



## The Role of Civil Engineering in Internationalization Efforts at Villanova University

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# The Role of Civil Engineering in Internationalization Efforts at Villanova University

## Abstract

In 2012, Villanova University joined the American Council of Education (ACE) as a member of their Internationalization Laboratory. The goal of joining this laboratory was to develop a strategic plan for comprehensive internationalization that will help strengthen the university's global leadership and engagement. ACE describes a process to develop, implement, and monitor an internationalization plan. This paper will describe the status of current internationalization activities at the university; specifically focusing on how the Department of Civil and Environmental Engineering can help the university articulate, assess, and attain their internationalization goals. This paper will describe the numbers of international students and faculty, level of internationalization within courses, numbers of students participating in semester and summer-long study abroad programs, as well as participation rates in international service learning projects. The paper concludes with recommendations for opportunities to strengthen and expand these internationalization efforts. Internationalization is not a one-size-fits-all process; however, the concrete examples provided may help other universities achieve their internationalization goals.

## Introduction

The American Council on Education (ACE) defines internationalization as the “process by which institutions foster global learning.”<sup>1</sup> They then define global learning as “three related kinds of learning: global (denoting the systems and phenomena that transcend national borders), international (focusing on the nations and their relationships), and intercultural (focusing on knowledge and skills to understand and navigate cultural differences).”<sup>1</sup> They sum it up by using the same language that appears in the Body of Knowledge<sup>2</sup>, stating that that global learning represents the “knowledge, skills, and attitudes” required by students to apply global learning concepts to their lives and careers. ACE works with participating institutions to audit and assess existing international initiatives, to develop a strategy for comprehensive internationalization aligned with mission, to articulate specific goals, and to assess progress towards these goals with a particular focus on student-learning outcomes.

While the concept of internationalization is not new<sup>3</sup>, universities have recently begun to re-examine the depth to which their internationalization efforts are affecting student learning<sup>4,5</sup>. This reexamination has created a need/desire for global learning outcomes assessment.

At Villanova University, in response to ACE's Internationalization initiative, the Vice President for Academic Affairs formed an international leadership team and provided them with the following charge:

- Develop a vision of internationalization for Villanova aligned with our mission and strategic plan.
- Create a set of international learning goals aligned with that vision and an assessment

plan for those goals.

- Review current internationalization activities at Villanova with the objective of sharpening institutional goals and determining whether students have sufficient opportunities to meet those learning goals.
- Analyze the findings of the review.
- Develop a strategic action plan analyzing the state of internationalization on campus and recommend internationalization goals and the means of achieving them.
- Create a communication and engagement plan to ensure that the wider university community, including faculty, staff, students and alumni, are informed of the committee's work, are engaged in meaningful discussion of the leadership team's work as it unfolds, and have adequate opportunities for input.

Although other areas to examine for assessment and/or development emerged over the course of the committee's deliberation and research, the following were suggested for at least initial review:

- cross-college and cross-discipline collaboration on international initiatives
- international research/grant development
- international teaching and learning (including curriculum, area studies programs, and learning outcomes development)
- education technology and internationalization
- education abroad
- faculty development in internationalization
- international scholar and student development
- organizational models for managing university-wide international affairs
- intersections among multiculturalism, globalism, and internationalization
- relationships with local ethnic/language communities and international stakeholders (e.g., multinational corporations, governmental and non-governmental organizations, and international professional organizations).

### **Relationship to the Strategic Plan**

In 2010 Villanova University developed a strategic plan<sup>6</sup>. The internationalization efforts must be supportive of the strategic plan to be successfully accepted and implemented. The international leadership team's initial review of the University Strategic Plan indicates that although the word "global" or "world" appears a number of times there is only three explicit references to a global goal. The first appears in "Our Vision for the Next Decade:" "We will enhance our reputation as a premier national university and be recognized as a preeminent Catholic University that prepares graduates for success throughout life in the *global environment*."<sup>6</sup>

The second reference refers to recruiting goals; the section entitled "Our Stewardship of Villanova," notes "Villanova's applicant pool will become *increasingly diverse in geography, race, and socioeconomic status*." Strategic Imperative Two echoes this goal stating: "*Our enrollment goal includes continuing to build a community that is diverse in race, gender, ethnicity, and culture*."<sup>6</sup>

The third instance appears in Strategic Imperative Four: “The Value of Villanova: Sharing our Story” which states “We will pursue aggressive media and marketing outreach to **increase awareness of Villanova worldwide** by building our faculty expert program and enhancing traditional, online, and new media strategies.”<sup>6</sup>

