International vs. Domestic Research Experiences for Undergraduates (REU): A Three-Year Assessment of the Preparation of Students for Global Workforces

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1.0 Introduction

This paper compares three years of data assessing what students who have participated in domestic and international research experiences learn as related to preparation for global workforces. The researchers compare the experiences of students participating in two Research Experiences for Undergraduates (REU) programs funded by the National Science Foundation; the NanoJapan International REU Program and the Smalley-Curl Institute (SCI) REU, formerly known as the Rice Quantum Institute (RQI) REU, at an urban private university. NanoJapan is a twelve-week international research program through which freshman and sophomore physics and engineering students complete nanotechnology research internships in labs at Japanese universities. The SCI is a ten-week domestic research program in which sophomore and junior students complete quantum-related research internships with faculty at an urban university.

This study is timely given that science and engineering (S&E) research is an increasingly international effort. In its 2015 Science Indicators, the most recent year available, the National Science Board noted that 33% of science and engineering papers published in the U.S. in 2013 were internationally coauthored; at the same time international citations among papers by U.S. authors increased from 43% to 53% between 1996 – 2012 [1]. This shows the increasing importance of international research and collaborations for science & engineering researchers in the U.S. Furthermore, in its 2011-2016 fiscal year strategic report, the National Science Foundation defines as a performance goal to "keep the United States globally competitive at the frontiers of knowledge by increasing international partnerships and collaborations", noting that "[a]s S&E expertise and infrastructure advance across the globe, it is expected that the United States will increasingly benefit from international collaborations and a globally engaged workforce leading to transformational S&E breakthroughs" [2].

Given that the global scientific collaborations are becoming the norm rather than the exception, students who choose to pursue graduate education in S&E fields should have opportunities to participate in experiences that build the skills sets necessary to successfully collaborate and communicate with researchers from different cultural backgrounds, and international STEM programs may be one effective approach. In fact, U.S. universities are experimenting with new curricular methods, including the development of international research experiences, to foster the development of skill sets necessary for successful international scientific collaboration. However, limited research exists that comprehensively assesses globally focused outcomes associated with such efforts in order to answer the question of whether international programs for S&E students are effective in meeting these goals.

This paper culminates a three year study in which the researchers compared data from the Engineering Global Preparedness Inventory, drawn from participants in a domestic and international research experiences, in order to gain insight into what global workforce competencies were developed in an international setting in comparison to what global workforce competencies were developed in a domestic lab setting. Our research identifies important differences between the measures of global preparedness between of students who complete domestic versus international REUs.

2.0 International Research Experiences in Context

It is well known that the number of S&E majors who participate in study abroad programs has historically lagged behind students from other majors, but the picture is beginning to change. For the 2013-14 academic year, the most recent for which data is available, social science, business, and humanities majors together comprised over half of all U.S. students studying abroad for academic credit. In comparison, students majoring in STEM fields participated in study abroad at 22.6%. This number represents significant growth in study abroad for STEM majors – only 16.2% of study abroad participants represented these majors in 2003-4 [3]. However, when compared to the 33% of all US undergraduates who received bachelor's degrees in science & engineering fields as of 2013, these students are still under-represented in study abroad [4].

Part of the reason for this growth in study abroad participation has been that universities and other educational organizations have specifically encouraged the creation of high-profile international education programs geared specifically to all STEM majors. Historically, study abroad for credit was considered the primary way by which students could obtain an international experience. However, Parkinson's classification of these programs captures the growing diversity of options for S&E students: dual degree, exchange, extended field trip, extension, internship or co-op, mentored travel, partner sub-contract, project-based learning/service learning, and research abroad [5]. Jesiek, et al. note that programs that emphasize international work, research, or service learning may appeal to S&E students because they may better fit with a student's academic schedule, provide a salary, or offer a required research experience [6].

