

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

Engineering Conferences International

Year 2003

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

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Student Exchange in Japan

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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**