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# Facilitation of a Global Engineering Education Experience through Consortium Membership

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Pingchien Neo is the Director of International Engineering Programs at the University of Florida Herbert Wertheim College of Engineering. Born and raised in Malaysia, she moved to the United States to pursue a B.S. in Nuclear Engineering at the University of California, Berkeley, and subsequently went on to receive her M.S. in Nuclear Engineering from ETH Zürich in Switzerland. Pingchien has studied, lived, and worked in countries in Asia, Europe and the US. The exposure to different countries and cultures gives her a unique perspective on intercultural personal and professional relationships. She strives to leverage her own international experiences as an engineer to encourage engineering students to study abroad. She is passionate about the need to encourage more globally-minded engineers to keep up with the increasingly connected environment. Through her initiative and direction, the International Engineering Programs at UF has gain great exposure and led to many more engineering students pursuing an international experience, whether through study, research, intern, or service learning.

## Randy Collins

Randy Collins is a Professor of Electrical and Computer Engineering at Clemson University. He is current the Chair of the Executive Committee of the IIE Global Engineering Education Exchange (Global E3 program). He is the incoming Dean of the College of Engineering and Technology at Western Carolina University beginning in August 2022. He has served as Associate Dean, Executive Director, and Associate Vice President at Clemson University. He was an ACE Fellow in 2012-2013, and is a licensed professional engineer in SC. His research specialization is electric power and energy.

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# Facilitation of a Global Engineering Education Experience through Consortium Membership: Perspectives from Four Member Institutions

## Introduction

The benefits of an international component within an engineering degree are clear: a broad perspective on the world and the issues the global community faces, gain in global and cultural competencies, institutional collaboration and relations, and innovation in engineering education, to name but a few. These benefits easily explain the reason behind the growing incorporation of global elements to engineering education in institutions around the world. However, the number of study abroad students from the engineering field still lag that of other disciplines, such as business, and liberal arts. As shown in Figure 1, in the United States, only 4% of all study abroad students in 2019/2020 are engineering students, whereas business and management students make up 21% of the numbers (Institute of International Education, 2020). There are considerable reasons for this: academic rigor, administration hurdles, the need for separate bilateral agreements with each partner institution, the loss of institutional knowledge when a faculty or administrator leaves the institution, and the assessment of academic equivalence of student programs.

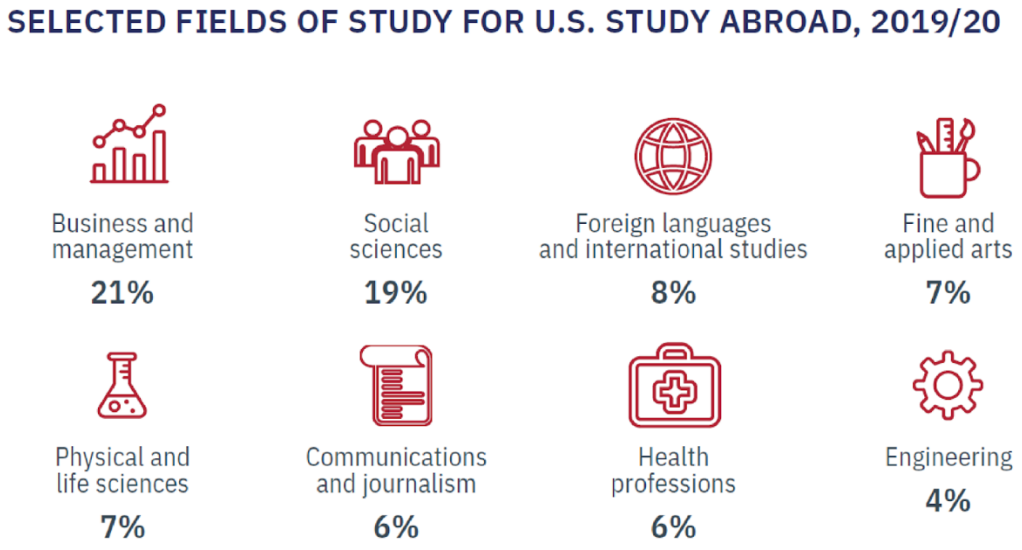


Figure 1: Selected Fields of Study for U.S. Study Abroad, 2019/20 according to the Open Doors Report on International Educational Exchange 2019/2020

The ability to participate in educational exchange and study abroad would be greatly simplified by using a centralized program that benefits both administrators, and students. The Institute of International Education (IIE) has many programs designed to support global experiences for students. One such program is the Global Engineering Education Exchange or Global E3. In this paper, the history and mechanism of the Global E3 consortium will be highlighted, the experiences of four major institutions in Australia, France, and the United States will be shared.