The establishment of international programs for S&E students are an increasingly familiar part of the education abroad portfolios at U.S. universities. Numerous summer research opportunities abroad have been developed that mirror the domestic Research Experiences for Undergraduates (REUs) that have traditionally been offered throughout the U.S. In a recent issue of the *IIE Networker*, focused on strategies for doubling the number of study abroad students by 2020 as part of Institute for International Education's Generation Study Abroad initiative, international research experiences were highlighted as an effective strategy for engaging more S&E majors with education abroad [7].Some examples of international REUs include NSF-funded programs, such as the Optics in the City of Light IREU hosted by the University of Michigan [8] and the Pacific Rim Experiences for Undergraduates (PRIME) project sponsored by UC San Diego [9]. IREUs supported by sources other than the NSF include the DAAD RISE Program [10], the American Chemical Society's IREU Program [11], and the University of Tokyo's Research Internship Program (UTRIP) [12].

Despite the growth in the number of IREUs – or perhaps because of this growth -- there is a need for more assessment of specific outcomes. A workshop report issued by Sigma Xi regarding how to assess international research experiences specifically identified as a necessary research agenda the need for studies that examined the motives for a scientist's or engineer's desire for international collaboration, including the relationship to education and career development. The report also called for studies to assess the impact of international collaboration on the careers of scientists and engineers at all stages [13].

3.0 Global Preparedness and STEM Education

International research experiences provide an opportunity for students to learn technical research skills while also gaining experience working as part of a cross-cultural research team. For this reason, they are assumed to be a useful experience for preparing students to be 'globally competent,' the term most frequently used in the engineering literature, but alternatively referred to as cultural competency, multicultural competency, intercultural maturity, cross-cultural adaptation, cross-cultural awareness, or intercultural sensitivity. Cross-cultural competency assumes that particular knowledge, skills, and attitudes can be developed or learned and is evidenced by individuals' "effective and appropriate behavior and communication in intercultural situations, which again can be further detailed in terms of appropriate behavior in specific contexts. [14].

Researchers have approached the question of what makes a globally competent STEM graduate from different perspectives. Parkinson identifies the knowledge, skills, and attitudes (KSAs) that are characteristic of globally competent engineers, based on a survey of experts from industry and academia [5]. Jesiek et al expressed concern that lists of KSAs were often based on an imprecise definition of global engineering competency define global engineering competency as "those capabilities and job requirements that are uniquely or especially relevant for effective engineering practice in global context." This team identifies three dimensions: technical coordination, or working with or influencing people to complete a project in a multinational/multicultural setting; understanding and negotiating engineering cultures, which refers to the multinational/cultural differences in the actual practices and processes of technical problem solving; and navigating ethics, standards, and regulations, which occur when technical coordination or technical problem solving "happen in the midst of multiple – and often conflicting – normative and/or policy contexts" [6].

Ragusa expands the concept of global competency to "global preparedness", which includes a readiness to engage and effectively operate in ambiguous situations and in different cultural contexts to address engineering problems. Global preparedness brings together the set of congruent behaviors, attitudes, and policies in a system, agency, or among professionals, enabling that system, agency, or those professionals to work effectively in cross-cultural situations. The concept of global preparedness frames this particular study because it examines not just the knowledge, skills, and attitudes required to work cross-culturally, but their specific application for technical professions [15].

4.0 Methods

This research explores the impact of two summer undergraduate research programs on the student groups' global preparedness. Accordingly, the study responds to the following research questions:

- What is the impact of students' international experiences on their preparedness for global workforces?
- What role does intercultural learning interventions play in undergraduate engineering students' global preparedness?

This research compares two different types of undergraduate engineering research programs to determine their impact on students' preparedness for the engineering global workforce.

4.1 Programs and Study Participants

We selected the NanoJapan: International Research Experiences for Undergraduates (NanoJapan IREU) and the Smalley-Cury Institute's Research Experiences for Undergraduates (SCI REU) programs for comparison because both programs are funded by the NSF, headquartered at a private unban university, recruit participants from universities nationwide via a competitive selection process, enable students to participate in cutting-edge research in fields related to nanoscale and atomic-scale systems, phenomena, and devices, and require participants to present topical research posters on their summer projects at a summer research colloquium as a capstone experience.

