Reflective Teaching

KATE WRIGHT

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“Reflective teaching means looking at what you do in the classroom, thinking about why you do it, and thinking about if it works - a process of self-observation and self-evaluation.”

The Reflective Teacher: Taking a Long Look

I think it looks more like this!

Image from http://cbs.umn.edu/blogs/cbs-connect/groundbreaking-biology-education-effort-launches

Image from http://asutechwebs.blogspot.com/2014_11_01_archive.html

Faculty at RIT are enthusiastic and passionate about their teaching.

Most faculty care very deeply about what they do in the classroom.

My goal: give a presentation about “reflective teaching”

Think of some discussion questions that might lead us to promote reflective teaching practices.

There are many things to reflect on.

Are the students in class engaged?

- How do I know?
- **Have I structured the course to allow/encourage engagement?**

Why does classroom engagement matter?

“Yet a growing body of evidence suggests that the lecture is not generic or neutral, but a specific cultural form that favors some people while discriminating against others, including women, minorities and low-income and first-generation college students. This is not a matter of instructor bias; it is the lecture format itself — when used on its own without other instructional supports — that offers unfair advantages to an already privileged population.”

Are College Lectures Unfair?

Gray Matter

By ANNIE MURPHY PAUL SEPT. 12, 2015

The New York Times

“But this is how I learned!”

The truth is you already had the tools to be successful.

Are College Lectures Unfair?

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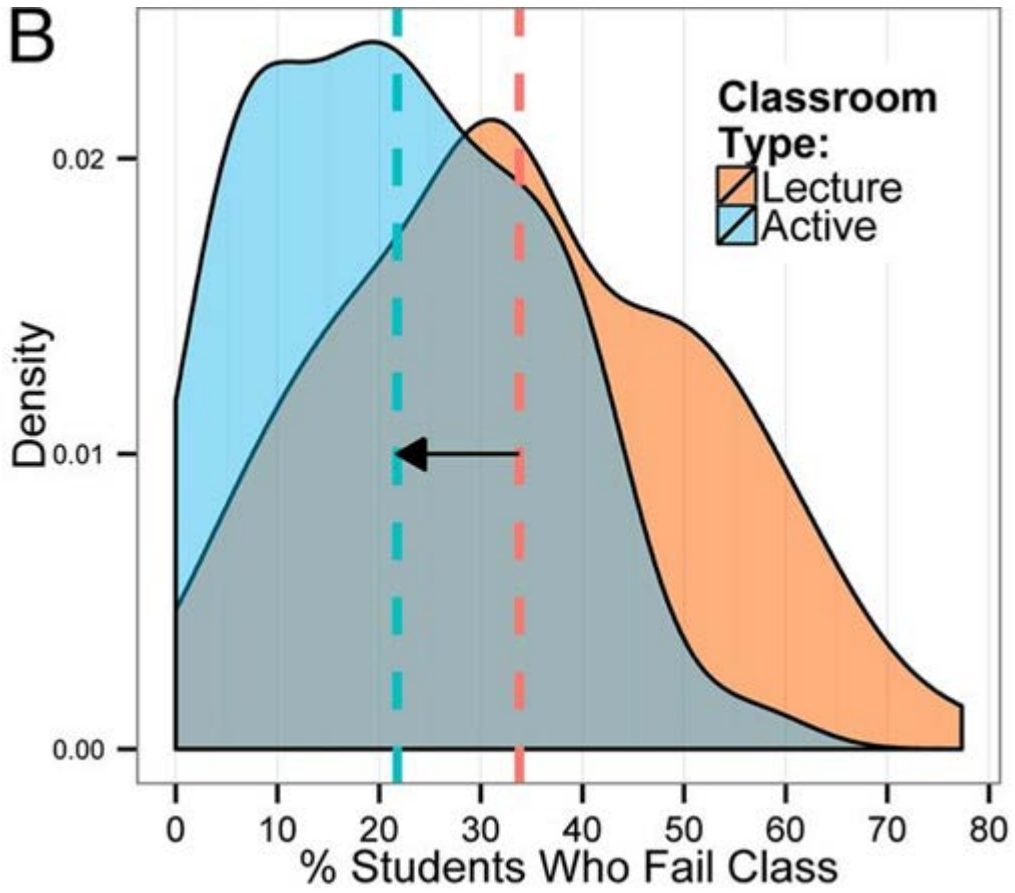
Active learning increases student performance in science, engineering, and mathematics

Scott Freeman, Sarah L. Eddy, Miles McDonough, Michelle K. Smith, Nnadozie Okoroafor, Hannah Jordt, and Mary Pat Wenderoth.
PNAS 2014 111 (23) 8410-8415



Changes in failure rate. (*B*) Kernel density plots of failure rates under active learning and under lecturing. The mean failure rates under each classroom type (21.8% and 33.8%) are shown by dashed vertical lines.

Active learning increases student performance in science, engineering, and mathematics

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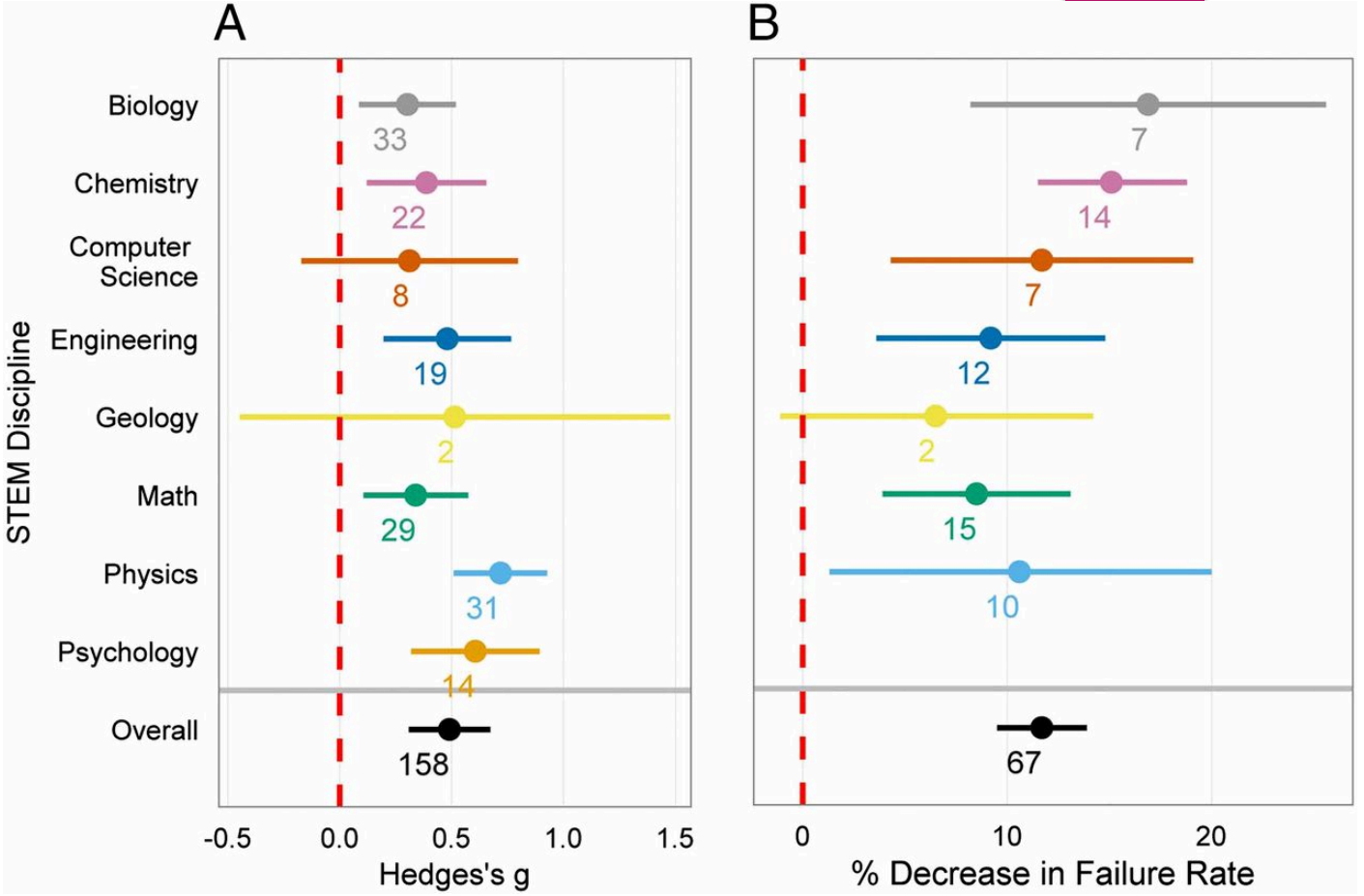