The goal of this paper is to share information regarding different approaches in administering international exchange across the four member institutions in Global E3. This paper demonstrates current practitioner experiences in the three different countries presented rather than research outcomes. The constraints vary depending on the cultural context and the institutional position in regard to international exchange. Nevertheless, Global E3 provides a platform to facilitate international experiences for students regardless of these institutional and cultural differences.

**Global Engineering Education Exchange**

The Global Engineering Education Exchange Program (Global E3) was established in 1994 as an exchange consortium focusing specifically on undergraduate engineering. The mission of Global E3 is to provide a consortium-based exchange program that can help streamline all the usual complexities and help reduce barriers for students to undertake an international student experience (Jons & Collins, 2021). The Global E3 program is relatively unique in the field of engineering education exchange. The program provides a centralized database for students to find and take part in study abroad around the world at member institutions without the need for the university to establish and manage separate bilateral agreements.

Students participating in a Global E3 program at an overseas institution continue to pay tuition at their home institution, and are assured of full credit transfer for courses taken while abroad, as long as proper equivalency has been established and approved. At the time of this paper, Global E3 has a total of 69 member institutions, with 39 non-U.S. members and 30 U.S. members. A full list of member institutions can be found in Appendix A, and updates are on the website. There are three modes of engagement available through Global E3, as shown in the figure below. Students from the U.S. can choose to study abroad in an international institution while international students can choose to study abroad either at a U.S. institution or another international institution.

From 2016-2020, the number of student placements through the Global E3 program has grown steadily between U.S. and international institutions, as seen in Figure 3. The tracking of inbound and outbound balances is important in any management of academic exchanges. The advantage of membership in the Global E3 consortium is that exchange balances are maintained by the program manager in IIE. Each institution is only responsible for balancing the exchanges with Global E3 as a whole. This not only increases the opportunities for students to study abroad, but quite importantly, reduces administrative burden for the international office personnel. For example, a U.S. institution is able to send one of its students to France, and receive a student from Australia without the need to achieve parity with the individual school, as would be the case if a bilateral exchange mechanism was used.

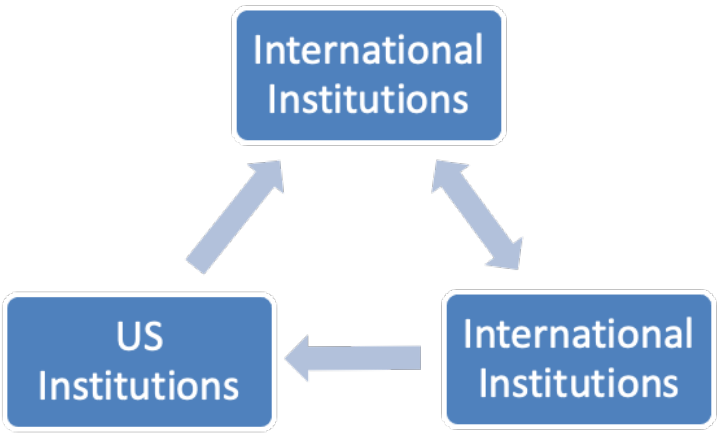


Figure 2: Exchange mechanisms between member institutions in Global E3

The membership gathers at an annual meeting in a rotating location to discuss engineering education and international education topics, best practices in engineering exchanges, and to facilitate networking through the member institutions. The use of a consortium model also ensures the sustainability of the program. Most bilateral agreements are initiated by a faculty or an administrator and oftentimes, there is a loss of institutional knowledge when the faculty or administrator leaves the institution. The consortium model will ensure the continuity of knowledge and be able to provide continued opportunities and support to the students.

