The Process and Challenges of International Academic Collaboration in STEM: Sharing UMP Experience

Presentation Outlines

- Learning objectives
- STEM in Malaysia
- Background of UMP and NIU
- Collaboration Process
- Issues and Challenges in international academic collaboration
Learning Objectives

At the end of presentation, participants will be able to:

• view STEM in Malaysia.
• value the benefits of international academic collaboration.
• apply various activities in international academic collaboration.
• experience the challenges faced during the collaboration process.

STEM in Malaysia

• National Science & Technology policy
  – MOSTI is responsible to educate the community in science, technology and innovation
  – Encourage R&D through ScienceFund, Community Fund, TechnoFund

• Industrial Master Plan (IMP)
  – Strengthens science and technology in the development of industrial sector, especially manufacturing

• Included in Nine National Strategic Challenges

• Science stream is declining
  – About 30% in science stream

• The government aims to achieve 60:40 by 2015
UMP Initiatives in STEM

• Egilent
  – Science Camp
  – Outdoor Activities

• Easy Science and Mathematics Camp (NIU Model)

• Program Insmartive

• Offer engineering technology program

New Issue in Engineering Technology

• About 80% of working field in engineering needs engineering technologist
• Out of 100,000 engineers, 80,000 doing engineering technologist work
• Government aims to produce 60,000 Technologists by 2020
• MTUN is responsible to produce Technologists
Campus Area

Area: 768 acre

Gambang Campus

Area : 126 acre
No. of students : 4,592

Gambang Campus

Pekan Campus

Area : 642 acre
No. of students : 3,718

Pekan Campus

TOTAL CURRENT STUDENTS : 8,310

CAMPUS’S LOCATION

GAMBANG CAMPUS

PEKAN CAMPUS

TOTAL CURRENT STUDENTS : 8,310
TOTAL STAFF

![Graph showing total staff distribution]

**TOTAL STAFF**: 1,585

<table>
<thead>
<tr>
<th>GROUP</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>990</td>
</tr>
<tr>
<td>Language Teacher &amp; Tutor</td>
<td>49</td>
</tr>
<tr>
<td>Management &amp; Professional</td>
<td>223</td>
</tr>
<tr>
<td>Supporting</td>
<td>723</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,585</strong></td>
</tr>
</tbody>
</table>

ACADEMIC STAFF WITH PhD
(not include Language Teacher & Tutor)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ACADEMIC STAFF WITH PhD</th>
<th>TOTAL ACADEMIC STAFF</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>19</td>
<td>250</td>
<td>8%</td>
</tr>
<tr>
<td>2007</td>
<td>26</td>
<td>306</td>
<td>9%</td>
</tr>
<tr>
<td>2008</td>
<td>38</td>
<td>350</td>
<td>11%</td>
</tr>
<tr>
<td>2009</td>
<td>70</td>
<td>434</td>
<td>16%</td>
</tr>
<tr>
<td>2010</td>
<td>104</td>
<td>495</td>
<td>21%</td>
</tr>
<tr>
<td>2011</td>
<td>148</td>
<td>530</td>
<td>28%</td>
</tr>
<tr>
<td>2012</td>
<td>199</td>
<td>573</td>
<td>34%</td>
</tr>
<tr>
<td>2013</td>
<td>210</td>
<td>590</td>
<td>36%</td>
</tr>
</tbody>
</table>

GROUP TOTAL

<table>
<thead>
<tr>
<th>GROUP</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>590</td>
</tr>
<tr>
<td>Language Teacher &amp; Tutor</td>
<td>49</td>
</tr>
<tr>
<td>Management &amp; Professional</td>
<td>223</td>
</tr>
<tr>
<td>Supporting</td>
<td>723</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,585</strong></td>
</tr>
</tbody>
</table>

UNDERGRADUATE STUDENTS

![Graph showing undergraduate student distribution by faculty]