The NanoJapan: IREU Program was the key educational initiative of the NSF PIRE grant that was awarded to this private university from 2006 - 2015. NanoJapan was a twelve-week summer program through which twelve freshman and sophomore physics and engineering students from U.S. universities complete research internships in the multidisciplinary field of nanoscience and nanoengineering in leading Japanese laboratories [16]. Within this PIRE grant, NanoJapan students conducted research related to aspects of nanoscience and nanoengineering, ranging from synthesis of nanomaterials through nanodevice fabrication to a variety of electrical, magnetic, and optical characterization measurements [17] [18]. The program first received five years of funding in 2006 and was selected for a five-year renewal in 2010; the final year of the program was 2015. The program has been redesigned with funding from the Nakatani foundation, and launched in January 2016 as the Nakatani RIES: Research and International Experiences for Students Program [19].

NanoJapan recruited high-potential freshman and sophomore physics and engineering undergraduates. Before beginning their research internships, students completed a three-week orientation program in Tokyo that combined 45 hours of Japanese language instruction, an orientation to Japanese life and culture, and a series of introductory seminars on solid state physics, quantum mechanics, and nanoscience. During the eight-week research internship period, each NanoJapan student was integrated into an existing PIRE international research project in a Japanese partner's laboratory. Students were co-advised by their Japanese host professor and a U.S.-based PIRE professor and received day-to-day mentorship under an English-speaking Japanese graduate student or post-doctoral researcher. The goal was to allow the NanoJapan students to experience working as part of a true international research collaboration and, over the course of the summer, to learn to successfully navigate not only differences in approaches to research in the U.S. and Japan but also language and cultural barriers within their research laboratories in Japan. In addition, students had to develop the skill sets necessary to overcome logistical barriers, such as time differences, to enable them to remain responsive and engaged with all members of the PIRE international research team. Throughout the summer, NanoJapan students completed weekly reports on topics related to their research and the cross-cultural experiences in their laboratories and receive feedback from their U.S. research advisors and education program staff [17].

The learning objectives for the NanoJapan IREU were: a) to cultivate an interest in nanoscience as a field of study among college students, b) to cultivate the next generation of graduate students in nanoscience, c) to add to the skill set of active nanoscience researchers, d) to create students who are internationally savvy and have a specific interest in and knowledge of Japan, and e) to educate students in culture, language, and technology, in order that they will be more effective when addressing global scientific problems. The program has been nationally recognized by both the National Academy of Engineering and the Institute of International Education as a best practice in the expansion of international opportunities for STEM students [20] [21].

The SCI REU was the first REU program at the university included in this study, established in 1996 with continuous funding provided until the program also ended in 2015. The program provided highly promising juniors and seniors with an opportunity to train during the summer in an intense, interdisciplinary, and collaborative research environment and involves them in a variety of discussions and interactions with faculty, post-doctoral researchers, and graduate students. Students from schools nationwide spend 10 weeks at the lead university, working on cutting-edge, fundamental research projects on quantum phenomena in physical, chemical, and biological systems under the advisement of SCI faculty fellows. In addition, each student is expected to attend special seminars and group discussions for REU participants, make a report of the project, and participate in the SCI Annual Summer Research Colloquium at the end of the summer. As with NanoJapan, participating students are frequently recruited from populations traditionally underrepresented in STEM fields and from schools with limited research experiences and resources. The objectives of the program are for students to: a) acquire the capability of reading and understanding advanced scientific publications, b) understand and experience how to bring a research project to a successful completion, c) be able to successfully present their work to an audience, and d) understand principles for ethical and responsible research [22].