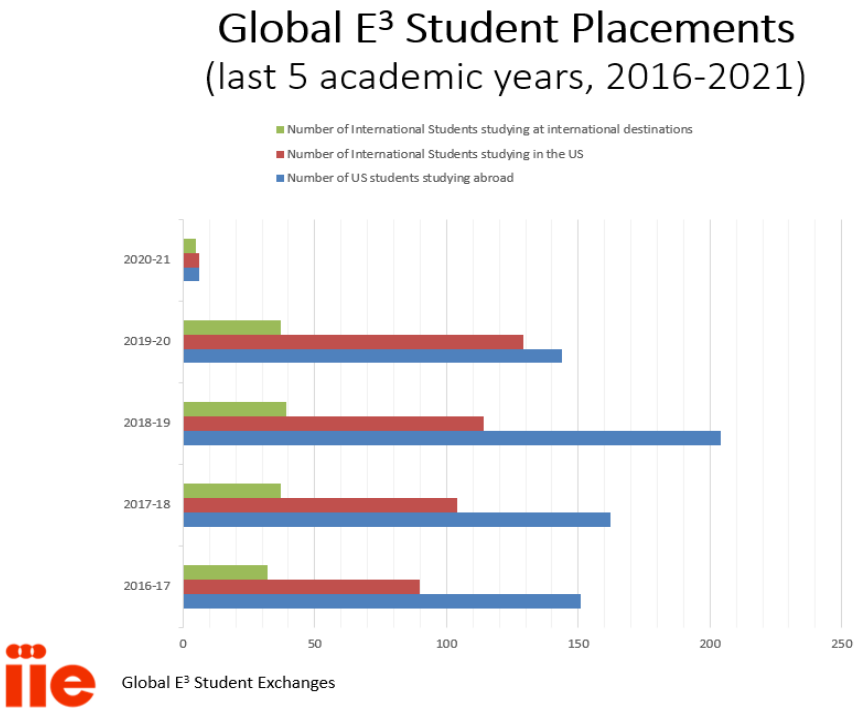


Figure 3: Annual exchange volume within the Global E3 program over the last 5 years (Institute of international Education, 2021). *Key – Blue: US to International, Red: International to US, and Green: International to International. In this context, "International" means non-US based institutions*.

Beyond exchange, the Global E3 have begun to investigate the option of research placements for students in international laboratories. In addition, international internships are now supported as part of the global exchange process. Some of the Global E3 members have provided the opportunity for virtual exchange as an alternative, driven by pandemic-related closures. The consortium can now be used as a tool to expand accessibility to international education and provides international educators and administrators the opportunity to develop programs outside of the consortium for the benefit of students.

**Case Studies**

1. **Clemson University**

Clemson University is a public institution in South Carolina, founded in 1889 as a "high seminary of learning to benefit the agricultural and mechanical arts, with an enrollment of about 26,000 students, including over 7000 engineering and computing students. The mission of the College of Engineering, Computing, and Applied Sciences (CECAS) at Clemson is to "create future graduates who can be productive in a global economy." Further, the mission explains "Because today's global citizen is expected to have experience beyond his or her primary discipline, our academic structure encourages cross-disciplinary collaboration…In addition, the University provides a number of experiential learning opportunities that require students to transfer academic knowledge and experience from the classroom to real-world work environments." In cooperation with the Office of Global Engagement at the university-level, the College's International Programs office promotes and facilitates international opportunities for students, including faculty-led study abroad programs, exchange programs with partners, and research and field opportunities for the students.

Clemson University wants students to grow as global citizens. International experiences, such as through study abroad, provide avenues for developing and advancing their global competencies. In summary, Clemson's global competency outcomes are that students will be able to apply knowledge, skills, and behaviors to their lives and careers in a global context. There are three thrust areas: (i) Professional and Disciplinary Contexts, (ii) Ethics and Social Responsibility, and (iii) Communications, Connectivity, and Global Diversity.

Like most schools, Clemson students can access international experiences in many ways, including through student exchange programs. On the average, the university's international student mobility via exchange programs has been relatively constant with a slow downward trend, with some cyclic ups and downs following world events and the economy. And like most institutions, took a dramatic tumble with the COVID-19 pandemic. The trends since 2017 are shown in the bar chart in Figure 4.

One mechanism through which CECAS provides international opportunities for students is via the IIE Global E3 program. Clemson was a founding member of the Global E3 program and has leveraged this program over the years to provide access to a large number of quality engineering programs across the world with a single agreement. This program has been very popular, and Clemson has sent 18 and received 21 students through the program over the last 5 years

(including the pandemic years), which is about 14% of the total exchange volume of the university. A bar chart showing the mobility with Global E3 is provided in Figure 5.

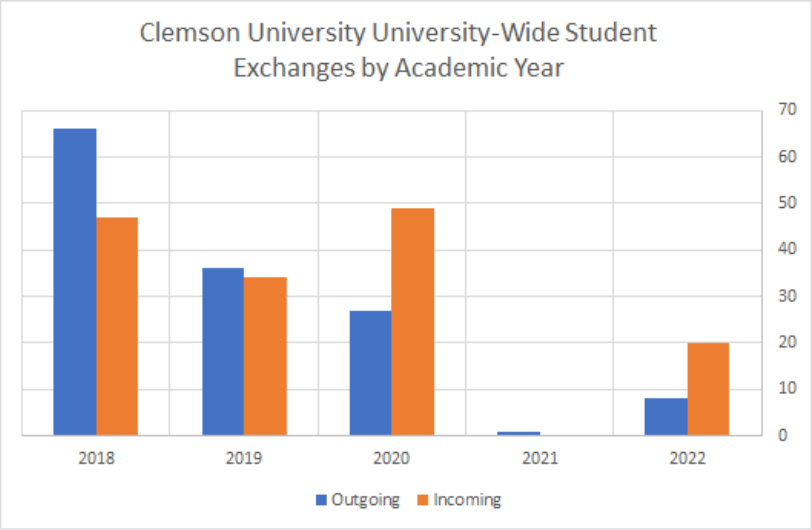


Figure 4: Clemson University total student exchange volume by academic year.

