



The U.S. SEA Change Initiative: Results of a Pilot Survey

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INTRODUCTION

AAAS has proposed to launch an initiative, SEA (STEM Equity Achievement) Change, to incentivize and support institutional transformation, especially in our universities. This initiative would enable institutions to succeed in their research and education missions by ensuring that the full range of talent for science and engineering can be recruited to science, technology, engineering, and mathematics (STEM).

Our scientific and engineering workforce must shift in ways that reflect the talent pool as well as the new demographic realities of our country. In addition to providing a more diverse and inclusive talent pool for science and engineering, we must also change the employment, social, and professional environments in which scientists and engineers work. Regardless of gender, race/ethnicity, disability, sexual orientation, or any other conditions unrelated to their interest in or performance as members of the STEM community, individuals must be respected and enabled to be productive and to contribute to the advancement and application of knowledge. This means providing environments where expectations of fairness and equal treatment are the norm.

In order to help colleges and universities and their STEM departments become more diverse and welcoming, it is important to undertake efforts that can lead to transformation in the organizational structures of these institutions, providing a more supportive learning and working environment for underrepresented faculty, staff, and students in STEM.

To achieve these goals of “institutional transformation for STEM,” we propose to create a pilot effort of voluntary institutional assessment, **SEA Change**. This U.S. initiative for assessing higher education institutions on their efforts and outcomes toward promoting an equitable environment for underrepresented groups in STEM will be based on the Athena SWAN (Scientific Women’s Academic Network) model developed in the United Kingdom to address gender equity in STEM. Persons involved in Athena SWAN are also serving as advisers to this initiative. The expected outcome of the pilot program is to develop a process and structure that will be innovative, appropriate, and effective in the United States. This means looking not only at baselines and targets for success for each demographic group (e.g., hiring and promotion of faculty and staff; salary comparisons; graduation rates and time to degree for undergraduate and graduate students), but also at workplace climate surveys, etc.

AAAS, working with a small steering group, convened an exploratory workshop in April 2016 that included advisers from Queen's University Belfast (a Silver Award institution from Athena SWAN), along with individuals and some teams from eight U.S. colleges and universities that had identified an interest in such an assessment program. These institutional representatives identified proposed metrics for SEA Change that include collection and assessment of data disaggregated by race/ethnicity, by sex, by disability, and by other demographics with attention to outcomes for specific disciplinary areas, for faculty, for staff, and for undergraduate and graduate students.

From the U.K. experience the conveners learned that any assessment/accreditation/rating system that is established must be recognized as prestigious, doable, credible, and of value to all members of the university community and the nation. The Athena SWAN Program has created healthy competition among U.K. institutions by awarding Bronze, Silver, and Gold level statuses to those departments in STEM (and to institutions as a whole) that meet high standards in promoting gender equity and diversity. In the United Kingdom, this program is coordinated through the Equality Challenge Unit, a registered public charity that established the Athena SWAN Charter in 2005 to “encourage and recognize commitment to advancing the careers of women in science, technology, engineering, math, and medicine (STEMM) employment in higher education and research.”

We will situate the U.S. SEA Change initiative within AAAS. As the largest general science organization in the world, AAAS has a more than 45-year history of commitment to advancing and promoting diversity and equity within science and engineering. As the U.S. lead for the SEA Change initiative, AAAS would work with colleges, universities, and other members of the STEM communities to build norms around “criteria-based metrics” to promote healthy competition among institutions. AAAS would adapt the Athena SWAN criteria-based system rather than a number-based “ranking” recognition system to encourage cross-institutional support and collaboration. Through collaboration and positive interactions with each other, including sharing best practices, multiple institutions will reach Bronze, Silver, and ultimately Gold levels. Using this method, we will create a system that drives change much as the U.S. Green Building Council’s LEED certification process has done for architecture and building.