Effect sizes by discipline. (*A*) Data on examination scores, concept inventories, or other assessments. (*B*) Data on failure rates. Numbers below data points indicate the number of independent studies; horizontal lines are 95% confidence intervals.

Active learning increases student performance in science, engineering, and mathematics

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- the odds ratio for failing was 1.95 under traditional lecturing (*n* = 67 studies).
- average examination scores improved by about 6% in active learning sections
- students in classes with traditional lecturing were 1.5 times more likely to fail than were students in classes with active learning

There are many things to reflect on.

Are the students learning?

How do I know?

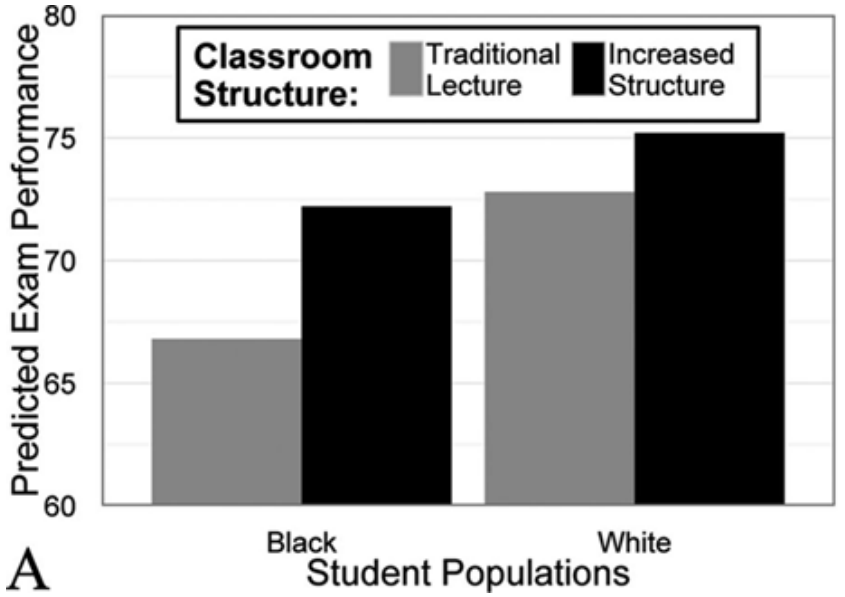
- Who *isn't* learning?
- Are certain groups of students not learning?

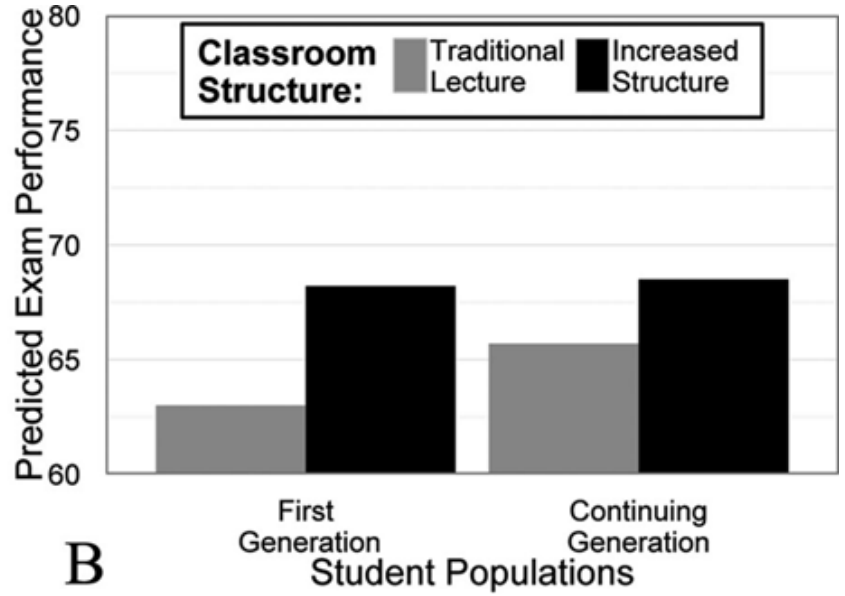
- Is background preparation adequate?
- **Am I providing scaffolding for learners to build upon?**

Why does classroom scaffolding/support matter?

Getting Under the Hood: How and for Whom Does Increasing Course Structure Work?

Sarah Eddy and Kelly Hogan. *CBE Life Sci Education* vol. 13 no. 3. 453-468 .





Point estimates for exam performance based on the regression models The bars are the regression model predictions of performance for four hypothetical students who are in the Fall term of the course.

There are many things to reflect on.