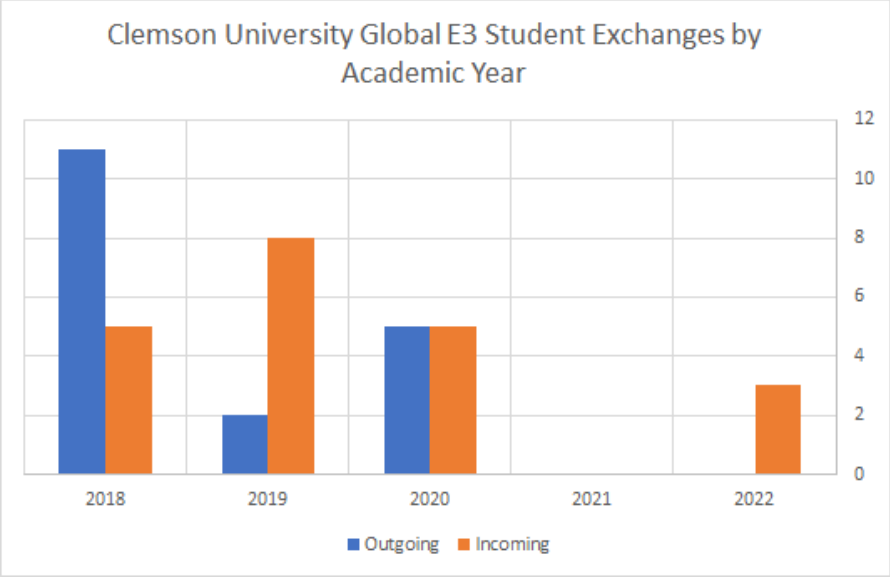


Figure 5. Clemson University number of engineering student exchanges by academic year.

Several institutions that Clemson has partnered with over the years are also Global E3 members. The Global E3 membership has been the catalyst for some of these programs, sometimes initiating because of discussions between university representatives during Global E3 events. Further, Global E3 membership has occurred through discussions between bilateral partners about the program and the advantages that membership could bring beyond just the bilateral.

Global E3 works alongside bilateral agreements and does not compete. A stated goal of the program is to facilitate other agreements between or among member schools, and such programs are encouraged. The Global E3's focus is student mobility via exchange. It works through an exchange balance model with the consortium and not between individual member schools. Thus, other programming, such as research lab placements for students, internships at universities, faculty exchanges and hosting of researchers, etc. are outside of the scope of the Global E3 but are facilitated by the connections made via the network. Further, schools can use the Global E3 as an additional route for student mobility alongside a bilateral exchange agreement. For example, students can exchange between two schools via the bilateral and concurrently exchange via the Global E3, enabling an alternative path for students if one of the programs is out-of-balance and cannot accommodate additional students. Clemson often uses Global E3 for an "overflow" from the bilateral, and this mechanism is very useful for students and the institutions.

In spite of access to nearly 40 institutions worldwide (outside of the US), Clemson students tend to request placements at just a few Global E3 member schools. (Students applying for study through Global E3 provide preferences for placements, but placement at their top requested school is not guaranteed.) As a result, the Global E3 network is under-utilized by Clemson's students. Experience has been that students tend to select schools where previous students and friends have attended, and where the courses those colleagues have taken abroad have been previously approved for credit transfer back at Clemson.

During the COVID-19 pandemic, the Global E3 program provided a "one stop shop" for managing multiple partners as the situation worldwide evolved. Rather than having to keep track of the openings, closings, and changing restrictions for each bilateral school individually, Clemson (and the other Global E3 members) were able to work with the Global E3 administrator who was keeping track of each member and could provide information as well as alternative placements for students as things evolved. This was tremendously valuable to members, students and advisors.

**2. University of Florida**

The University of Florida (UF) is a public 4-year research university in Gainesville, Florida. UF is accredited by the Southern Association of Colleges and Schools (SACS). It is the third largest Florida university by student population, and is the fifth largest single-campus university in the United States with 57,841 students enrolled during the 2020–21 school year. The University of Florida is home to 16 academic colleges and more than 150 research centers and institutes, with the Herbert Wertheim College of Engineering (HWCOE) as the largest professional school, the second largest college, and one of the top three research units at UF. HWCOE has slightly over 10,000 enrolled students, distributed among ten departments and 15 degree programs.

The HWCOE mission is to provide world-class engineering education, research, and service to enhance the economic and social well-being of the citizens locally, nationally, and globally. The New Engineer initiative is centered around 3 core areas: (1) Engineering Leadership, (2) Engineering Innovation, and (3) Interdisciplinary Research. The initiative aims to develop engineers who are not only technically-competent, but also have strong leadership skills, ethical

and principled, and a creative problem-solver who can contribute to the global community. Dean Cammy Abernathy highlights that "The New Engineer is not only technically competent but one who is capable of leading and innovating in a world that is increasingly global". Therefore, it is an imperative that Gator Engineers are equipped with the necessary tools to engage on a global scale.

