Toward Efficacy and Equity When Implementing LAs in Physics
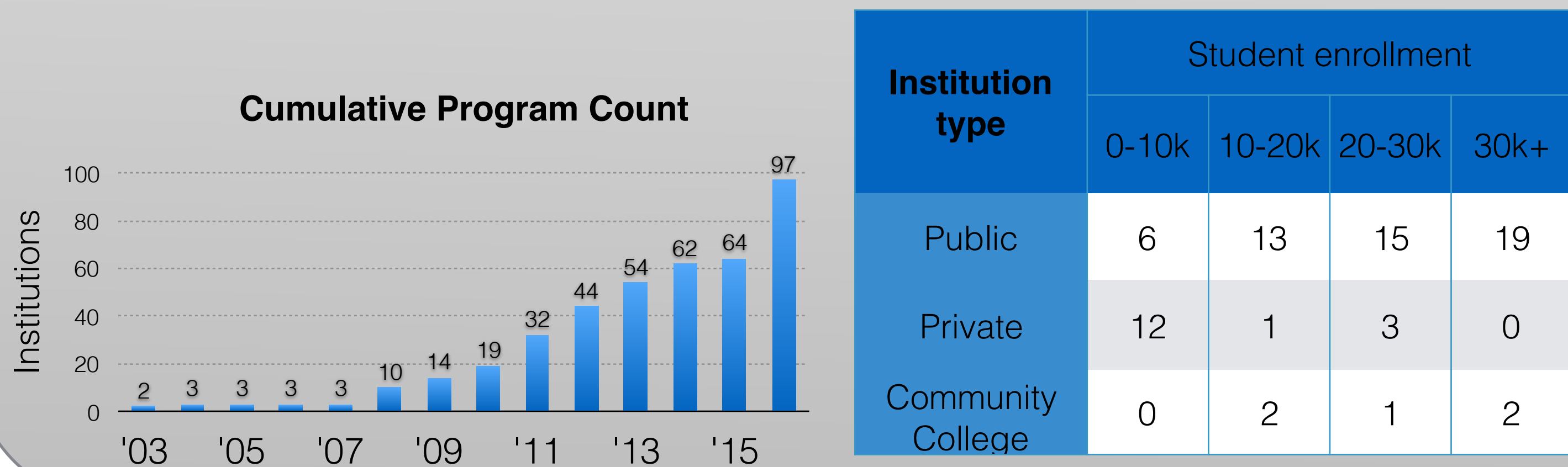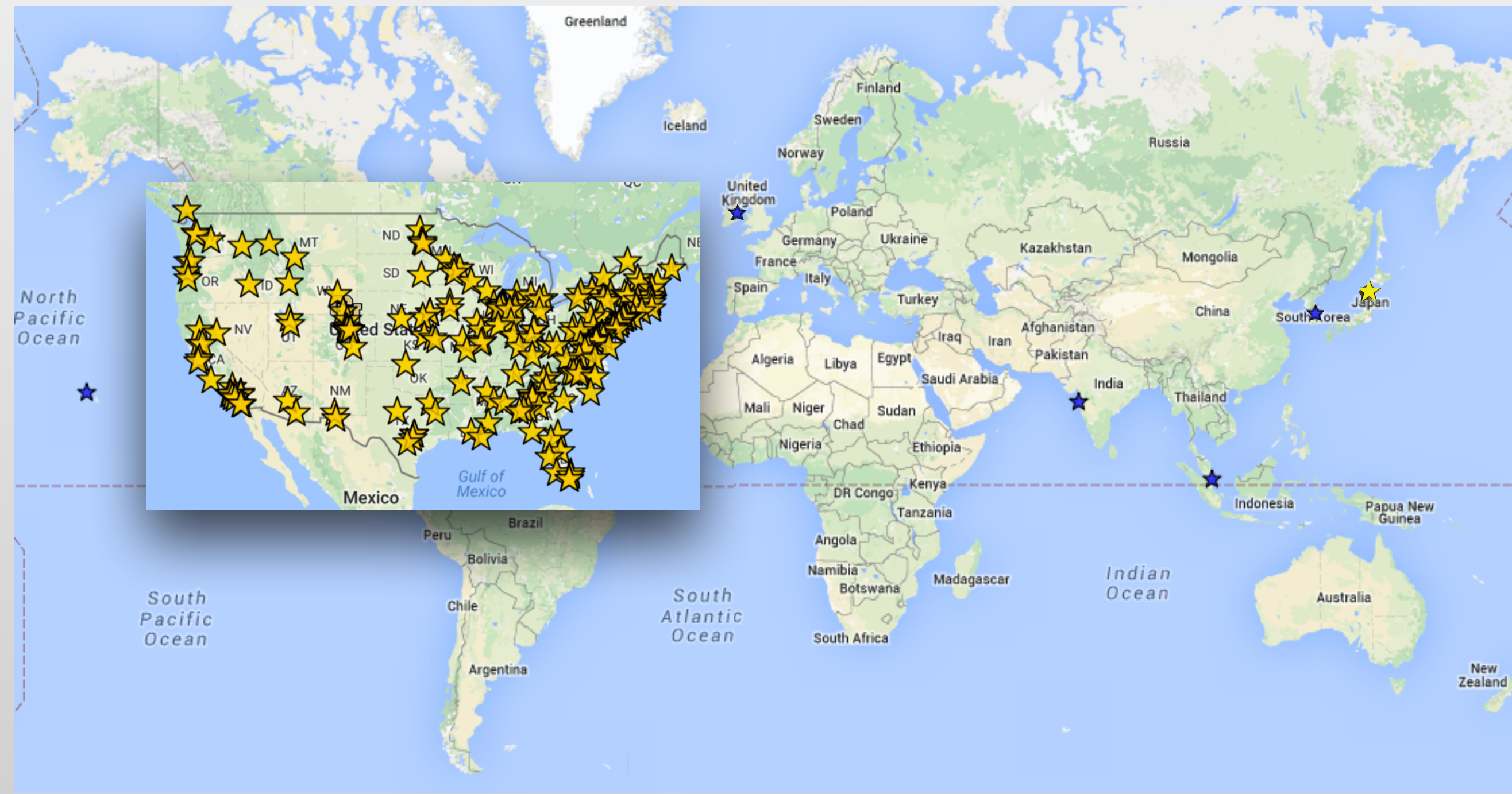
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Research Questions