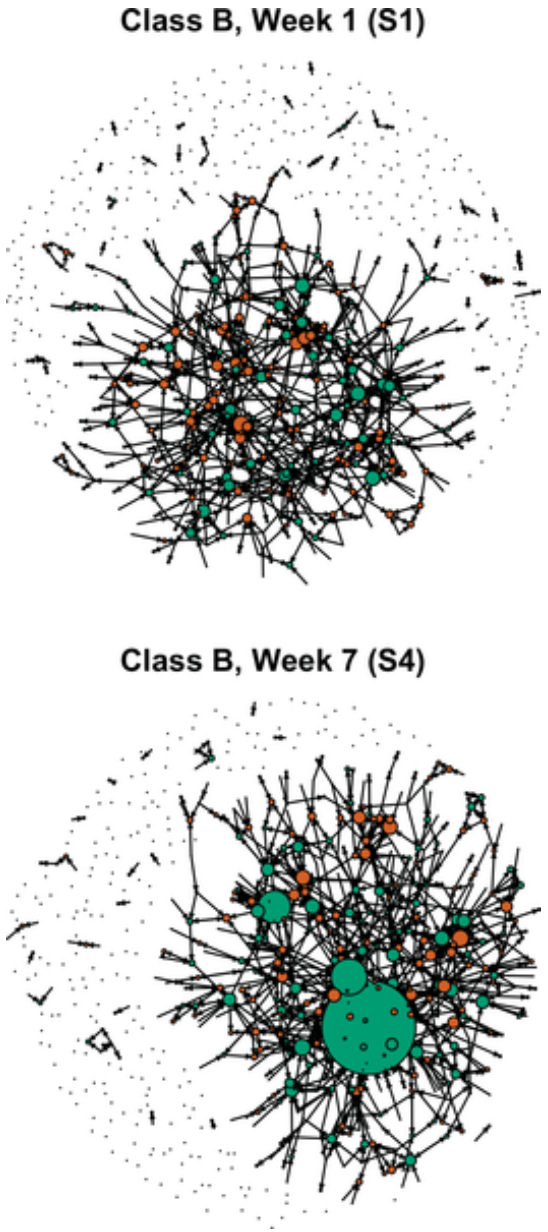
Who speaks up in class?

- Does anyone speak up?
- **Do the same few people always speak up in class?**

Why does “speaking up” in class matter?

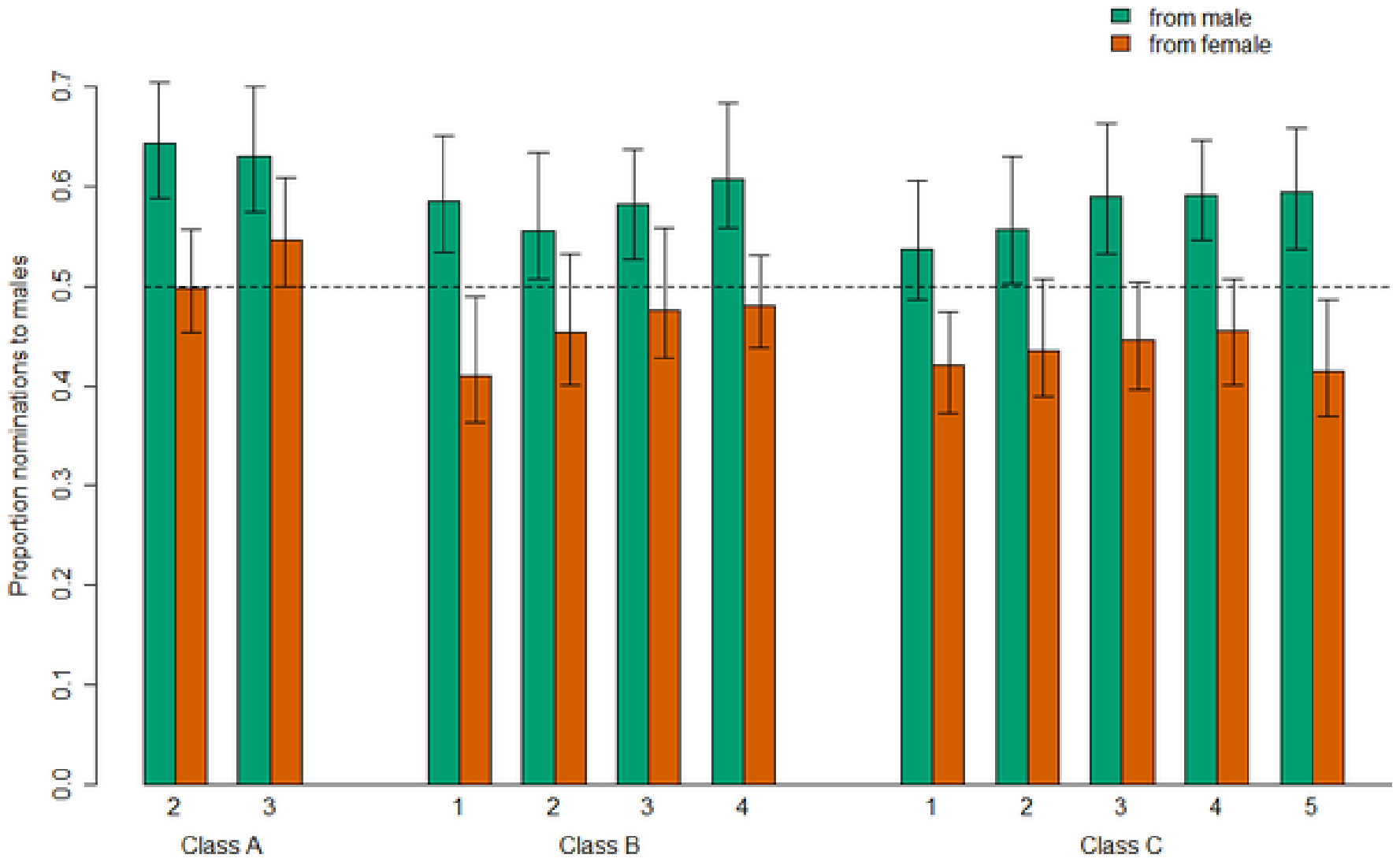
Males Under-Estimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms

Grunspan DZ, Eddy SL, Brownell SE, Wiggins BL, Crowe AJ, Goodreau SM (2016). PLoS ONE 11(2): e0148405.



Unequal distribution of peer perception of mastery of content among genders grows over the term.

Sociographs at the beginning of course (S1) and after exam 3 (S4) in class B. Male students are represented by green circles and females by orange circles. The size of nodes correlates with how many nominations each student received. Arrows show direction from the nominator to the nominee.



Males over-nominate males; females are closer to equitable in their nominations.

