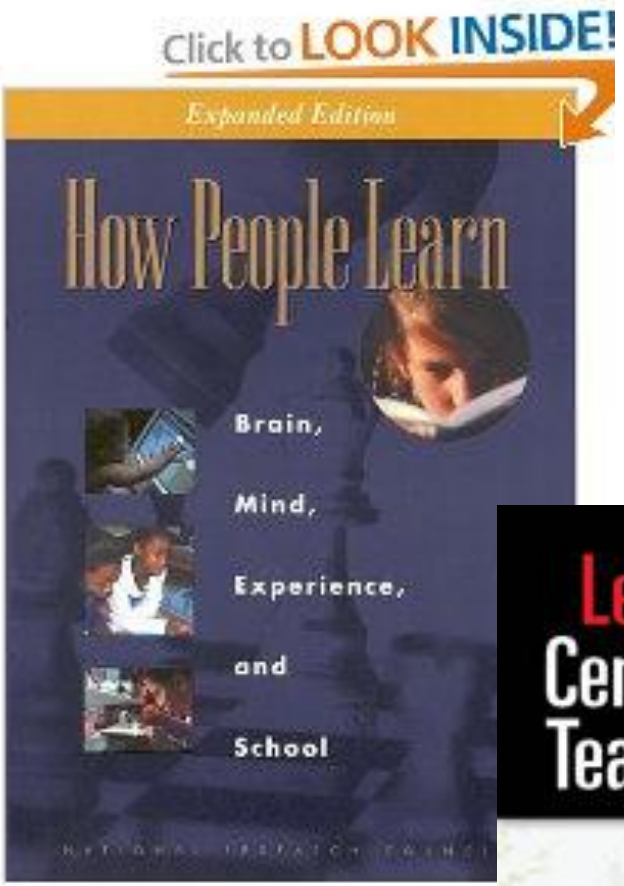
## Biology

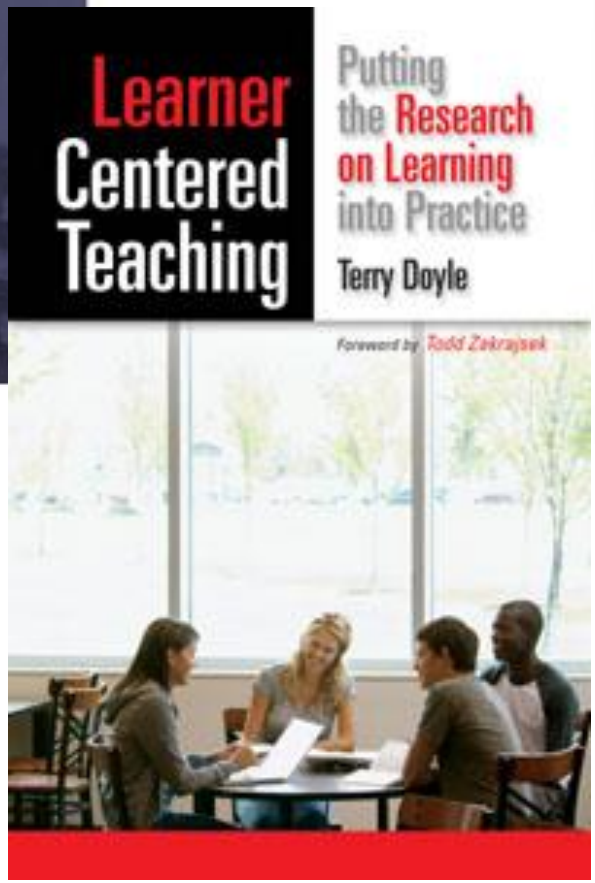
# What is teaching?