(1) How do LAs impact the amount of physics that students learn? (Efficacy)
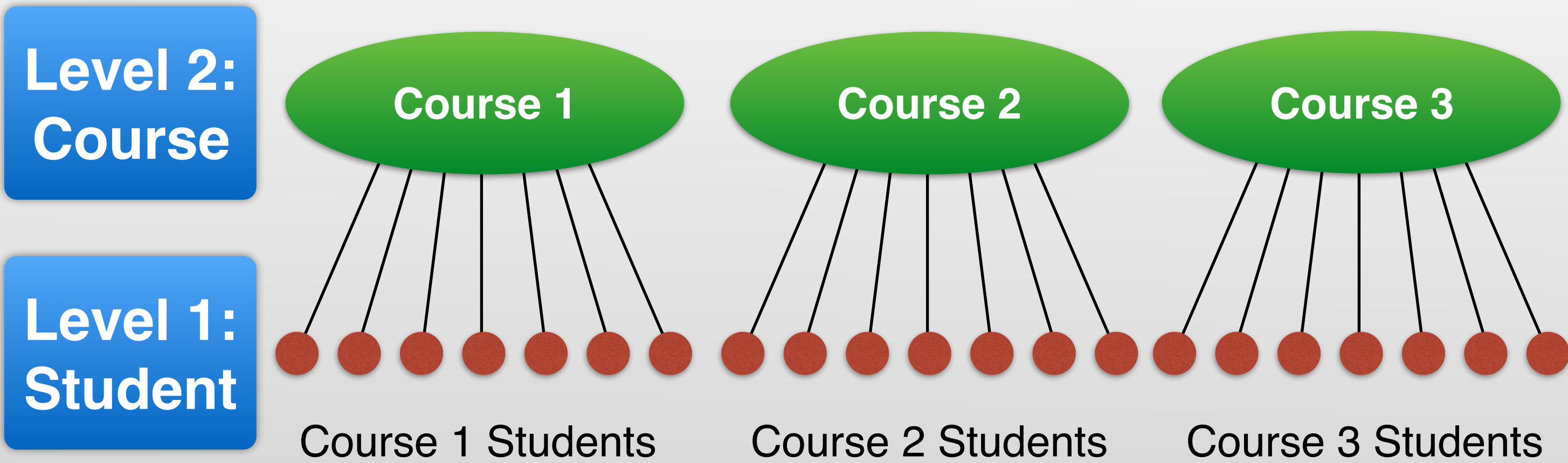(2) How do LAs impact the equality of physics learning? (Equity)