In the section entitled “The Villanova Promise” it states that Villanova is a “broad, welcoming, inclusive community.” Other references throughout the Strategic Plan refer to “diverse faculty community” and that “Villanova believes that **all human beings are connected as one worldwide community**” and “**our personal responsibility to others spans from our neighbors to all people on the planet.**” “**Villanova attracts students interested in volunteerism here and abroad**, and all academic programs at the University emphasize service in their curricula.”<sup>6</sup>

### **Internationalization Process**

ACE describes a process<sup>1</sup> to develop, implement, and monitor an internationalization plan. These steps are:

1. Prepare and select the team
2. Inventory current programs
3. Set educational outcomes
4. Develop internationalization plan, including
  - a. Timeline
  - b. Action items and responsible agents
  - c. Funding
5. Implement the plan and monitor progress
6. Create a structure to continue successes
7. Assess progress and make changes based on assessment

Currently, Villanova University has completed step four. The Civil and Environmental Engineering (CEE) Department has one faculty member that is serving on the Leadership Team and the Education Abroad subcommittee and one faculty member served on the International Students and Scholars subcommittee. In addition to these CEE faculty members, two faculty members from the College of Engineering (CoE) are on the Teaching and Learning subcommittee and another is on the International Research subcommittee. The seven subcommittees are:

1. Strategic International Partnerships
2. Education Abroad
3. International Students and Scholars
4. International Teaching and Learning
5. International Research
6. Internationalization, Co-curricular/Campus life, and Multicultural Affairs
7. Internationalization and Community Engagement and Outreach

The sub-committees inventoried existing programs, courses, and co-curricular activities, which have an international component. For some of the subcommittees, the inventory process was straight forward, while for others a survey of the faculty was needed to ferret out all of the initiatives occurring at the university. For example, at Villanova University, all education abroad

programs are funneled through one office; as a result, the inventory of programs occurred quickly. International research, however, is typically department or faculty driven and thus highly dispersed, making an inventory more difficult to complete.

The results of a university-wide survey at Villanova University indicated that a strong majority of full-time faculty agree that internationalizing our curriculum will help students be more successful after graduation (78% agree or strongly agree). Nearly 95% of faculty agree or strongly agree that colleges and universities should prepare students for an increasingly interconnected world. However, a weaker majority (58% agree or strongly agree) believe that global and international topics should be incorporated into all undergraduate programs. This latter issue likely reflects the specific needs of the professional colleges, such as Engineering, and science departments to develop a robust education plan that meets standards within technical disciplines. In the absence of a well-defined university-level core curriculum where course content could be standardized to meet internationalization goals, however, each college has strategized quite differently to prepare students for a more global and multicultural workplace.

The ACE internationalization committee concluded that the CoE had the least international focused curricular content at Villanova University. Considering the educational mandates for an engineering degree and the trend towards reducing credits required for graduation<sup>7, 8</sup>, the addition of more required Liberal Arts courses to boost exposure to international content is not likely. In addition, it is also not likely that the Liberal Arts electives will be restricted to classes with international content as students often use those electives to complete minors in such broad areas as Theology, Bioengineering, and Sustainability Studies.

The ACE committee suggested that the CoE define a strategic plan to enrich the majors' curriculum with international/global learning; the college has begun working towards this goal. This paper is an attempt to show how and where the CEE Department can lead the way in internationalization for the College generally and in student global learning outcomes specifically, while also suggesting strategies that might be of interest to other engineering programs. The current level of internationalization opportunities available to students in CoE, including curricular (general education, majors/minors/concentrations), co-curricular (including service learning), and study abroad is provided. We also discuss the presence and integration of international students and scholars and international research opportunities that currently engage students, and conclude with some recommendations to enhance internationalization.

## **Internationalization Efforts in the College of Engineering**

### *Curricular Programs*

The CoE accounts for about 16% of the total undergraduate student population at Villanova University. All undergraduate engineering students complete a minimum of six courses within the humanities offerings in the College of Liberal Arts and Sciences. The CoE is driven by the core belief that the engineering profession serves society best by improving the lives of people. The CoE mission states that “as a community of scholars, we seek to educate students to pursue both knowledge and wisdom, and to aspire to ethical and moral leadership within their chosen careers, their community, and the world.”<sup>9</sup> Courses in the humanities are included in the

curriculum across major areas so that the student engineer is more fully aware of the social responsibilities and better able to consider non-technical factors in the engineering decision making process. While the CoE seeks to educate strong leaders and citizens, it does not, at present, include global learning experiences as part of its core mission. However, diversity of experience is valued and promoted through exploration of the humanities and inclusion of specific cultural-rich courses within the core.