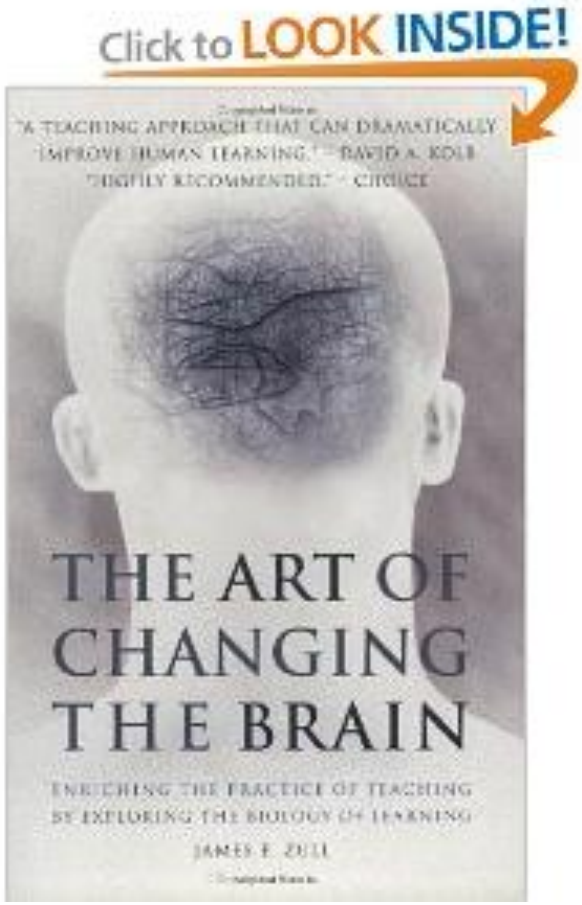
## Architecture

Creating conditions in which learning can happen

## Brain change!


Click to LOOK INSIDE!
Expanded Edition
How People Learn
Brain,
Mind,
Experience,
and
School


Learner
Centered
Teaching
Putting
the Research
on Learning
into Practice
Terry Doyle
Foreword by Todd Zakrajsek

