Nomination of Dr. Colin Harrison for the 2024 Scholarship of Teaching and Learning Award

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Georgia Tech School of Biological Sciences

310 Ferst Drive • Atlanta, GA 30332

9 February 2024

Dear Teaching Awards Selection Committee,

I am delighted to nominate my colleague, Dr. Colin Harrison, Senior Academic Professional in the School of Biological Sciences, for the Scholarship in Teaching and Learning (SoTL) Award. I have had the pleasure of working with him as a co-instructor and undergraduate committee member, and I believe in his abilities as a stellar SoTL Scholar.

Dr. Harrison and I have been allies since we started in 2016 in pushing for the learning objectives of our courses to better align with the activities and assessments of student learning. Over this time, he has worked through a slow-and-steady approach to better align the current labs with the course objectives, while refining the lab objectives to create a more cohesive approach to true scientific inquiry. Importantly, while making these changes, Dr. Harrison has been careful to include teams of undergraduate scientists to assess both the effective and affective responses of students to these changes. This has meant systematically training a series of undergraduates in SoTL so that they may collect data on (and improve!) student satisfaction and progression from novice to more expert-like scientific thinking.

Taking a targeted approach, Dr. Harrison is trying out new labs which are aimed at data-determined failures of the past curriculum. In particular, he has worked to revise the laboratory manuals to promote relevancy of experiments and diversity of scientists working in these fields. This helps to provide meaningful context, particularly for the non-majors in our large, required courses. As part of this, he has brought in the work of other scientists via Scientist Spotlights, which aim to introduce scientific concepts through personal narratives about the diverse scientists who work in those fields. Similar to the results of other institutions, we, too, have seen these stories support our students in their journey as scientists. I really appreciate approaches which look to systematically assess the outcomes of curricular change, and his Science Identities project plays right into demonstrating whether the laboratory activities spark lifelong learning and trust in science, in addition to retaining more of our students. Spoiler alert: it works!

Building off of his work to create community amongst our faculty by being a regular member of our budding education research group within biology, I appreciate that much of Dr. Harrison's work has been facilitated through the efforts of scientists-in-training. Being in a non-tenure-track teaching role, I need to stress that we're not rewarded for research (nor is time allotted to doing it), but our dedication to students is strong. Through SoTL, Dr. Harrison has directly guided undergraduates through very time-consuming formal research study, particularly as it has been on projects whose content is not generally covered during a typical biology undergraduate degree (e.g., educational psychology is not a standard part of a biology major's degree). However, by leveraging self-study of the students, Dr. Harrison has been able to create more time in his schedule to be engaged in interesting SoTL work via his students, while providing them valuable training as scientists.

Notably, Dr. Harrison is serving on the editorial board of one of our flagship journals, has been invited for talks, and is a steering committee member for a large NSF grant. These roles emphasize his reach is not just limited to Georgia Tech, but is nationally felt. In short: Dr. Harrison is a colleague who is excellently striving to steer a set of large introductory courses toward inquiry-based learning, while also examining what pedagogically works, for whom, and why. He embodies what it means to be SoTL Scholar, through the research he uses and conducts in his classroom, and through the students he trains in the process. He

Sincerely,

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Endorsed by Dr. Todd Streelman
Chair, School of Biological Sciences

Teaching Philosophy

Everything that I do in the classroom and in the scholarship of teaching and learning revolves around one idea: equity. My goal as an educator and researcher is to make sure that everyone in the classroom or lab has an equal opportunity to learn, no matter their experience or background in a subject. When I work with the development of my teaching assistants I do an activity called “What’s in the Resource Bag?” in which participants are given bags filled with supplies to create a baby mobile with a partner. What the participants are not aware of is there are different levels of materials in their bags, high, medium, and low resource. At the end of the activity we reflect on how these bags can represent how the resources available to our students are vastly different from student to student. This simple activity showcases the ways in which I try and approach equity in the classroom. Different students need different things because they have access to different resources. As instructors should be using every tool available to us to help meet each student’s needs.

A lot of research about equity in academia focuses on two different but linked concepts that try to overcome these resource gaps: (1) Ways in which to better support students directly in their work and (2) ways in which to provide them with skills to be resilient in the face of challenges. While many of the evidence-based practices I use in the classroom directly support the students, it is in the aspect of minimizing student challenges in the classroom and providing ways for students to be resilient when faced with challenges outside of the classroom that much of my scholarship focuses on. Since we cannot always know what resources our students have available to them we need to provide them with a supportive structure that allows them to feel like they belong in academic spaces. By focusing our efforts on teaching in this manner we can make science a more welcoming place for all.