The LA Alliance

Learning Assistants are undergraduate students who are hired by university faculty to help transform undergraduate courses to include small groups of students articulating, defending, and modifying their ideas about relevant problems or phenomena.

Cumulative Program Count

Institution type	Student enrollment			
	0-10k	10-20k	20-30k	30k+
Public	6	13	15	19
Private	12	1	3	0
Community College	0	2	1	2

Data Collection/Analysis

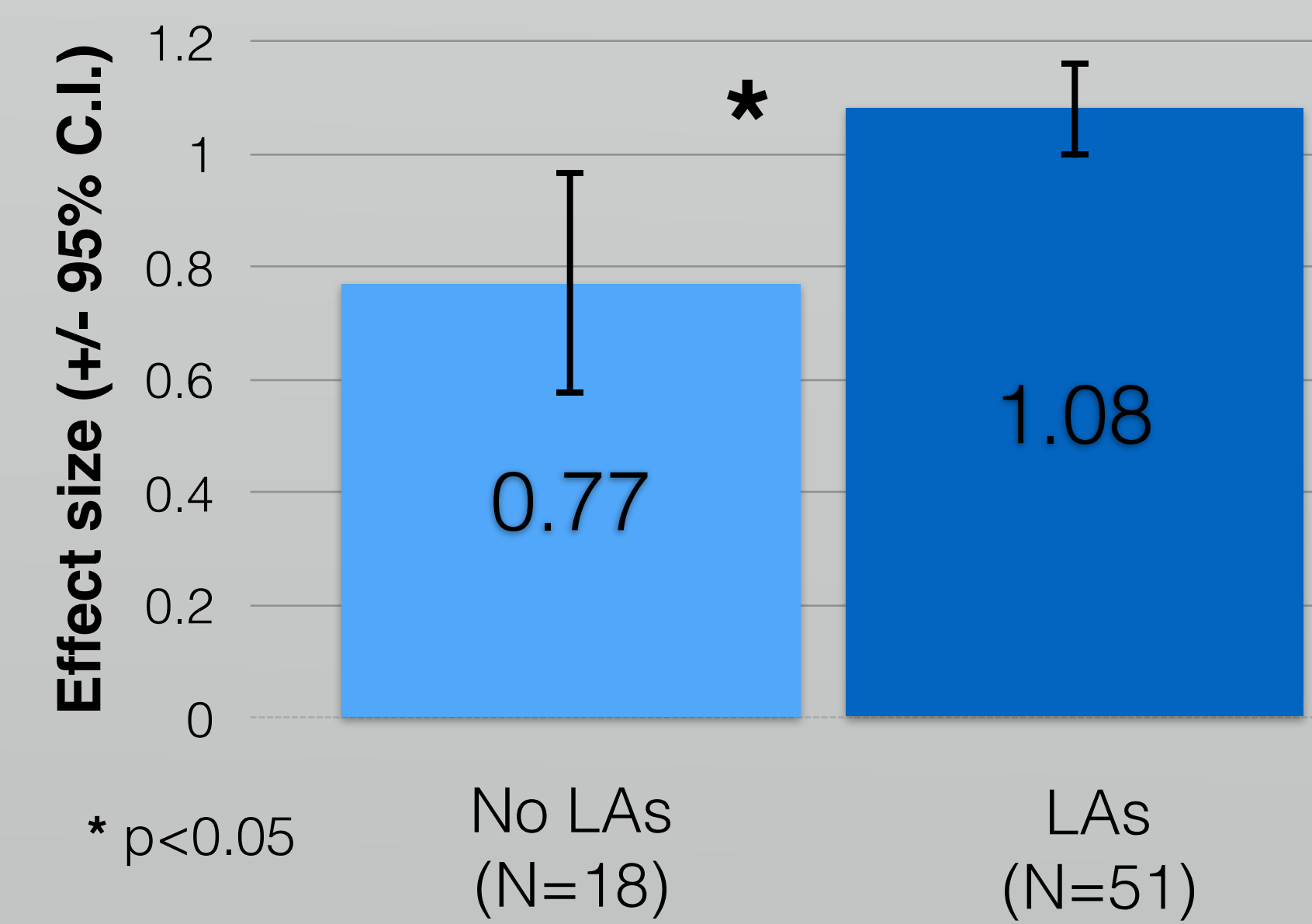### LA Supported Student Outcomes (LASSO) tool