**TOTAL STUDENT**: 7,812

<table>
<thead>
<tr>
<th>CODE</th>
<th>FACULTY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>FKKSA</td>
<td>FACULTY OF CHEMICAL &amp; NATURAL RESOURCES ENGINEERING</td>
<td>1,272</td>
</tr>
<tr>
<td>FKASA</td>
<td>FACULTY OF CIVIL ENGINEERING &amp; EARTH RESOURCES</td>
<td>1,069</td>
</tr>
<tr>
<td>FKEE</td>
<td>FACULTY OF ELECTRICAL &amp; ELECTRONICS ENGINEERING</td>
<td>1,029</td>
</tr>
<tr>
<td>FSKMP</td>
<td>FACULTY OF COMPUTER SYSTEMS &amp; SOFTWARE ENGINEERING</td>
<td>1,050</td>
</tr>
<tr>
<td>FKM</td>
<td>FACULTY OF MECHANICAL ENGINEERING</td>
<td>1,127</td>
</tr>
<tr>
<td>FSTI</td>
<td>FACULTY OF INDUSTRIAL SCIENCES &amp; TECHNOLOGY</td>
<td>554</td>
</tr>
<tr>
<td>FKE</td>
<td>FACULTY OF MANUFACTURING ENGINEERING</td>
<td>475</td>
</tr>
<tr>
<td>FTEC</td>
<td>FACULTY OF TECHNOLOGY</td>
<td>903</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>7,479</strong></td>
</tr>
</tbody>
</table>
Masters/PhD Students

Master of Engineering
- Master of Engineering (Electric)
- Master of Engineering (Electronic)
- Master of Engineering (Instrumentation)
- Master of Engineering (Chemistry)
- Master of Engineering (Bio-Process)
- Master of Engineering (Mechanical)
- Master of Engineering (Manufacturing)
- Master of Engineering (Automotive)
- Master of Engineering (Civil)
- Master of Engineering (Construction)
- Master of Chemical Engineering with Entrepreneurship (Course Work)

Master of Science
- Master of Science (Computer)
- Sarjana Sains (Software Engineering)
- Sarjana Sains (Bionotechnology)
- Sarjana Sains (Industrial Chemistry)
- Sarjana Sains (Advanced Material)

Master of Technology Management
- Master of Technology Management (Industrial Safety & Health)
- Master of Technology Management (Human Capital Resources)
- Master of Technology Management (Project Management)
- Master of Technology Management (Operation Management)
- Master of Business Administration

Doctor of Philosophy
- Doctor of Philosophy (Technology Management)
- Doctor of Philosophy (Computer Science)
- Doctor of Philosophy (Biotechnology)
- Doctor of Philosophy (Industrial Chemistry)
- Doctor of Philosophy (Advanced Material)

Masters/PhD Students

Data as at 20 May 2013
Source: Institut Pengajian Siswazah

International Students

International Students
Number Based On Level of Study

Bachelor Degree: 46
Master: 53
PhD: 99
Total: 200

Data as at 20 May 2013
Source: International Office (IO)

- Course work: 87
- Research: 439
PhD: 305

Total: 831
**VISION**
To be a world-class Technological University.

**MISSION**
We provide high quality education, research and services in engineering and technology in a culture of creativity and innovation.

**OBJECTIVE**
1. To produce outstanding graduates by providing competitive engineering and technological programmes.
2. To spearhead cutting edge industry-relevant research initiatives.
3. To be a leading service provider to industries and community based on our niche and areas of expertise.
4. To be recognized as an institution for excellent management and work culture.

---

**Faculty of Technology**
*Programs Offered*

<table>
<thead>
<tr>
<th>No</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bachelor of Project Management with Honors</td>
</tr>
<tr>
<td>2</td>
<td>Bachelor of Industrial Technology Management with Honors</td>
</tr>
<tr>
<td>3</td>
<td>Bachelor of Occupational Safety and Health with Honors</td>
</tr>
<tr>
<td>4</td>
<td>Bachelor of Engineering Technology (Electrical) with Honors</td>
</tr>
<tr>
<td>5</td>
<td>Bachelor of Engineering Technology (Manufacturing) with Honors</td>
</tr>
<tr>
<td>6</td>
<td>Bachelor of Engineering Technology (Energy &amp; Environment) with Honors</td>
</tr>
</tbody>
</table>
International Academic Collaboration