The way in which I approach equity in academia starts with the language we use in academic environments. After graduate school I was fortunate enough to work as a postdoc in the Science Education Partnership and Assessment Laboratory at San Francisco State University. It was there that I began working in the area of instructor talk. Instructor talk is anything that an instructor says in class not directly related to course content or logistics. By using positively framed instructor talk we can help make more students feel comfortable in class even when they may be struggling (Harrison et. al 2019). My experience with this research completely changed the way I approached talking to my students in class. I now practice, reflect on, and adjust what types of things I say to my students in class, just like I would with the actual content of a course.

Academia can be a lonely and isolating place for many students. By focusing on instructor talk I try to build the relationship with the students so that when they are struggling they do not feel so alone in my classroom. One of my goals is for the students to feel comfortable being vulnerable with me and able to reach out when they need extra support. This is particularly important because students remember what we say in class and it influences their perspective on the course and instructor (Ovid et. al 2021).

While I can control my own language in the classroom, I cannot control my students experiences in academia outside the classroom. With my approach to equitable teaching I hope to be able to give students the academic and emotional resources to be able to be resilient when met with challenges. My work studying microaggressions and mindset interventions has informed my approach into how to provide support for students that extends beyond the classroom (Harrison and Tanner 2018).

Pedagogically, I do this by connecting my students with examples from real world situations in which they can relate. This way, when they encounter challenges, they can reflect on the struggles other scientists may have gone through and how their own connections to biology are important. One of the ways I approach this is an assignment we do in introductory biology called Scientist Spotlights. These short writing assignments, where students read about the career paths of a diverse set of scientists and then reflect on them, allow students a different way to connect to the course material. By seeing themselves reflected in scientists who have gone on to great success, it can help them to realize that that everyone struggles on their journey (Shinske et. al 2017).

In the laboratory environment we directly link what they are doing in the lab to actual research and careers in biology. Students write research proposals in which they tackle a problem in biology by approaching the problem through the tools and perspective of a specific biology career. We also utilize course based undergraduate research experiences (CUREs) to help connect students to real research in partnership with local Atlanta organizations. These types of experiences can help close equity gaps by providing students with scientific opportunities they might not have access to outside of the teaching labs (Hanauer et. al 2017, Rodenbusch et. al 2017).

How do we assess whether or not our equity-based strategies are working and are we helping to develop students as scientists? This is where my research efforts intersect directly with my pedagogical choices in the classroom. I currently have projects in varying levels of progress looking at issues related to instructor talk, novice-to-expert transition, science self-efficacy and identity, instructor-based mindset interventions, testing anxiety, syllabus language, and microaggressions. This process of reflection through research helps me better support my students in class and labs through evidence-based practices. Who are the students we are still missing with our efforts? How can we better identify and help students who may be struggling but their struggle is not visible to instructors? How do we iterate on things that have worked well and expand them to reach a larger population? By answering these questions through research, we can continue to expand our efforts to make science a place where all students can achieve their academic goals.

Evidence of Impact

In pursuit of my goal of an equitable classroom I have been involved in the scholarship of teaching and learning (SoTL) through my own research and use of evidence-based practices. I have also been involved in biology education research at the national level to try and help bring my vision of an equitable classroom to spaces beyond Georgia Tech. Below I have broken down my efforts into four sections that highlight ways in which my SoTL has influenced my activities in the classroom and teaching labs.

1. Language in the Classroom

Research Evidence

Instructor Talk

My initial research interest in SoTL was looking at instructor talk. We published a paper showing that instructor talk was widely used across a variety of different classrooms and instructors (Harrison et. al 2019) (Fig 1). Subsequent studies have shown that teaching assistants use even more instructor talk than course instructors (Gelinas et. al 2022). Most important for how we think about students, there is strong evidence that students remember the instructor talk that they hear in class, with increased awareness of negatively-phrased instructor talk among women, first gen students, persons excluded due to ethnicity and race (PEER), and persons of color (Ovid et. al 2021). This increased awareness among students who can often be marginalized or isolated in biology shows how important instructor talk is for ensuring an equitable teaching environment.