Grunspan DZ, Eddy SL, Brownell SE, Wiggins BL, Crowe AJ, et al. (2016) Males Under-Estimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms. PLoS ONE 11(2): e0148405. doi:10.1371/journal.pone.0148405
http://journals.plos.org/plosone/article?id=info:doi/10.1371/journal.pone.0148405

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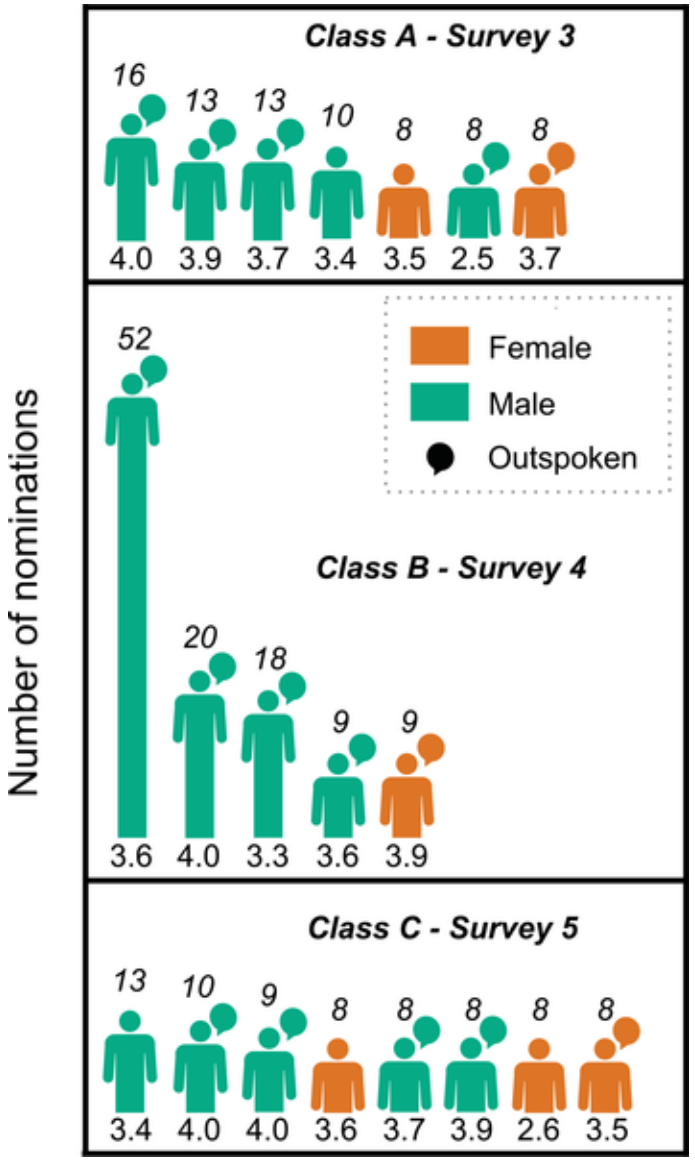


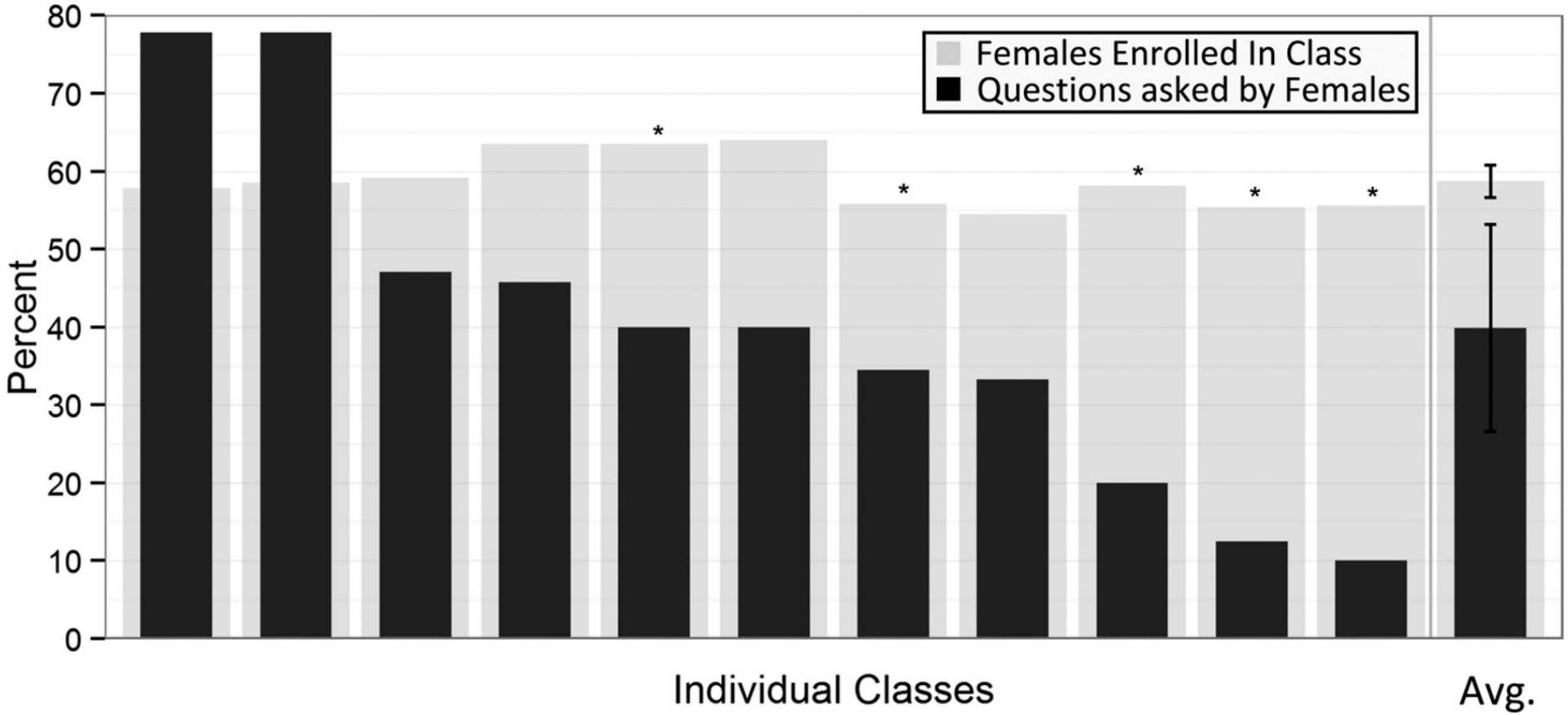
The most renowned students in each class tend to be male.

Students with the five highest numbers of nominations are depicted for each class. The numbers above each student represent how many nominations that student received, while the numbers below each student represent their grade point average earned in the course out of 4 points.

