“Engineering globalization: How to establish an international engineering undergraduate research exchange program” - Thomas J. Webster, Ph.D., Department Chair and Professor, Chemical Engineering, Northeastern University, Boston, MA 02115

Introduction
The United States is significantly behind some other countries in terms of educating and graduating engineers, especially at the Ph.D. level [1]. In an effort to increase interest in research (which has been shown to promote student interest to attend graduate school), the Department of Chemical Engineering at Northeastern University established an international global research exchange program in 2014 and 2015 with undergraduate chemical engineering students.

Methods
In 2014, 12 chemical engineering undergraduate students were paired with faculty to conduct research either at URV (Tarragona, Spain) or NTU (Singapore) for summer session 1 (May-June). After identifying a faculty match, students immediately exchanged emails, Skyped, and used other forms of communication to learn about their project. They were given the opportunity to earn up to 4 technical and 4 general elective credits. At the end of their summer program, the program director listened to research presentations where students presented research findings as well as their overall experience conducting research in different countries. In addition, at the conclusion of their summer research exchange, some Northeastern students participated in a panel discussion at Northeastern to share their experiences with fellow students. Northeastern also hosted students from URV and NTU during 2014/2015 providing equal research experiences. For 2015, the number of partnering universities grew to now include URV, NTU, Gachon University (South Korea), Soochow University (China), and Chalmers University (Sweden). The number of participating Northeastern undergraduates also grew to 36 students.

Results and Discussion
All students had excellent experiences as noted during end of the summer interviews and surveys. While all expressed an increased interest in going to graduate school to continue research, none noted a significant difference in how engineering research is taught at their host country to increase undergraduate student interest in engineering graduate school. Similar feedback was received for the international students conducting research at Northeastern. With an increased number of students and partnering Universities in 2015, it is anticipated that students will continue to become interested in global research and may learn of differences concerning how research is conducted between different regions of the world. Difficulties in establishing an international research exchange program (from visa to housing to funding difficulties) will also be discussed.

Conclusions
This study showed that international research exchanges can be used to promote interest in research leading to greater interest in engineering graduate school among undergraduates. It may also provide a greater incentive for undergraduates to conduct research since such research is being conducted internationally.