The following represents the characteristics of this three-year study participants:

Table 1: Socio-demographic/Experiential Characteristics of the NanoJapan and SCI Students: 2013, 2014, and 2015

	NanoJapan (n=38)	SCI (n=33)
Gender		
Female	36.8%	41.7%
Male	63.2%	58.3%
Age Range		
Less than 20:	47.4%	28%
20 - 24	47.4%	68%
24 - 29	0%	0%
30+	5.3%	4%
Race/Ethnicity		
African-American	10.5%	
Asian/Pacific Islander	18.4%	
Caucasian/White	42.1%	
Hispanic	10.5%	
Multi	0%	
American Indian/Alaska Native	2.6%	
No Response Given	15.8%	

4.2 The Engineering Global Preparedness Index (EGPI)

The Engineering Global Preparedness Index (EGPI) [23] was used to measure the students' preparedness for global engineering workforces. This is a widely accepted instrument developed by one of the papers co-authors and has been used to measure engineering students global preparedness at 93 universities in the United States and globally. The EGPI is aligned to both ABET's more difficult to measure professional skills and the NAE's, *Engineer of 2020*. The EGPI is not a survey of perception of learning; rather, it directly measures how prepared students are for the global workforce. The index is grounded in global citizenry theory.[25, 26] It utilizes four subscales, as provided in Table 2, each of which have been validated using item response theory and extensively tested for reliability (alpha coefficient=.92).

The first subscale is *Global Engineering Ethics and Humanitarian Values.* This construct refers to the depth of concern for people in all parts of the world, with a view of moral responsibility to improve life conditions through engineering problem solving and to take such actions in diverse engineering settings. The second subscale is *Global Engineering Efficacy.* This refers to the belief that one can make a difference through engineering problem solving and is in support of one's perceived ability to engage in personal involvement in local, national, international engineering issues and activities towards achieving greater global good using engineering methodologies and approach. *Engineering Global-centrism* is the third subscale. This refers to a person's value of what is good for the global community in engineering related efforts, and not just one's own country or group. It refers to one's ability to make sound judgements based on global needs in which engineering and associated technologies can have impact on global improvement. Finally, *Global Engineering Community Connectedness* is the last subscale. This subscale refers to one's awareness of humanity and appreciation of interrelatedness of all people and nations and the role that engineering can play in improving humanity, solving human problems via engineering technologies, and meeting human needs across national boundaries [23].

Table 2: EGPI Sample Items by Selected Subscales/Constructs

Subcale/Construct	Sample Index Item
Engineering Ethics & Humanitarian Values	Engineers in my country have a moral obligation to share their engineering knowledge with the less fortunate people of the world.
Global Engineering Efficacy	I believe that my personal decisions and the way that I implement them in my work activities can affect the welfare of others and what happens on a global level.
Engineering Global-centricism	I think my country needs to do more to promote the welfare of different racial and ethnic groups in engineering industries.
Engineering Community Connectedness	To treat everyone fairly, we need to ignore the color of people's skin in our workplaces.