Level 1 (N= 3,753 students)
- Pre & post scores
- Gender
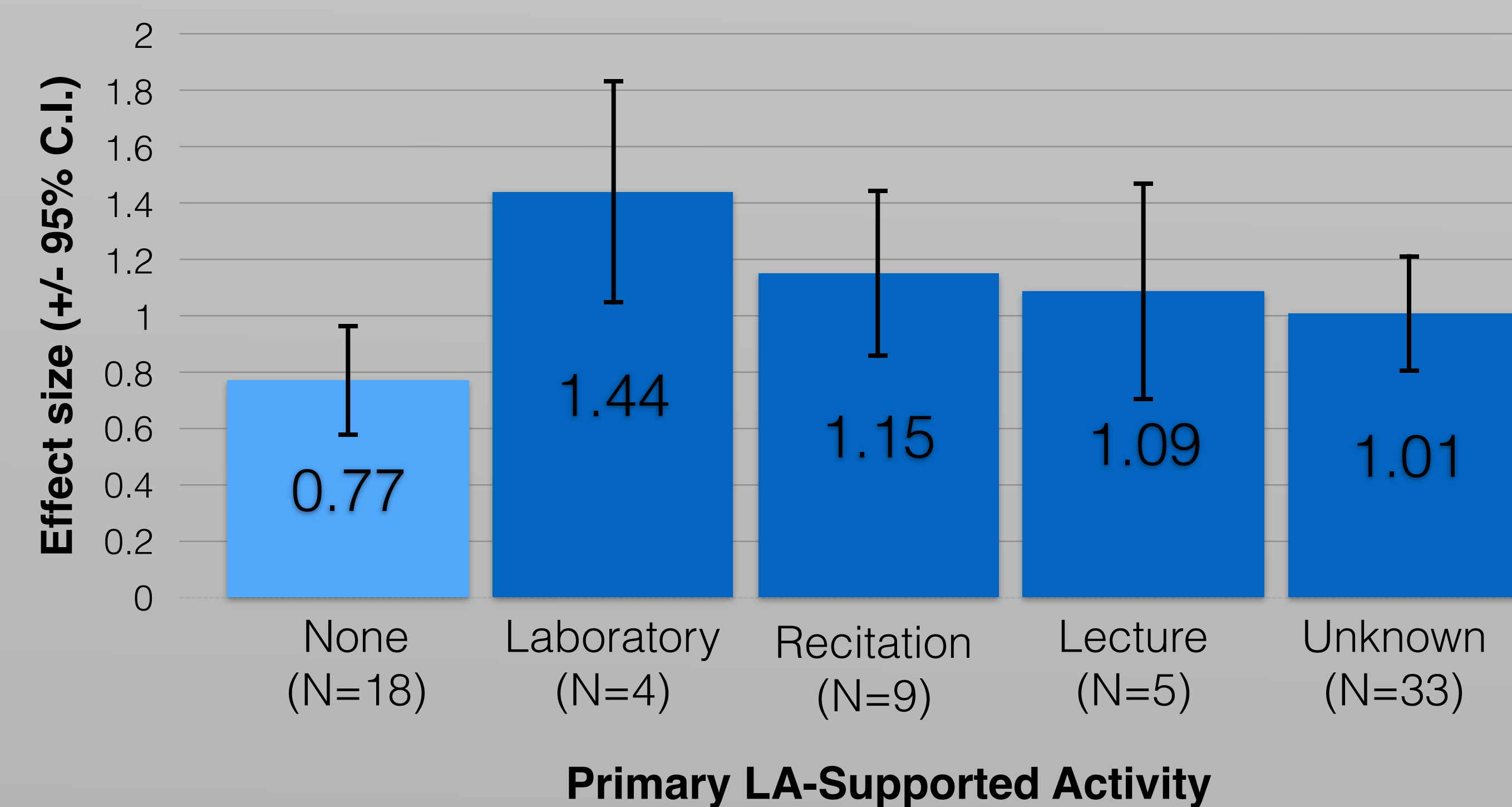- Race
- Ethnicity