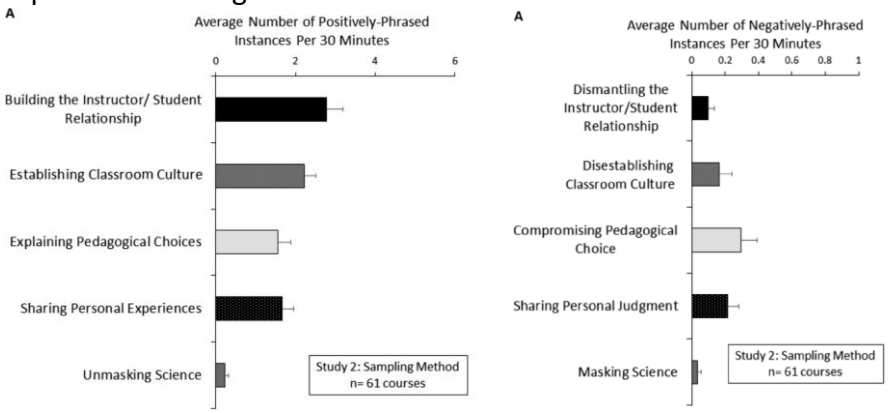


Figure 1: Average number of instructor talk instances per 30 minutes for each of the five positively-phrased and five negatively-phrased instructor talk categories. Error bars represent the standard error of the mean. Reprinted from Harrison et. al 2019.

I am currently working on expanding the research knowledge in this area by working with Dr. Dax Ovid in the University of Georgia Department of Physiology and Pharmacology. Dr. Ovid's group is measuring the use of instructor talk and student affective outcomes as well as recognition of instructor talk before and after a change from a didactic classroom environment to one driven by active learning.

Mindset Intervention Grant

I am involved in an NSF-IUSE grant proposal that is looking at how instructor led mindset interventions in syllabus language, as well as post-exam messages from the instructor, can play a role in student performance in introductory biology courses. There is a wide range of evidence showing that mindset interventions can have a large impact on students' achievement and persistence in a class or degree, especially among marginalized students (Harris et. al 2019,

Yeager et. al. 2019, Broda et. al 2018, Claro et. al 2016). We are currently wrapping up the data collection phase, but early results look promising for this intervention having some role in student performance in introductory biology courses.

Microaggressions Grant Writing

In addition to my work on instructor talk with Dr. Ovid, we are currently in the process of writing a grant looking at microaggressions in biology departments. The project is expecting to explore the experiences of both undergraduate and graduate students in biology related programs both here at Georgia Tech and at UGA. If funded, this would be important work into understanding the climates of programs at both institutions.

Student Evidence

Students recognize the way in which I utilize language in the classroom to create a positive environment. I have been a multi-semester recipient of the Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll award (F23, SP23, F22, SP21, F20). This is reflected in my interpolated median CIOS scores related to classroom environment in courses where I was the primary instructor. Scores for Respect for Students (4.8), Enthusiasm (4.8), and Inclusivity (4.9) indicate that students are recognizing how my use of language positively impacts their learning environment.

Below are a selection of comments from students that illustrate ways in which my approach to language in the classroom has benefitted students:

- "*Dr. Harrisons excitement for the course was contagious and his care for us as a class and as students outside of it made it a more effective and enjoyable course."*
- "*I don't think I've ever encountered a professor who made me feel more welcomed and understood than Dr. Harrison. He is truly a gem.*"
- "*Professor Harrison is super kind and caring about his students. He clearly cares about their wellbeing and has the student's best interest. He's super passionate and knowledgeable about biology and also does a great job including a lot of diversity and inclusion while he's teaching.*"

2. Incorporating Real World Problems

Research Evidence

Science identity and science self-efficacy

Laboratory learning can be an excellent location for promoting equitable teaching practices as it has been shown that opportunities in inquiry labs and CUREs can provide opportunities for students to participate in authentic research experiences when they may not be able to participate in other research opportunities (Hanauer et. al 2018, Rodenbusch et. al 2016, Eagan et. al 2013). In addition, by using real world scenarios tying lab experiments to scientific problems or providing students with authentic research experiences can help strengthen a student's connection to science (Estrada et

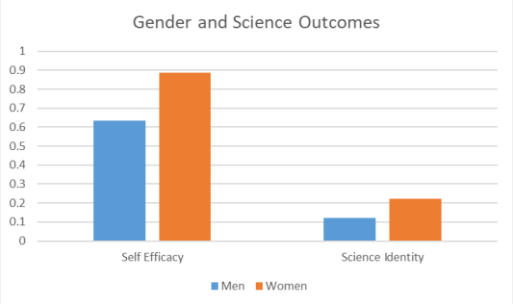


Figure 2: Difference in pre and post semester Likert survey responses (5 point). Men have a lower overall magnitude change than women for both self-efficacy and science identity.

al. 2011). My research group is currently analyzing data from past semesters of the introductory biology labs looking at whether or not we can improve science self-efficacy and science identity by incorporating real examples into inquiry labs. Early evidence shows that while on average all students see an increase in self-efficacy and to a lesser extent science identity, female students have a larger increase than male students (Fig 2). In addition, when courses were forced online during the COVID-19 pandemic, we were able to show that using these real-world scenarios we could effectively administer a satisfactory experience for students (Fig 3).