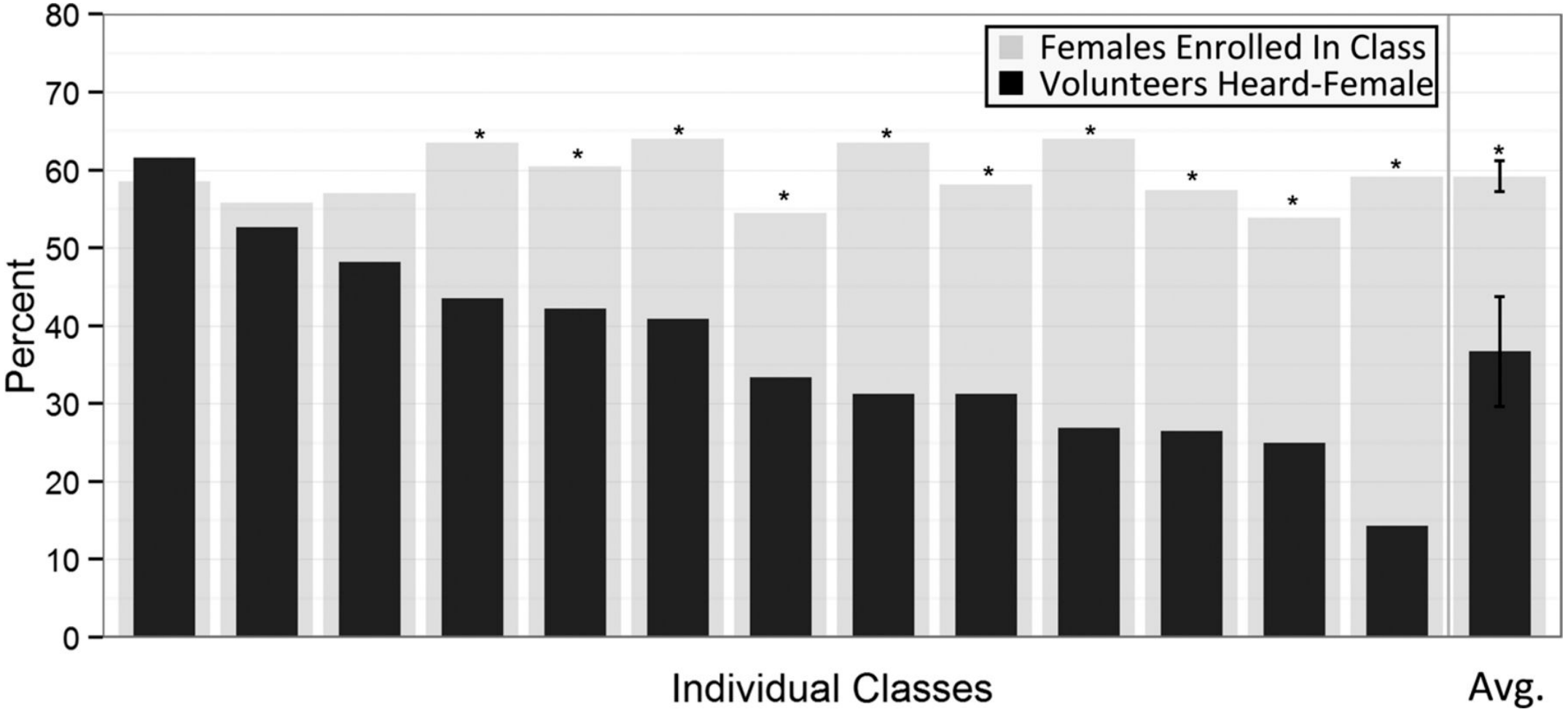
Gender Gaps in Achievement and Participation in Multiple Introductory Biology Classrooms

Eddy, S. Brownell, S. Wenderoth, MP.(2014) *CBE Life Sci Educcation* vol. 13 no. 3. 478-492

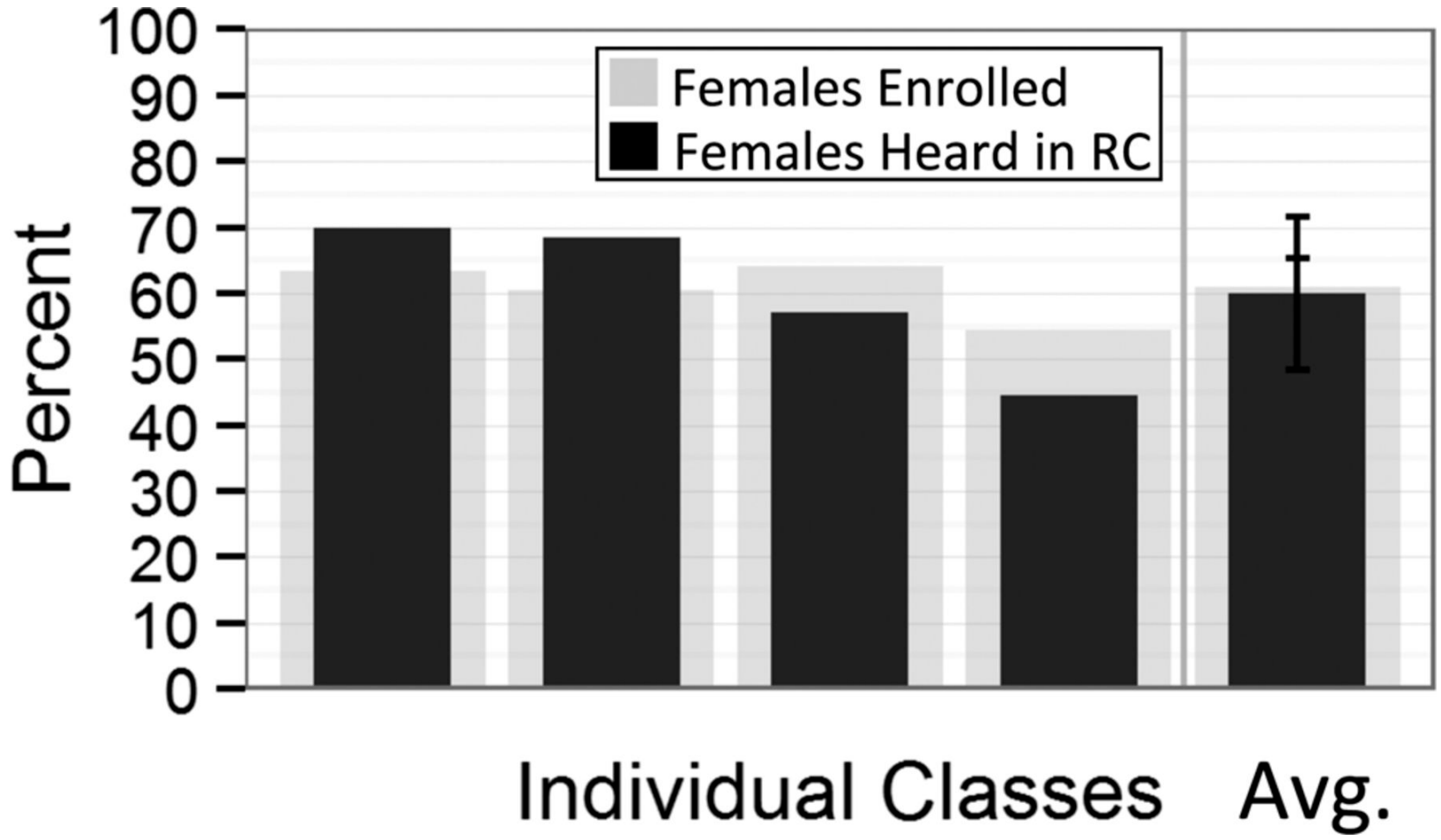
Variation by class in the percentage of questions asked by females. Comparison of the percentage of females in a class (gray bars) with percentage of unprompted questions in class asked by females (nested black bars). Asterisks (*) indicate that the exact binomial test was significant at the $p = 0.05$ level.