Level 2 (N= 69 classes in 17 institutions)
- Discipline
- Uses of LAs

$$Cohen's\ d = \frac{Post - Pre}{Class\ S.D._{pooled}}$$

Efficacy Outcomes

* p<0.05

No LAs (N=18): 0.77
LAs (N=51): 1.08 *

1. Courses with LAs have 1.4x more learning than courses without LAs.
2. All uses of LAs were associated with improved learning.

Primary LA-Supported Activity

None (N=18): 0.77
Laboratory (N=4): 1.44
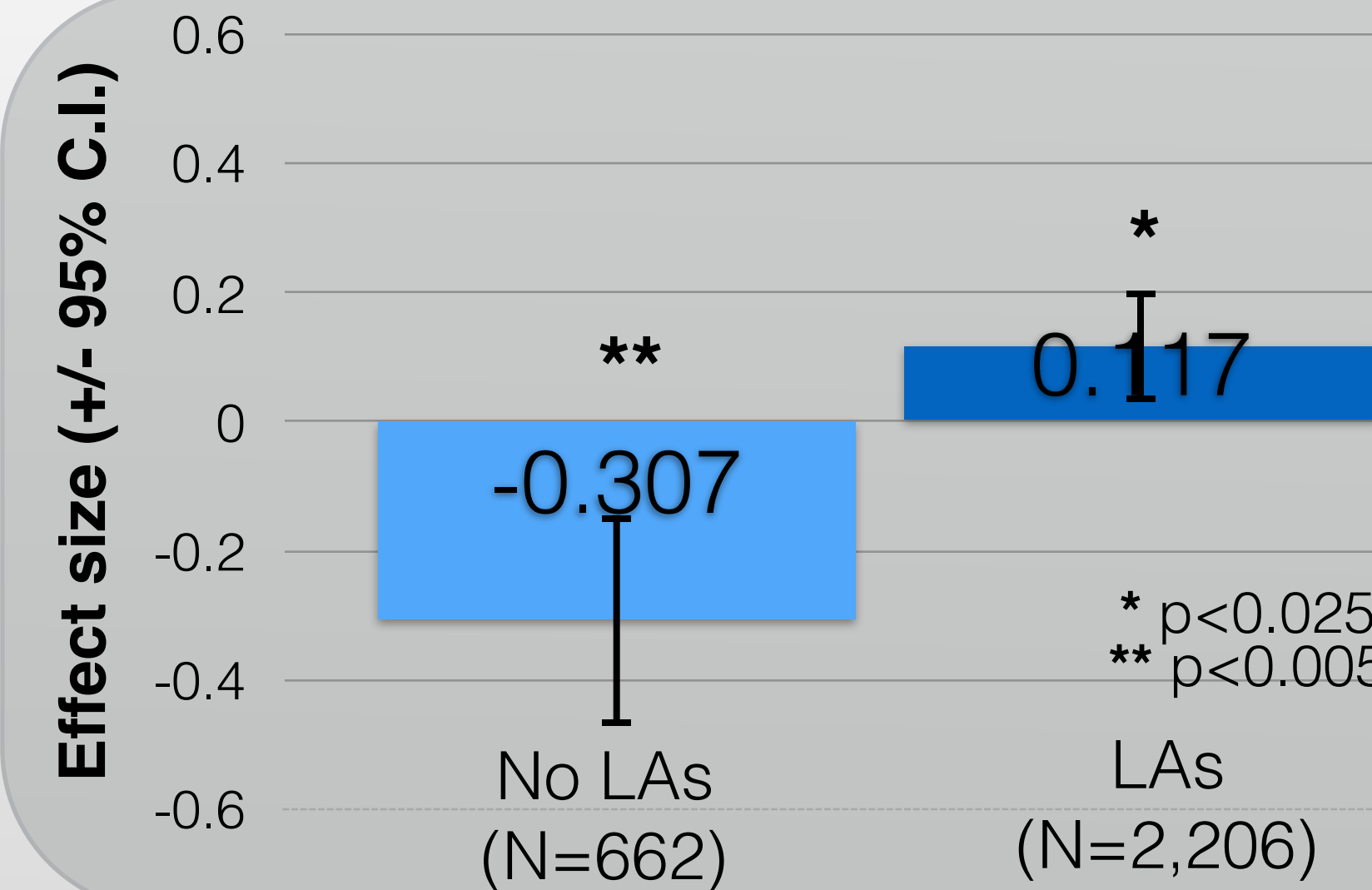Recitation (N=9): 1.15
Lecture (N=5): 1.09
Unknown (N=33): 1.01