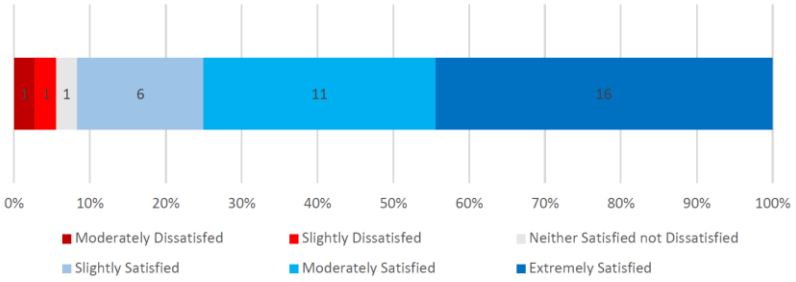


Figure 3: Self-rated student satisfaction for students in online biology lab with inquiry-based labs and authentic research design and data. Reprinted from Harrison et. al 2023.

Scientist spotlights

Scientist spotlights are short writing assignments in which students are introduced to the backgrounds and science of a diverse group of scientists and reflect on their relationship to them. These assignments have been shown to have a positive impact on student belongingness in biology (Shinske et. al 2017, https://scientistspotlights.org/). As co-chair of the Introductory Biology Committee, we were successfully able to incorporate scientist spotlights into all of our introductory biology courses.

Student Evidence

Below are a selection of student comments on their experiences with real world scenarios in the intro labs:

- "*I think this lab course did a good job of demonstrating what working in a biology lab could be like.*"
- "*The experiments done in lab were a great way to apply knowledge gained from the lecture to more real-life applications of the topics.*"
- "*The best features were the presentations that accommodated the experiments afterwards. It allowed for me to utilize my strengths, and made it feel like I was an actual scientist presenting my findings (especially since my group usually had a very unique experiment).*"

Here are a selection of student comments on the scientist spotlights:

- "*Best feature of the course was the scientist spotlights because it gave us some real-world background on scientists in the field.*"
- "*I found the scientist spotlights very interesting since we had the chance to look at some work several scientists have done in different fields.*"
- "*I especially enjoyed the scientist spotlights and learning about scientists of different backgrounds*"

3. Developing the Next Generation of Scientists

Research Evidence

Experimental Card Sorting

One of the most difficult things to measure in a large-scale manageable style is improvements in research knowledge. To that end, Dr. Megan Cole in the Emory University Department of

Biology and our respective research groups have developed a card sorting task looking at the way people organize their experimental design knowledge (Cole et. al 2023). We were effectively able to show the difference between novices and experts in the way people organize this knowledge, with experts sorting based on deep features (experimental design principles) and novices sorting on unexpected or surface features (organism type) (Fig 4). We also showed that students who had scored a 4 or above on the AP exam performed more like experts on the card sorting task than those that had not.

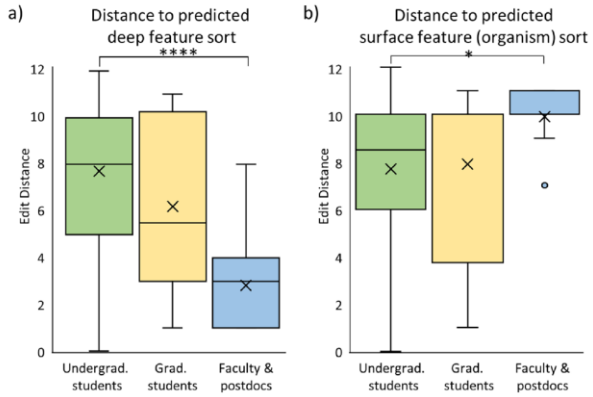


Figure 4: Unframed edit distance to a) deep feature and b) surface feature for undergraduate graduate and faculty and postdocs. Significance indicated by *. Whiskers indicate nonoutlier minimum and maximum score. Reprinted from Cole et. al 2023.

We are now expanding this previously published study to try and see if we can measure changes in freshman biology students between the beginning of their first semester on campus to the end of their second semester on campus. We are also examining whether student performance on end of the year lab reports correlates with how they organize their experimental design knowledge. By better elucidating what factors are involved in the shift between novice and expert-like thinking, we can take a more equitable approach to supporting our students in teaching labs.