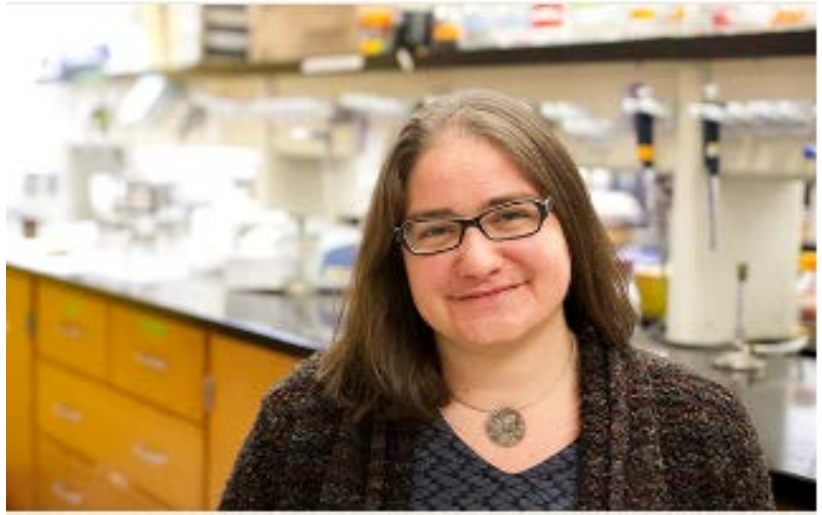


Females heard in volunteer student–instructor interactions significantly less than expected based on enrolment. Comparison of the percentage of females in a class (gray bars) with percentage of volunteer-based student–instructor interactions that involved female students (black bars). Asterisks (*) indicate that the exact binomial test was significant at the p = 0.05 level.



Random call extinguishes gender gap in whole-class participation.
Comparison of the percentage of females in a class (gray bars) with percentage of females who are called on during random call (RC)-based discussions (nested black bars).





"We tend to think our classrooms are distinct from society, but the processes from our larger society are being brought into the classroom."

—Sarah Eddy

"Professors typically have the ability to look back at numbers and performance in a class. Start prying a little deeper and really assess what's going on in each classroom."

—Dan Grunspan

From https://www.washington.edu/trends/what-is-your-class-telling-you/


the BiG BANG THEORY
Spigot

Resources I have used that have helped me be a more reflective instructor

Science + Math

SCIENCE AND MATHEMATICS EDUCATION RESEARCH COLLABORATIVE

Welcome to SMERC

An interdisciplinary group conducting STEM education

SMERC
RIT's Science and Mathematics Education Research Collaborative

IN THIS SECTION

- SMERC Home
- People
- Journal Club
- Seminar Series

The RIT Science and Mathematics Education Research Collaborative runs a weekly journal club and monthly seminar series, open to all, and consults with faculty interested in incorporating research-based methods and assessment into their classrooms.

DBER REU

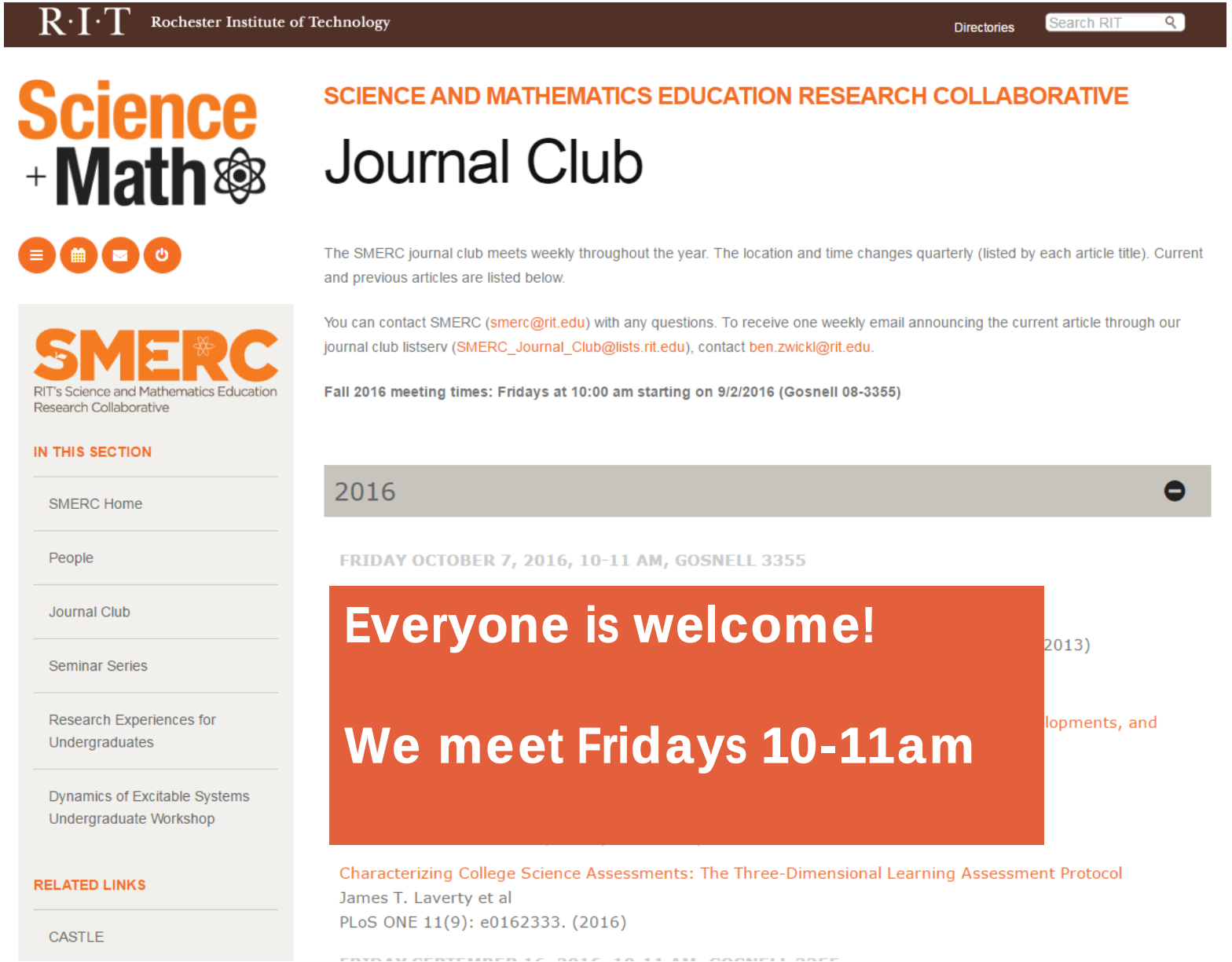
SMERC hosts the DBER (Discipline-Based Education Research) Research Experience for Undergraduates. The

