

## AAU Initiatives in Undergraduate and Graduate Education

The Association of American Universities (AAU) is committed to helping our member campuses be as excellent in teaching as they are in research. AAU's initiatives in undergraduate and graduate education work to create more student-centered educational environments by identifying and dismantling inequitable structures and practices. The initiatives take a systemic approach to change and are informed by broader theoretical perspectives about organizational change in academia. They are designed to address the multiple parts of the ecosystem that surround department-level educational innovations. In addition, they acknowledge the faculty recognition and rewards structures as powerful levers for change<sup>1</sup>.

Since 2012, AAU has received 18 grants (\$9.2M) from private foundations, corporate foundations, and the federal government to advance the association's efforts in undergraduate and graduate education.

AAU institutions have expressed widespread enthusiasm and interest in being engaged in the initiatives. To date, 63 AAU member universities have participated in STEM initiative activities (e.g., [STEM Network Conferences](#), [Department Chair Workshops](#)), engaging 615 unique faculty members and institutional leaders in AAU hosted events. Additionally, 368 doctoral students, faculty members, and administrative leaders from eight member campuses are engaged in PhD Education Initiative pilot cohort activities (e.g., [Wheel Bazar Conversation Series](#)). AAU professional staff have made 84 campus site visits related to the initiatives, during which they have conducted numerous semi-structured interviews and focus groups with faculty members, students, and administrative leaders. Also, AAU sends announcements with information and resources to the STEM and PhD network communities. The STEM Network distribution list includes 1,041 individuals across all 65 member institutions, and the PhD Network distribution list includes 464 individuals from 43 member campuses.

Advisory boards consisting of national thought leaders and experts exist for both the undergraduate and graduate education efforts. The boards meet annually to learn about initiative progress and give guidance for future directions. AAU staff also consults with board members individually for specific questions related to their expertise. AAU collaborates with four Senior Scholars to help advance the overarching objective and goals of the initiatives, and partners with other scholars on specific, funded research projects.

AAU engages with other national associations, disciplinary societies, industry leaders, and numerous multi-institutional efforts working to improve the effectiveness of undergraduate and graduate education. These collaborations enable AAU to help bring alignment to the work nationally. In addition, significant legitimacy is garnered locally on member campuses when their efforts are supported by AAU, or when AAU has been able to showcase their work in various public forums.

To disseminate our understanding about how to influence the culture around educational improvements in the context of research universities, AAU has facilitated over 100 workshops and presentations on campus or in national and international forums as well as published 19 reports, articles, book chapters, and papers. AAU staff write annual activity summary reports for the initiatives, and maintains sets of presidential talking points.

### **The Undergraduate STEM Education Initiative**

In 2011, AAU launched the [Undergraduate STEM Education Initiative](#) in collaboration with member institutions to improve the quality and effectiveness of introductory undergraduate science, technology, engineering and mathematics (STEM) courses. In partnership with our member campuses, AAU has worked to influence the culture of STEM departments so that faculty members are encouraged and supported to use evidence-based

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<sup>1</sup> A collaborative project with Dr. Adrianna Kezar, professor of higher education at the University of Southern California and co-director of the Pullias Center for Higher Education at the USC Rossier School of Education and supported by NSF (DUE IUSE Grant No. 1432766) examined the role of a national association in influencing institutional change and leveraging the multiple parts of the ecosystem that surround educational improvement efforts. A full evaluation [report](#) and corresponding [guidebook](#) was published in 2018.

teaching and learning practices<sup>2</sup>. Through its holistic and systemic approach to change, the initiative specifically addresses the needs of PEERS - persons excluded because of their ethnicity or race<sup>3</sup>. Research shows that high-structured evidence-based teaching techniques are especially powerful for increasing the learning and success of students historically marginalized (e.g., women, students from racial or ethnic minority groups, first-generation college students, and students from low-income backgrounds) in higher education<sup>4</sup>.

In 2012, AAU seed-funded [eight project sites](#) to improve foundational science and mathematics courses. Over three academic years the eight STEM Project Sites engaged 39 departments, reformed 162 courses, involved 230 faculty-members and 1,676 learning assistants (graduate and undergraduate), and transformed STEM courses for 138,531 student-seats. Project sites reported trends toward improved learning gains, decreased failure rates, improved persistence from introductory to later courses, and narrowing achievement gaps especially for women, racial or ethnic minorities, and first-generation college students. The changes have been long-lasting, scaled across course sections and to subsequent courses in the series, as well as expanded to additional departments which were not originally included in projects. As a result, the number of student-seats impacted has increased substantially in successive years.

