

Creating opportunities for postgraduate students at a R1 University to teach and engage with students and faculty at MSI/2YC institutions

The Stanford InTeGrate program is a partnership between the Stanford School of Earth, Energy and Environmental Sciences and STEM faculty at local two-year colleges (2YCs) and minority serving institutions (MSIs). Postdoctoral and advanced graduate students at Stanford receive pedagogical training and are matched with faculty mentors at local 2YCs and MSI, where they teach InTeGrate module material to undergraduate students.

Primary objective: to recruit and increase the retention of underrepresented minorities within the STEM disciplines at all levels of academia.

We work towards this objective in two ways:

1. Exposing undergraduate students in general science or early geoscience courses to geoscience modules that address global sustainability issues, thereby increasing accessibility and relevancy for URM students.
2. Creating opportunities for URM postdoctoral and advanced graduate students to teach these modules in classrooms at our partner institutions.



Pre and post surveys measured changes in undergraduate students' geoliteracy and attitudes towards the geosciences. Surveys were also used to measure graduate/postdoctoral students' and faculty mentors' satisfaction with the program as well as its impact on their career goals. Results indicated that after course participation, 59% of students were more motivated to take action personally or professionally to create a more environmentally sustainable society. 40% of students also reported an increase in their interest in an Earth or Environmental Sciences career path.

By the end of the 2 teaching cycles, 11 postdocs and advanced graduate students participated in InTeGrate module training,

pedagogy development, and taught in 9 undergraduate classrooms at our partner MSI/2YC institutions. The postdocs/advanced graduate students also made positive connections with their mentors that served as a source of career networking. All of our postdocs/advanced graduate students finished the program feeling re-inspired in their own sense of purpose regarding their academic careers; whether they chose to pursue full-time lecturing positions at teaching universities, adjunct lecturing, or research at the R1 level, they did so with confidence due to their teaching experience and career insights.

Summary of faculty response: The main difficulties were for postdocs/grad students to understand coming in how much to expect from students in the classroom and to adjust the material accordingly; material needed to be adjusted based both on this and the amount of time that each postdoc had--this varied with each course.

100% of faculty responded that they would like to participate in the program again next year, that they will recommend the program to colleagues and that they support helping to establish a formal partnership between Stanford and their institution. They listed several benefits to having Stanford postdocs/grad students teaching in their classrooms: a fresh voice and approach to teaching; new classroom activities and pedagogical tools; availability to expertise in module subject area; and a source of inspiration, born in part from the respect with which undergraduate students were treated.

Summary of survey response from postdocs/grad students:

- 100% postdocs/grad students said the program exceeded their expectations.
- All participants had limited time to commit to teaching and so the fact that it was an intensive and short teaching period with flexibility made it possible for them to participate and have a meaningful experience where they gained valuable teaching skills.
- They appreciated the responsibility given to them by faculty to handle their lectures/class time independently.
- They all had good support and communication with the faculty mentors.
- They all found the 2-day workshop on pedagogy and module material was very helpful and the right amount of material was covered; in an ideal world they would have liked to learn more, but they were limited by their own time constraints.
- 100% said that their objectives were met, they would recommend the program to others and they were happy that they participated in the program.

Overall, initial findings indicate program success in increasing undergraduate student interest in creating a more environmentally sustainable society, pursuing a career in Earth or Environmental Sciences, and increasing retention at the post-graduate level.