White, J.S.S, Van Dusen, B., Roualdes, E. (in press). The Impacts of Learning Assistants on Student Learning of Physics. *2016 PERC Proceedings*.
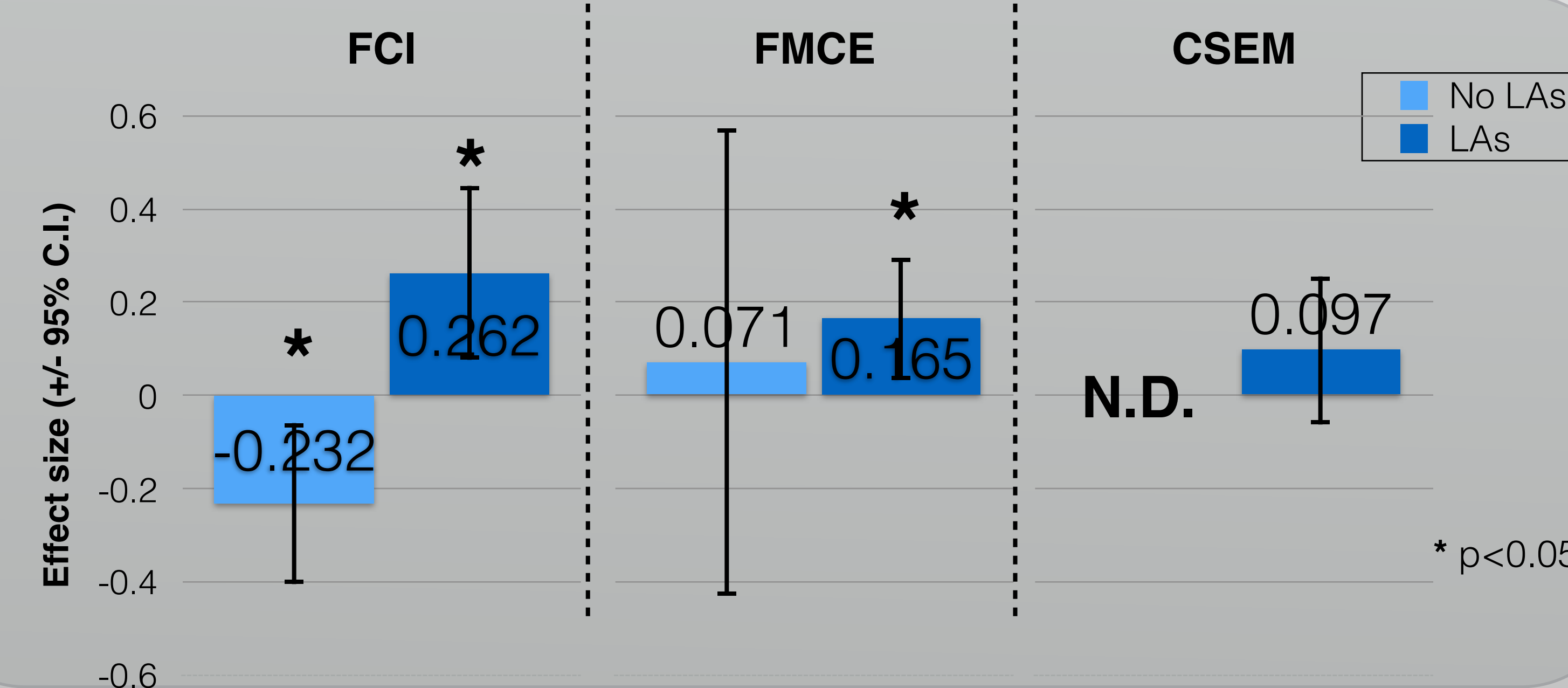
Equity Outcomes

