

The Resilient Civil Engineer with the Changing Global Environment

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Abstract— As the world becomes more globally integrated and interdependent, college graduates must be prepared to meet the new challenges of globalization. Students should be made aware of their critical roles in society as the world economy becomes more globally integrated and increasingly exposed to new challenges, threats, opportunities for innovative solutions, and rewards. Engineering students in particular must understand the importance of leadership and creativity on the social, cultural, political and economic systems in the global economy. An approach that has been successfully used to infuse global perspectives into the Civil Engineering curriculum at the United States Coast Guard Academy is presented. The approach is based on four key pillars (technical, cultural, ethical and leadership) that are complimented with four professional skills competencies.

Keywords—civil engineering, cultural, globalization, ethics, leadership

I. INTRODUCTION

Globalization is a multi-faceted process viewed as the ongoing cultural, social, political, economic, environmental, and technological integration of the world [1, 2]. The degree of its impact varies across countries, sectors of the economy, and professional designations due to nations' distinct history, tradition, religion, culture, economic institutions and political priorities [3]. Figure 1 illustrates the dimensions of the dynamic globalization process that is grouped into four major categories. An important dimension of globalization is the continuous sharing of advanced technology and the spread of new knowledge, ideas, concepts, attitudes, and values across borders [4].

The globalization process has improved and affected many areas of human life including education for professional practice in all disciplines. The biggest challenge of globalization is ensuring the availability of a well-trained and highly-educated cadre of workers across borders [5]. Understanding the effects of globalization on both teaching and learning is essential to educate professionals, who would become valuable and indispensable contributors to the integrated and interdependent global economy [6, 7]. Professionals should strive to become responsible global citizens who are able to embrace and value the contributions of others and celebrate the cultural differences, manage

multiple identities, comfortably interact with people from different cultures or backgrounds, and confidently move across cultures in the virtual or physical worlds.

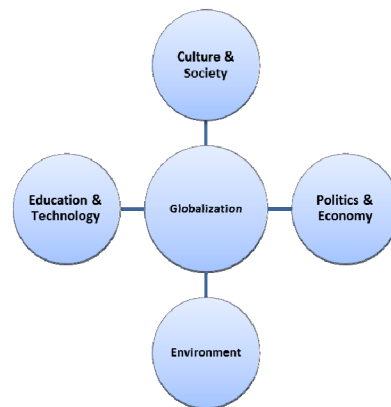


Fig. 1. Dynamic Global Process

Some of the key attributes of global citizens are listed in Table I [8]. Global citizens are expected to develop an understanding of the interconnectedness and interdependence of all humans, cultural knowledge and linguistic abilities. This would enable them to respect and work with other cultures, laws, religions, and traditions as well as possess leadership and teamwork capacities to manage the complexity of living in a globalized world.

TABLE I. KEY ELEMENTS FOR RESPONSIBLE GLOBAL CITIZENSHIP (SOURCE: OXFAM'S GLOBAL CITIZENSHIP [8])

Knowledge & Understanding	Skills	Values & Attitudes
<ul style="list-style-type: none">• Social Justice & equality• Diversity• Globalization & interdependency• Sustainable development• Peace & conflict	<ul style="list-style-type: none">• Critical thinking• Information technology• Communications• Ability to challenge injustices & inequality• Respect for different cultures• Cooperation & conflict resolution	<ul style="list-style-type: none">• Sense of identity & self-esteem• Empathy• Commitment to social justice• Concern for the environment• Commitment to sustainable development• Belief that people can make a difference