Although the university does not have a common cross-college core curriculum, all students, including CoE students, are unified through participation in the freshman year Augustinian and Culture Seminar (ACS), which is a two three-credit course sequence. This course sequence is intended to create a common conversation amongst first-year students about books and ideas and to give them a foundation from which they will build their academic experience. While there is no requirement for ACS instructors to include global awareness in the curriculum, many faculty incorporate multicultural texts and present content in light of the historical context of the authors in both the Ancients and Moderns courses.

The Office of Student Life has partnered with the ACS Program over the past 15 years to create “Learning Communities” as thematic approaches to the ACS curriculum linked to a one-credit class (or fourth hour) that is specific to that theme. Incoming freshmen may elect to participate in a Learning Community (LC) whereby housing assignments are structured to provide students with a common intellectual focus an opportunity to live within the same dormitory and to regularly meet for academic enrichment through the fourth hour credit requirement. At present there are nine options for LCs including one titled “Global Community.” Participation in this LC has been consistent over the past several years at approximately 48 total students. The ACS courses that these students take are thematically focused to provide global community and international awareness. Because ACS courses are part of the freshman curriculum across all colleges, all incoming students regardless of major may participate in a LC. Therefore, these 48 freshmen students in the Global Community LC include cross-college participants.

Although CoE students are not required to take language classes, students may pursue language minors as an elective curricular enrichment. The number of 2013 Engineering graduates earning a minor within one of these language/cultural areas is shown as Table 1. The total number of engineering graduates in 2013 was 225.

**Table 1. Number of 2013 graduates in engineering earning a language minor**

<b>Minor/Concentration</b>	<b>Number of students</b>
French Language and Literature	3
Italian	1
Japanese	2
Spanish Language and Literature	5

Injecting an international component into already existing classes need not be an onerous task and many faculty already integrate international examples into their classes. This effort is also consistent with the Accreditation Board for Engineering and Technology (ABET) criterion 3h: “the broad education necessary to understand the impact of engineering solutions in a *global*,

economic, environmental, and societal context.”<sup>10</sup> For example, a faculty member in the CEE Department has presented an internalization element in engineering economics, a required junior level course, by introducing the Panama Canal expansion project currently underway. A preliminary review on the impact of the Canal’s expansion on global freight economy and marine transportation system was discussed in conjunction with traditional economic factors. This discussion was supplemented by course assignments that required more detailed analyses. Other examples are the use of international case studies for exams and homework in soil mechanics, such as the design of a berth structure in Viet Nam<sup>11</sup> and the design of infrastructure for developing countries in capstone design projects.

### *Study Abroad*

For over 30 years, Villanova University has offered international education opportunities for its students through faculty-led summer programs, institutional exchange programs and both Villanova coordinated and affiliate-run semester based programming. The current defining philosophy in the Office of International Studies is a focus on student immersion in the host country and culture. This focus on immersion<sup>12</sup> is meant to guide the development of university specific programs and also narrow affiliated program options to those study abroad programs that meet the four main program criteria: 1) maintain non-profit status 2) offer program in conjunction with non-US university 3) offer classes taught by non-US faculty, and 4) offer integrated housing options. While some Villanova University summer programs do not all meet these criteria, it is the benchmark used to determine if a non- Villanova University program can be accepted for academic credit.

The Office of International Studies (OIS) at Villanova University consistently ranks highly in Institute for International Education’s Open Doors survey for the number of students we send abroad<sup>13</sup>. In addition, over the past ten years, the number of students participating in study abroad has increased from 498 in academic year 2002-2003 to 852 in academic year 2012-2013.

The CoE has been increasingly supportive of study abroad, with the CEE Department leading the effort<sup>12</sup>, which has resulted in more students taking advantage of this opportunity. Students must carefully plan their experience to ensure that they will fulfill their curricular requirements while overseas. This planning requires close collaboration with their academic adviser and the OIS to ensure that they are able to take the courses needed to keep them on schedule to graduate in four years. This planning has been successful – to date none of the students that have studied abroad from CEE have had their time to complete their degree extended as a result of the experience.

Since 2000, 56 civil engineering students have participated in semester-long abroad programs and 62 have participated in summer-long programs (Figure 1) with a dramatic increase occurring over the past decade. To help understand these trends, in 2009 three questions regarding study abroad were added to the CEE Department’s senior exit survey. The three questions were:

- Were you aware of study abroad opportunities?
- Did you study abroad?
- If you did not, why not?