SEA Change is a departure from the usual strategies undertaken to promote equity, inclusion, and a supportive professional environment in that it aims for **overall transformation** rather than taking a project-based improvement approach. Movement from incremental intervention programs to systemic, structural, and lasting change has proven elusive for our higher educational institutions, our governmental agencies, and our nongovernmental organizations. We will build on the experience base of Athena SWAN even as we chart a course that uniquely addresses American challenges.

FIRST STEPS: INITIAL SURVEY OF PILOT INSTITUTIONS

To identify a baseline of where U.S. institutions stand with respect to this type of disaggregated data collection, AAAS conducted an initial pilot survey. This served as a “trial run” of asking proposed pilot institutions to collect and share data related to gender, race and ethnicity, and people with disabilities; specifically, the survey asked for the types of data currently available, the ability of institutions to report and share these data, and the interest of the institution in working to improve data collection moving forward. This survey also helped the SEA Change team identify challenges and roadblocks related to institutional preparation and submission of these data for SEA Change award consideration.

Because SEA Change aims for an overall transformation of the institution, it is critical to have buy-in at the highest levels. Therefore, we asked pilot institutions to report to their chancellor or provost and to brief these individuals on the mission and goals of the SEA Change project before signing on. Our preliminary survey suggested that institutions vary in whether the chancellor or provost has the authority over this type of data. We suggest that, moving forward, SEA Change explicitly defines the top levels of institutional “buy-in” it requires.

ABOUT OUR PILOT INSTITUTIONS

Eight institutions of higher learning participated in our pilot survey. Seventy-one percent identified as doctoral universities, 14% identified as master's colleges and universities, and 14% identified as baccalaureate colleges. There is no representation from baccalaureate/associate's colleges, associate's colleges, special focus institutions, or tribal colleges.

Four institutions identified, using Carnegie classification, as private institutions, and four institutions identified as public institutions. The oldest institution was founded in 1839 with the newest being founded in 1951.

Within the pilot study, the average size of the undergraduate population is ~12,000 students and the average size of the graduate population is ~8,000 students.

DATA COLLECTION

Data collection and availability will be critical to institutions applying for SEA Change status. In our survey, pilot institutions were asked to list the individuals responsible for managing these data. The majority of institutions (7/8) listed two people in this role, which we believe will make it easier for institutions to provide SEA Change with the required data.

Response rates for our survey varied from 2 weeks to 3 months collection time, indicating that it will take a good deal of prior preparation to collect these data. Institutional access to current data also varied; one institution reported their most recent data as being from 2014.

Challenges moving forward:

As more institutions join the SEA Change movement, issues with data collection will invariably arise. For example, faculty and staff data may be handled by a different office than student data, or some institutions may have difficulty separating undergraduate and graduate data. In addition, many data are not routinely collected, such as data relating to people with disabilities and data on postdoctoral fellows. We recommend that the SEA Change application contain a detailed list of specific data categorizations, describing

what data are needed and the format and quantity acceptable for submission. We further recommend that institutions anticipate this data collection process to take up to 3 months. Because of this, SEA Change requirements for Bronze, Silver, and Gold awards should be made publicly available at least 6 months prior to the deadline for submissions.

It remains unclear at this time whether the SEA Change award will only assess STEM-related data. The data we discuss in this report are university-wide and not separated as STEM and non-STEM. We recommend the SEA Change advisers make a decision about this distinction before releasing a call for applications, and make the criteria of STEM-specific or university-wide extremely clear in the application. The parsing of STEM-specific data will likely also increase the time it takes for an institution to collect and submit data to SEA Change.

DATA COLLECTED ON GENDER

In line with national data, the average gender representation at pilot institutions for undergraduate students favors women (43% male, 57% female). Graduate student data are almost identical (42% male, 58% female). It is important to note that these data are institution-wide and have not been parsed out into STEM-only data.

The gender for faculty was 65% male for full-time tenured positions (one institution did not report) and 53% male for full-time non-tenured positions (one institution did not report); this reflects a gender disparity among tenured faculty.