The literature on academic pedagogy stresses that the globalization process has affected the direction of education by moving it away from the traditional, local or national trends to developing professional global citizens who possess ethical and adaptive leadership skills in addition to technical skills as well as information technology and communication skills [9]. It has become apparent that undergraduate engineering programs have been introducing students to professional practice in a limited context of the global economy, environment, and climate change. For engineers to be successful in an increasingly global environment, they need to have an awareness of engineering needs and practices across racial, cultural, religious, ethical, economic, and political systems within the global economy. As the social and cultural dimension of today's globalization has led to an increased interconnection of people, ideas and professional engineering practices; engineers must develop sensitivity and understanding for other cultures in order to practice engineering within those settings. Learning about and understanding the wide range of cultural, political, economic and ethical aspects within the global economy is becoming increasingly important. The engineering accreditation organization, ABET, acknowledges this and requires that civil engineering programs provide a *"framework of education that prepares graduates to enter the professional practice of engineering who are (i) able to participate in diverse multicultural workplaces; (ii) knowledgeable in topics relevant to their discipline, such as usability, constructability, manufacturability and sustainability; and (iii) cognizant of the global dimensions, risks, uncertainties, and other implications of their engineering solution"* [10]. In addressing the ABET requirements, the curricula of engineering programs should be strategically infused with a more global perspective on these key aspects and their relevance to the practice of engineering throughout the world. Therefore, academic institutions are striving to educate future engineers to be *resilient* with the changing global environment. Resilience can be defined as the ability to recover from or adapt to adverse conditions. In the same context, a resilient engineer should demonstrate attributes such as:

- Technical aptitude and commitment to life-long learning.
- Adaptable leadership skills and ability to work in diverse and multi-disciplinary environments.
- Unwavering commitment to professional ethics throughout the world.
- Capacity to handle change.
- Cross-cultural sensitivity.
- Understanding of the global perspectives of engineering practice.
- Understanding of public policy and its influence on engineering decision.

The authors emphasize that with a sound technical knowledge and understanding of cultural, environmental, business, and ethical forces within the global context, engineering graduates will be better prepared to work effectively in addressing the challenges within the changing

global environment. Furthermore, civil engineers should also be able to address the uncertainties associated with the changing climatic conditions. Due to these changes, the civil engineering community is faced with the challenge of not only ensuring that infrastructures are resilient, but also understand the associated costs and impact to business practices. The authors argue that in order to effectively face the complexities of current and future global challenges, college students should develop *resiliency*, global perspective and global consciousness. The necessary global perspectives that will foster respect and understanding can be achieved by incorporating appropriate pedagogy and curricular developments within engineering programs. Some academic institutions are already taking steps to address globalization. However, for this need to be consistently addressed by academic institutions, changes such as the following might be required:

- Revision of accreditation requirement to capture the need for resiliency and global perspectives.
- More effective collaboration between practitioners and academia.
- Institutional vision to prioritize a strategic plan that promotes global engineering education and practice.

This paper highlights the efforts and strategies that have been used to infuse global perspective to strengthen the Civil Engineering (CE) Program at the United States Coast Guard Academy (USCGA). The focus is on how students develop as ethical leaders with an appreciation for global and business issues by infusing key aspects affecting the global engineering community into the CE curriculum and in co-curricular activities at USCGA. The authors discuss how students can be developed into ethical and *"resilient"* engineers who are capable of adapting and developing solutions to address the changing global challenges. The paper presents some examples of activities that provide students with knowledge of the "world without borders." These examples show how curriculum design and class activities can help students become global and resilient citizens who appreciate the diversities of human values and interests, and to see the world through the eyes of others.

II. RESPONSE TO THE CHANGING GLOBAL ENVIRONMENT

Educational institutions around the world have already recognized that there was a continuous need to develop new academic curriculum to meet the need of globalization [11]. Bringing new concepts, theories, courses, teaching and learning techniques into the classrooms is critical for students to adapt to the new trends and associated global challenges [12]. Today, higher education is more than ever responsible for delivering highly skilled professionals and contributing to the research base and innovation capacity that increasingly determines competitiveness in the knowledge-based global economy [13, 14].

