CST-NU COLLABORATES FOREIGN UNIVERSITIES FOR THE GLOBAL INTEGRATION OF MECHANICAL ENGINEERING EDUCATION

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Abstract

Globalization is a very broad word that should be defined down into a very specific concept to give definite meaning. The word itself was used in this paper to discuss how the specific field of expertise can be unified, and enhance for its further growth and development. Globalizing of mechanical engineering education is a very hard task, and working to this kind of vision needs strong dedications and hard works from the higher rank down to the lowest rank level. The objective of this paper is to give emphasize on how foreign universities collaborates in promoting and upgrading mechanical engineering knowledge globally. The international relationship initiated by the College of Science and Technology of Nihon University (CST-NU) between two big Universities from different countries, the Technological University of the Philippines (TUP) and Xi'an University of Technology (XUT) as examples of successfully free trade of learning was historically reviewed in this paper. Their full cooperation and continues collaborations from their respective academicians and experienced industrialists gives an access to become open for an exchange information not only on aspect of analytical and theoretical expertise but also it promotes building strong relationship that helps one another to become competitive in responding the unstoppable technology change challenge. Different programs has been established and integrated for the sustainability of international information exchange.

Keywords: Globalization, exchange Information, International, Global exchange, Technical communication skills

1. Introduction

Many Universities witnessed the rise of so-called “engineering globalization” of the 21st century. From this viewpoint overseas collaborations and partnership has been established. The College of Science and Technology (CST) of Nihon University (NU) is very much aware to this trend. Getting in to this trend, factors that affect the current challenges regarding engineering education and its development must be determine to see the possible solution for its success. There are two (2) factors that can be considered as hindrances in promoting engineering education worldwide; first is the role of finance in promoting educational funding and secondly is the issue of looking some of the implications of the global trends towards rapid expansion of higher education [1]. Many countries are in the most at-risk of failing to achieve universal education by 2015. The current political instability of states and the legacy of past conflicts governance causes to unable to generate domestic resources for development. They are typically very heavily dependent upon external sources of funding, but may also pose particular problems regarding good governance and aid effectiveness, thus, that despite the international commitment for universal education, the prevailing attitude of targeting aid to “good performers” has led to under-investment in those countries that are the most in need of development assistance [2]. These factors have been considered in working towards wide perspective and positive outlook for the attainable vision in globalizing engineering education.

However despite of these factors and other circumstances, Nihon University under the College of Science and Technology didn’t stop working on this undertaking. Because of perseverance, hard works and dedications, CST-NU achieved this goal. As an evidence, CST-NU penetrated and established strong relationship from eight foreign universities: the University of Minnesota in the USA, Technological University of the Philippines in Manila; Korea Maritime University (Busan) and Chonbuk National University (Jeonju) in Korea; the University of Melbourne in Australia; the Technische Universität Darmstadt (Dalmshutat Technology University) in Germany; and the Xi’an University of Technology and Xi’an University of Architecture and Technology in China. Like other local Universities, the internationalization of CST-NU passed through a gradual and step-wise process.

After being successfully globally open and after establishing strong worldwide universities relationship, CST-NU still continually working for the sustainability and further development of different engineering programs that has been formed and agreed upon by the different tie up foreign universities for the pursuance of its commitment.
The College tried to extend their hands to reach out domestic and international Universities to promote cooperation between them. They also conducted academic conferences between domestic and international affiliated Universities and inviting overseas and domestic lecturers and participants to exchange academic knowledge and technical experiences. The authors of this paper introduced one of the successful cases of globalized engineering education and its degree towards among affiliated Universities

The relationships between CST-NU and Technological University of the Philippines (TUP) were historically reviewed in this paper to give comprehension about the importance of integration of engineering education globally particularly in the field of mechanical engineering.