In 2014, HWCOE established the International Engineering Programs to foster an engineering student population that is globally aware and has the skills to become culturally sensitive, internationally competent, and engaged global citizens. The college aims to provide support and opportunities in order to increase participation of undergraduate engineering students, particularly under-represented engineering students, in international experiences through study, research, internships, and service learning. One of the ways that this goal is being achieved is through membership in the Global Engineering Education Exchange (Global E3). HWCOE became a member of Global E3 in 2014 and sent its first cohort of students abroad through the consortium in Spring 2015.

At the University of Florida, Global E3 is housed in the HWCOE Office of Student Affairs, in partnership with the UF International Center (UFIC). The Director of International Engineering Programs in HWCOE serves as the academic advisor for the students looking to study at a Global E3 partner institution, while the UF advisors provide expertise on application processes, country-specific information, and pre-departure/reentry information.

The benefit of partnership in the Global E3 consortium has been plentiful for UF HWCOE who have a relatively young presence in the field of international engineering education. Global E3 has increased the number of international exchange partners from 8 in 2014 to 36 in 2022. The number of outbound engineering students has steadily increased since joining Global E3, shown in Figure 6.

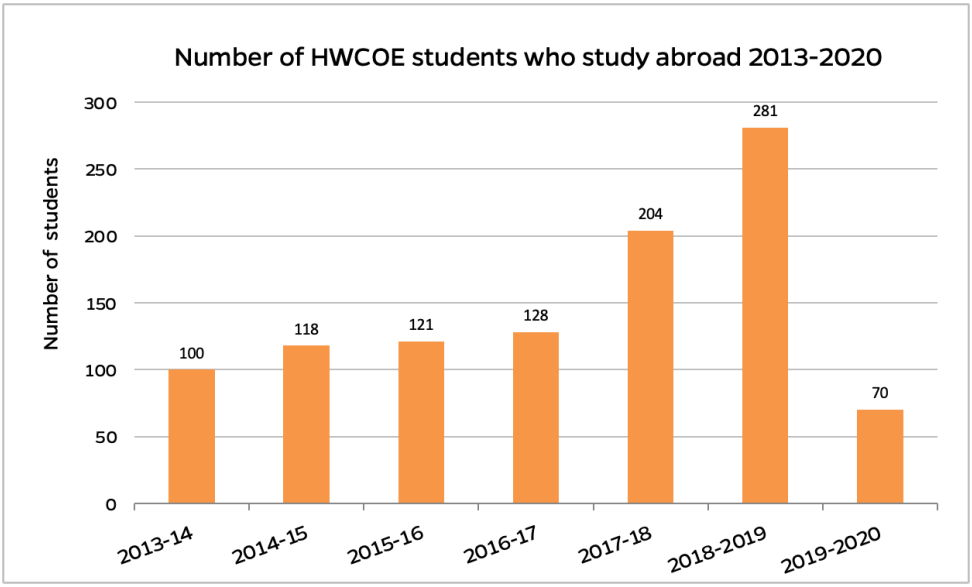

Figure 6: Number of UF engineering study abroad students

Since joining Global E3, University of Florida has not only gained partners through the network but has also increased the number and strength of collaboration with a lot of bilateral partners. Due to increased demand from students to study abroad through Global E3, the University has established bilateral relationships with international partners in order to create more capacity for international engineering programs.

### 3. INSA-Lyon

INSA Lyon is one of the largest engineering graduate schools in Europe, and operates a fully integrated Education, Research and Innovation approach. It is the 1st engineering school in France in terms of number of students (approximately 6,200 students from bachelor to doctorate level). Created in 1957, it is distinguished from other schools by its philosophy and values. The two founders of INSA, Gaston Berger, General Director of Higher Education, and Jean Capelle, Rector, envisioned a new kind of institution capable of providing innovative solutions to the challenges facing society. Since its creation, INSA Lyon has been training engineers capable of meeting the challenges of the future, with a model organized around two dimensions: social and humanistic.

The school is committed to implementing a multi-criteria and egalitarian recruitment policy for its students from diverse backgrounds. It supports them in their professional projects by providing them with knowledge of the engineering sector in order to make their diversity a key factor in the attractiveness of companies facing the challenges of globalization. Convinced that diversity is the source of innovation, the school has designed tailor-made programs for students with atypical profiles (high-level sports section, arts and studies section, students with disabilities, international students, etc.), to give them the opportunity for a dual career and to enable them to integrate successfully into the global workplace.

One question INSA Lyon wants to address INSA Lyon is what skills are expected of students in order in a study abroad program. The University believes that this experience will allow students to open up to the world, to adapt to another way of thinking, another way of teaching and thus to progress in foreign languages. However, this "conviction" must also be consolidated by a potential evaluation of the added value of going abroad. However, this evaluation quickly raises the question of what exactly the competence is. The University must therefore clearly define these skills. This would also make it possible to validate these skills through experiences other than the exchange or internship.