Challenges moving forward:

SEA Change should request the disaggregation of data by faculty with tenure and those working toward tenure. A few pilot institutions did this without explicit instruction and the data showed more encouraging numbers for faculty currently working toward tenure.

It is worth noting the importance of and difficulty in obtaining and reporting disaggregated data based on race/ethnicity and gender; it is critical that these data address the intersectionality of these categories and, in particular, the unique experiences of women of color. The rationale for the collection of disaggregated data should be explicitly defined in the SEA Change guidelines.

DATA COLLECTED ON DISABILITY

The percentage of individuals with disabilities across all categories was very low in this pilot study, and responses indicate that institutions do not always reliably collect these data. (Several respondents entered zero, and it is unclear if this means 0% or that these kinds of data are not available.) The percentage of individuals with disabilities was 3% for undergraduate populations (with two of seven reporting zero) and 1% for graduate populations (with three of seven reporting zero).

Challenges moving forward:

SEA Change will need to clearly define disability. Is SEA Change interested in students with physical disabilities? What about cognitive disabilities such as autism spectrum disorders and dyslexia?

Data are sparse and not standardized for this category (and could be misleading if percentages are smaller than the sensitivity of a survey, i.e., less than 1%). We also anticipate an issue with institutions only categorizing those who access student services as individuals with disabilities.

Feedback from institutions relating to these kinds of data collection was mixed. Several institutions noted that these data are not made public. Additionally, several institutions were concerned with singling out traditional “disabilities,” as they are more concerned with supporting equity and accessibility than addressing specific disabilities or special needs.

We propose that SEA Change develop a clear and robust rubric for all institutions, regardless of SEA Change participation, to start using for data collection relating to individuals with disabilities. This rubric must clearly define specific disabilities to be included.

DATA COLLECTED ON RACE/ETHNICITY (collected only for the whole student body)

The percentage of Native American students was very low and was complicated by the fact that our survey could not register percentages below 1%. (Three of eight institutions reported zero, and it is unclear if this means 0% of the population, or if data are not available.)

Asian students represented 16% of the total population. (One of eight institutions reported zero, and it is unclear if this means 0% of the population, or if data are not available.)

Black or African American students represented 18% of the total population.

Hispanic or Latino students represented 12% of the total population.

Native Hawaiian or Other Pacific Islander students represented 1% of the total population. (Four of eight institutions reported zero, and it is unclear if this means 0% of the population, or if data are not available.)

White/Caucasian students represented 39% of the total population. (One of eight institutions reported zero, and it is unclear if this means 0% of the population, or if data are not available.)

Challenges moving forward:

SEA Change will need to add an option for “data not available” within their demographic survey. Not having this option greatly influenced the data in this pilot survey.

Additionally, it would be interesting to ask for these data from previous years (i.e., 1985, 1995, 2005) as a way to assess institutional progression, if any. We realize these data may be unavailable and therefore do not recommend this as a requirement for SEA Change accreditation, but rather we recommend that Sea Change ask as a way for institutions to reflect on their own progress.

DATA COLLECTED ON PAST AND CURRENT DIVERSITY EFFORTS

Seventy-five percent of pilot institutions have received National Science Foundation (NSF) Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE) funding, and 50% have received NSF Partnerships for Adaptation, Implementation, and Dissemination (PAID) funding. Eighty-eight percent of pilot institutions reported receiving other awards/grants supporting efforts to advance equity in gender and/or diversity.

This indicates that, not surprisingly, institutions that committed to being part of this pilot study already recognized the need for institutional change relating to diversity.

AT WHAT LEVEL (e.g., department/school/college) DO INSTITUTIONS WANT TO FOCUS?

The SEA Change Awards will embrace the mission of establishing a national, transformative, institutional change initiative to achieve a diverse and inclusive culture for STEM—change that is both measurable and sustainable. The system will be based on reaching certain goals that lead to Bronze, Silver, and Gold awards that will signify having reached different levels of accomplishment in the effort to attain diversity goals. To “go for Bronze,” an institution must identify a plan to advance diversity/gender equity. For their institutions, each pilot participant was asked to identify their unit of focus (e.g., department/school/college).