Student Evidence

Below are a selection of quotes from students highlighting growth as scientists:

- "*Having to go through the whole process of building up a hypothesis and an experiment helped me understand the concepts of the lab much better. In previous lab classes, we didn't spend a lot of time in the preparation and the reasoning behind the experiments and just dived right into the lab work.*"
- "*I really liked that this course focused on designing your own experiments. I feel like it is a great way to learn about the scientific method and develop a greater understanding of how to write academically*."
- "*The research proposals and actual lab activities improved my skills in scientific research and lab work (respectively).*"

In addition to these student testimonials, our work with the team at Georgia Tech analyzing the learning outcomes of the formerly titled Core Area D courses has shown that students are achieving the learning outcomes related to research and design (87% early semester lab reports, 91% end of semester lab reports, *statistically significant increase).

4. Broader Impacts

Research Evidence

SABER DEI Initiatives

My work in SoTL has extended beyond my work at Georgia Tech as well. I worked as a member and chair of the Diversity, Equity, and Inclusion Committee for the Society for the Advancement of Biology Education Research (SABER). My time on this committee coincided with a period of great social upheaval around the country including the events in Minneapolis. SABER regularly holds their national meetings in the Twin Cities and as a part of this committee we took this opportunity to enact changes within the organization to become a more equitable entity (Dewsbury et. al 2021).

Peer and Institutional Evidence

In addition to this research work with SABER, my expertise as an expert in the field of academic equity has provided me with several opportunities to help shape SoTL research both nationally and here at Georgia Tech.

In 2017 I co-authored a paper entitled "Language Matters: Considering Microaggressions in Science". Since that time, I have repeatedly been invited to give talks on the subject, with demand being so high I have had to decline opportunities. Over the past several years I have had the honor of being an invited speaker at a wide range of institutions and organizations such as the National Science Foundation's BP Knowledge Sharing Group, Health Canada, SABER, and Emory University. I have also participated in the podcast series "Teaching for Student Success" with Steven Robinow (Teaching For Student Success Episode 19).

Below are some selected follow up messages indicating the impact of these talks:

- "*Thank you so much for the wonderful presentation last week. Really has me thinking about what to do when I hear microaggressive conversations in work scenarios.*"
- "*I had the pleasure of attending your virtual discussion "Language matters: Considering racial microaggressions in science". I found the manner in which you approached the subject more interactive and informative than other webinars I have attended on the topic. I really liked how you explained the various types of microaggressions with concrete examples and as well how you explained the effects microaggressions have on a person. I really liked that this was supported with research.*"
- "*Your talk was so informative and helpful! Thank you for sharing your important work on microaggressions in academia with us today! I think I speak for everyone when I say it was fantastic! Thank you!*"

For the past year I have been a monitoring editor for one of the most well-respected biology education research journals CBE Life Sciences Education. In this time, I have put my experience into equitable practices in academia to work in helping to get papers published on topics including, gender, sexual orientation, and race and ethnicity. My work in this area has been acknowledged by my colleagues in the biology SOTL field as I have been regularly requested by the authors to serve as monitoring editor for work related to DEI.

At Georgia Tech, I have had the honor to serve on the working group for innovative and inclusive teaching and scholarship as part of the Diversity Equity and Inclusion strategic plan which itself supported the Georgia Tech strategic plan. Through the meetings of the working group, we helped formulate ways in which GT could better support SoTL efforts on campus.

References

Broda M, Yun J, Schneider B, Yeager DS, Walton GM, and Diemer M. Reducing Inequality in Academic Success for Incoming College Students: A Randomized Trial of Growth Mindset and Belonging Interventions. Journal of Research on Educational Effectiveness. 2018 Jan 5; 11(3).

Claro S, Paunesku D, and Dweck CS. PNAS. 2016 Aug 2; Vol 113 No3. 8664-8668.
Eagan Jr MK, Hurtado S, Chang MJ, Garcia GA, Herrera F, and Garibay JC. Making a Difference in Science Education: The Impact of Undergraduate Research Programs. Am Educ Res J. 2013 Aug; 50(4): 683–713.

Cole MF, Britton CO, Roberts D, Rubin P, Shin HD, Watson YR, and Harrison C. A card-sorting tool to measure expert versus novice thinking in scientific research. CBE – Life Sciences Education. 2023 Sep 26;Vol 22 No 4.

Dewsbury B, Segura-Totten M, Lo SM, Harrison CD [and 47 other authors]. Chronicling the journey of the Society for the Advancement in Biology Education Research (SABER) in its effort to become antiracist: from acknowledgement to action. Frontiers in Education. 2021 Dec; Vol 6.