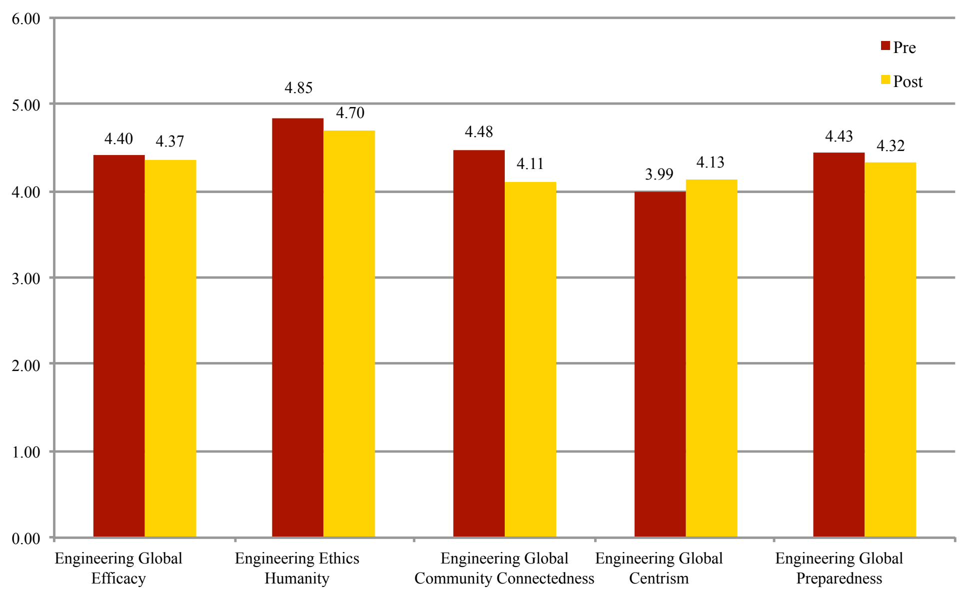
4.3 Analytical Approach

The data collected via the EGPI was analyzed using SPSS version 22. Descriptive statistics were computed on all socio-demographic data, means were calculated on the EGPI subscales and full scale and the two groups were compared to themselves pre-post via a paired sample *t*-test and to each other via an independent sample *t*-test at post program.

5.0 Results

As previously described, a paired *t*-test was performed in an effort to determine the impact that the SCI and NanoJapan programs had on preparing undergraduate engineers for a globally focused workforce. Mean scores were deliberately compared by subscale of the instrument in pre and post program comparisons. These results are interesting and diverse, and vary by EGPI construct.

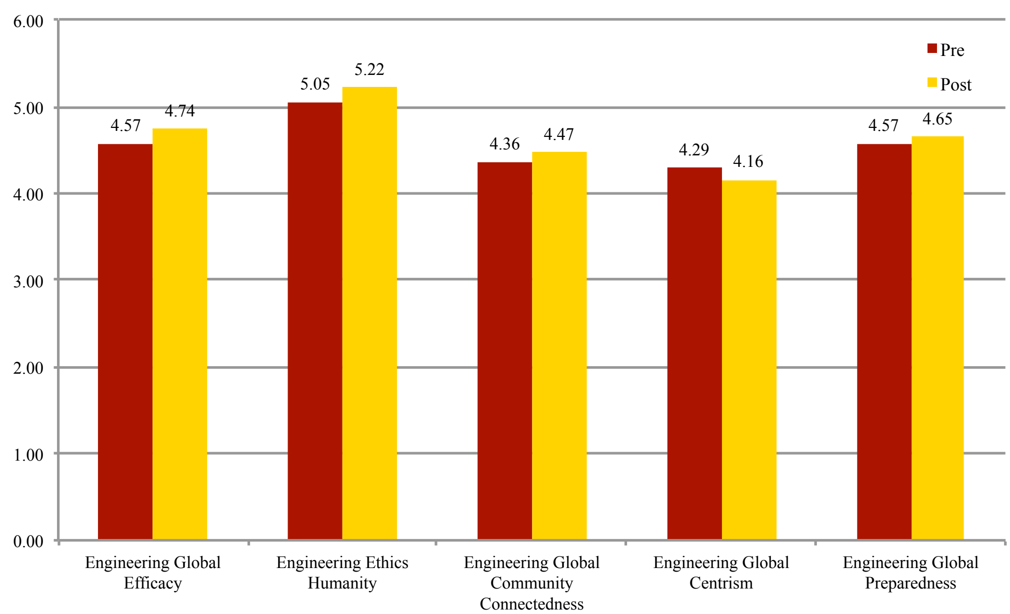
Figure 1: Pre-Post Comparison – R SCI (N=33)



