

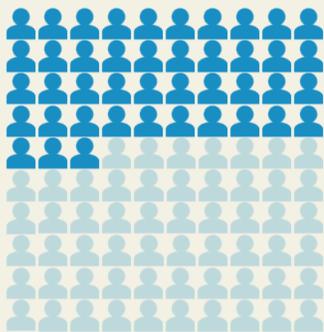
ACTIVE LEARNING TRAINING FOR FACULTY ENHANCES STUDENT SUCCESS IN INTRODUCTORY LIFE SCIENCES COURSE

The implementation of active learning in introductory (or "gateway") science courses has been shown to decrease a course's DWF rate¹, which is defined as the percentage of students that receive a final grade of D, W, or F. Many introductory science courses traditionally have high DWF rates, which affects students' ability to progress in their major and can lead to students retaking courses and delaying their graduation, major changes to non-science fields, or even student attrition.

A major gateway course for students pursuing science degrees at UW is Life Sciences 1010 (LIFE 1010). The course is core to the curriculum of the biology, botany, microbiology, molecular biology, physiology, wildlife and fisheries biology and management, and zoology undergraduate majors, and each year, approximately 900 students take the course. We analyzed students' final grades for all 20 sections of LIFE 1010 taught from Fall 2016 – Spring 2020.² DWF rates for each section were calculated – the overall DWF rate for the 20 sections was 36%. DWF rates were compared between sections that were taught by LAMP-trained faculty and non-LAMP-trained faculty. An analysis of LAMP-trained faculty who taught LIFE 1010 was also performed to compare DWF rates in their sections before and after they received LAMP training, during the full period of their teaching the course (which varied from instructor to instructor). Paired t-tests were used to find differences in DWF rates both between 1) non-LAMP-trained and LAMP-trained instructors' courses' DWF rates and 2) LAMP-trained instructors' courses' DWF rates before and after their training. All quantitative results displayed below are significant at $p < 0.05$. Qualitative results come from interviews conducted with two LAMP-trained LIFE 1010 instructors.

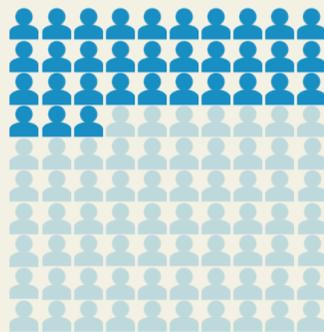
10% LOWER DWF RATES

IN SECTIONS OF LIFE 1010 TAUGHT BY INSTRUCTORS TRAINED IN ACTIVE LEARNING



43%

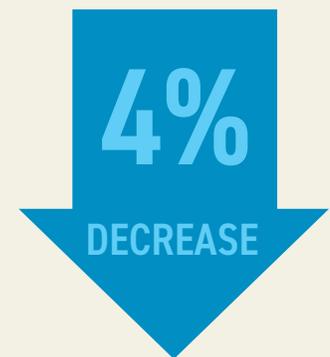
DWF rate for instructors **not** trained in active learning



33%

DWF rate for instructors trained in active learning

ON AVERAGE, INDIVIDUAL LAMP-TRAINED INSTRUCTORS SAW A



IN DWF RATES IN THEIR LIFE 1010 SECTIONS AFTER LAMP TRAINING

3 FUNDAMENTAL WAYS LIFE 1010 INSTRUCTORS CHANGED THEIR TEACHING



NEW ACTIVE LEARNING CLASSROOM WILL REMOVE BARRIERS

“The [current] room is setup as Sage on the Stage. The new ALC will make it easier to move around to groups and communicate with groups.”

“1010 is still pretty heavily lecture. I'm somewhat constrained in what I can do. When we move to the new ALC, I think you'll see it change a lot more once we start using that room.”

¹Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H, Wenderoth MP (2014) Active learning increases student performance in science, engineering, and mathematics. *PNAS* 111(23):8410-8415.

²Nine different instructors taught these courses, which enrolled 3,578 students - an average of 179 students per section. One instructor that was not formally LAMP-trained through the year-long institute, but who has been mentored extensively by LAMP's director for 20 years (and who integrates active learning in their teaching), was included in the LAMP-trained group for analysis. Also, in Spring of 2020, many courses were offered pass/fail (S/U) because of the COVID-19 crisis. Therefore, grades of "U" were counted with the D's, W's and F's in the calculation for the DWF rate during Spring of 2020. We would also be remiss to omit mention that the Life Sciences department is pursuing other measures to decrease fail rates in LIFE 1010, such as raising the math requirement for registration.