

# University of Houston program earns kudos for improving grades, retaining students

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Students attending recitation in the Comprehensive Student Success Program at the University of Houston complete an activity on the mechanism for transport and metabolism of lactose. Credit: UH Department of Biology and Biochemistry

To improve students' chances of completing introductory biology courses and decrease poor grades, the University of Houston (UH) implemented a comprehensive student success program, employing various interventions for students at risk for failure.

Through a grant from the Texas Higher Education Coordinating Board (THECB), the Department of Biology and Biochemistry embarked on a

pilot program focusing on first-year students taking "General Biology" for non-majors and "Introductory Biology" for [science majors](#). These two classes have high rates of students either making a D or F or dropping the course completely, with a 30 to 40 percent non-passing rate.

"Freshman-level biology courses have high enrollments and consistently have the highest non-completion and failure rates of all the department's courses," said Dan E. Wells, dean of the College of Natural Sciences and Mathematics and director of the program. "Through the Comprehensive Student Success Program, however, we are making strides toward turning this around. Our success to this point is due to the whole-hearted support and involvement of more than half of the biology and biochemistry faculty."

Funded through the Coordinating Board's College Access Challenge Grant, the program includes curricular enhancement and increased opportunities for student engagement in lecture halls, faculty development workshops and peer-led recitation sessions. Sixteen faculty and staff members and 16 undergraduate majors serving as facilitators make up the [student success](#) program team. An additional 24 departmental faculty, postdoctoral students and graduate students have contributed to the program as field trip and lab tour leaders.

"Since fall 2012, the program has served 2,653 students in the introductory course of science majors," said Donna Pattison, the program's co-director and an instructional professor of biology and biochemistry. "The initiative resulted in a 14 percent department-wide increase in the number of students successfully completing the introductory course for biology majors."

Particularly successful is the intervention plan for low-performing students. This component begins after the first exam, with students who

score below 70 percent being required to attend weekly group sessions led by junior or senior life science majors, called recitation sessions, as well as meet one-on-one in advising sessions with faculty or staff members on improving time management and study skills. Additional elements include field trips designed to get students engaged with faculty in smaller group settings and tours of labs in the biology and biochemistry department to introduce students to research and faculty. While required for the low-performing students, these opportunities are available to all students in the classes, regardless of exam performance.

"We designed specific curriculum for the recitation sessions. It's not tutoring. The students work in groups on activities that reinforce concepts learned in class, such as making hands-on models of biological processes," Pattison said. "We've noticed [students](#) are doing better with these peer-led, interactive recitations being made available to them, and we intend to use the results in these courses as a model for future curriculum development in upper-level courses."

The program has been so successful that it received a "Recognition of Excellence" for "Comprehensive Student Success in STEM" from the Coordinating Board this summer, based on "the exceptional work, success and efforts to sustain and scale" the initiative. Additionally, the THECB awarded more funding to the program for development of an online toolkit to share best practices with the broader college and university community, as well as make available many of the materials developed for the pilot program in biology. The toolkit will include videos of learning activities, such as demonstrations and models, with instructions for implementation, as well as curriculum materials for peer-led, team-learning recitation sessions and resources for student advising, peer-facilitator training and faculty professional development.

Furthermore, based on the success of this [pilot program](#) for the entry-level [biology](#) courses, UH recently received a \$1.5 million grant from the

Howard Hughes Medical Institute to expand the program to entry-level physics, chemistry and mathematics courses.

Provided by University of Houston

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