Diversity is also expressed through INSA Lyon's international development. The University welcomes foreign students from the very beginning of their university studies, sometimes with special arrangements to ensure their success. In addition, for the past four years, all students have been required to have international experience, either as a semester-long or year-long exchange (about 900 students per year) or as an internship in a company (about 200 students per year). INSA Lyon has more than 200 exchange agreements around the world, but some areas are more popular with students, especially North America and the USA. As a result, the GE3 program is an excellent opportunity for students to go on exchange to top universities in the country they want most.

INSA Lyon has been a member of the Global E3 network for 10 years now. The institutional and operational aspects are hosted by the International Relations Department and managed by the North American project manager under the authority of the Director of International Relations. Joining this network has been an essential step for INSA Lyon in the implementation of an international strategy aimed at increasing its visibility on all continents.

Figure 7 represents the evolution of the outgoing, incoming students as well as the number of Outgoing students who chose USA as a destination for INSA Lyon. Note that the numbers for 22/23 are just based on student applications.

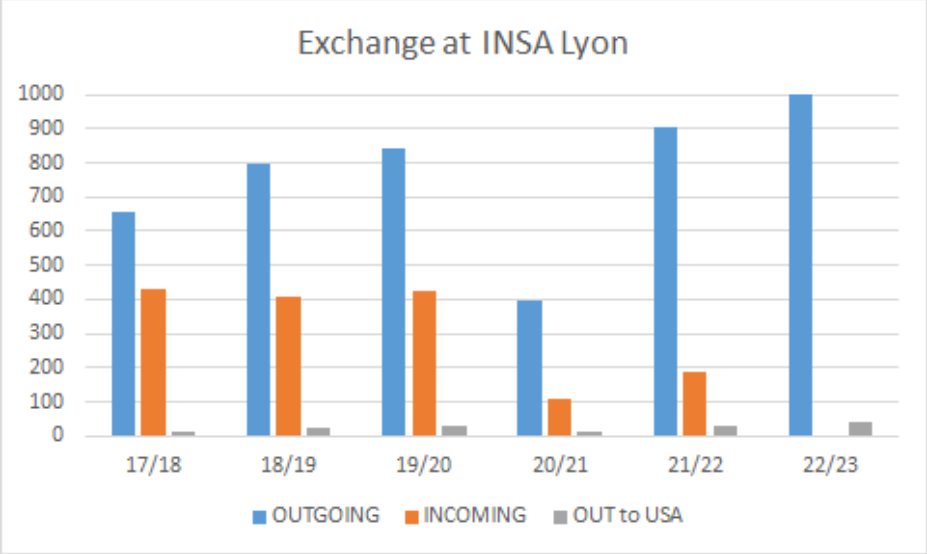


Figure 7: Number of outgoing and incoming students for INSA Lyon

The numbers are large since all students have to go abroad in 2017/2018. The University can thus see an increasing number of students going abroad and the trend is the same for outgoing students to the USA. The difference between Incoming and Outgoing students becomes more and more critical for us. INSA Lyon have been engaged in order to attract more students by switching a lot of courses in English, developing short programs, promoting INSA Lyon at international fairs but also by being part of different international networks.

The COVID-19 crisis can be clearly seen by the sudden decrease of the number of outgoing students in 20/21. It is worth noting that the University has been able to maintain some mobility by sending students to Europe. Right after the main crisis, the outgoing numbers have recovered to the same level as before but not the incoming numbers. It is also very interesting to see that concerning the next year, the number of candidates for outgoing students broke the record. The students really want to go abroad again for exchange. The outgoing numbers for the USA follow the same trend.

The Global E3 offers a safe and stable opportunity. The number of Incoming students has not recovered yet unfortunately. If the University focuses on exchange through the GE3 network, the number of incoming and outgoing academic mobilities has increased significantly allowing us to send 5 to 7 students per year, to receive as many or more and also to welcome about twenty

students per year in the framework of short programs. These students benefit from a special rate, as their institution is a member of the GE3 network. This has also allowed us to be "accredited" for the IST program, dedicated to international students in the IT field. It is also with the support of the GE3 network that INSA Lyon has set up, as early as 2016, the opportunity to undertake short programs in English dedicated to an international student body, at a time when no other French engineering school was offering this on the market.
Despite the pandemic, INSA Lyon has managed to send students abroad and to welcome them when the security and health conditions allowed it. The relationship with the members of the network has been further reinforced since the onset of the COVID-19 pandemic. INSA has managed to set up innovative experiences for students attributed to the strength and resiliency of the consortium. To name just two examples, the University has organized virtual short programs dedicated to international students who could not leave their country. Also, Faculty members of GE3 met virtually to offer a common course to their students, allowing them to add an international and intercultural element to their journey in this constrained period. It was possible to step out of comfort zones because the group knew each other, it was possible to work together to find solutions and move forward together.