Higher education cannot be developing and progressing in isolation from political, economic, cultural, technological and social changes that arise from the dynamics of globalization

[15]. Since September 11 2001, academic awareness of the importance and complexity of global issues and problems has increased significantly [16, 17]. Colleges and universities have long sought to prepare their graduates to become responsible and informed global citizens; this increased awareness of the importance of global issues means that a college education is now expected to help students develop an understanding of multiple interacting factors that span across, social, economic, political and environmental challenges [18, 19]. A wide range of perspectives and practices in higher education has emerged reflecting a considerable interest in empowering students with the knowledge in human conflict and cooperation, fostering of cross-cultural understandings, and promoting the knowledge, attitudes and skills relevant to a multicultural, interdependent world [20, 21]. Reimers [16, 22] also argues that students require global skills and competencies, the attitudinal and ethical dispositions that make it possible to interact peacefully, respectfully, and productively across political, religious, and cultural borders. Similarly, Merryfield [17] argues that students need to develop an acceptance of different cultures, a concern for the world, an understanding of interconnectedness, and the value of world citizenship. Rather than shifting emphasis into standardized knowledge of content and mastery of routine skills, many of the advanced education systems are focusing on flexibility, creativity and problem-solving to help students develop deep learning, information literacy, communication technology and technical proficiency. Parkinson [23] and Warnick [24] presented the rationale for developing global competence and its importance for engineers working in a global environment. They presented survey results and essential global competencies for engineering success within the global environment.

One of the most recent changes made in addressing globalization within a civil engineering program can be found at Georgia Institute of Technology [25]. The School of Civil and Environmental Engineering introduced a new minor “Leadership Studies” with a focus on “Global Engineering Leadership” in fall 2015. The goal of this program is to produce graduates with excellent problem-solving skills, foundational knowledge about global issues, communication skills, ethics, and cultural competence. The program prepares graduate to be global citizens by exposing them to the engineering grand challenges of the 21st century and equipping them with the knowledge and practical skills required to lead in the development of global innovative and economic solutions. Also, the Department of Civil and Environmental Engineering at the University of Illinois at Urbana Champaign has similar programs that were established in 2011 [26]. Both programs, “*Global Leaders in the Sustainable and Resilient Infrastructure Systems (SRIS)*,” and “*Energy-Water-Environment Sustainability (EWES)*” were designed to provide background in global issues affecting infrastructure systems and prepare students interested in professional practice or research in the international arena. The programs foster collaborations between disciplines and leadership in holistically planning, designing, and managing sustainable and resilient infrastructure systems and their interactions. Students

learn to balance short term costs of facility development and the need for integrating this facility within an infrastructure system that is resilient to natural and human-made disasters.

III. INFUSING GLOBAL PERSPECTIVES AT USCGA

There are several principal ideas that should be contained within the dimension of infusing global perspectives to meet the challenges of globalization in academe. Efforts should be made to address principles related to economic and political development, the environment, public policy, culture, gender and race equity, health, terrorism, peace and conflict resolution, rights and responsibilities. The USCGA approach is to help students understand the nature of this interdependence, and provide students with opportunities to study various interacting global systems that include economic, cultural, social, political, environmental, and technological aspects. Students are introduced to the strategies, skills, and dimensional issues that define global affairs. This approach has helped students understand how they are affected by the global systems and how they can develop strategies to live and work within those global systems. Students are encouraged to explore their roles in developing solutions to the issues and problems that exists within the global economy.

USCGA has a commitment to the enhancement of global dimensions of academic programs across all majors. The USCGA has adopted a holistic model to developing a resilient global engineer that is illustrated in Figure 2 and discussed in details in the following sections. This model is dynamic and incorporates four key pillars, *Technical, Ethics, Cultural and Leadership* that are complemented or supported by four professional attributes (information literacy, public policy awareness, global awareness, and service).