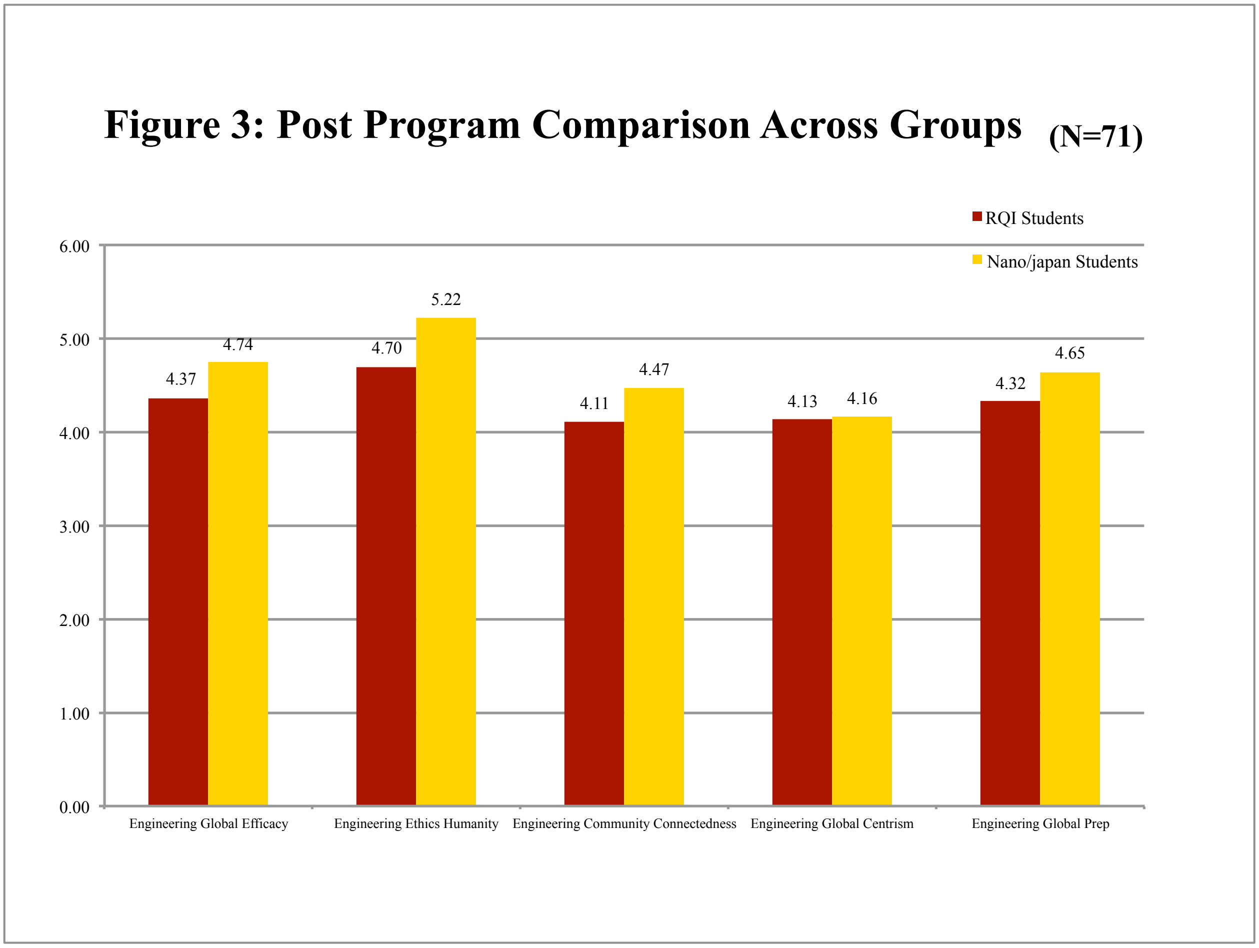
Figures 1 and 2 compare the pre- and post- experience means for each of the EGPI subscale constructs for the SCI (N=33) and NanoJapan (N=38) groups. As reported in Figure 1, the SCI student participants' scores decreased slightly in overall engineering global preparedness (M_{pre} = 4.43; SD = 0.657; M_{post} = 4.32, SD = 0.832; 6-pt Likert-type scale). This difference, however, was not statistically significant [$t(32) = 0.907$, $p = 0.371$]. Across the subscales, the SCI student participants' scores statistically significantly decreased only in Engineering Global Community Connectedness [M_{pre} = 4.48; SD = 0.804; M_{post} = 4.11, SD = 1.174; $t(32) = -2.420$, $p < 0.05$; 6-pt Likert-type scale].