### 4. University of Newcastle

The University of Newcastle, Australia, is a comprehensive university with five campus locations in New South Wales: Callaghan, Ourimbah, Newcastle City, Sydney City and Port Macquarie and a campus in Singapore. The city of Newcastle is situated approximately two hours drive North of Sydney on the coast. The city is the economic hub of the Hunter Region, with a population of over 600,000. The University has over 38,000 students enrolled across degrees in Engineering, Science, Health Sciences and Medicine, Education, Business and the Humanities. The Engineering and Computing enrolments are approximately 5,000 across undergraduate, postgraduate coursework and research higher degrees. The University has recently been through significant structural change moving from five faculties to three colleges. The Former Faculty of Engineering and Built Environment (FEBE) joined the former Faculty of Science to become the College of Engineering, Science and Environment in 2021. Much of the information reported here is derived from the former FEBE.

In 2015 the FEBE developed a strategic roadmap which included a strong focus on internationalization for both staff and students, with benefits including the development of intercultural competencies which can be derived from others from different cultural backgrounds that can change attitudes, opinions and behaviors that result in positive interaction with others and enhanced employment opportunities. Some of the strategies the Faculty implemented to achieve its internationalization objectives included international exchange opportunities for both staff and students, hosting international visiting academics, global recruitment strategies, allocation of funds for international conference travel grants, outbound exchange scholarships and faculty-led international tours for undergraduate students. All of these opportunities were promoted on the Faculty website and through regular newsletters.

Student exchange was promoted actively to prospective students via marketing publications, degree information pages on the University website and through social media. In addition, return exchange students were invited to present on their experiences at regular exchange recruitment

events. The Faculty developed tools and resources to encourage students to take exchange opportunities. The challenge was always balance. It was harder to encourage outbound student exchange than inbound exchange. For Engineering students, in particular, employment rates upon graduation were extremely high contributing to higher than average starting salaries for graduates of over A$90,000. Any activity that might delay graduation had significant financial implications. The Faculty worked hard to create program plans which supported students to undertake exchange without extending their study time. Allowing the inclusion of four elective units went a long way towards facilitating uninterrupted program planning.

The University is a member of the Global E3 with key participants located in the Faculty. The University's central Global Engagement and Partnerships section provides support to students through provision of advice and information. Participation in the consortium has helped curation of opportunities and a reduction of administrative hurdles for students interested in exchange. The process is streamlined with support from the Global E3 team which helps students to minimize time between application and approval. The number of outbound Engineering students has increased in recent years (prior to the COVID-19 pandemic) at the same time as the overall University number of outbound students has decreased.

Australian government policy over 2020, 2021 and the beginning of 2022 has severely restricted international travel with borders completely closed to international visitors from March 2020 through to February 2022. International students with visas already approved were able to return to Australia from December 2021 beginning to pave the way for a return to regular patterns of travel and student exchange. Some of the Faculty's international students found themselves unable to re-enter Australia during the pandemic and were able to utilize Global E3 exchange opportunities to access face-to-face teaching rather than continue their studies online. University of Newcastle students located in India were able to undertake exchange through the Global E3 to attend classes in the UK and USA where there were relatively few restrictions on international travel.

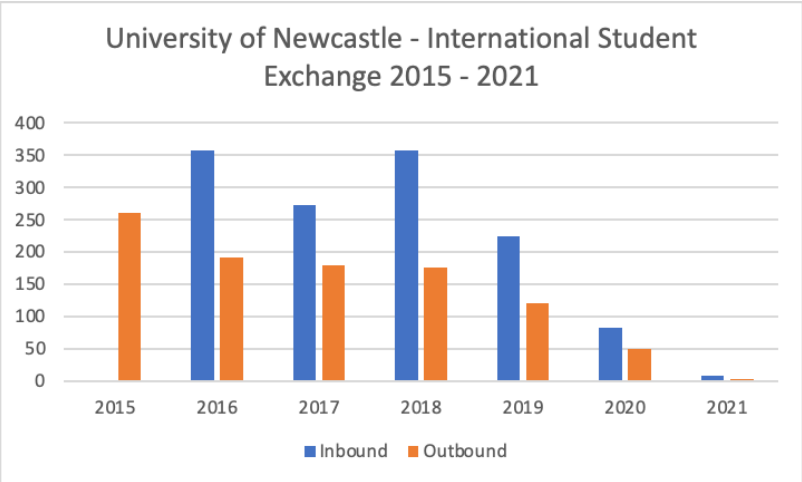


Figure 8. University of Newcastle, Australia, international student exchange numbers 2015 - 2021 * *Inbound exchange data for 2015 was not available*

## Conclusion and Future Work

Engineering students are generally less likely to take the opportunity to participate in an international experience during their degree studies, based on reports done by IIE Open Doors Data among others. The benefits of global experience to improve cultural competence and employability are clear. Evaluation conducted of the Global E3 program participants showed that 90% of students said that they gained a better understanding of engineering practices and standards in the host country while the same percentage of students said they were more likely to seek jobs in multinational companies (L. A. Gerhardt, York, & Martin, 1999). This is an important outcome as the engineering industry becomes increasingly globalized and international mobility of the workforce becomes common. Current socio-economic issues around the world also add to the urgent need to help address rising global threats such as climate change, along with looming challenges associated with rapid and unpredictable technological advancements (Jesiek, 2018).