The results from this survey are presented in Table 2. Typically, students study abroad either second semester sophomore year or first semester of junior year<sup>12</sup>. As a significant number of

students studied abroad either in summer or semester programs in 2012 and 2013, it is anticipated that the percentage of students studying abroad from the graduating class of 2014 and 2015 will be much higher than in past years. In the past, the percentage of CEE students studying abroad has varied from 16% to 29%, which is much higher than the national average of 3%.<sup>14</sup>

The results of the survey indicate that the number of students aware of study abroad opportunities has increased and the reasons why students do not go abroad have been fairly consistent. The major area where advising can help improve the number of students that study abroad is educating students that it is possible within the curriculum to study abroad and not get behind. Since advising sheets were developed in 2009, the number of students stating that they did not know about study abroad has decreased; however, since 2011, the number of students citing financial constraints has increased.

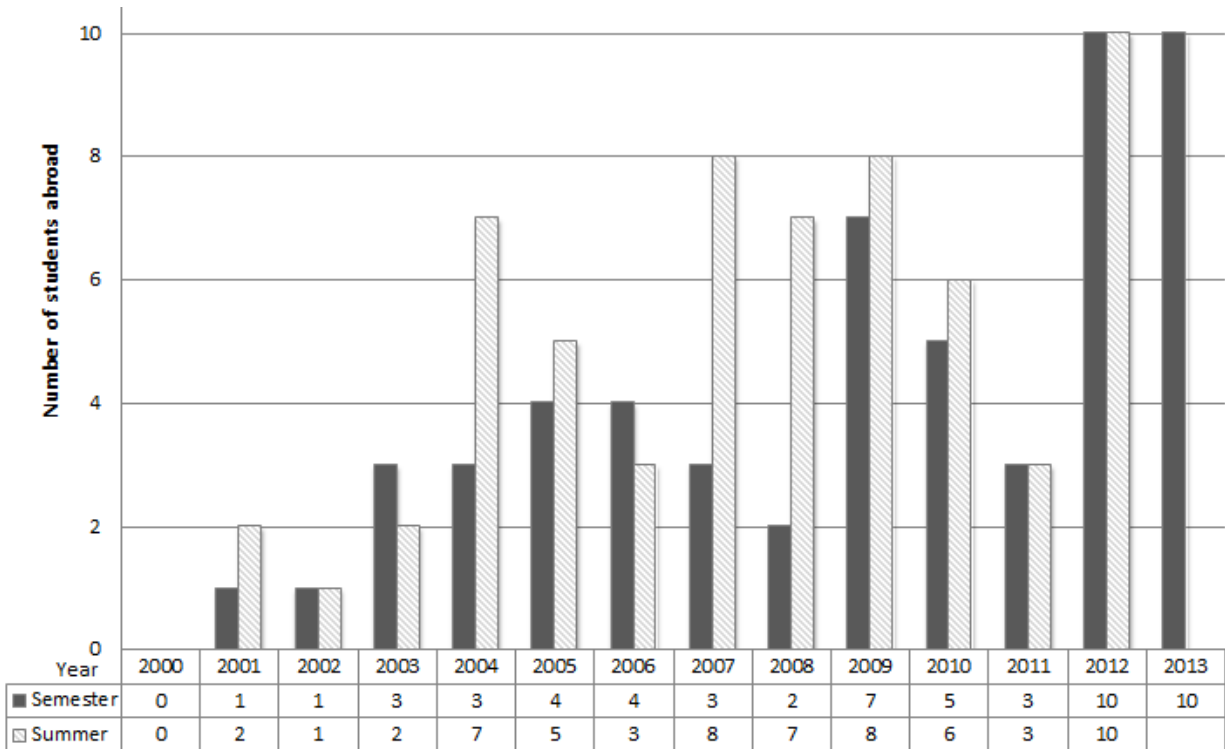
Civil engineering students have spent one semester or more at the following universities (in decreasing popularity):

- National University of Ireland, Galway, Ireland (with a follow-on internship available)
- University of Melbourne, Australia
- The University of Queensland, Australia
- The University of Technology, Sydney, Australia
- The University of Auckland, New Zealand
- Carlos III University, Madrid, Spain
- City University, London, UK
- Queen Mary, University of London, UK
- University of Bath, Bath, UK
- The University of Sheffield, Sheffield, UK

A program with Swarthmore College and Jagiellonian University and Technical University of Krakow in Krakow, Poland has been developed, but to date, no students have participated.

