GEO-NEEDS: STAKEHOLDER NEEDS ASSESSMENT FOR BROADENING PARTICIPATION IN THE GEO SCIENCES AT TWO-YEAR AND MINORITY-SERVING INSTITUTIONS

Heather Petcovic1,2, Andrew P.K. Bentley1,2, David Mogk2, Emily Ward3, Sheldon Turner4, Tina Cartwright5, Nicole LaDue6, Xai Her6
1,2Geosciences, 3The Mahillon Institute for Science Education, Western Michigan University, Kalamazoo, MI; 2Earth Sciences, Montana State University, Bozeman, MT; 3Geology, Rocky Mountain College, Billings, MT; 4Environmental Science, Triton College, River Grove, IL; 5Education, Marshall University, Huntington, WV; 6Geology & Env. Geosciences, Northern Illinois University, DeKalb, IL

ABSTRACT

Despite a significant investment of resources, the geosciences remain one of the least diverse of all science, technology, engineering, and math (STEM) disciplines, with underrepresented minorities making up <4% of the geoscience-related workforce. Although this persistent underrepresentation has been attributed to numerous factors, our NSF-funded project focuses on the lack of access to undergraduate geoscience courses and programs of study at two-year technical and community colleges (2YCs) and minority-serving institutions (MSIs) with two related goals: (1) identify barriers and opportunities for better use of existing resources that engage underrepresented students in the geosciences at 2YCs and MSIs, and (2) explore what an “ideal model” of resources, partnerships, professional development, and ongoing support for faculty and institutions might look like.

To reach these goals, we convened four focus group meetings in August 2015. The 40 participants were drawn from four key stakeholder groups: 2YC and MSI geoscience instructors, 2YC and MSI administrators, organizations that create and/or disseminate geoscientific resources and educational materials, and researchers with expertise in equity, access, and diversity in either the geosciences or broader in higher education. Through brainstorming activities, discussions, and an ideal model activity, we elicited participants’ views of the current status of geoscience instruction at 2YCs/MSIs and their recommendations for expanding access to the geosciences for underrepresented students at these institutions. In July 2016, we supported 20 instructors from 2YCs and MSIs to attend the Earth Educators Rendezvous (EER) and a follow-on Geo-NEEDS workshop. Here, participants developed an action plan detailing a course, curriculum, or extracurricular program that would expand access to the geosciences for 2YC/MSI students.

Products of this project include the 2015 Focus Group Meetings Report and Executive Summary, a collection of resources and recommendations derived from the 2015 focus group meetings, and a collection of action plans derived from the EER workshop. All materials are available on the Geo-Needs website: http://serc.carleton.edu/geoneeds/index.html

THE GEO-NEEDS PROJECT

GEO-Needs is an NSF-funded project that seeks to explore barriers and opportunities for enhancing geoscience instruction at two-year colleges (2YCs) and minority-serving institutions (MSIs) so that these students have greater opportunities for employment in the geosciences. Two primary activities were conducted: a series of focus group meetings with stakeholders, and professional development for 2YC/MSI faculty.

2015 FOCUS GROUP MEETINGS

2016 EARTH EDUCATORS RENDEZVOUS WORKSHOP

EER Workshop Goals:
1. Build capacity of 2YC/MSI individuals and institutions to offer geoscience courses and programs.
2. Offer professional development to faculty and administrators with limited experience in the geosciences.
3. Help participants create an Action Plan to increase participation of students from underrepresented groups in the Earth Sciences.

EER Workshop Agenda:
Day 1: Thursday July 21
8:30-8:45 Welcome and Introduction 845-5:15 Participant Introductions 9:15-9:45 A Focus on College Students 9:45-10:15 Writing Time/ Break 10:15-11:00 A Focus on your Curriculum/Instructor Program 11:00-11:30 Take Home Workshop (work on action plans) 11:30-11:45 Road-Check

Day 2: Friday July 22
8:30-11:15 Individual writing time with group progress check 11:15-11:30 Wrap-Up and Evaluation

EER Workshop Participant Demographics:
Total Participants: 41
Participants supported by Geo-Needs: 18
- 2YC Participants: 13
- 2YCs represent 3 states (CO, OR, CA)
- 2YCs represent 5 different 2YCs
- 2YCs range in enrollment from 6,000 to 12,000

- MSIs represent 2 states (CA, IL)
- MSIs represent 5 different institutions

- 2YCs: 10, 12, 14, 22, 26, 31
- MSIs: 1, 3, 4, 5, 6

Expectations:
Participants supported by Geo-Needs were expected to:
- Attend all five days of the 2016 EER
- Attend social networking dinner hosted by Geo-Needs
- Attend the 2-day EER workshop
- Submit an action plan following the workshop

All Geo-Needs workshop participants were expected to:
- Attend the 2-day Geo-Needs workshop
- Submit an action plan following the workshop

EER Workshop Roles:
- 1. Principal Investigators: Heather Petcovic, Andrew P.K. Bentley
- 2. Information and Communication: Andrew P.K. Bentley, Heather Petcovic
- 3. Fiscal Management: Nicole LaDue, Xai Her

2015 MEETINGS REPORT AND EXECUTIVE SUMMARY

http://serc.carleton.edu/geoneeds/index.html

PRODUCTS AND RECOMMENDATIONS

Key Recommendations for Broadening Participation in the Geosciences at 2YCs and MSIs:
1. Institutions need to focus more on support for the whole student and the cultural context of instruction. Mentoring and other forms of individual student support are critical to recruitment and retention efforts. Faculty want support for adapting curricula and instruction to local places and contexts.
2. Geoscience needs more proactive and positive marketing with underrepresented students, parents, and communities. Outreach efforts, both within the institution and in the institution’s community, should focus on portraying the geosciences as a career path contributing to the good of society.
3. Personal connections are needed to sustain diversity efforts. Individuals as well as institutions must build and sustain partnerships between 2YCs, MSIs, and stakeholders to create multiple pathways to geoscience careers.
4. Future efforts should focus on developing pathways for specific 2YC or MSI contexts (e.g., workshops just for urban, Hispanic-serving institutions and their faculty). Regional partnerships between 2YCs, MSIs, and 4YCs are critical to sustaining these pathways.

ACKNOWLEDGEMENTS

We would like to thank our meeting and workshop participants for their time and contributions. This work was supported by the National Science Foundation under grants no. DUE-1100927 (Petcovic), DUE-1100928 (Bentley), DUE-1445227 (Petcovic) and DUE-1445228 (Mogk). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.