

# Eight schools test-drive PULSE certification of undergraduate biology education

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The PULSE (Partnership for Undergraduate Life Science Education) certification process is an ambitious endeavor designed to motivate important changes in life sciences education nationwide. More than 70 life science departments applied to be part of the pilot certification project, funded by a National Science Foundation grant, and eight were selected based on initial evidence of transformed and innovative educational practices, including Gaston College, Whatcom Community College, Davidson College, Stony Brook University, Georgia Southern University, the University of Wyoming, and Morgan State University. The programs chosen represent a wide variety of schools, including two-year colleges, liberal-arts institutions, regional comprehensive colleges, research universities and Minority Serving Institutions.

This effort is widely recognized as important in the [life sciences](#) community. "For too long higher education has eschewed responsibility for assessing the quality of their courses, programs and gains in student learning. We are now seeing some of the consequences of this lack of involvement across the country as state legislatures and other bodies attempt to impose systems of assessment. If the [life sciences education](#) community is willing to embrace and implement the rubrics [certification effort] developed by its own members, we may finally have a model for using valid and reliable assessments to improve learning, the quality of program offerings, as well as teaching," says Jay Labov Senior Advisor for Education and Communication for the National Academy of Sciences (NAS) and the National Research Council (NRC). And Cynthia Bauerle, Senior Program Officer in

Precollege and Undergraduate Science Education at the Howard Hughes Medical Institute states, "The genius of this approach is in authorizing the community of life science educators itself to recognize members who have achieved notable accomplishments in their ongoing work. ...The Certification initiative has true potential to transform the practice of undergraduate life science education in the 21st century."

After participation in an extensive self-study and site visits by PULSE certification team members, assessment data were analyzed and Progression Levels were assigned to each program. PULSE Progression Levels provide independent verification of a life science department's transformative features and are designed to reflect how far the department has come in implementing the recommendations of the Vision and Change in Undergraduate Biology Education: A Call to Action, a report issued by the American Association for the Advancement of Science in 2011. Tom Jack, Professor of Biology at Dartmouth College and a member of the certification team, explained "For the pilot, we intentionally selected applicants that had demonstrated progress in departmental transformation. Participation in the pilot was highly competitive; more than 70 departments applied and we chose eight from a very strong applicant pool." For the PULSE progression levels, every level of PULSE Progression indicates a dedicated and concerted effort by the department to change their approach to life sciences education and sustain their transformation efforts.

In this vein, PULSE Progression is much like the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) certification where organizations displaying certain thresholds of achievement are recognized, such as LEED Silver, Gold, and Platinum Certification.

Of the eight departments in the pilot, one achieved "PULSE Progression Level III: Accomplished". Six departments achieved "PULSE

Progression Level II: Developing" and one pilot department achieved "PULSE Progression Level I: Beginning". All of the schools have made significant movement towards the recommendations of Vision and Change (V&C) relative to a traditional life sciences curriculum. Overall, the response from the eight pilot schools has been positive.

Barbara Lom of Davidson College, which achieved PULSE Progression Level III, stated "[Faculty] had little information from peers to assess how well our department's efforts compared to the ambitious goals of Vision & Change. This certification process provided our department with important opportunities to reflect on our individual and collective pedagogical goals, consider our curriculum, assess our outcomes, chart our progress, and gain new perspective... We now have a much clearer sense of aspects where our department excels as well as aspects where we need to improve."

Additional program participants acknowledged that the process was beneficial. "Everyone at Gaston was thrilled with our report and are excited to continue improving" said Ashley Hagler of Gaston College. "The University of Wyoming's Life Sciences Program has benefitted greatly from being involved in the PULSE Pilot Certification Program.... the process has helped us identify areas where we can improve to meet the call of Vision and Change which has helped us leverage resources on our campus to do so" said Mark Lyford of the University of Wyoming. . Dr. Cleo Hughes Darden, Chair of the Biology Department at Morgan State University, stated that "this pilot will better align our ongoing vision and activities with the National Vision and reveal unique roles for our institution in its fulfillment."

PULSE is a collaborative effort developed and funded by NSF, NIH/NIGMS, and HHMI and consists of forty current or former life-science department chairs or deans who serve as Vision and Change Leadership Fellows. "Since it was formed in 2012, PULSE has been

instrumental in helping to mobilize the community to implement the recommendations in the Vision and Change in Undergraduate Biology Education: A Call to Action report" says Yolanda George, Deputy Director, American Association for the Advancement of Science (AAAS). The new education paradigm places more emphasis on scientific reasoning and the ability to think critically rather than the mastery of facts only. Laboratory work is given a new prominence and shifts from teacher-directed exercises to student-centered ones, where the students design their own experiments to answer the questions they generate.

"I applaud PULSE for its steady and sustained work to engage biology department leaders in the critical conversations and actions that are needed to improve undergraduate biology education for a student population that is increasingly diverse in many dimensions. Many similar efforts in the past have enjoyed limited or no success" says Jay Labov.

**More information:** [visionandchange.org/files/2011 ... nge-Final-Report.pdf](https://visionandchange.org/files/2011...nge-Final-Report.pdf)

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