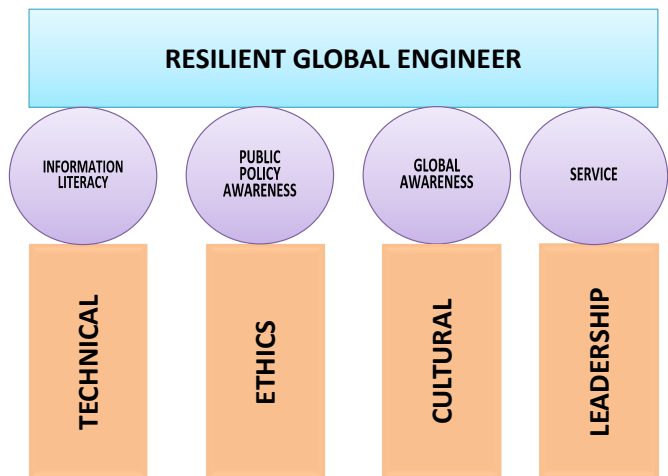


Fig. 2. USCGA Global Engineer Development Model

A. Technical Pillar

The USCGA is a small undergraduate institution of approximately 1000 cadets (students) with eight majors and approximately 15-20 percent of the cadet corps graduating with a Civil Engineering degree. All cadets must graduate in

four years unless an extension is granted by the Superintendent on rare occasions. The Civil Engineering curriculum includes a variety of required core courses in the humanities, science, engineering, mathematics, professional maritime studies, organizational behavior, management, leadership and law. This “Core” of 102 credits must be successfully completed by every student prior to graduation in addition to the major specific requirements for civil engineering of at least 34 credits. The Program provides students with a solid technical background, creative problem solving, understanding of professional responsibilities, leadership and ethical development, opportunities for international immersion experience, exposure to other cultures and to political principles.

Graduates pursue a number of different career paths and many of them serve in the Coast Guard as practicing civil engineers, pursue professional licensure, and attend graduate programs in Civil Engineering. Emphasis is placed on balancing theory and practice of engineering so graduates are intellectually and professionally prepared to provide engineering services to the Coast Guard. Professional skills are particularly reinforced in the engineering courses through laboratory reports, technical papers, presentations, design projects, field trips, interaction with practitioners and Coast Guard officers, community outreach activities, and professional membership. In addition to academics, students are challenged non-academically (militarily, athletically and socially) through daily interactions with each other, USCGA faculty and staff, and through structured military and athletic training opportunities. There are also multiple opportunities for students to interact with local, federal and international officials.

By weaving experiential modes of teaching throughout courses, students with a variety of learning styles grasp concepts and see the application of what they are learning. These techniques have been used to infuse global and industrial awareness into the Civil Engineering Program. The following pedagogical techniques have been used:

1. Combining classroom instruction with industrial exposure through field trips. If possible, each upper level course is linked to at least one field trip. The objective of these trips is to reinforce topics discussed in class through exposure to practical applications. They provide familiarization with equipment, operation, production management and problem solving in real life conditions. Field trips also provide excellent opportunities for students to interact with practicing professional and get a feel for real engineering work. This concept has been used at USCGA for a decade in which all civil engineering students participate in at least ten industrial field trips during their junior and senior years.
2. Guest lectures by practitioners. Several presentations by practitioners are encouraged throughout the program. Topics of discussion are linked to the course content and practical application of the concepts discussed at that time. These presentations, enable students to see the

relevance of the concepts been taught and provide insight into the profession.

3. Discussion of local and/or international projects as case studies and practical examples. Case studies provide opportunities for discussion of engineering principles and concepts as well as fostering professional development in ethics and life-long learning. They enhanced students understanding of engineering principles and improved their understanding of the problem-solving process [27]. Several course instructors have integrated a “*professional practice moment*” in which students take turns presenting a contemporary engineering event during the first few minutes of each class. In the “*Geotechnical Engineering Design*” course, each student research and present a case study or project application of a soil improvement technique. In “*Civil Engineering Materials*” course, students and instructors tour the campus identifying examples of asphalt and concrete pavement distresses, causes and recommend remedial actions. Classroom examples are also tailored to emphasize the practical significance of the topic being discussed.
4. Project Based Learning has been integrated into upper level courses. In three senior level courses, a common project is used. The various project components are addressed in the appropriate courses so that students appreciate the connections between the various sub-disciplines in real-world civil engineering practice. Furthermore, the design process is progressively integrated from freshman through senior year. This progressively integration of design experiences have helped students perform at higher levels of cognitive learning. Assessment data indicates that students are making progressive improvements in problem-solving abilities and are better prepared to complete senior capstone design projects [28].
5. Language electives and cultural studies have been emphasized at the institutional level. Currently, civil engineers have limited choices for electives unless they validate required math and science courses which allow them to take electives that broaden their education. Recently, there was a comprehensive review of the core curriculum and changes are in the process of implementation. A new “global perspective” course will be added to enhance students’ global consciousness and ability to address global challenges.