Another option for Villanova University students is to attend one of the approximately 15 summer programs lead by Villanova faculty or summer programs run by another university (Figure 1). These programs are typically six weeks long and are held in a variety of locations throughout Europe, South America, Africa, and Asia. Typically, civil engineering students take classes that will fulfill their general education requirements. In summer 2012 a program entitled Architecture and Augustine was developed. This program, which is taught on location in Italy, includes a class that will fulfill a technical elective and a Theology elective. The development of this program, which offers civil engineering credit during the summer, is responsible for the increase in students participating in summer programs in 2012. It is anticipated that this program will run every other year.





**Figure 1. Number of civil engineering students studying abroad**

**Table 2. Summary of senior survey results**

Year	Size of graduating class	Were you aware of study abroad opportunities?	Did you study abroad?	If you did not study abroad, why not?
2009	49	59%	16%	No interest/don't want to leave Villanova Didn't think I could/engineering curriculum is too constrained Too many activities (e.g. sports) here Couldn't afford it
2010	56	95%	29%	
2011*	60	88%	40%	
2012	50	91%	20%	
2013	41	77%	16%	

\*The results from this year are not representative as the completion rate was low

### *Service Opportunities*

Service learning opportunities that include an international component are well established at Villanova University<sup>15</sup>. These experiences can vary from co-curricular activities, such as Engineers without Borders, to for-credit classes. Most of these opportunities include an on-site visit, but the length of the stay can vary from one to several weeks. Since 2000 the CEE Department has sponsored service-learning trips for credit every year, with the exception of

2012. From 2000 to 2011 the students in CEE 4611 CE Service learning provided engineering expertise and help to an orphanage in Honduras. Unfortunately, this program was halted when Honduras was added to the US Department of States travel-warning list. At the time of writing, CEE 4611 has been resumed with the students focusing on projects at the Cheypo Bayano Mission in Panama.

A multifaceted partnership is developing in Panama. The programs either in existence or developing in Panama with CEE involvement are:

- An interdisciplinary undergraduate course, GEV 3000 Humanity, Technology & Infrastructure was developed by CEE faculty in collaboration with faculty from the Colleges of Liberal Arts and Sciences and Nursing. This course, which focuses on current water resource planning efforts in Panama, was first taught in spring 2012 and is run on an annual basis.
- Service learning program in partnership with Father Wally Kasuboski and his Cheypo Bayano Mission. This partnership was renewed in 2010. Most of the work has focused on developing water resources for the community. A new project involving the design of a bridge is underway. The water resources and bridge project are also the focus of CEE 4611, as described previously.
- Water resources partnership with the City of Knowledge. This partnership is currently being developed and is likely to involve research and a graduate-level distance education component.
- A Panama Experience Summer Program is currently being developed. This experience would involve an internship program with the Panama Canal Authority (ACP). The first group of students to participate in this for-credit program will travel to Panama this summer. Housing, transportation, and cultural interactions are being planned.
- Study abroad and/or service learning possibilities with Universidad Catolica Santa Maria la Antigua (USMA) are currently being explored.

### *International Students and Scholars*

The subcommittee on International Students and Scholars, which includes a CEE faculty member, was charged with addressing a variety of issues related to the impact of these two groups on the full internationalization of the Villanova University.

#### International Students

Within the Student Exchange Visitor System (SEVIS), Villanova University currently tracks approximately 350 F-1 visa holders (this number represents those international students who are presently on-campus and those who are on Optional Practical Training, which takes place upon graduation). In 2012, this represented 2% of the total undergraduate population and 8% of the graduate student population. Over the past five years, there has been an average increase of 5% in the number of undergraduate international applications received each year. The top two sending countries from which Villanova receives its international student body are India and China (in 2012, 110 and 32 students, respectively). Most of these students, 93% (102) of the Indian student population and 72% (23) of the Chinese student population, are pursuing a graduate degree. Table 3 presents the country distribution of international students at Villanova University for year 2012.

**Table 3. Home countries of international students in 2012**

<b>Country</b>	<b>Undergraduate</b>	<b>Graduate</b>	<b>Total 2012</b>
India	8	102	110
China	9	23	32
Panama	12	0	12
Vietnam	10	1	11
South Korea	7	4	11
Iran	0	11	11
Canada	6	4	10

The subcommittee conducted an international student survey to gather general information about international students' educational experiences and to determine their overall level of satisfaction at Villanova. The survey polled current students and recent graduates at both the graduate and undergraduate level. Of the 543 individuals surveyed, 96 responded for a response rate of 18%. Of the respondents, 57 were undergraduates and 39 were graduate students. When asked about their overall satisfaction with their Villanova University experience, 51% were very satisfied and 33% were moderately satisfied. This represents a significant marketing opportunity for engagement of new international students. When asked about the reasons they were interested in Villanova University, the majority of the respondents reported the university's strong academic reputation that is reflected in the rankings, value, faculty engagement, and strong graduation rates. Students are also attracted to the location, with Villanova being located in one of the more popular states to attend college. In addition, for some students both the Catholic tradition and overall size are attractive components. Finally, career outcomes was another reason international students chose to come to Villanova.