All eight institutions will opt for the award at the college level. This is significant, as it moves diversity work past the departmental level and closer to institutional change.

WHY ENGAGE WITH SEA CHANGE?

Institutions' reasoning behind wanting to move toward institutional change, in their own words (at this point in time, institutions will remain anonymous):

- XXX University is committed to excellent teaching, innovative research, and the personal and intellectual growth of its students in a diverse academic community. Our mission and values clearly align with the goals of this program. As a leading university with strong commitment to diversity, equity, and inclusion, we continually strive for excellence as we work to improve the experience, opportunities, and outcomes of our students, trainees, and faculty. Working toward obtaining BRONZE will allow us to review our collective efforts, enhance cross-institutional communication, and encourage new partnerships. Additionally, our pursuit of BRONZE will further underscore our commitment to and concern for the success of members of underrepresented groups in STEM.
- We feel we are well situated in our efforts to diversify our students, faculty, and staff. We have structures and policies in place; we collect and publicly present our data.
- We are thinking about it as a way to showcase significant progress in specific places on campus, use data to support change, and bring awareness of the progress of peers.
- There are both top-down and bottom-up efforts at XXX University to raise awareness of excellence by embracing diversity and inclusion—not only in STEM. We have an open search for a University-wide Associate Provost for Faculty Diversity & Inclusion. Equivalent administrative officers will be appointed in each of our schools and colleges. The reason we select the unit of focus to be the university and college/school level is because we believe that it will be critical to have both top-down and bottom-up efforts to drive and effect change. It is likely that through the SEA Change process, including webinars, we will narrow down to one or two departments as pilot cases. As one example, the College of Engineering (COE) has a synergistic goal to diversify our programs from K-16 to graduate to faculty populations. Diversity is one of five strategic goals of our institution-wide strategic plan.
- XXX is motivated based on its sustained success in meeting its historic mission of access to excellence for immigrants and first-generation students.
- Visibility for the college
- XXX has set diversity and inclusion as central to our Strategic Plan. With our recent NSF Advance IT award, we are eager to continue and advance our strategic investment in this area.

- We want to solidify our commitment to diversity and inclusion and make sure it is independent of administrative or faculty leadership—that the commitment is indeed institutional; this would be akin to academic accreditation.

MAIN CHALLENGES IN “GOING FOR BRONZE”

Institutions’ responses, in their own words:

- Our biggest challenges may be in coordinating data collection, inventorying best practices, and securing placement outcomes for a wide range of students, trainees, and faculty across various departments that may not have standard data storage and tracking mechanisms in place.
- The decentralized nature of our university and higher education, in general. We also have limited data related to disability and gender orientation.
- Time and resources to collect data, convincing interested parties of the value of the process and award.
- A challenge will be effective communication of the main goals of SEA Change to chairs and other leadership at the university. It would be helpful to have a one-page document that we can share with our colleagues to help us garner support on campus. This could be in a flier format that is a simple message that will resonate with our colleagues and should give clear guidelines of the goals of SEA Change and the process. In addition, we acknowledge that the main challenges will likely be in implementation of our goals. Tactical challenges include implicit and unconscious bias. We also face pipeline issues of faculty candidates. Other issues include converting faculty offers into hires and enhancing mentoring and professional development of underrepresented faculty hires. We have multiple efforts on campus that are addressing these issues.
- Collection and analysis of data has been an issue for the institution as well as having a full understanding of the range of activities across the campus that promote diversity and inclusion. Faculty diversity lags behind that obtained within the student body.
- The university has faced challenges in developing appropriate diverse pools for faculty positions. Going for the Bronze provides us a context for enhancing the university commitment to networking and outreach strategies in this area. Receiving guidance on Bronze criteria will be important to receive as soon as possible because we are about to launch faculty searches.
- Resources, particularly funding; we already have a good idea of what we need to do to become more diverse and what programs need to be initiated, but sources of funding remain an issue.