$$Gap = d_{non-dom} - d_{dominant}$$

Dominant = white or asian, non-hispanic, males

No LAs (N=662): -0.307 **
LAs (N=2,206): 0.117 *

* p<0.025
** p<0.005

1. Traditional learning gaps are inverted for courses with LAs (i.e. students from non-dominant backgrounds learn more than their peers).

	No LAs	LAs
FCI	-0.232 *	0.262 *
FMCE	0.071	0.165 *
CSEM	N.D.	0.097

* p<0.05

Van Dusen, B., White, J.S.S, Roualdes, E. (in press). The Impact of Learning Assistants on Inequities in Physics Student Outcomes. *2016 PERC Proceedings*.

Future Work

(1) Characterize LASSO data with nationally normed data
(2) Disaggregate non-dominant status
(3) Examine the impacts of disciplinary LA practices

Why Participate?

LASSO Instruments

Discipline	Assessment (Fall '16)
Physics	Force and Motion Concept Evaluation (FMCE)
	Force Concept Inventory (FCI)
	Brief Electricity and Magnetism Assessment (BEMA)
	Conceptual Survey of Electricity and Magnetism (CSEM)
	Colorado Learning Attitudes about Science Survey - Physics (CLASS)
Chemistry	Chemistry Concept Inventory (CCI)
	Colorado Learning Attitudes about Science Survey - Chemistry (CLASS)
Biology	Concept Inventory of Natural Selection (CINS)
	Genetics Concept Assessment (GCA)
	Introductory Molecular and Cell Biology Assessment (IMCA)
	Colorado Learning Attitudes about Science Survey - Biology (CLASS)
Math	Pre-Calculus Assessment (PCA)
	Calculus Concept Inventory (CaCI)
Astronomy	Light and Spectroscopy Concept Inventory (LSCI)
Teaching	*Perceptions of Teaching as a Profession (PTAP)*

Italic = Coming soon

How to participate

(1) Join the LA Alliance (no LAs required!) (learningassistantalliance.org)
(2) Answer a few questions about your course
(3) Upload a class and start the pre-assessment—including email notifications to your students—with a click of the mouse
(4) Run the post-assessment at the end of your course
(5) Get a detailed report and complete results
(6) Enjoy free time

Sample Report