#### International Scholars

International scholars are defined as individuals who are undertaking a defined course of teaching and/or research and has been lawfully admitted into the United States (and are not US citizens or permanent residents). International faculty come to Villanova University on a case-by-case basis, as opposed to an institutional, strategic effort. Although the CoE does not have a well-coordinated plan to recruit international faculty, the CoE has the largest number of international scholars (both tenured/tenure track and non-tenure track) as compared to Villanova University's other academic units. The majority of these scholars serve in a research capacity in the CoE (more than 50% of total international scholars). During the academic year 2013, 23 scholars (nine women and 14 men) hail from 17 different countries and no particular nation is a prime supplier of internationals in the non-tenure track (Table 4).

Villanova's cohort of international tenured/tenure track scholars and research associates is increasing. During the 2013 academic year, there were 36 tenure-track international scholars compared to 14 in the prior year. This group is balanced between men and women (18 men and 18 women). The scholars in this category tend to populate five of the Villanova University's six academic units while the majority of tenure track international scholars reside in the CoE. The

tenure track international scholars represent 16 countries from around the globe with the majority hailing from India or the People’s Republic of China.

**Table 4. Non-tenure track international scholars by country of origin in engineering**

Fall 2013	Fall 2012	Fall 2011	Fall 2010	Fall 2009
Argentina 1	Austria 1	Argentina 1	Argentina 1	India 2
Belgium 1	Cameroon 1	Cameroon 1	Cameroon 1	Ireland 1
Cameroon 1	China PR 3	Canada 1	Canada 1	Italy 1
Chile 1	France 2	China PR 2	Chile 1	South Korea 1
China PR 4	India 1	Colombia 1	China PR 1	New Zealand 1
Colombia 1	Iran 2	France 3	France 1	Slovenia 1
France 1	Ireland 2	India 2	India 2	Spain 2
India 2	Japan 1	Ireland 2	Ireland 2	Turkey 1
Iran 1	Malaysia 1	Italy 1	Italy 1	
Ireland 1	Netherlands 1	Japan 1	Japan 1	
Lebanon 1	New Zealand 1	Malaysia 1	Nepal 1	
Montenegro 1	Spain 1	Nepal 1	New Zealand 1	
Nepal 1	Turkey 1	New Zealand 1	Spain 1	
Netherlands 1		Sweden 1	Turkey 2	
Slovenia 1		United Kingdom 1		
Turkey 2				
United Kingdom 1				
<b>Total 23</b>	<b>Total 19</b>	<b>Total 20</b>	<b>Total 17</b>	<b>Total 10</b>

The subcommittee conducted a survey to assess international scholars’ satisfaction level at Villanova University. When asked “*How would you characterize your experience at Villanova up until now?*” 60% indicated “very positive” with another 31% indicating “moderately positive.” When asked “*How relevant is your international background to your teaching and research at Villanova?*” 41% indicated “very relevant” with an additional 34% indicating “moderately relevant.” When asked about being “*in tune*” with the Villanova culture” 50% indicated feeling very much at home.

The CEE faculty is comprised of a mixture of domestic and foreign-born scholars. In addition, approximately 20% of our graduate and 3% of our undergraduate students are foreign-born. Some of the internationally focused scholastic activities in the CEE Department include:

- Research collaboration with ACP and Villanova University<sup>16</sup>. This research is one of the areas described as part of the emerging program in Panama.
- The CEE Department will host one PhD researcher from University of Naples in Italy during Spring 2014. It is expected that this collaboration will facilitate future international PhD and/or post-doctoral researcher hosting.
- Research activities in collaboration with the City of Knowledge in Panama and a Brazilian firm are under consideration/development.
- Research collaboration with University of Montenegro pertaining to video image processing.
- Sabbaticals at overseas universities by several CEE faculty have been taken and are planned.