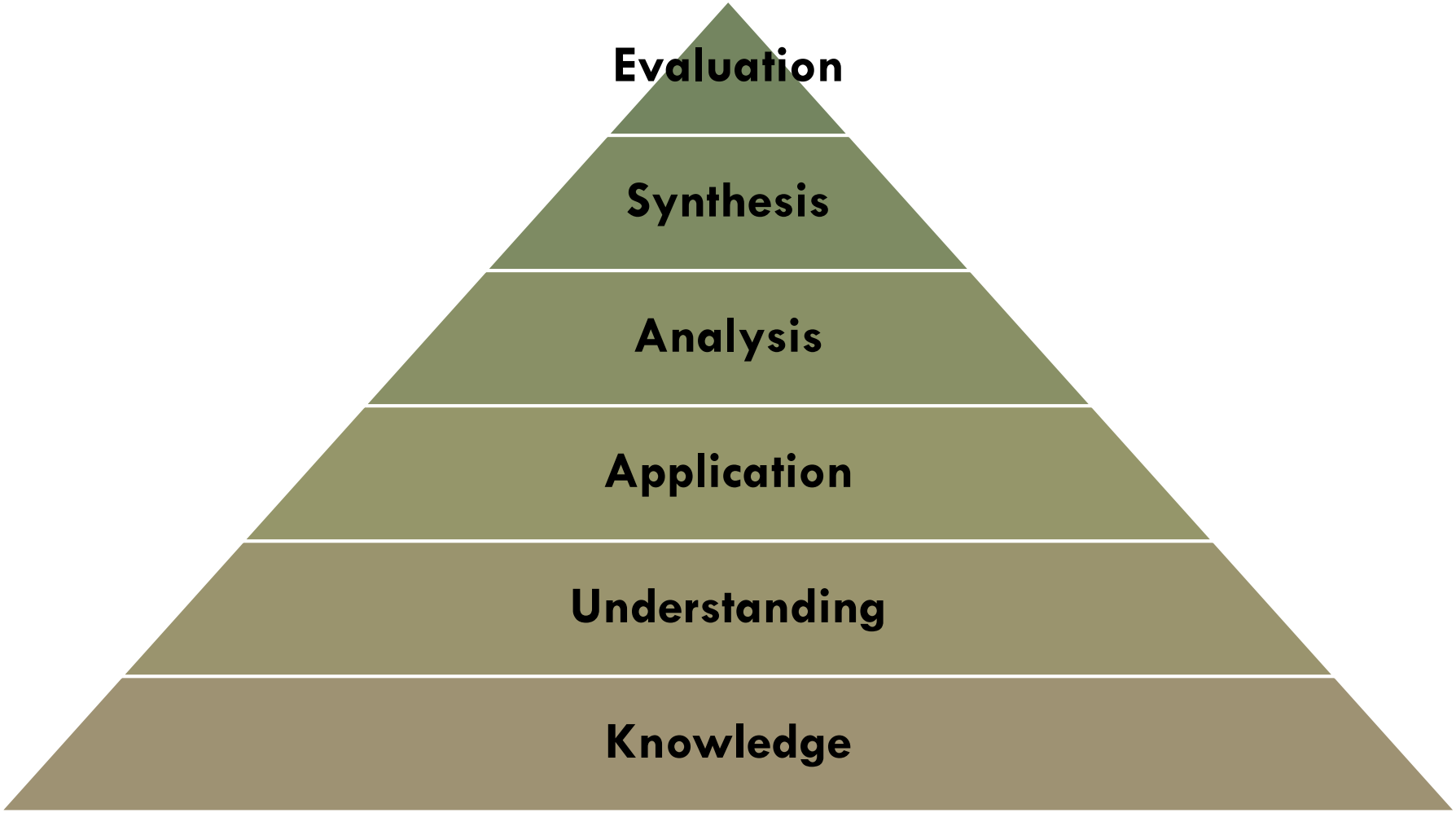

Click to LOOK INSIDE!
THE ART OF
CHANGING
THE BRAIN

# Biology 2002 applies basic principles of learning.

- Each brain is unique.
- What I pay attention to is what I learn.
- More senses = more learning.
- The person who does the work learns.
- Making memories requires repetition, elaboration, & sleep.
- The brain is social.
- Metacognition enhances learning.

After four years of college, what should you be able **to do**?

# We try to focus on higher levels of Bloom's taxonomy of cognition.

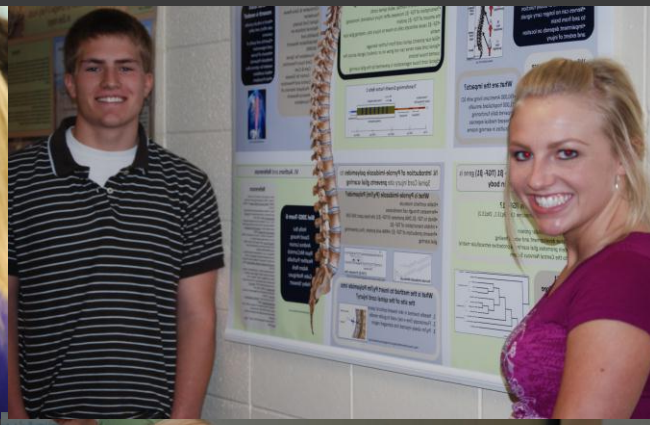


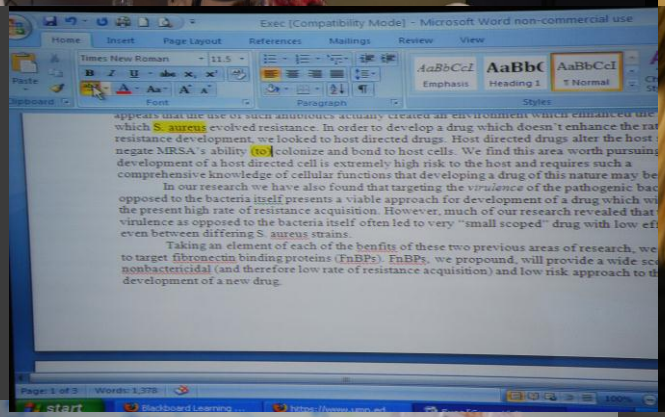
# Leveraging an active learning class: an active learning course

Biology 2002 – Foundations of Biology for Majors

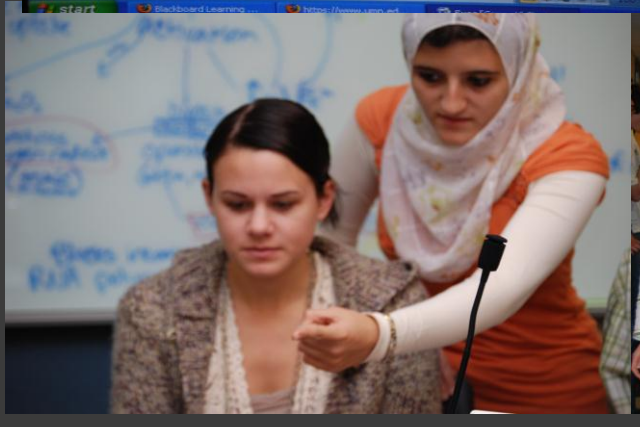
Goals:

- Apply the biology of learning
- Focus on higher order skills
- Represent authentic work of biologists







Foundations

# Learn biology by being a biologist…

# What are the learning outcomes of the foundations courses?

You will…

- Learn foundational biology concepts in an evolutionary context

It is very important that you learn about traxoline.

