A Statistical Analysis of the Learning Assistant Program at FGCU

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Abstract

FGCU's Learning Assistant (LA) program began in 2016 and spanned a wide range of STEM disciplines. In the last year, it has expanded to non-STEM classes as well. We are interested in measuring the effectiveness of the program and determining methods of improvement for the future. We have analyzed DFW data, as well as surveys that were given to both LAs and their mentors.

Objectives

We'd like to find answers to the following questions:

- Do DFW rates among *all subject areas* improve when an LA is present compared to when they are not?
- Do DFW rates among classes with the same instructor improve when an LA is present compared to when they are not?

Learning Assistant Program

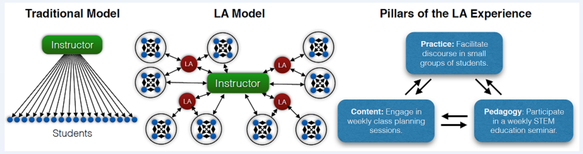
- Established in 2003 at UC Boulder. Currently >200 universities.
- LAs are talented undergrads who have recently taken a STEM course and *remember what it's like to learn the material.*
- They help transform undergraduate courses to include small groups of students articulating, defending, and modifying their ideas about a relevant problems or phenomena.
- Their main role is to support student learning in interactive classroom environments, working with small groups of students as they solve challenging conceptual or mathematical problems.

From 2016-2019:

- Noyce supported **60 sections** with Learning Assistants that reached over 3000 total students.
- Twenty-five faculty members from **7 STEM departments** voluntarily participated as mentors.
- Six LAs also became Noyce or Schulze scholars.
- The program has continued in 2019-2020 funded internally by the Office of Undergraduate Scholarship and supported by the Center for Academic Achievement, and now includes LAs in non-STEM classes from Languages and Literature, History, Business, and Rehabilitation Sciences.

"I fully believe that the reason I have been so successful as a student is because of being able to be a part of the LA program. It sharpens my skills and knowledge on the fundamentals of my major which inevitably come up in later courses. This allows me to learn new topics quicker and easier."

"If you plan/want to do anything in education, it is a great experience. Helping students by interacting one-on-one or in small groups is rewarding."



Analysis

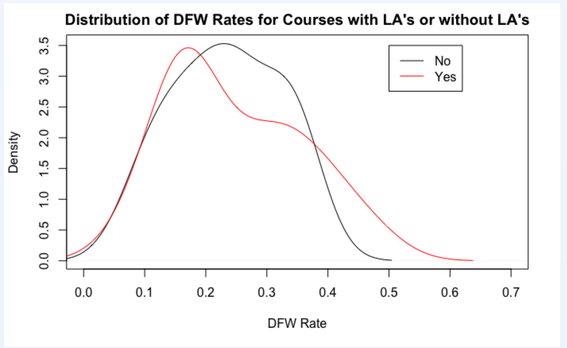
We may begin by accounting for the subject areas involved in our analysis. Data was taken from 18 STEM courses from semesters spanning the Fall 2016-Spring 2018 semesters at FGCU:

Course (# students, DFW Rate)

Calculus I (516, .316)
Calculus II (165, .23)
College Algebra (3121, .28)
College Physics w/Lab II (64, .16)
Elementary Calculus (325, .387)
Engineering Mechanics (89, .225)
Finite Mathematics (307, .131)
General Biology w/Lab I (1498, .346)
General Chemistry I (2302, .374)
General Chemistry II (791, .365)
Intermediate Algebra (2345, .224)
Intro Earth Science (464, .151)
Intro to Computer Science (347, .195)
Intro. Environmental Science (254, .083)
Introduction to Programming (210, .126)
Precalculus (1091, .242)
Social Science Statistics (98, .177)
Statistical Methods (2834, .246)

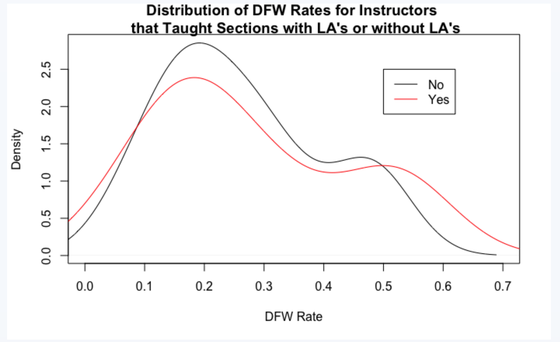
- Do DFW rates among *all subject areas* improve when an LA is present compared to when they are not?

There is no statistically significant difference between DFW rates for subject areas when an LA is present compared to when they are not (t=.898, df=17, p=.8092)



- Do DFW rates among courses with the same instructor improve when an LA is present compared to when they are not?

There is no significant difference between the same course in different sections with the same instructor for when an LA is present compared to when an LA is not (V=36, p=.6225).



Conclusion and Considerations

- Are there other more effective metrics for Learning Assistant impact than DFW rates?
- Is the lack of significant improvement in DFW's a result of lack of funding/support?
- Courses with a Learning Assistant had only one and no Instructional Assistants. However, courses with no Learning Assistants may have had an Instructional Assistant.
- In more recent semesters, classes with a Learning Assistant may have more than one.
- Instructors self-select to use Learning Assistants. Could we see better results when changes are made across sections?

References

- Ben Van Dusen, Laurie Langdon, and Valerie Otero. Learning assistant supported student outcomes (lasso) study initial findings. In *Physics Education Research Conference* 2015, PER Conference, pages 343–346, College Park, MD, July 29-30, 2015.
- Ben Van Dusen, Jada-Simone S. White, and Edward Roualdes. The impact of learning assistants on inequities in physics student outcomes. 2016.
- *Learning Assistant Program*, www.colorado.edu/program/learningassistant/.