Conservation Education Essay

Due date: 17 November 2022
Recommended Length: 1 page

Diversity, equity, and inclusion are inadequate in most sectors in the United States, but they are disproportionately lacking in Science, Math, Engineering, and Technology (STEM; Odekunle 2020; Wingfield 2020). Among many factors contributing to STEM disparities, the "leaky pipeline" is well documented. Women and underrepresented minorities often encounter obstacles, discouragement, and discrimination throughout STEM educational and training programs, leading to disproportionately low rates of retention, graduation, and promotion (Mourad and Middendorf 2020). Recent analyses show that field courses can improve success for all students, while reducing some of the disparities (Beltran et al. 2020). The same authors expanded their analysis to outline factors that support inclusive success in STEM and ways that field courses can promote those factors (Zavaleta et al. 2020). Many of these factors also apply to STEM courses and degree programs more broadly.

Table 1, copied from Zavaleta et al. (2020), lists factors that support student success and strategies that faculty and courses can implement promote those factors. Although Zavaleta et al. (2020) focused on inclusivity in ecology and evolutionary biology, the factors and strategies apply to some extent to students of every background and every STEM discipline. (The third factor may not be relevant to disciplines conducted indoors, but there are relevant analogs – e.g., comfort in laboratory settings.)

(1) Briefly describe your experience with the factors listed in the left column of Table 1.

(2) Describe any of the strategies delineated in the table you may have encountered at WWU.

(3) Based on your experience, identify the strategy that would be most effective in helping more WWU students overcome barriers to completing degrees in STEM. The strategy may be one listed in Table 1 or another.

References

Beltran RS, E Marnocha, A Race, DA Croll, GH Dayton, ES Zavaleta. 2020. Field courses narrow demographic achievement gaps in ecology and evolutionary biology. *Ecol. Evol.* 00:1-13. https://doi.org/10.1002/ece3.6300

Mourad T, G Middendorf. 2020. Using collective impact to overcome systemic racism. *Front.Ecol.Environ.* 18:368. https://doi.org/10.1002/fee.2245

Odekunle EA. 2020. Dismantling systemic racism in science. *Science* 369:780-781. https://doi.org/10.1126/science.abd7531

Wingfield AH. 2020. Systemic racism persists in the sciences. *Science* 369:351. https://doi.org/10.1126/science.abd8825

Zavaleta ES, RS Beltran, AL Borker. 2020. How field courses propel inclusion and collective excellence. *Trends Ecol. Evol.* 35:953-956. https://doi.org/10.1016/j.tree.2020.08.005

Table 1. Factors That Support or Enhance Retention and/or Career Interest in Ecology and Evolutionary Biology and Recommendations for Their Incorporation into Field Courses

Factor	How field courses can promote
Belonging – social belonging, feelings of membership [6,7]	• Have students work, travel in groups/teams • Have community meal preparation, celebrations • Include group assignments such as presentations, papers • Build in time off outside the classroom.
Self-efficacy – confidence in science skills, competence [4,15]	• Facilitate research design by students, participation • Teach and provide experience in specific science skills like data collection and analysis using field tools, species identification, making and recording observations, and communicating findings • Recognize student contributions to science.
Comfort outdoors – field work, living skills [6]	• Explicitly teach, model outdoor skills • Provide supported experience living, working outdoors
Role models – of any identity, of same identity [6]	• Have staff, instructors travel, work, eat with students • Have 1:1 mentoring (as well as instructional) interactions • Hire a diverse staff
Communal goals/ service to society [6]	• Focus on cooperative problem solving • Practice varied leadership skills • Use student-led inquiry to facilitate discovery • Explore EEB links to stewardship of nature, education, environmental quality and health
Science identity – recognition by self, others as scientist [8]	Provide scientific ownership through authentic research experiences such as original hypothesis generation, experimental design, using evidence to explain findings.

Table 1 from Zavaleta et al. 2020, p.954.