Estrada M, Woodcock A, Hernandez PR, and Schultz PW. Toward a Model of Social Influence that Explains Minority Student Integration into the Scientific Community. J Educ Psychol. 2011 Feb 1; 103(1): 206-222.

Gelinas KA, Ovid D, [and 18 other authors]. Investigating Instructor Talk among Graduate Teaching Assistants in Undergraduate Biology Laboratory Classrooms. CBE – Life Sciences Education. 2022 Apr 25;Vol 21 No 2.

Hanauer DI, Nicholes J, Liao F, Beasley A, and Henter H. Short-Term Research Experience (SRE) in the Traditional Lab: Qualitative and Quantitative Data on Outcomes. CBE – Life Sciences Education. 2018 Nov 29;Vol 17 No 4.

Harris RB, Grunspan DZ, Pelch MA, Fernandes G, Ramirez G, and Freeman S. Can Test Anxiety Interventions Alleviate a Gender Gap in an Undergraduate STEM Course? CBE – Life Sciences Education. 2019 Aug 9;Vol 18 No 3.

Harrison CD, Tanner KD. Language Matters: Considering Microaggressions in Science. 2018 Mar 22. CBE: Life Sciences. Vol 17 No 1.

Harrison CD, Nguyen TN, Seidel SB, [and 74 other authors]. Investigating Instructor Talk in Novel Contexts: Widespread Use, Unexpected Categories, and an Emergent Sampling Strategy. CBE—Life Sciences Education. 2019 Aug 30;Vol 18 No 3.

Harrison C, Britton CO, Shin HD, and Watson YR. An Online Introductory Biology Laboratory Utilizing Inquiry-Based Methods Leads to High Student Satisfaction. Journal of College Science Teaching. 2023 September 01;Vol 52(7).

Ovid D, Rice MM, Vargas Luna J, Tabayongyong K, Lajevardi L, and Tanner KD. Investigating Student Perceptions of Instructor Talk: Alignment with Researchers' Categorizations and Analysis of Remembered Language. CBE – Life Sciences Education. 2021 Oct 4;Vol 20 No 4.

Rodenbusch SE, Hernandez PR, Simmons SL, and Dolan EL. Early Engagement in Course-Based Research Increases Graduation Rates and Completion of Science, Engineering, and Mathematics Degrees. CBE – Life Sciences Education. 2017 Oct 13;Vol 15 No 2.

Shinske JN, Perkins H, Snyder A, and Wyer M. Scientist Spotlight Homework Assignments Shift Students' Stereotypes of Scientists and Enhance Science Identity in a Diverse Introductory Science Class. CBE – Life Sciences Education. 2017 Oct 13;Vol15 No 3.

Yeager DS, Hanselman P, Walton GM, [and 22 other authors]. A national experiment reveals where a growth mindset improves achievement. Nature. 2019 Aug 7; 573(7774): 364-369.

Condensed Curriculum Vitae

Earned Degrees

Emory University — Atlanta, GA.
Ph.D. Genetics and Molecular Biology — 08/2007-04/2015

University of Wisconsin — Madison, WI.
B.S. Genetics — 08/2003–05/2007

Academic Appointments

Georgia Institute of Technology — Atlanta, GA.
Senior Academic Professional — 07/2021-Present

Georgia Institute of Technology — Atlanta, GA.
Academic Professional — 07/2016-07/2021

Tanner Lab (SEPAL), SFSU — San Francisco, CA.
Postdoctoral Associate — 04/2015-07/2016

Academic Honors and Awards

Student Recognition of Excellence in Teaching: Class of 1934 CIOS Honor Roll (F23, Sp23, F22, Sp21, F20)
Georgia Tech Thank a Teacher (2019, 2020, 2021, 2022, 2023)
2020 Innovation and Excellence in Laboratory Instruction Award

Georgia Tech Teaching Assignments

BIOS 1107: Biological Principles, BIOS 1107L: Biological Principles Lab, BIOS 1108L: Organismal Biology, BIOS 1207L: Biological Principles Project Lab, BIOS 1208L: Organismal Biology Project Lab, BIOS 3450 Cell and Molecular Biology

SoTL Publications

Published

Cole MF, Britton CO, Roberts D, Rubin P, Shin HD, Watson YR, and Harrison C. A card-sorting tool to measure expert versus novice thinking in scientific research. CBE – Life Sciences Education. 2023 January 01;Vol 22 No. 4.

Harrison C, Britton CO, Shin HD, and Watson YR. An Online Introductory Biology Laboratory Utilizing Inquiry-Based Methods Leads to High Student Satisfaction. Journal of College Science Teaching. 2023 September 01;Volume 52(7).