## **Recommendations to Enhance Internationalization**

### *International Students and Scholars*

Based on the survey and face-to-face meetings as part of subcommittee's activity, Villanova University could enhance its reputation with international students/scholars if it were to undertake the following options:

- Provide on-campus and/or guest housing to international students/scholars.
- Provide financial support such as increased need and merit based support for incoming international students; limited emergency funding for students with documented emergencies, including bridge funding; and continued opportunities for international students within the CoE to obtain graduate tuition scholarships, graduate assistantships, and research assistantships.
- Recognize cultural considerations such as formalizing and expanding the cultural component for the J-1 Exchange Visitor program. In addition, expansion of dining/meal plan options to meet the dietary and religious requirements of the international student/scholar population will make international students and scholars feel more welcome.
- Continue supporting public-transit programs, which are used heavily by international students/scholars.

By recruiting international scholars and adequately supporting them once they are here, the CEE Department can contribute to the internationalization efforts of the university. Furthermore, the CEE Department's research collaborations with international universities will also promote internationalization goals.

### *Undergraduate Curriculum*

An internationalization survey administered to the faculty revealed that faculty members have robust interest in gaining access to materials and experiential opportunities that would assist them in internationalizing their courses. These resources vary from sample course materials to mentorship to travel funds. The following suggestions stem from the overwhelming need for faculty assistance and resources as uncovered by the survey.

Internationalization database: The broader curriculum would be further enriched, particularly as related to thesis and capstone projects, by student access to faculty expertise with respect to international research or educational experiences through a common informational database. Faculty colleagues could also use this database as a way to identify potential collaborators in development of internationally-focused student capstone experience projects or course topics.

Mentorship and global-learning outcomes: The Villanova Institute for Teaching and Learning (VITAL) should create a repository of educational modules /syllabi from faculty who received a VITAL grant to internationalize a course. This resource collection would serve as a starting point for faculty looking at models to enrich the learning experiences of current and future courses. In addition, VITAL could develop a workshop held during its annual Teaching and Learning Symposium that is focused specifically on course internationalization. This workshop could

connect faculty with mentors who can advise them during course development. These resources would promote curricular innovation across the university. VITAL could be the central hub providing mentor contacts, resources, and training experiences.

Guest speakers: The University should identify faculty with international research projects and make this information broadly accessible within the institution so that instructors could identify potential invited speakers and/or teaching partners for course development. Development of a university-wide database on faculty expertise related to their personal life experiences from study-abroad, international faculty exchange, as well as their scholarship endeavors would promote collegial interactions in the classroom based upon focal invitations to participate in course-related projects and discussions across the curriculum.

Faculty development funds: Each college should designate funds specifically for faculty development related to internationalization of the curriculum. This resource allocation could be distributed as a competitive faculty-development grant to support travel costs for faculty to visit international institutions/locations to establish curricular initiatives such as embedded study abroad for a particular course or field-related experience. In CoE, funded travel would assist in development of additional international senior capstone project options based upon faculty assessment of opportunity and commitment level by colleagues and regional industries/governments in other countries. These funds would promote development of robust experiences that would motivate students to more fully engage professionally with international communities.

Promote interdisciplinary approaches to internationalization of courses, curricula, and research: Villanova University seeks to educate a diverse student body and to promote their development as life-long learners and active participants within society. Future professionals and leaders will need to better understand multi-cultural aspects in the workplace and international perspectives that shape the future of industry and the economy. Therefore development of a multi-cultural and international perspective should be a cross-college effort. Interdisciplinary initiatives both within and outside the classroom will fuel innovative advancements in business practice, technology development, humanitarian aid, healthcare practice, and discovery processes. Diverse perspectives and team-based approaches to problem solving will increasingly drive the industries and professional endeavors of this century. The University must invest resources to promote enrichment of the educational experience of our students to prepare them for a more interconnected and inter-professional workplace. The University should define a mechanism to drive inter-disciplinary interactions between faculty through development of a university-wide structural framework for faculty teaching load assessments for inter-disciplinary courses, particular those that are cross-college. In addition, a University-wide database of faculty expertise both personal as well as scholarship and teaching focused will promote access for future interactions in and out of the classroom.

Promote internationalizing the majors: College-specific approaches have framed the incorporation of international learning based upon their unique mission. However, the lack of a university-defined common core curriculum prevents development of a more university-wide cohesion with respect to international/global learning. In addition, each college should assess the value of internationalization as an essential component of their strategic plan. If the University

seeks to educate global citizens and individuals who will succeed in a multi-cultural workplace, each college should develop and promote a robust curricular map for specific majors that will assist students in achieving this goal.

The CoE can boost internationalization of their majors' curriculum by exploring enhanced opportunities for field-related experiences and projects that take students outside the U.S. While a number of such opportunities currently exist, options could be expanded by provision of travel funding for faculty to establish field sites and complete documentation and paperwork processes that are necessary for research and professional collaborations.