- Hochschule Karlsruhe Technik und Wirtschaft (HsKA University)
- University Al-Azhar
- University Sarajevo
- South Central University of Natinalities
- Northwest University for Nationalities
- Hebei University
- Xinjiang University, China
- Beijing International Studies University, Beijing
- Xian Shiyou University, Xian
- Northern Illinois University
- Universitas Gadjah Mada, Indonesia
- Institut Teknologi Bandung, Indonesia
- Institut Pertanian Bogor, Indonesia
- Misr University for Sciences & Technology (MUST), Mesir
- Alexandria University, Mesir
- Dundalk Institute of Technology, Ireland
- Athlone Institute of Technology, Ireland
- Institute of Technology Tallaght, Ireland

WHY
NORTHERN ILLINOIS UNIVERSITY
ENGINEERING TECHNOLOGY PROGRAM
### Abundant Academic Option

- National Recognition of academic excellence
- World-renowned faculty who teach undergraduates
- Undergraduate research opportunities
- Exceptional resources of a major comprehensive university, including top-level facilities
- Student / Faculty ratio (17 students to 1 Professor)
- 6 Business program, including Accounting
- 4 Engineering Programs
- 8 Health Science Programs, including Nursing
- More than 70 Graduates Programs

### COLLEGES

- College of Business
- College of Education
- College of Engineering and Engineering Technology
- College of Health and Human Sciences
- College of Law
- College of Liberal Arts and Sciences
- College of Visual and Performing Arts

### RECOGNITIONS

- Nationally recognized for community services
- Ranked in top 100 universities

Ref: [http://www.niu.edu/academics/departments.shtml](http://www.niu.edu/academics/departments.shtml)
The undergraduate programs in electrical engineering, industrial and systems engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

In the technology program, the emphases in electrical engineering technology and manufacturing engineering technology are accredited by the Technology Accreditation Commission of ABET, and the emphasis in industrial technology is accredited by the National Association of Industrial Technology.

Opportunities

- Internationalization
  - Branding
  - Competitive

- Recognition
  - Washington Accord
  - World Recognition

- Mobility
  - Student Exchange
  - Staff Attachment

- Fellowship
  - Fellowship Program
Companies that employ NIU’s Eng Tech graduates

The Process
Process Flow of Collaboration Procedures

Identify Institution

Prepare LoI for Collaboration

Prepare paper work for approval:
• JNJS (Standing Committee)
• Senate

Discussion and Negotiation

MoU Signing

Prepare paper work for approval:
• MQA
• MoHE

Get approval from:
• BTE
• BTM
• BTV

Working on curriculum

Discussion and Negotiation

MoU Signing

Get approval from:
• MQA
• MoHE

Implementation

DISCUSSION AND NEGOTIATION

Northern Illinois University + Universiti Malaysia PAHANG
MoU Signing
Materializing Memorandum of Understanding (MoU) with Northern Illinois University (NIU) on May 20, 2011

Implementation

- Bachelor of Engineering Technology (Electrical) with Honors.
- Bachelor of Engineering Technology (Manufacturing) with Honors.
- Bachelor of Engineering Technology (Energy & Environmental) with Honors.
Challenges

- Distance
- Culture Difference
- Funding
- Implementation
- Accessibility
- Accreditation

1. Distance

- Time Consuming
  - Long distance travelling
  - Getting material for T&L

- Cost Effectiveness
  - How your expenses benefit you

- Tiring
  - This may effect your delivery. E.g. Presentation, discussion etc.

- Communication
  - Delay due to the time difference
  - Schedule and re-scheduling
2 Culture Difference

<table>
<thead>
<tr>
<th>Religion</th>
<th>Ethnicity</th>
<th>Socialization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Funding

UMP has to bear the cost for
- Travelling
- Curriculum development
- Administrative works

Government Fund
- Limited funding
- Delay or uncertain
4 Implementation

**Fellowship Program**
- Searching for candidates
- Dealing with host institutions

**Delivery**
- Curriculum
- Teaching materials

**Administrative**
- Academic visits
- Management meeting

**Dual Degree Program**
- To be discussed in phase 5 and 6

5 Accessibility

**VISA**

**Immigration**
6 Accreditation

- Documentation
- Academic Audit

ABET

MQA

MBOT

Program Accreditation

- Documentation
- Academic Audit

Thank You