Dewsbury B, Segura-Totten M, Lo SM, Harrison CD [and 47 other authors]. Chronicling the journey of the Society for the Advancement in Biology Education Research (SABER) in its effort to become antiracist: from acknowledgement to action. Frontiers in Education. 2021 Dec; Vol 6.

Harrison CD, Nguyen TN, Seidel SB, [and 74 other authors]. Investigating Instructor Talk in Novel Contexts: Widespread Use, Unexpected Categories, and an Emergent Sampling Strategy. CBE—Life Sciences Education. 2019 Aug 30;Vol 18 No 3.

Spencer C, Harrison CD. Designing Course-based Undergraduate Research Experience (CURE) Labs with Citizen Science and Service-learning. ABLE. 2018 Jun ;Vol 39.

Harrison CD, Tanner KD. Language Matters: Considering Microaggressions in Science. 2018 Mar 22. CBE: Life Sciences. Vol 17:1.

Owens MT, Trujillo G, Seidel SB, Harrison CD, Farrar KM, [and 63 other authors] Collectively Improving Our Teaching: Attempting Biology Department-wide Professional Development in Scientific Teaching. CBE: Life Sciences Education. March 1; 17(1):ar2

Owens MT, Seidel SB, Wong M, [and 80 other authors including Harrison, CD]. Classroom Sound Can Be Used to Classify Teaching Practices in College Science Courses. Proceedings of the National Academy of Sciences. 2017 Mar;114(12): 3085-3090.

In Preparation
Jeong H, Kang J, Schwartz-Silvera A, Park J, and Harrison C. Measuring Science Attitudes in Intro Biology Labs. In Preparation.

Harrison C, Suh K, Mir Z, Rubin P, Avakaram P, Bhatia S, and Cole MF. Measuring Differences in 1st-Year Biology Students Through Their Performance on a Card Sorting Task. In Preparation.

Gordon ML, Runton R, and Harrison C. Measuring Test Anxiety Related to Studying During Break Periods. In Preparation.

Livingston ML, Harrison C, and Ovid D. Comparing Instructor Talk Usage Between Pre- and Post-Course Redesign. In Preparation.

Navlekar A,… Harrison C,… Limeri L, Canning E. Improving student success and equity with student-level and instructor-level growth mindset interventions. In Preparation.

Harrison CD, Vanderwaal Mills KE, and Young M. Instructor Course Expectations and Syllabus Analysis. In Preparation.

SoTL Presentations
Invited

University of Georgia, Department of Physiology and Pharmacology	Online
Language Matters: Considering Microaggressions in Science	02/2023
NSF Broadening Participation Knowledge Sharing Group	Online
Language Matters: Considering Microaggressions in Science	11/2023

Teaching for Student Success Podcast — Online
Episode 19: Microaggressions: Language Matters with Colin Harrison — 04/2022

Emory Post-Doc Lunch and Learn Series — Online
Language Matters: Considering Microaggressions in Science — 05/2021

Health Canada Seminar Series — Online
Language Matters: Considering Microaggressions in Science — 05/2021

Health Canada Science Forum – Panel on Systemic Racism in Science — Online
Moderator — 01/2021

SABER Seminar Series — Online
Language Matters: Considering Microaggressions in Science — 10/2020

Georgia State - Presentation — Atlanta, GA.
Language Matters: Considering Microaggressions in Science — 03/2019

Emory University - Presentation — Atlanta, GA.
Language Matters: Considering Microaggressions in Science — 11/2017

University of Tennessee - Presentation — Knoxville, TN.
What are Biology Instructors Saying in Class? Comparing Instructor Talk Across 55 Biology Courses — 11/2016

Submitted

Association of Biology Laboratory Education Conference – Major Workshop — Madison, WI.
Designing Project-Based Labs with Citizen Science and Service Learning — 06/2017

Society for the Advancement of Biology Education Research National Meeting — Minneapolis, MN
What are Biology Instructors Saying in Class? Comparing Instructor Talk Across 55 Biology Courses — 07/2016

SoTL Grants

Title of Project: Collaborative Research: Improving student success and equity with student-level and instructor-level growth mindset interventions
Agency/Company: NSF
Total Dollar Amount: 1,995,777
Role: Senior Personnel
Collaborators: Lisa Limeri (Co-PI), Elizabeth Canning (co-PI),
Period of Contract: 2/1/2022-2/1/2026
Candidates Share: $7,500

EMORY COLLEGE OF ARTS AND SCIENCES

Faculty of Arts and Sciences
Department of Biology

Dear awards committee,

I am writing to enthusiastically support the nomination of Dr. Colin Harrison for the Georgia Tech Center for Teaching and Learning Scholarship of Teaching and Learning award. Dr. Harrison's outstanding contributions to the scholarship of teaching and learning, particularly within the field of science education, make them an exemplary candidate for this prestigious recognition.