Develop global learning outcomes for majors, minors, programs, and degrees: Colleges, Departments, and Programs should clearly define the level of internationalization of their curriculum for both majors and minors/concentrations. Efforts should be made to provide a layered approach to international/global learning so as to develop a mature perspective and active citizenship of its students to apply their experiences to the professional setting. While professional degree programs, such as Nursing and Engineering, as well as the Natural Sciences may be somewhat restrictive in defining course selection strategies that promote depth of international learning, the curriculum should be evaluated to ascertain areas of opportunity within the major, or associated field experiences so that every student gains practical knowledge relevant for a more interconnected workplace. Meetings with Department chairs and Program Directors to discuss academic mission and vision for the future with respect to global/international education may be critical to gain in-depth knowledge of interest and concerns so that resources and support can be provided to assist in development of long-term curricula strategies.

Map the curriculum for learning opportunities for students to achieve those outcomes: Once areas of opportunity have been defined and internationalization goals have been developed by Department Chairs, Program Directors, and faculty, curriculum maps should be provided to assist students in selection of courses that promote a global perspective. Mapping will require specific guidance within each Department. To assist the process, the University should develop a registration-related tagging system that delineates the level of internationalization of a particular course. While the recent faculty survey defined four levels of internationalization, the Teaching and Curriculum committee recommended that only courses with the highest two levels of internationalization be considered as robust educational experiences worthy of an international course designation. In addition, these courses could be segregated within the student's academic compliance report so students can clearly envision the depth of exposure and inter-relatedness of their international educational experience.

Develop strategies for measuring students' achievement of stated learning outcomes: The faculty members from the CEE Department are well versed in writing educational outcomes using Bloom's taxonomy<sup>2</sup> and in assessing educational outcomes<sup>10</sup>. ACE<sup>1</sup> recommends the revised Bloom's taxonomy<sup>17, 18</sup> for writing outcomes, which is summarized in Table 5. The major change from the old (1956) taxonomy and the new (2000) is the shift from using nouns (e.g. Knowledge) to using verbs.

**Table 5. Bloom's Taxonomy**

<b>New Version</b>	<b>Old Version</b>	<b>Verbs</b>
Remember	Knowledge	define, duplicate, list, memorize, recall, repeat, reproduce, state
Understand	Comprehension	classify, describe, discuss, explain, identify, locate, recognize, report, select, translate, paraphrase
Apply	Application	choose, demonstrate, dramatize, employ, illustrate, interpret, operate, schedule, sketch, solve, use, write
Analyze	Analysis	appraise, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test
Evaluate	Evaluation	appraise, argue, defend, judge, select, support, value, evaluate
Create	Synthesis	assemble, construct, create, design, develop, formulate, write

Assessment of internationalization within courses could be incorporated within the existing assessment process used for accreditation. Specifically, coursework that is used to fulfill ABET student outcome (3h), which is “the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context”<sup>10</sup>, would be the logical place to examine the role of internationalization in the curriculum. The largest hurdle within the CEE Department will be convincing faculty to perform more assessment; thus, it will be important to incorporate internationalization assessment into the existing processes as much as possible.

Incorporate internationalization into first-year programs, capstone courses, and senior graduation projects: The Villanova University Center for Liberal Education, as director of the ACS freshmen course sequence, should discuss adding a requirement to both or either course (Ancients and/or Moderns) for faculty to add at least one international text as required reading. The ACS sequence is a critical opportunity point for internationalization because every student across the University regardless of College is required to take these courses as part of their general core curriculum. By using this course sequence as a starting point in the freshman year, all students would participate in international-culture related learning and discussion. This course would then set the stage for further enrichment based upon desire and opportunity for course selection along an international theme or set study abroad expectations early within the undergraduate experience.

### *International Research and Collaborations*

International collaborations by the faculty in the CEE Department are flourishing. Resources for international travel are critical to the development of these relationships. In addition, a visiting scholar position that could be rotated within the college would allow the space and support needed to entice international scholars to come to Villanova. Furthermore, if a university truly values faculty international activity it should be included as a category in the promotion and tenure guidelines. Applicants would be required to describe international collaborations, recognition, and service. The value of these types of activities should be rewarded in the process.



## Conclusions

The CEE Department at Villanova University is well suited to help the university achieve its internationalization goals. Two faculty members from the department are serving on internationalization committees or subcommittees. We have existing assessment protocols in place that could be enhanced to include global learning assessment. Our existing numbers of international scholars and students, study abroad programs, service learning opportunities, and international research collaborations could be strengthened and enhanced to help the university reach its goals.

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