There is a program where Civil Engineering students work at Coast Guard Civil Engineering Units for five weeks between their junior and senior years. Students are selected for this summer program based on cumulative grade point average, military rank, and various other criteria. Once eligible students are identified, then student interests and location preferences are matched with units participating in the program.

The Civil Engineering faculty works together with Coast Guard personnel at field units to identify real engineering projects for use as capstone design projects. This collaborative

approach ensures that we fulfill our dual role of developing Coast Guard Officers and Civil Engineers through a total design experience working on an actual civil engineering project with engineers in the field. Whenever possible, one or two non-Coast Guard projects that are community based are included in the choices. Engineering projects that serve the community are an excellent way to introduce students to real world projects and to allow them to serve the public in the spirit of their chosen career path. Through community outreach with organizations such as Engineers Without Borders, Habitat for Humanity and local community programs our students have several opportunities for public service.

Information technology continues to advance and the need for effective communication skills in engineering practice has become even more important. Students need to develop and improve their communication skills in the context of the current and emerging information infrastructure. This has become even more important with the current trends in online access, texting and instant communications. As a result, engineering educators must ensure that students learn the important steps of evaluating the credibility and appropriateness of sources while properly synthesizing, using and citing information from several sources. In the Civil Engineering Program at USCGA, specific performance indicators related to information literacy have been developed and linked to several ABET student outcomes. The goal is to promote information literacy within the current civil engineering curriculum by developing assignments, and assessing student achievement of performance indicators. Components of information literacy were progressively infused throughout the curriculum to enable students to develop and foster the appropriate skills [29]. Most recently, there has been an institutional effort to develop information literacy as a thread throughout USCGA. As this work progresses, it is important that faculty take the lead in promoting information literacy in close collaboration with the library staff so that life-long learning skills are valued and supported in the context of academic disciplines.

B. Leadership Pillar

To become an effective civil engineer, engineering students need to understand and develop skills in both leadership and management. Skipper and Bell [30] recognized that leadership is a complex subject that is impacted by such variables as skill requirements at different stages in a career, the varying role assumed by leaders within different organizations, and the impact of technology. They also defined "leaders" as persons who recognize the need for and implement change, establish direction, align people, facilitate dialogues, motivate and inspire, give away as oppose to hoard power, communicate a vision of where the organization is headed, build teams and share decision making, mentor and coach subordinates, and demonstrate a high degree of integrity in their professional interactions.

At USCGA, our thinking about leadership development is divided into four categories: leading self, leading others, leading performance and change, and leading the Coast Guard. These four categories consists of several competencies or skills

such as team building, communications, accountability, conflict management, and technical proficiency that students develop over four years at the Academy. These competencies that students develop through this process are listed in Table II [31]. This model could serve as an example that can be adopted by other academic institutions as they strive towards preparing future leaders for the civil engineering profession.

During their freshman year, the focus is predominately on the competencies detailed in the leading-self category. Freshman year is one of the most important stages of a student's academic life. This is when much of self-discovery, understanding of the academic system, as well as an early development of technical proficiency in the areas of study and learning take place. With each progressive year, the students shift their focus to the next set of competencies, while still working on honing their skills in the previous categories [32]. Students are also challenged militarily, athletically and socially through daily interactions with each other, USCGA faculty and staff, and through structured military and athletic training opportunities.