Traxoline is a new form of zionter. It is montilled in Ceristanna. The Ceristannians gristerlate large amounts of fevon and then brachter it to quasel traxoline. Traxoline may well be one of our most lukized snezlaus in the future because of our zionter lescelidge.

Directions: Answer the following questions in complete sentences.

1. What is traxoline?
2. Where is traxoline montilled?
3. How is traxoline quaselled?
4. Why is it important to know about traxoline?

---Judy Lanier

# What are the learning outcomes of the Foundations courses?

You will…

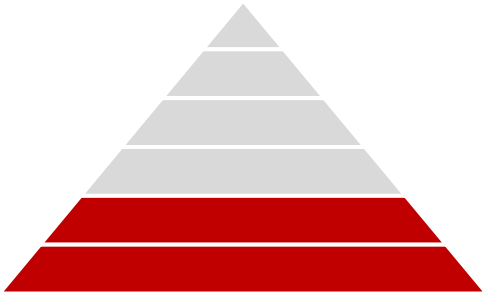
- Learn foundational biology concepts in an evolutionary context
- Develop foundational skills needed for success in science & future careers
  - Problem solving, critical thinking
  - Data analysis & interpretation
  - Laboratory skills & experimental design
  - Team work & Communication
  - Quantitative reasoning

# What's different about Foundations?

| Learning outcomes | Bloom's taxonomy | Class activities & Assessments |
| --- | --- | --- |
| Biology concepts | Knowledge & understanding | Text, self-tests, quizzes |
| Critical thinking, communication skills, team work, collaboration, skills for life after college, etc. | Application & analysis | Concept lab activities; Exams |
| | Synthesis & evaluation | Team projects; Exams |

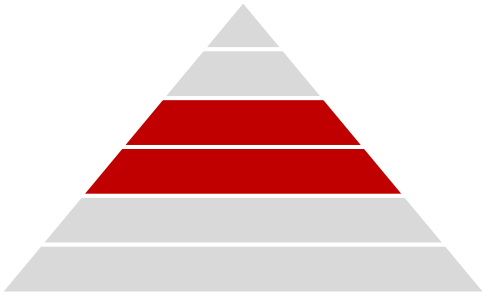
# Concept Lab General Schedule

| DAY | TIME | ACTIVITY |
|---|---|---|
| **Monday** | 35 minutes | Learning readiness quizzes & debrief |
| **115 minutes** | 55 minutes | Application & Analysis Activities |
| | 10 minutes | Metacognition |
| **Wednesday** | 60 minutes | Application & Analysis Activities |
| **115 minutes** | 45 minutes | Team Project Work |
| | 10 minutes | Metacognition |
| **Friday** | 100 minutes | Team Project Work |
| **115 minutes** | | Office Hours |
| | | Exam discussion, etc. |
| | 10 minutes | Metacognition |



# Knowledge & Understanding

- Before class
  - Study guides
  - Text book
  - Self-tests
- In class
  - Quizzes



# Application & Analysis

- Problems
- Simulations
- Videos
- Data Analysis
- Discussions
- Models
- *etc.*

# Synthesis & Evaluation

# Questions?

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# Comments & Feedback Welcome:

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**Robin Wright**, wrightr@umn.edu

**http://z.umn.edu/lsr**

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# Upcoming LSC Activities

- **LSC Webinar: The University of Illinois at Chicago**
  Experience with Project Oasis, an Informal Learning Space Program
  - December 11, 2012 / 4:00 p.m. EST

- **LSC Workshop at Portland State University**
  - February 9, 2013

# Contact Information

**For more information:**
**http://www.pkallsc.org/**