POWER

Photonics and Optics Workforce Education Research (POWER) unites higher education, discipline-based

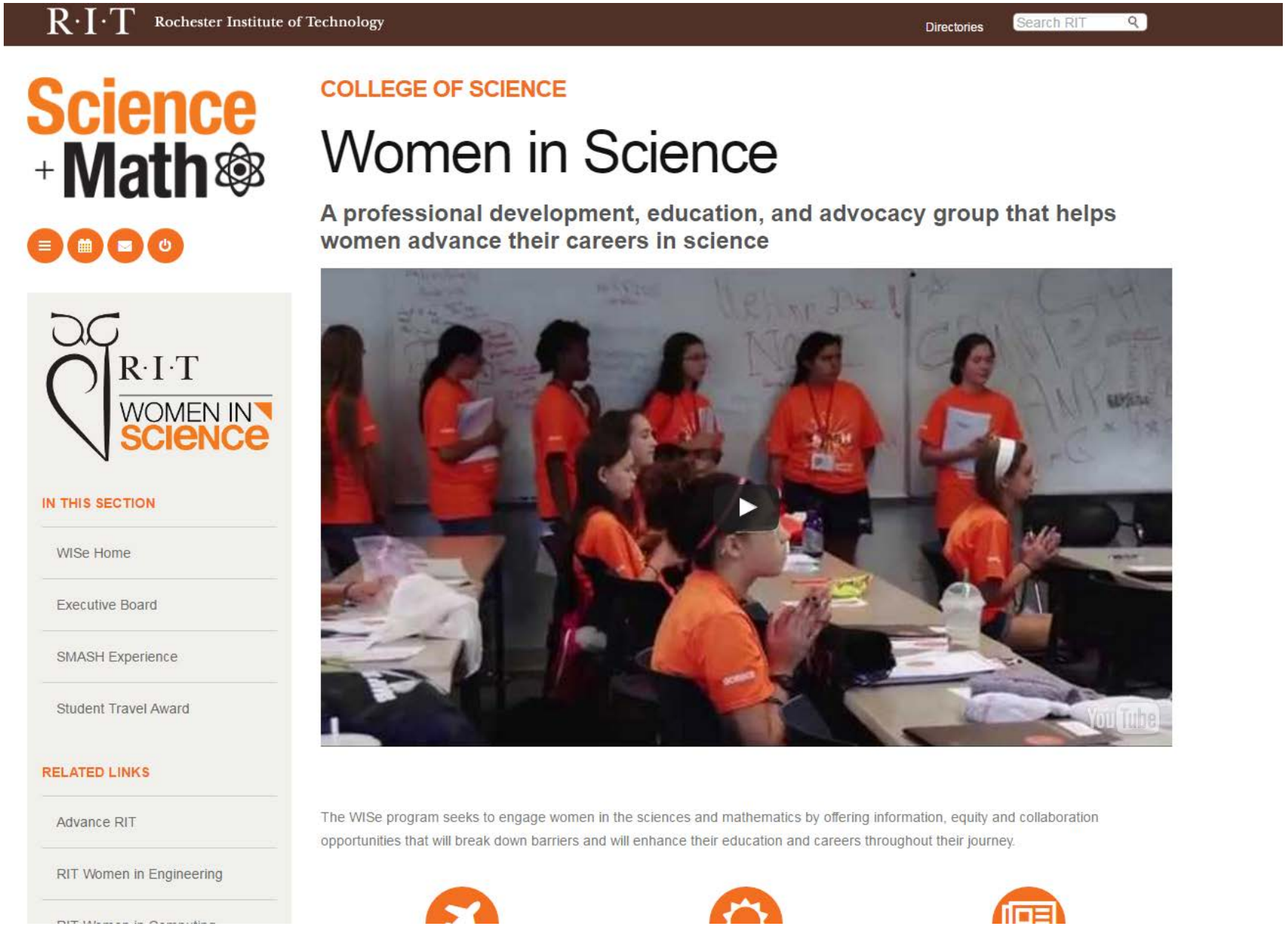
MBER

Molecular Biology Education Research Group



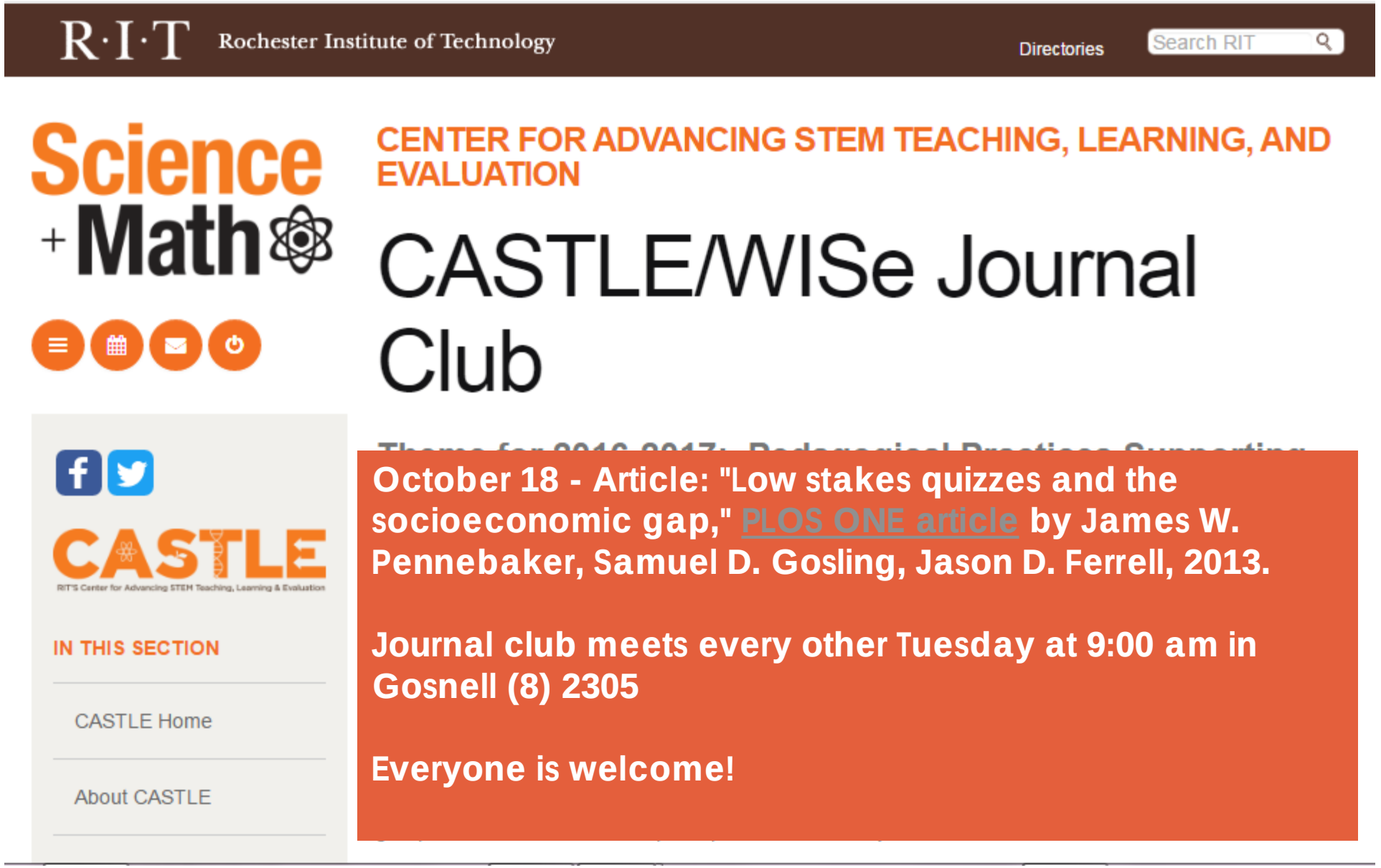
Journal club articles focus on discipline-based education research.

