



Learning Lessons and Their Impact on Student Success in First Year Biology Classes

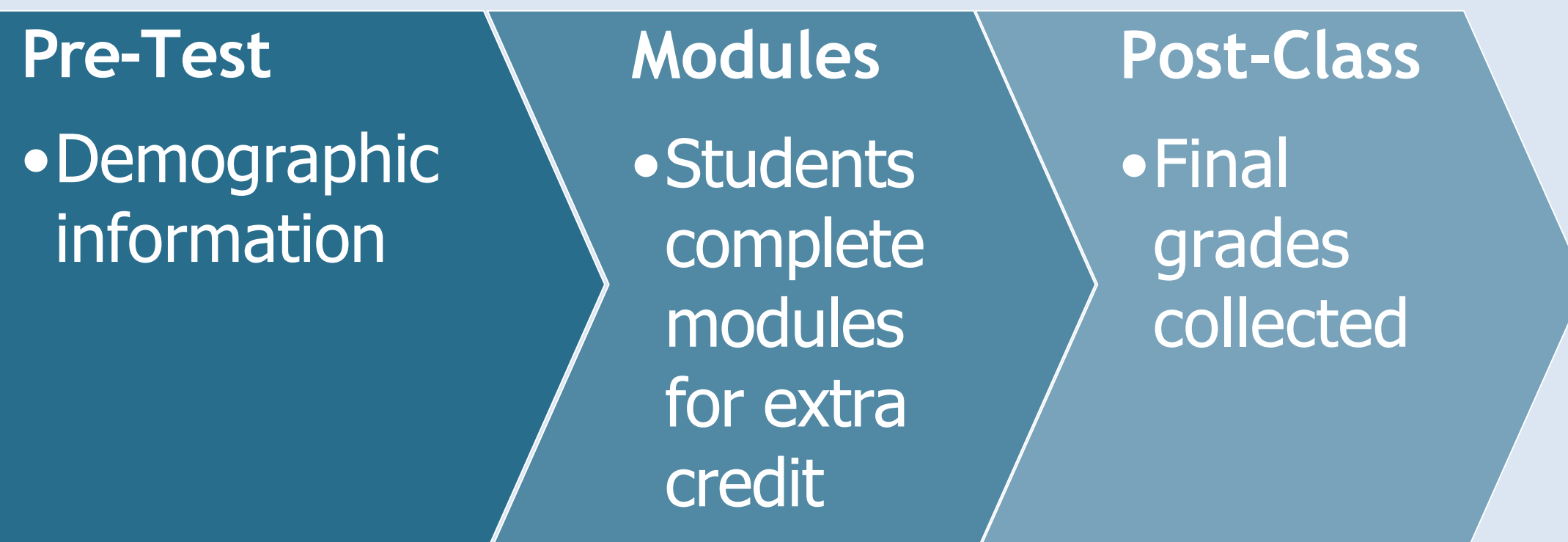
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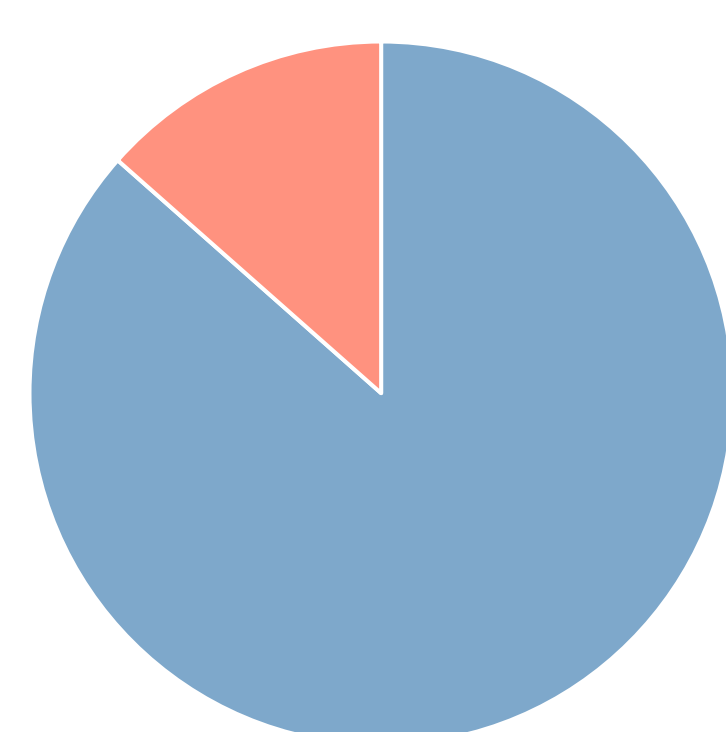
Introduction

- Introductory science, technology, engineering and math (STEM) courses are pivotal entry points into STEM occupations and jobs
- First-generation college students (FGCS) underperform in university level courses (Marco-Bujosa, et al, 2024).
- FGCS face social, language, cultural, and academic preparedness barriers to perform in college coursework (Stebleton & Soria, 2012)
- The curriculum of first semester university classes may be contributing to inequities between FGCS and their peers (Wieman 2020)
- Success in first semester classes are integral to retention and graduation in STEM majors (Dika et al. 2016).
- Effective instruction on how to learn could help close achievement gaps between FGCS and Non-FGCS (Carpenter et al, 2022)