In contrast, student participants' scores in the NanoJapan program increased slightly in overall engineering global preparedness (M_{pre} = 4.57; SD = 0.540; M_{post} = 4.65, SD = 0.505; 6-pt Likert-type scale), butsimilar to *t*-test results for the SCI program, were not significant[$t(32)$= -1.47, p = 0.152]. Notably, students in the NanoJapan program statistically significantly increased their scores in Engineering Ethics and Humanity [M_{pre} = 5.05, SD = 0.614; M_{post} = 5.22, SD = 0.549; $t(32) = -2.261$, $p < 0.05$; 6-pt Likert-type scale].

Figure 2: Pre-Post Comparison – NanoJapan (N=38)



The two-sample (independent groups) *t*-test was used to determine whether the mean scores of SCI and NanoJapan students were different from each other in post program assesment. Figure 3 represents a post program comparison by subscale across the two groups. Results revealed statistically significant difference in scores of the two groups in the Engineering Ethics and Humanity subscales of the EGPI. The mean score of SCI students (M = 4.70, SD = 0.829, N = 33) was statistically significantly lower than that of NanoJapan students (M = 5.22, SD = 0.549, N = 38), t(72) = 3.045, p = 0.003).



6.0 Discussion

The results of this study, which furthers initial results reported in a previous conference paper [25], indicate that the NanoJapan students made sizable gains on all of the EGPI subscales, but only differences on the Engineering Ethics and Humanity subscale were statistically significant. . The difference between groups may reinforce the importance of aspects of the NanoJapan program that encourage students to reflect on culture differences between the US and Japan, which they were of course experiencing daily as part of their research assignments. This finding suggests that international experiences that combine intensive language and culture instruction, hands-on, cutting-edge research experience, and intentional activities that require reflection upon the way in which they experience the culture in research, may improve students' global understanding in context; thereby better preparing them for engineering global workforces. This finding is consistent with literature from study abroad that suggests that students demonstrate the greatest gains in intercultural learning when they also engage in intentional reflection on cultural differences [26][27]. Given that engineering schools and the National Academies desire to improve the global preparedness of undergraduate engineering students, this study provides insight into the need for comprehensive programs that include not only international experience for students but also link pedagogical practices that enable students to fully process the experiences in which they are engaging with before, during, and after they return to their home university.

References

[1] National Science Board, "Science and Engineering Educators 2014," 2014. [Online]. Available: http://www.nsf.gov/statistics/seind14/. [Accessed 25 January 2016].

[2] National Science Foundation, "National Science Foundation Strategic Plan 2011-2016," 2011. [Online]. Available: https://www.nsf.gov/news/strategicplan/NSFstrat2011_entire.pdf. [Accessed 25 January 2016].

[3] Institute for International Education, "Open Doors," November 2015. [Online]. Available: http://www.iie.org/Research-and-Publications/Open-Doors/. [Accessed 25 January 2016].

[4] National Science Board, "Science and Engineering Educators 2016," 2016. [Online]. Available: www.nsf.gov/statistics/2016/nsb20161/#report/chapter-2/undergraduate-education-enrollment-and-degrees-in-the-united-states/undergraduate-degree-awards. [Accessed 30 April 2016].

[5] A. Parkinson, "Engineering Study Abroad Programs: Formats, Challenges, Best Practices," *Online Journal for Global Engineering Education,* vol. 2, no. 2, 2007.