As part of this work, AAU identified cross-cutting strategies to achieve long-lasting improvements in undergraduate STEM courses that are documented in the five-year status report, [Progress Toward Achieving Systemic Change](#). AAU has awarded [26 mini-grants](#) to member campuses to seed fund work in these domains. In addition, many AAU member campuses have received other sources of funding to advance these approaches.

To date, AAU has awarded 38 of our member campuses with a total of \$5.6M in funding to support undergraduate STEM education improvement efforts.

From its inception, the AAU initiative has emphasized the need to better evaluate effective and inclusive teaching, as well as leverage the faculty rewards structures and broader impacts as mechanisms to support teaching reforms. In 2014 through 2017, AAU collaborated with the RCSA Cottrell Scholars on [understanding the landscape](#) of teaching evaluation practices and rewards at research universities, and to [develop guidance](#) for research universities to value, assess, and reward effective teaching. In 2021, AAU received a [gift](#) from the Sarah Gilbert & Carl Wieman Charitable Fund to advance a new program to support department-level development, implementation, assessment, and dissemination of more effective methods for evaluating undergraduate STEM teaching. Five AAU STEM departments were [selected](#) to host teaching evaluation demonstration projects. In 2022 AAU [secured funding](#) from the Howard Hughes Medical Institute (HHMI) to form a learning community dedicated to creating better systems to recognize and reward evidence-based and equitable teaching practices that results in student success and the full inclusion of students from diverse backgrounds. The [evaluating effective and equitable teaching project](#) aims to catapult institutional- and departmental-level work in the space of teaching evaluation; ensure essential departmental leadership are primed for discussions on how to more effectively recognize and reward faculty members and instructors for their efforts to improve undergraduate education through evidence-based pedagogy and inclusive teaching practices; and highlight this work in the national and international higher education landscape.

### **The PhD Education Initiative**

The [AAU PhD Education Initiative](#), which was launched in 2018, actively works to reorient the educational environment to foster the full inclusion of current and prospective doctoral students from diverse backgrounds by placing greater emphasis on students as individuals with a full range of educational ambitions and professional goals. This student-centered mission aligns with recommendations made in the 2018 National Academies of Sciences, Engineering and Medicine report [Graduate STEM Education for the 21<sup>st</sup> Century](#).

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<sup>2</sup> Grunwald Associates. (2022). Undergraduate STEM education: Key insights from select NASEM publications. <https://www.nationalacademies.org/event/05-23-2022/docs/DAFF69690812F45C49A67F3FCA3F5701E05D2384DB9B>

<sup>3</sup> David Asai, "Race Matters," Cell, Volume 181, Issue 4, (2020): 754-757, doi: [10.1016/j.cell.2020.03.044](https://doi.org/10.1016/j.cell.2020.03.044).

<sup>4</sup> Scott Freeman et al., "Active Learning Increases Student Performance in Science, Engineering, and Mathematics," Proceedings of the National Academy of Sciences 111, no. 23 (2014): 8410–15, doi: [10.1073/pnas.1319030111](https://doi.org/10.1073/pnas.1319030111).

During the initial phase of the initiative, a pilot group of [eight member universities](#), representing 32 academic departments, are implementing reforms within science, technology, engineering, math, social sciences, arts, and humanities PhD programs to make diverse PhD career pathways [visible, valued, and viable](#) for all students. These reforms address the culture, behavior, policies, and practices necessary to create educational environments in which all PhD students feel a sense of belonging in their departments and have the support necessary to achieve their desired educational and professional goals.

Components of the initiative include: 1) Driving Institutional Change: Influence the culture and behavior at the department level to provide PhD students with the knowledge, skills, and ability to succeed in careers within and beyond academia; 2) Promoting Data Transparency: Identify institutional policies and practices to make PhD program data – including data about the career pathways and employment trends of their PhD alumni – widely available; and 3) Implementing Effective Strategies: Highlight and encourage effective university, disciplinary society, and federal agency strategies and programs to support career diversity. [Resources](#) produced from initiative activities have been made publicly accessible.

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