2. The across the globe journey of CST-NU

CST-NU had been active in providing opportunities for international information exchanges since 1990. Its across the globe journey caused an astonishing discovery for research and educational negotiation fulfillment that led in open gate collaboration from different foreign Universities. The following are the few accomplishments of the college as marks of its journey that engraved to its history of education;

1. Darmstadt Technology University, Germany and CST-NU established student exchanges started 1998. In order to develop into a more globalized institution, a dual - degree system for master's programs was established between these two Universities. Darmstadt Technology University and the CST-NU commit to an agreement for their continuous tie up and for the sustainability of the said established program which contains the following:

   A) Students must have acquired the necessary qualification to be accepted into the graduate school program of the receiving university.

   B) The number of students to be accepted in each school year shall be limited to a maximum of two students.

   C) A student shall be accepted as a regular (degree-seeking) student by the receiving university and must be enrolled for two years.

   D) The receiving university shall recognize and accredit the units taken at the graduate school from the origin university, with the objective of finishing a master’s degree in the host university, in accordance to its rules and regulations.

2. A yearly academic conference and seminar in collaboration with XUT (China) which was held started since 1999

3. A joint symposium with Korea Maritime University every one or two years since 2000

Furthermore, as a result of dedications and hard works of faculty and staff of this college with favorable support from the entire Administration of the University, the college increased their number of enrollments, at present 233 graduate students and 707 undergraduate students from overseas are currently enrolled at NU. Also the college produced 61 undergraduate and 32 graduate students as international students last May 1, 2006.

Through deepest commitment and perseverance in upgrading the engineering education particularly the mechanical engineering, CST-NU continuous actively in participating numerous discussions through international conferences that supplements additional knowledge for a better output.

This is just a proof that working towards the goal with a wide perspective gives admirable accomplishments.
3. College of Science and Technology of Nihon University and Technological University of the Philippines and its series of conferences

CST-NU initiated the Pacific Asia Conference on Mechanical Engineering (PACME) on international research in cooperation with the Technological University of the Philippines (TUP). PACME was formed to build strong relationships between the two Universities aiming to tighten their international linkages in improving mechanical engineering education globally. PACME serves as a good venue for professors, practitioners, engineers and students to engage in knowledge exchange and to be updated with the new technology trends. The following are the series of PACME events organized by CST-NU and TUP held for the promotion of science and technology through innovative researches and advance academic studies:

1. The 1st PACME was held last 1995. The College of Industrial Technology (CIT) of TUP and College of Engineering (CE) of Nihon University participated on this conference. It was attended by approximately one hundred participants who discussed numerous subjects in Mechanical Engineering.
2. The 2nd PACME took place in 1998
3. 3rd PACME in 2002
4. 4th PACME was held last August 2007

All of these events were held in the Philippines. The latest PACME has a big impact and said to be a special feature for the Japanese graduate students as compared to any other international conferences because they took a huge number of attendances 53, compared to the faculty members 17, who attended during the said event. Almost all students commended the event, because it provides a good opportunity for them to develop their international communication skills and it helped to boast their confidence in sharing and discussing their fields of specialization and expertise. In the side of TUP, aside from the faculty and staff of Integrated Research and Training Center (IRTC) who headed the event, three (3) colleges were also helped and actively involved, these were; the College of Engineering (COE), College of Industrial Technology (CIT), and the College of Science (COS). Also, other academicians and researchers from different universities and industries all over the Philippines were attended and participated.

PACME is not only one of a kind avenue of communication for continuous exploration and disseminations of research outputs information, but it also promote good camaraderie among all participants and create a humane environment for the two Universities as a whole as one of a tools in achieving national and global mechanical engineering development.

4. Future Plan in Developing Global Relationships

As far as the dual-degree program is concern, it is necessary to increase the number of international students for its sustainability. The following plans or program could help in attaining this concern:

1. Increase the entrance examination opportunities for overseas students.
2. Educate both students and faculty members in Japan to develop global communication from the very beginning, using the following programs:

   2.1 Programs to educate students on progress in technical and global communication skills
2.2 Programs for faculty members to develop skills for keeping pace with the trends of the global society and creating research activities and curricula that will appeal to scholars and students all over the world.