Methods



Introductory Biology Class Demographics



n = 463

■ Non-FGCS

■ FGCS

Results

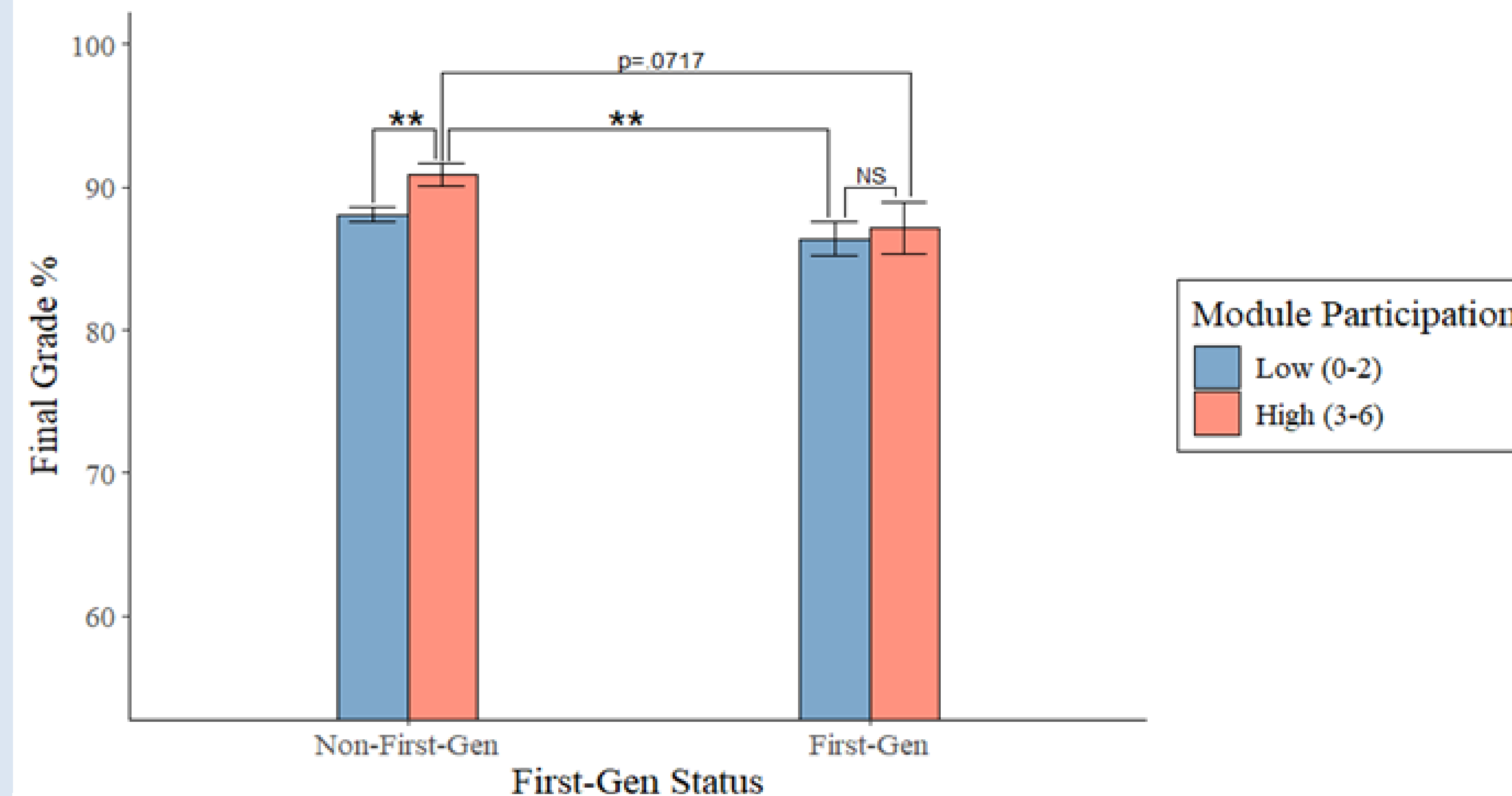


Figure 1: Course Performance in Relation to First-Generation Status

Welch's t -test were used for analysis. Non-FCCS high completers obtained significantly better final grades than both the non-FGCS low completers, $t(158) = -2.9, p < .01$ and the FGCS low completers, $t(90) = -3.1, p < .01$. The difference in average grade for non-FGCS high completers and FGCS high completers was marginally significant $t(17) = -1.9, p = .0717$. We observed no statistically significant difference between FGCS high and low completers $t(25) = -0.4, p > .05$.

Learning Modules

The Study Cycle	Three components of the study cycle: • Preview • Understand • Practice.
Student's Choice	• Growth Mindset • Learning Myths • Imposter Syndrome
Test Anxiety	• How the brain is linked to test anxiety • Study strategies to mitigate it
Motivation and Procrastination	• Intrinsic vs. extrinsic motivation • Plans to manage procrastination
Wellness	• Six dimensions of wellness, • Creating a study plan to include wellness

Discussion

- High learning module completion (3+ completed) is correlated with higher class performance in introductory biology classes
- Non-FGCS achieved higher course grades compared to FGCS (marginally significant)
- Learning modules are a potential tool to help level the playing field in introductory biology classes by helping students learn effectively

Future Directions

- Expand to university classes with more FGCS
- Utilize surveys like MSLQ and CLASS-BIO to further understand learning module impact
- Explore the possible benefit in other disadvantaged groups

References

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