

GIFTS: Global Classroom Project: Bringing global competency to the STEM classroom

The Global Classroom Project aims to develop global awareness in undergraduate students at Penn State University. The goal is to bring together first-year domestic and international students to enhance classroom learning and engage with the concepts of student integration and global competency. Actively integrating international and domestic students not only fulfills the purpose of enriching their academic experience, we find that it also increases global competency and awareness. The first-year seminar courses serve as a platform for STEM students' academic and social integration and are often designed to prepare students for future collegiate decisions by "planting seeds" that will eventually lead to certain desirable outputs [1], [2].

The overarching structure of this project is based on Astin's Input-Environment-Output (IEO) Model [3]. The inclusiveness of the IEO model allows us to assess individual outcomes with consideration to both their predisposed characteristics and the influence of their environments. With the IEO construct, we focused on three criteria – disposition, knowledge, and ability – to measure student global and intercultural competence before, during, and after the first-year seminar. These criteria have been widely used in the assessment of global and intercultural competency, especially in the field of engineering [4], [5], [6], [7].

The project was conducted with six first-year seminar courses with varying topics in the College of Engineering at Penn State. Course rosters were monitored to ensure that international and domestic students enrolled in each course. We recruited professors with minimal international experience who each taught two first-year seminar courses, one control course and one treatment course; our aim was to reduce individual differences in teaching style and permit direct comparison between control and treatment course pairs. In the treatment courses, instructors integrated six globally-focused, in-class activities into their curriculum, whereas in the control courses, instructors did not include globally-focused activities. We developed discipline-neutral, globally-competent pedagogy that could fit within existing curricula. For example, one activity encouraged educators to use the UN's Sustainable Development Goals in tandem with their curriculum to guide students through structured activities [8]. Students were instructed to consider global solutions within their discipline. Over the course of the semester, the instructors completed surveys and semi-structured interviews, and all the courses were observed twice. This design permitted the evaluation of semester-long integration and global competency growth.

The results of the instructor interviews, survey responses, and the third-party, in-class observations point to student global awareness growth in disposition, knowledge, and ability in the treatment courses and no notable improvement in the control courses. The treatment courses showed increased international and domestic student integration when instructors fostered a safe environment for global discussion and intentionally brought students together in the class. Instructors reported that the in-class activities cultivated global engagement in engineering topics that, in past semesters, were not designed to be globally-focused. One instructor stated that introducing global competency through the lens of engineering and intentionally including international student voices in the course "made a big impact on cultural acumen for students." In sum, including real-world, global pedagogy for first-year students leads to better global competency and helps international and domestic students to integrate in the classroom.

References

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