Recruiting of foreign students and putting them under unusual program is a very difficult task, however it is very attainable by establishing a research and education base-center in other countries. Bases should be established through the collaboration of universities or research centers in their associated locations and research fields. These bases will serve as offices for an entrance examinations venue in other countries as what the other Japanese universities did in China and in Korea.

A unit credit policy must be established between two cooperated universities to secure the credential of the students. The CST-NU should cooperate and align its school calendar to the University that they collaborated with for its dual-degree programs applicability; otherwise school calendar must be change to a more and common system such as semester calendar. CST-NU already implemented dual-degree program, even though the participation is currently limited to two students per academic year, the College still continuous in working out of its sustainability. The CST-NU has a perspective that the expansion of the dual-degree program will strengthen its’ across the globe relationship. The development of the said program is their priority that they are working on.

Finally, to globalize the engineering education and to increase the numbers of exchange students, it is necessary to provide financial support for international students. As it is difficult to prepare for direct costs to the students, the authors propose the provision of inexpensive rooms and meals in the student dining hall as the equivalent of financial support. CST-NU has already been addressing this problem, and as a result Toshiro Kasahara Memorial Hall was erected. This hall has been using for visiting faculty members and international exchange students on campus since it was built. It has 7 furnished rooms (Single type: 4, Twin type: 2, Family type: 1), and has a beautiful well maintained facilities. However with the price of 2,500 to 5,000 yen per day, it becomes unaffordable to the students reason for them to rent and stay outside rather than to rent in this hall. If only these rooms can provide much lower cost for accommodation for the foreign students, the issue of lack of support to the students will be eradicated and the hall including all the facilities will be utilize and could help to generate income for the University. Thus, in order to encourage foreign students, a conducive and reasonable price accommodation should be addressed.

Moreover, international conferences heighten the development of global communication skills, such as CST-NU’s PACME, in which should be held regularly. Such conferences provide opportunities for the practical application of these education programs, as well as big chances for cooperation with other overseas universities. Furthermore, another most effective way to globalize Japanese universities is to increase the number of foreign faculty members in a certain universities to uplift the standards of teaching and to responds the development challenges of research towards its goal with more efficiency.

5. Conclusion

It is indeed that conducting and attending conferences like PACME is truly laudable. This kind of endeavor gives an opportunity to academicians and industrialist to become abreast in the latest trends of technology. CST-NU and TUP relationship promotes not only humane environment it also provides technical upgrading in the areas of education, researches and development and industrial networking. Their collaborations enhance and sustain the universities development efforts in providing the professionals and students with quality education as its contribution in forging a prosperous global relationship. As the rapid developments occurring in the field of mechanical engineering and its consequences, PACME seeks to gather new information and latest technology to discuss the field’s emerging trends and its latest issues for the development and continues growth of mechanical engineering education worldwide and prepare for the demands of upcoming century.

Furthermore, CST-NU and TUP partnership believes that the contributions of our professionals and students will be critical to the country’s efforts in achieving the technological mastery and dynamism needed to be counted as among the technology makers of tomorrow.

6. References

7. Biography

The main author is a Filipino citizen. He was born (April 29, 1982) in Casate, Ubay Bohol – Philippines. He finished his Bachelor of Science in Mechanical Engineering and Masters of Engineering last 2004 and 2008 respectively from the Technological University of the Philippines – Manila. After he graduated, the University tops him to become a faculty member in the mechanical engineering department. He conducted researches as well as consultancy works from various private firms. At his very early age, he published national paper about the application of the Biofuel in the External combustion engine specifically in power plant application. At present, he is now taking up his Ph.D in Mechanical Engineering with a major of Visualization of Multi phase flow, using Process Computed Tomography at the College of Science and Technology, Nihon University.

Masahiro Takei: He received his M.Sc.(Eng) in Resource Engineering in 1991 from Waseda University, Tokyo Japan. He also received his Ph.D. in Resource Engineering in 1995 from Waseda University. He has worked in Department of Mechanical Engineering, Nihon University, Tokyo Japan as an associate professor since 1995. His research interests are Computed tomography, Multiphase flow, Image processing and PIV.