Analyzing research data and methods encourages me to think about different pedagogies (and if they were successful or not)



Coffee chats

Member of the “implicit bias” WISe team


R·I·T Rochester Institute of Technology
Directories
Search RIT
Science + Math
CENTER FOR ADVANCING STEM TEACHING, LEARNING, AND EVALUATION
CASTLE/WISe Journal Club
CASTLE
RIT'S Center for Advancing STEM Teaching, Learning & Evaluation
IN THIS SECTION
CASTLE Home
About CASTLE
October 18 - Article: "Low stakes quizzes and the socioeconomic gap," PLOS ONE article by James W. Pennebaker, Samuel D. Gosling, Jason D. Ferrell, 2013.
Journal club meets every other Tuesday at 9:00 am in Gosnell (8) 2305
Everyone is welcome!

R·I·T Rochester Institute of Technology

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Science + Math

WELCOME TO CASTLE

Welcome to the LA Program

LA Program
Rochester Institute of Technology

IN THIS SECTION

- LA Program Home
- Faculty Information
- Student Information
- Apply
- FAQs
- Forms and Documents
- Testimonials

RELATED LINKS

- CASTLE

Important Learning Assistant Program Dates:

Friday, October 14th: Spring Recruitment Fair 1 – 2 pm

Friday, October 14th: Faculty and Student applications open

Friday, October 21st: Faculty and Student application close

Having Learning Assistants (LAs) in my classroom has allowed me to transform my classroom into "student-centered"

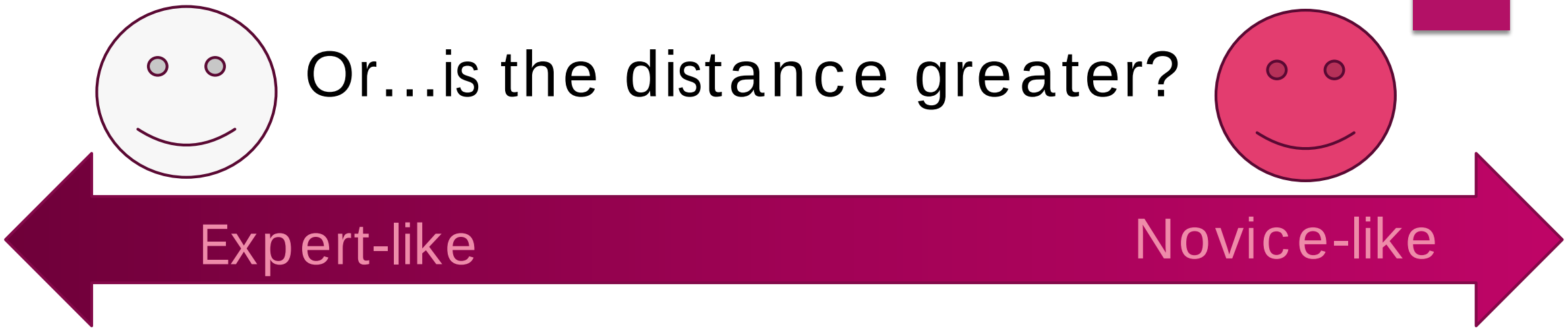
The LAs also provide me with "ears"

One last point

Think about it...

The more research we do, the more times we instruct a course, the more time we spend thinking about a subject....

Or…is the distance greater?



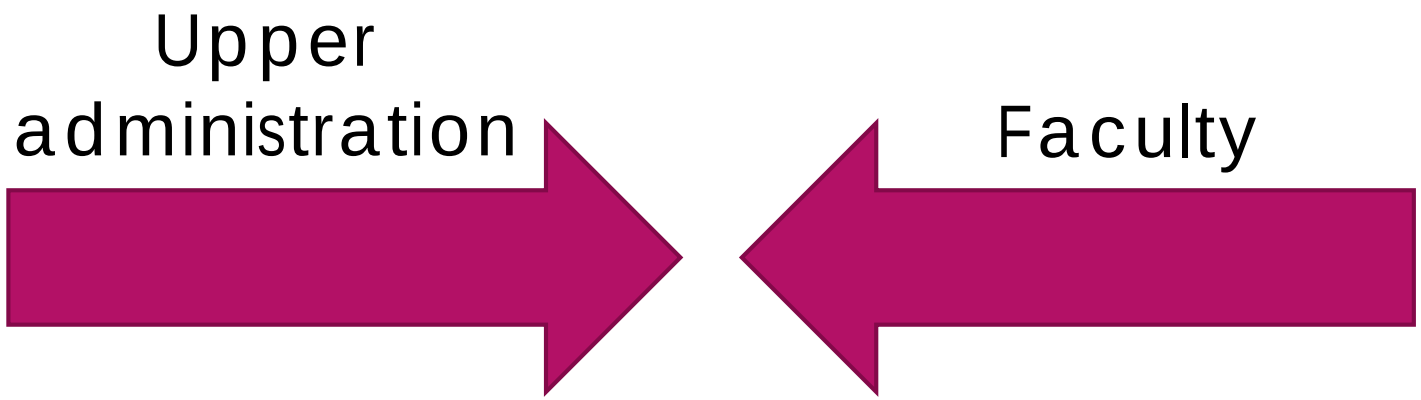
"Students these days are really weak"

"In my opinion, the students are getting worse"

"In all my years of teaching…."

How do we encourage more reflective teaching practices in our faculty?

Diclaimer: I have zero expertise/experience in the "changing academic culture" research/literature.



Change has to come from both "ends", but efforts must be coordinated

Discussion Questions:

What would your model of “change” look like?

What would reflective teaching look like in your school?

What resources already exist? What resources would need to be created?

How would you convince/encourage faculty to change?