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## CEAS e-news 01.17.2008

College of Engineering and Applied Sciences

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## STEP first-year experience connects freshmen / raises retention rates

**Dr. Edmund Tsang**, CEAS associate dean for undergraduate program and assessment, has been revamping the freshman engineering experience with a five-year, \$1.97 million National Science Foundation grant.

The “Student and Faculty Learning Communities to Increase Graduation Rates in STEM [Science, Technology, Engineering, and Math] Disciplines” project runs from 2004 to 2009 and is funded by the NSF STEM Talent Expansion Program, or STEP.

The initial challenge was to improve a CEAS second-year retention rate of 60% (compared to 74.3% for WMU), and a third-year rate of 40.6% (compared to 61.1% for WMU). The baseline rates were averages based on 2000-2004 retention rates.

STEP results include improved retention rates. Data show that the CEAS retained 68% for the second year for students in the Fall 2005 cohort and 71% for students in the Fall 2006 cohort and that third-year CEAS retention is up to 54.3% (69.5% for WMU). “We have shown a significant improvement,” Tsang said.

To achieve these results, Tsang and the CEAS faculty have taken several actions to assist CEAS students in their first year of college. Among these are establishing learning communities with faculty mentors, developing co-curricular activities to enhance students’

connection to the college, and revamping STEM curriculum to improve students’ success.

Each fall for the last three years, up to 20 students have been placed in the same three-to-five courses based on their majors and math placement. They are encouraged to connect and to assist one another.

Mentored by members of the CEAS faculty and administration, students are encouraged to participate in co-curricular activities (academic, professional, and social) and to explore careers, the college, the university, and themselves. Tutors in content areas are available at night and on the weekends.

STEP has been popular. With each new fall semester, more freshmen have opted into a learning community: 256 for 2005-06, 294 for 2006-07, and 328 for 2007-08.

Tsang credited faculty buy-in for changes in various curricula that have improved students’ retention. Faculty mentors meet monthly to share successful mentoring strategies and problems, coordinate co-curricular activities, and discuss assigned readings. Several changes have led to improved student performance.



Dr. Edmund Tsang



STEP Advisory Board (left to right): Dr. Cynthia Halderson, Dr. Penny Gilmore, Dr. Daina Briedis, Dr. Edmund Tsang, Dr. Eileen Evans, Kathleen Kallen, Dr. Diane Anderson, Dr. Paul Engelmann, and Dr. Tim Greene. Not shown: Dr. Michael Barcelona & Dr. Len Ginsberg

The math and chemistry faculty have worked together to develop a set of 40 Algebra I problems that are based on Chemistry I coursework. Preliminary results show students who took the enhanced Algebra I and who continued to take Chemistry I have a 88.9% success rate in Chemistry I with an average GPA of 3.33. The average Algebra II GPAs also improved, going from 2.75 to 3.11. “That’s a very big improvement,” Tsang said. “We are looking forward to the next year’s results.”

Other improvements include expanding the career exploration portion of the first-year technical communication course to show freshmen the future career potential of various majors and the reporting of midterm grades beginning in Fall 2006 to give students a “heads up” on their progress.

In Fall 2007 new software enabled students to grant their parents access to their registration and grade records. Also, a pilot residence program initiated in Fall 2006 with 41 students expanded to 118 students last fall.

While acknowledging many improvements, Tsang said future goals include building relations with CEAS departments to create more customized learning communities, raise the awareness of faculty role in student success, and address critical engineering science classes to improve third-year retention.

WMU co-investigators for the project are **Dr. William Cobern**, director of the Mallinson Institute for Science Education, and **Dr. Leonard Ginsberg**, vice president of research. For more information on STEP is available on its Web site: <http://www.wmich.edu/step>

Send your thoughts or suggestions for future topics to the editor at [jerrie.fiala@wmich.edu](mailto:jerrie.fiala@wmich.edu) Thank you.