Dr. Harrison's impact on the field is evident through his numerous publications, each offering valuable insights and practical solutions to enhance the teaching and learning experience in science classrooms. One notable contribution is the publication on microaggressions in the classroom, which skillfully identifies problematic language within the science domain and provides effective strategies to address these issues. This work not only raises awareness but also equips STEM teachers with actionable tips to create inclusive and respectful learning environments, ultimately improving the overall student experience.

In addition to addressing critical issues like microaggressions, Dr. Harrison has further enriched the teaching community with practical resources on classroom materials. His work on the success of an online research experience and a citizen science lab course demonstrates a commitment to advancing innovative and effective teaching methods. These resources serve as invaluable tools for educators seeking to enhance the quality of their courses and engage students in meaningful learning experiences.

More recently, Dr Harrison published an article with a novel assessment tool to measure expert-like thinking in research skills. This tool may prove to be widely valuable as it can be applied to any research-based course regardless of model organism, student level, or lab techniques used in the course. As impacts of research experiences and Course-Based Undergraduate Research Experiences are an exciting area of education research currently, this tool may help move this research forward by providing a measure outside of student self-perception of research skills.

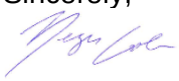
Dr. Harrison’s work has been published in top-tier peer-reviewed education research journals including CBE-lse (Cell Biology Education - life sciences education) and JCST (Journal of College Science Teaching). His research includes both quantitative and qualitative analyses of student data so his publications provide multi-faceted lines of evidence backing up his conclusions. As Dr. Harrison is well versed in the education literature, having participated in weekly science education journal clubs since he was a graduate student, his manuscripts adeptly contextualize his work within the larger scientific literature of the field. Also of note is the fact that Dr. Harrison has co-authored manuscripts with undergraduate Georgia Tech students, further enhancing their education by practicing science education research themselves.

In conclusion, Dr. Harrison's dedication to the scholarship of teaching and learning is commendable, and their impactful contributions undoubtedly align with the goals of the Georgia Tech Center for Teaching and Learning. His research is undeniably benefitting both the education research community and the students fortunate enough to be a part of his courses. I wholeheartedly endorse Dr. Harrison's nomination for the Scholarship of Teaching

and Learning award and believe that their work exemplifies excellence in advancing education within the science community.

Sincerely,

Sincerely,



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February 5, 2024

Dear members of the CTL Scholarship of Teaching and Learning Award committee:

I support the nomination of Dr. Colin Harrison for this award with unabashed enthusiasm. I co-taught the large (200+ enrollment) Bios 1107/2107 lecture courses with Colin for a few semesters before my retirement. We nearly always attended each other's class sessions, so I was able to observe how he incorporated his scholarship into his teaching.

Colin has done ground-breaking work on what he calls "instructor talk," including both what the teacher says deliberately, and crucially, what the teacher says in unplanned, off-hand comments and how these words and phrases affect student performance and perceptions. This work has been published in CBE Life Sciences, with his post-doctoral mentor Kimberly Tanner. I noted how Colin translates this work into his careful word choices in the lecture hall, and his verbal encouragement of students. The overwhelmingly positive CIOS scores from students are evidence of students' positive reception of Colin's "instructor talk." Colin's work and teaching practice has influenced my own teaching, such that I came to a similar approach in how I talk in the classroom.

Colin is fully cognizant of current student-centered teaching practices and readily adapted to the flipped model in Bios 1107. He developed some of his own in-class teaching modules (mini-case studies) with formative assessment built-in. His module on the genetics of eye-color using himself and his wife and their child was particularly memorable and popular with students.

Colin has also implemented innovations in the Introductory Biology labs, which have also been published in refereed journal articles with undergraduate student co-authors. Although I have not observed the teaching of these labs, his latest work on card-sorting to illuminate student understanding is fascinating. I very much enjoyed a demonstration of how different ways that people sort cards can reflect their level of knowledge and expertise in the subject. I sincerely believe that card-sorting can be a valuable tool in the kit for assessing student learning.

Colin Harrison is a superb teacher, researcher and mentor in the scholarship of teaching and learning.

Sincerely,

Jung H. Choi

Jung H. Choi
Associate Professor (Retired), School of Biosciences
Former Director, Professional MS Bioinformatics Program