TABLE II. LEADERSHIP DEVELOPMENT FRAMEWORK AT USCGA [31]

Leading Self	Leading Others	Leading Performance & Change	Leading the Coast Guard
Accountability & Responsibility	Effective Communications	Conflict Management	Financial Management
Aligning Values	Team Building	Customer Focus	Technology Management
Followerhip	Influencing Others	Decision Making & Problem Solving	Human Resource Management
Health & Well Being	Mentoring	Management & Process Improvement	External Awareness
Self Awareness & Learning	Respect for Others & Diversity Management	Vision Development & Implementation	Political Savvy
Personal Conduct	Taking Care of People	Creativity and Innovation	Partnering
Technical Proficiency			Entrepreneurship, Stewardship, Strategic Thinking

With over 30 National Collegiate Athletic Association (NCAA) sanctioned teams and multiple nationally ranked sports club, students have numerous opportunities to develop and practice their leadership skills. Students are introduced to balancing competing time demands for themselves and others; successful students learn to manage their time well in meeting their academic and non-academic responsibilities at the Academy. In order to meet the requirements of graduating cadets in four years, there is significant mentoring and advising that takes place throughout students' years at the Academy. Three advisors (academic, military and athletic) work with each cadet to monitor their intellectual development, personal and professional growth. A

commitment to meeting the needs of society begins for the civil engineer with the development of a sense of service to the community or humanity in general.

USCGA is unique because this sense of community service is introduced during freshman year and reinforced yearly through a mandatory eight hours of community service per semester and other military training. Although students have the freedom to select community programs of interest, the overall impact of these activities on the outlook and preparedness of civil engineering graduates has been very positive. Community service is also organized through the student professional engineering chapters such as the American Society of Civil Engineers (ASCE) and Society of American Military Engineers (SAME). ASCE student members have participated in several Habitat for Humanity Construction projects within the local community.

It is inevitable in today's global economy for leaders to deal and conduct business with peoples from different cultures, backgrounds, etc. Part of good leadership is to promote diversity and tolerance. As parts of their development as leaders, students at USCGA are exposed to the extreme case of intolerance depicted by the Holocaust. The Holocaust is used as an example of leadership in a global context because it is a good reflection of severe consequences when leaders lack the knowledge of their role in preventing or causing tragedies.

C. Ethics Pillar

Ethics education in undergraduate programs has been ongoing for years [33], however, in the last decade; there has been a growing emphasis on the importance of this focus. Recent experience of the global financial crisis highlighted the importance of good ethical practice across all sectors of industry and its consequences have highlighted the importance of a strong values framework and professional ethics of practitioners in all professional settings. Professional ethics education will not by itself reduce unethical practice, but awareness of proper conduct and the empowerment of individuals to challenge practices are critical outcomes of a professional ethics educational program. This contributes significantly to the ongoing preservation of ethical behavior in any profession. A comprehensive professional ethics education will support the individual to become critically aware and scrutinize practices around them rather than becoming enculturated with existing norms, practices and values. It has also been suggested that an important factor in developing students' ethical reasoning ability is exposing them to curricular experience that require deep cognitive processing about ethical issues at the appropriate level of Bloom's Taxonomy [34]. Carpenter, et al. [34] also recommends promoting extracurricular and co-curricular involvement through service programs and professional organizations. Institutions should establish and communicate clear behavioral expectations across administration, faculty, staff, and students such that the culture of the institutions promotes ethical development.

The USCGA's mission is: "*To educate, train and develop leaders of character who are ethically, intellectually, and professionally prepared to serve their country and humanity*".

Officers constantly face challenges in mission operations involving diverse cultures and in order to meet these challenges, they must regularly act ethically and exercise competent leadership. The Academy articulates core values that include: *Honor, Respect, and Devotion to Duty*; these values are the framework for the professional conduct and ethical responsibilities that the Coast Guard expects. USCGA fosters ethical leader development and global awareness through a breadth of required core courses in the humanities, science, engineering, mathematics, professional maritime studies, organizational behavior, management, leadership and law. Co-curricular programs, such as the Annual Ethics Forum and the new Professional Conduct & Risk Management workshops, support the Academy's mission in preparing cadets to be leaders in a dynamic and ever-changing world. The combination of core courses, major-specific engineering courses and co-curricular activities provides students with opportunities to develop leadership and professional ethical conduct required for engineering practice and service as Coast Guard Officers.