[6] B. Jesiek, Y. Haller, J. Thompson., "Developing Globaly Competent Engineering Researchers: Outcomes Based Instructional and Assessment Strategies from IREE 2010 China Research Abroad Progra," *Advances in Engineering Education,* vol. 4, no. 1, 2014.

[7] S. Phillips & C. Matherly, "Expanding International Opportunities for Science and Engineering Students: A Case Study on the NanoJapan International Research Experience for Undergraduates," *IIE Networker,* pp. 25-27, Fall 2014.

[8] University of Michigan, "Optics in the City of Light IREU," [Online]. Available: http://java.engin.umich.edu/ParisREU/Home.html . [Accessed 26 January 2016].

[9] S. Arzberger, G. Wiehnausen, D. Abramson, J. Galvin, ,Prime: An Integrated and Sustainable Undergraduate International Research Program," *Advances in Engineering Education ,* vol. 2, no. 2, 2010.

[10] DAAD, "Resaerch Internships in Science and Engineering," [Online]. Available: https://www.daad.de/rise/en/.

[11] University of Tokyo, "UTRIP Research Internship Program," [Online]. Available: http://www.s.u-tokyo.ac.jp/en/utrip/ .

[12] "http://www.nsf.gov/statistics/nsb1003/start.htm," [Online].

[13] "https://www.nsf.gov/news/strategicplan/NSFstrat2011_entire.pdf," [Online].

[14] American Chemical Society, "International Research Experience for Undergraduates," [Online]. Available: http://www.acs.org/content/acs/en/global/international-center/programs-by-country/global/global-undergraduate-programs/international-research-experience-for-undergrads--ireu-.html.

[15] Sigma Xi, "Developing evaluation approaches to international collaborative science and engineering activites," Sigma Xi, Research Triangle Park, NC, 20o8.

[16] D. Deardorff, Assessing Intercultural Competence, 2011.

[17] G. Ragusa, "Ragusa, G. Engineering Preparedness for Global Workforces: Curricular

Connections and Experiential Impacts," in *Conference Proceedings: Annual Meeting American Society of Engineering Educators*, Vancouver, Canada, 2011.

[18] S. Phillips, C. Matherly, J. Kono., "NanoJapan-International research experience for undergraduates program: Fostering U.S.-Japan research collaborations in terahertz science and technology of nanostructures," in *Proc. SPIE 9188, Optics Education* , 2014.

[19] S. Phillips, C. Matherly, J. Kono, "NanoJapan: An International Research Experience," *Optics and Photonics News,* pp. 18-19, 2014.

[20] Rice University, "Nakatani RIES: Research and International Experiences for Students," [Online]. Available: http:nakatani-ries.rice.edu.

[21] Institute for International Education, "2008 Heiskell Award Winners: Study Abroad," [Online]. Available: http://www.iie.org/Who-We-Are/IIENetwork-Membership/Heiskell-Awards/Study-Abroad/2008-Rice-Tulsa.. [Accessed 25 January 2016].

[22] National Academic of Engineering, "Infusing Real World Experience Into Engineering".

[23] National Academy of Engineering, "Infusing Real World Experience Into Engineering," 2013.

[24] Rice University, "About the SCI REU," [Online]. Available: http://sci.rice.edu/reu/.

[25] "Nakatani RIES: Research and International Experiences for Students," [Online]. Available: http://nakatani-ries.rice.edu. [Accessed 30 April 2016].

[26] M. Hammer, "The Intercultural Development Inventory: A new frontier in assessment and development of intercultural competence," in *Student Learning Abroad*, Sterling, VA, Stylus, 2012, pp. 115-136.

[27] M. VandeBerg, J. Connor-Linton, Paige, R.M. "The Georgetown Consortium Project: Interventions for Student Learning Abroad," *Frontiers: The Interdisciplinary Journal of Study Abroad,* vol. 18, pp. 1-75, 2009.