ASCB Declaration on Effective and Inclusive Undergraduate Biology Education

Part of the fun, excitement, and responsibility of being a scientist is preparing the next generation of scientists, including undergraduates in the courses we teach and undergraduate researchers in our lab groups. There is a preponderance of evidence regarding how to teach and mentor diverse groups of students in ways that promote their conceptual understanding, their development as scientists, and their success in college and beyond. Yet, there remains only modest uptake of these evidence-based practices because incentives and supports are needed at all levels of science as well as within and across disciplines – from the single faculty member to the department and institution – to promote widespread change. Although numerous high-profile organizations such as the American Association for the Advancement of Science and the Howard Hughes Medical Institute have called for transformation of undergraduate life science education toward use of evidence-based educational practices that benefit all students, there is a gap between the national-level conversation and the typical faculty member. This Declaration aims to address this gap by articulating core tenets and making concrete, actionable recommendations for stakeholders in life science education: faculty members, teaching staff, graduate students, departments, institutions, and organizations that support undergraduate education.

The core tenets of the Declaration are:

- We must use evidence to inform how we teach and mentor. Teaching and mentoring are more effective when they are designed according to research on how people learn and develop.
- Scientific progress can best be made when organizational culture encourages the active involvement of individuals who bring diverse perspectives, knowledge bases, and skillsets. Such diversity results in novel ideas and creative and divergent approaches and solutions that can be applied to scientific problems.
- We must establish and make widespread use of processes to support, motivate, and reward faculty members for teaching and mentoring effectively and inclusively. Through effective and inclusive education, we will be able to cultivate all available talent to forge new scientific frontiers and address the most pressing societal challenges of our time.

Overarching recommendation:

1. Commit to collecting, analyzing, and making use of data to inform educational work, including teaching, mentoring, advising, and programming. Use existing higher education accreditation processes to support this work because these processes already require making use of evidence to inform program improvements.

For faculty members:

2. Approach teaching and mentoring as an opportunity to learn and improve, including participating in teaching and mentoring professional development, reading and reflecting on how to use a resource, and making a habit of noting what improvements to make in teaching and mentoring along with supporting data and reasoning.

3. Commit to developing cross-cultural awareness and sensitivity, including listening to understand and recognizing the influence of cultural identity, privilege, and feeling like an imposter.
4. Advocate for holistic and formative evaluation of teaching, including moving beyond student end-of-course evaluations as a sole metric of teaching quality.

5. Tap colleagues and other resources for teaching and mentoring support, such as science faculty with education specialties, discipline-based education researchers, other education scholars and social scientists, centers for teaching and learning, offices of diversity and inclusion, and professional society minority affairs and education committees.

For departments and programs:

6. Require teaching, mentoring, and inclusion statement(s) as part of job applications and weigh them in the hiring process.

7. Require teaching demonstrations during job interviews and weigh them in the hiring process for any position that involves teaching.

8. Make use of holistic and formative evaluation of teaching with respect to effectiveness and inclusion, including substantive peer and expert evaluation of teaching with the aim of helping faculty make improvements.

For institutions:

9. Provide more substantive support (time, training, incentives, rewards) for faculty and future faculty learning to teach and mentor effectively and inclusively.

10. Commit to more substantive evaluation of teaching and mentoring activities based on principles of effective and inclusive education, including formative support for faculty members and summative evaluation for annual performance reviews and promotion and tenure.

11. Seek out professional societies as partners for teaching and mentoring professional development and for accreditation activities.

For professional organizations that work in the education space:

12. Offer guidance to stakeholders on where to find curriculum, instruction, assessments, and other resources (e.g., curriculum mapping tools, teaching evaluation processes, inclusive teaching strategies, etc.) that are aligned with principles of effective and inclusive education.

13. Offer robust, evidence-based professional development programming on effective and inclusive education.

14. Design programs and offerings to ensure strong representation and participation by individuals from diverse backgrounds.

For funding agencies:

15. Be explicit in the review criteria for proposals of educational projects and programs, including research training programs, that the project or program must be designed based on research on effective and inclusive education.

16. Ensure that budgets of educational projects and programs are sufficient to conduct an appropriate level of evaluation with respect to effectiveness and inclusivity.

17. Structure program announcements and requests for applications to allow for innovation in evaluation and research on educational projects/programs as well as cross-project/program evaluation and research.