A more detailed coverage of ethics within the civil engineering practice is currently addressed as part of the Civil Engineering Design (CED) course. A major component of the course is to write leadership essays and research and present an ethical scenario from ASCE's "A Question of Ethics" case study archive [35]. The case studies are related to the seven Canons of ASCE Code of Ethics [36]. Each group is allotted fifteen minutes to present their Ethics Case Study and the team facilitates a short in-class discussion. The objective of the ethics case studies is to present relevant engineering ethical situations in the classroom to stimulate discussion of ASCE Code of Ethics and critical thinking. Students volunteer to take on one of the Canons, research, identify and review case studies in relation to ASCE Code of Ethics and present their findings to the entire class.

D. Cultural Pillar

The student body at USCGA is made up of students from almost every state in the U.S. as well as international students. There is a rich culture of teamwork, comradery and mutual respect. Some of the activities that promote cultural understanding and diversity across the Academy include:

- *Eclipse Week* - During the spring semester, the Office of Inclusion and Diversity together with faculty advisors and eight student councils representatives plan various week-long activities that focus on generating a climate of inclusion, promoting tolerance and cultural understanding. Several Coast Guard officers, alumni and experts on diversity from across the nation are invited to mentor and inspire students to excel and get prepared to become global citizens. Eclipse week supports USCGA's Strategic Plan vision of "*Modeling a Community of Inclusion*", improving retention and strengthening recruitment and officer accession.
- *International Student Council* - This is a student run organization with supervision from a faculty advisor and the Office of Inclusion and Diversity. Participation is open to the entire student body. The mission of

International Council is to engage students in activities that promote cross-cultural exchange, dialogue and engage students expanding their view of the world. This is accomplished through several activities that prepare USCGA students for effective participation in the dynamic global society, broaden their awareness about international events, and establish international networks that they can rely on in the future. Some of the Council's activities include: community service, visits the United Nations Headquarters, the Naval and Army Academies, speed mentoring program, international culture night, and numerous council lunches and dinners.

- *Travel abroad*- Some students have opportunities to travel abroad as part of their summer assignments, mini study abroad semester, and capstone projects. There have also been overseas travels to participate in international projects that involve the interest of the United States and the Coast Guard. The most travelled areas include the Arctic region, European Union and Africa. Cadets' travel enables them to collect data and perform interviews in order to conduct senior research projects. Cadets also travel to participate in both national and international conferences where they not only officially represent the USCGA, but they also share their research results. They also participate in official regional meetings where they are involved with advancing international or regional economic and development cooperation. Summer internships allow cadets to travel to other academic and non-academic institutions in order to conduct research and learn new research methods, technologies and leadership techniques.

Business and economics education has been acknowledged over the years as a necessity in preparing students for an increasingly global world [37]. However, economics curriculum often presents a rather narrow concept of globalization that may not acknowledge the cultural, political, and social dimensions of internationalization and globalization [38]. Economics education should offer pedagogical techniques that allow students to function within foreign cultures and to respond critically to the ideas of making decisions and conducting business across global economy [39]. Understanding the importance and the value of tradition, culture, the religion and their influence on governing powers should be included in courses that taught issues on globalization [40].

All students at USCGA are required to take an Economics course. They also have opportunities to take several electives in the Management Department. One such course that addresses aspects of global and cultural values is "*Global-Economics Issues*." This is a foundational course that has been taught in order to play a critical role in developing student understanding of issues in the global economy. "*Global-Economics Issues*" is geared to introduce students in a sensitive way, to different cultural traditions, new ways of looking at the world, and foster intercultural insight, understanding and sensitivity. The course consists of an