The many barriers to participation in exchange, the administrative requirements in particular, can be reduced through participation in a centralized program that benefits both administrators and students. The Institute of International Education's (IIE) Global Engineering Education Exchange or Global E3 has provided a platform for members for simplified exchange with benefits of membership beyond exchange to help members improve teaching and administrative practice. The group intends to help improve research exchange and provide access to internship exchanges in the future.

The authors see much potential in the future in conducting further research into various aspects of the Global E3 consortium, such as assessment of learning outcomes, institutional perceptions of global engineering education, and outcomes beyond college for program participants. There are plans in the future to extend research based on the work of Gerhardt et al. (1999) on program evaluation and the effectiveness of the consortium model.

## References

Gerhardt, L. A., York, N., & Martin, S. (1999). The Global Engineering Education Exchange Program – A Worldwide Initiative. *29th ASEE/IEEE Frontiers in Education Conference*, 11–14.

Institute of International Education. (2021). 2020 Open Doors Report. In *Open Doors Report on International Educational Exchange*. Retrieved from https://www.iie.org/Research-and-Insights/Open-Doors/Data/US-Study-Abroad/Fields-of-Study

Jesiek, B. (2018). Internationalizing Engineering Education: Looking Forward, Looking Back. *Journal of International Engineering Education*, *1*(1). https://doi.org/10.23860/jiee.2018.01.01.01

Jons, Sylvia & Collins, E. R. (2021). Global STEM Partnerships via Consortium Models for Resilience During a Pandemic. *2021 ASEE Annual Conference*, American Society for Engineering Education.

iie GLOBAL E³
GLOBAL ENGINEERING EDUCATION EXCHANGE

## GLOBAL E³ MEMBER INSTITUTIONS

### ARGENTINA
- Instituto Tecnológico de Buenos Aires

### AUSTRALIA
- University of Melbourne
- University of New South Wales
- University of Newcastle

### BELGIUM
- KU Leuven

### CHINA
- University of Michigan - Shanghai Jiao Tong University Joint Institute
- Xiamen University

### COLOMBIA
- Universidad de los Andes

### DENMARK
- *DTU*: Technical University of Denmark

### EGYPT
- American University in Cairo

### FRANCE
- *ENSEA*: Ecole Nationale Supérieure de l'Electronique et de ses Applications
- *INSA Lyon*: Institut National des Sciences Appliquées, Lyon
- *UTT*: Université de Technologie de Troyes

### GERMANY
- Hamburg University of Applied Sciences
- HM Hochschule München University of Applied Sciences
- RWTH Aachen University
- Technische Universität München

### HONG KONG
- City University of Hong Kong
- Hong Kong Polytechnic University

### INDONESIA
- Institut Teknologi Bandung

### ISRAEL
- Technion – Israel Institute of Technology

### ITALY
- Politecnico di Milano

### JAPAN
- Tohoku University

### MALAYSIA
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- Universiti Teknologi PETRONAS

### MEXICO
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### THE NETHERLANDS
- Delft University of Technology
- University of Twente

### NEW ZEALAND
- University of Canterbury

### SINGAPORE
- Nanyang Technological University

### SOUTH KOREA
- Hanyang University
- *KAIST*: Korea Advanced Institute of Science & Technology

### SPAIN
- Universidad del País Vasco
- Universidad Politécnica de Madrid
- Universidad Pontificia Comillas

### SWEDEN
- Lund University

### UNITED ARAB EMIRATES
- Khalifa University of Science and Technology

### UNITED KINGDOM
- University of Leeds
- University of Sheffield

### UNITED STATES
- Boise State University
- Case Western Reserve University
- City College of New York
- Clemson University
- Drexel University
- Embry-Riddle Aeronautical University
- Franklin W. Olin College of Engineering
- Georgia Institute of Technology
- Illinois Institute of Technology
- Lehigh University
- Louisiana State University
- Mississippi State University
- Missouri University of Science & Technology
- New Jersey Institute of Technology
- New York University
- Rensselaer Polytechnic Institute
- Rose-Hulman Institute of Technology
- Texas Tech University
- University at Buffalo, SUNY
- University of Florida
- University of Illinois, Urbana-Champaign
- University of Miami
- University of Michigan
- University of Minnesota
- University of New Hampshire
- University of Pittsburgh
- University of Portland
- University of Rochester
- University of Tulsa
- University of Wisconsin, Madison