Proceedings

Enhancement of the Global Perspective for Engineering Students by Providing an International Experience

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Student Exchange in Japan: Why and How to Provide Engineering Students with an International Experience

Itsuo Ohnaka
Osaka University

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Student Exchange in Japan

Itsuo Ohnaka
Department of Adaptive Machine Systems
Graduate School of Engineering, Osaka University
Yamada-oka 2-1, Suita-shi, Oska 565-0871, Japan

1. Introduction
2. Statistics and Current Situation in Japan
3. Some Activities at Osaka University
4. Concluding Remarks
Introduction

• Globalization of economy
• North - south problems
• Improvement of sustainability of the earth
  Environmental problems such as global warming, natural resources, food, water, etc.
Requirements: Education

- Understanding of various cultures, religions, geography, etc.
- Sensitivity to global needs and global engineering ethics
- International cooperation
- Working in international teams
- Communication skills
Educational Methods

• Lecture with texts, multimedia, video, etc.
• Study abroad including internship and research
• PBL in an international team abroad
• PBL in an international team in homeland
Statistics

Dispatch of students before the War
Total: 3163
Number of foreigners employed by Meiji Government Agencies in 1872
After the War

To USA

- GARIOA Program (1949-1952)  1047
- Fulbright Program (1952-1971) >4000

From USA (education)   778

To Germany

- A. von Humboldt   ca 40/year
  (Mainly Researchers)

To France:

- Culture Exchange Program  ca 100/year
Intake of Foreign Students in Some Countries
International Student Programs in Japan
MEXT Budget of 2003

• New Intake under J. Government Scholarship
  ca 200 mil.$ 5355 students (120 up)

• Support to foreign students at personal expense
  ca 100 mil.$ 11,500 students (600 up)

• Student-exchange Programs  ca 30 mi.$
  Short-Term:
    Intake: 2000 (50 up)  Dispatch: 635 (50 up)
  Academic Frontiers Student Exchange Promotion
    Intake: 150 (100 up)  Dispatch: 150 (100 up)
  Student Exchange Initiative Support  35 x 3 (new)

Intake Total: 7355  Dispatch Total: 890
MEXT Short-term Study Program

- 2000 inbounds to 22 universities
- 635 outbound
Academic Frontiers Student Exchange Promotion Program in 2003-04 (MEXT)

Purposes: To support exchange students in accordance with student exchange plans of the graduate students of Japanese universities and foreign students who participate in joint research between Japanese universities and foreign universities/research institutes, aiming to help foster the future’s foremost researchers to lead the world on the academic frontier of education and research.

Outbound 150        Inbound 150        3-12 months
100,000 yen + air ticket
Frontiers to be Supported

• Life Sciences
• Information Technology
• Nanotechnology and Materials
• Environmental Science and Technology
• Energy
• Social Infrastructure
• Manufacturing and Robotics
• Exploratory Areas (Space, Ocean Engineering, etc.)
• Economics, Business Administration, Law & Public Policy
Student Exchange Initiative Support Program

• Similar program between EU and USA, EU and Canada
• Outbound 150
• Inbound 150
• Coalition: Ex. Univ. Tokyo, MIT, Swiss Federal Institute of Technology, Chalmers University of Technology
IAESTE
International Association For The Exchange Of Students For Technical Experience

• Promote international understanding and goodwill amongst students of all nations irrespective of race, color, sex or creed
• From 1948: Internships summer, 8-12 weeks
• 70 countries; 5000-6000 students/year

[http://www.iaeste.org]
Japanese Student Number dispatched with IAESTE (Engineering)
2003

- Offer 82
- Placement 53
- Unused 29

Language, desired field, major
UMAP
(University Mobility in Asia and Pacific)

• Founded in 1993
• Voluntary association of government and non-government representatives of higher education (university) sector.

Aim: to achieve enhanced international understanding through increased mobility of university students and staff.

Members: 28 countries and regions such as Australia, Japan, Mexico, New Zealand, People’s Republic of China, Philippines, Republic of Korea, Russia, Taiwan, Thailand, USA
Others

• AEARU
  (Association of East Asian Research Universities)

• APRU
  (Association of Pacific Rim Universities)
Activities at Osaka University

• Short-term study program
• International Project-Based Learning (PBL) with Stanford University
• International PBL with e-mail
• Other exchanges
1. Short-term study at Osaka University
2. International PBL
Stanford, Osaka, Kyoto Universities

• Japanese Center (Kyoto)
• Stanford students 8-11; Japanese students 2-4
• 2-4 teams, 2-4 company liaisons
• Real-world problems provided by companies
• 1 Stanford instructor; 2-4 Coaches
Roles of Staff

- Dr. David Cannon: Instructor and Main Coach
- Prof. L. Leifer: Responsible at Stanford
- Prof. I. Ohnaka: Moderator in Japan
- Company Liaison: Information on company needs, constraint, evaluation, small financial support
- Coaches: Consultation on how to get necessary information, giving hints, encouragement, etc.
The Team

• Stanford
  Roger Kim
  Jason Yang
  Elizabeth Yin
  Claudia Yu
  Sam Hui

• Osaka University
  Takero Kurauchi

• Kyoto University
  Kouichi Goto
  Daisuke Miura
Energy Problems in Japan

• Increasing usage
• Dependence on non-renewable resources
• Carbon dioxide emission
Vehicle-to-Grid System
3. International PBL
VAC, KTH, Osaka University

• VAC Engineer: Mr. G, Sjöberg
  Prof. H. Fredriksson, Prof. I. Onaka
• Inlet manifold of the hydrogen pump for the Vulcain rocket engine, Airiane 5
• 1 MS student at KTH: Mechanical properties and hydrogen content
• 1 doctoral student at Osaka: Modeling of hydrogen absorption by super-alloy materials
• E-mail and FAX
4. Student Exchange between KAIST in Korea and Osaka Lab.

- Two students from each graduate school visit the other and present their work and visit industry: 1 week stay
- Traveling expenses paid by home laboratory
- Living expenses paid by host laboratory
- All arrangements made by students
Others

- Cooper Union
- Chinese universities, etc.
- Exchange of researchers
Good Effects

- Good motivation for study
- Good training for communication skills in English and ability to work with foreign people
- Good chance to become friends and develop international network

Problems

- Expenses, accommodations, food, etc.
- Language
- Different semester, credit and grading systems (Accreditation is not enough)
- Often not enough time
- Good theme
TOEFL Scores (Asian countries)
Concluding Remarks

- E-mail based PLBs
- Harmonization of educational systems, including credits and grading
- Peaceful world