overview of the international business environment architecture, a historical overview of the development of international business in the twentieth century, and an exploration of the factors that facilitate and limit international business including: culture, technology, and national, regional, and supranational organizations and policy. This is achieved through a number of in-class group exercises that culminate in a term paper and the students presenting their work to the class. The purpose of the term paper is to examine the relationship between economic theory and practice; and was designed to provide an opportunity to learn about a selected country's culture and political and economic systems and measure their impact on international business. Students are expected to: (1) analyze and describe the impact of different cultures, economic systems, economic outcomes, and government policies on global economy; (2) evaluate the lack or presence of economic efficiency and its effect on global economy; (3) identify the role of growth and development of the private sector on economic efficiency of global economy; and (4) reflect on the relationship between the political, social, and cultural influences present in the country and their effects on peace and safety. This course is an excellent vehicle for exposing students to the elements of the international environment and the interaction between those and the operation of international business. As a result of completing this course, it is expected that students will not only have a better understanding of international business but they will also have a greater appreciation of the diversity of characteristics that exist throughout the world.

Another opportunity for student exposure to key cultural challenges in a global context is provided by the study of the Holocaust. Educating students about the Holocaust helps future leaders understand the key concepts that are critical when studying other examples of mass violence or terrorism. When students explore the history of massive human rights violations, they are able to draw on their understanding of the Holocaust and become more aware of their own responsibilities as global citizens, followers and finally leaders in the U.S. economy. Given the fact that genocide, mass atrocities, terrorists attacks and violation of human rights are no longer historical but contemporary realities in the twenty-first century, a careful study of the Holocaust provides a comprehensive understanding of the political, economic, and social ramifications of the many faces of discrimination, prejudice, and intolerance. Therefore, an analysis of the mechanisms that led to the Holocaust helps in recognizing the importance of accepting and appreciating diversity rather than seeing it as a cause for discord. As we witness an increasing rate of terrorism, violence, discrimination, and social injustice towards individuals of different ethnicities, religion or race, teaching and learning about the Holocaust provides a good context for leadership growth. Learning about the Holocaust sensitizes future leaders to the position of minorities or diversity group and most importantly cruel and evil tendencies and intentions of the latest terroristic groups such as ISIS. The study of the Holocaust opens up a platform for discussions about the importance of leadership and silent followership in organizations. Students are expected to recognize the ethical implications of the Holocaust and understanding that genocides

occur because people and governments make decisions that perpetuate discrimination and persecution. Group discussions and study of the Holocaust enables students to think about political responsibilities and explore the functioning of governmental structures. The Holocaust was a State enterprise legitimized by the law. Its study clearly raises questions of the use and abuse of political power for violent purposes on a national level and, ultimately, on an international level. The goal of the Holocaust education is to promote awareness about genocide, ethical dilemmas, and to develop respect for diversity. Understanding and respecting the differences among diverse groups and institutions is crucially important in the rapidly changing global environment.

IV. CONCLUSIONS

As the current rapid social and economic changes caused by globalization continues, it is vital that institutions of higher education consider their contribution to the global society from a broad and long-term perspective. To meet the challenges associated with these changes, academic institutions in particular must focus on the development of a skilled and knowledgeable workforce with the appropriate global perspective that will be resilient in such an environment. It is critical that students develop the skills and abilities that will promote cultural sensitivity, respectful international relations, ethical and moral values, teamwork, service, and adaptive leadership.

The USCGA has created an environment with institutional goals for student learning, growth, and development both inside and outside the classroom to ensure that graduates are prepared to meet the many challenges they will face throughout their professional careers. The Civil Engineering Program in particular, has integrated several aspects of globalization into the curriculum. Emphasis is placed on having students understand the multi-dimensional changing world around them. The approach is based on a holistic model with four key pillars (technical, cultural, ethics and leadership) that are complemented by four professional attributes (global awareness, service, public policy awareness, and information literacy). Data is being collected through our alumni and supervisor surveys that are conducted every two years. Revisions are being made to the surveys to more appropriately capture graduates' and supervisors' perspectives on the effectiveness of the Civil Engineering Program in preparing resilient global engineers for the Coast Guard. Although there are currently no complete survey data on all the components of the model, the Coast Guard Officer Evaluation process indicates that civil engineers are professionally prepared. It is anticipated that over the years, further data will be collected to fully assess the effectiveness to infuse global perspectives into the Civil Engineering Program.

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