University- Industry Collaboration (UIC) in Vietnam
An Empirical Analysis from Higher Education Perspective

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Outline
- Introduction
- Literature review
- Higher education and UIC in Vietnam
- Analysis
- Findings
- Concluding Remarks

Introduction
- Background
  - Knowledge as a key for economic and social development
  - Universities are as knowledge producers
  - Collaboration between universities, industries, and government

Objectives of the Study
- To investigate the collaborations between universities and industries (UIC) in Vietnam.
- To identify the contributive factors for such collaborations.
- To explore the perspectives of people from higher education sectors towards the UIC.
- To identify the most active universities in collaboration with industries, and
- To introduce a model for UIC in Vietnam

Introduction
- Background
  Current Trends for University Development:
  - The knowledge-based economy
  - The industrialization and modernization by 2020
  - Budget cut
  - Socialization and privatization
  - Mass education, and
  - Universities are as knowledge producers

Research Questions and Implementation
Qualitative Analysis
- How is the UIC in Vietnam?
- What benefit can universities earn from collaborations with industries?
- Are there any policies or mechanisms in Vietnam that encourage the UIC?
Research Questions and Implementation

Quantitative Analysis
- Which university is most active in the UIC?
- How does budget affect the way that universities collaborate with industries?
- Which interpersonal tools are most frequently used in the UIC?
- Which technological enabled resources (TER) communication means are most frequently used in the UIC?
- How has the university's institutional culture been changed due to the UIC?

Research Scope and Limits
- Population
- Classification Methods
- Data

Legislative and Literature Review

Legislative Review
- Education Law 2005
  - Article 12 on role of the State in promoting higher education development
  - Article 13 on investment in higher education
  - Article 14 on autonomy given to higher education and universities
- Science and Technology Law

Legislative and Literature Review
- Resolution 8 of the Central Committee of the Vietnamese Communist Party
  - UIC as a major force for scientific and technological development in Vietnam
- Central Congress VI on Science and Technology
- Strategy for Science and Technology Development by 2020

Legislative and Literature Review
- The Triple Helix as the theoretical framework for UIC
  - The emergence of the model
  - The enhancing role of universities
  - The importance of the emergence

Legislative and Literature Review
- The Triple Helix as the theoretical framework for UIC
Legislative and Literature Review

- Literature Review
  - Clack (1998, 2004), Tijssen (2007) on universities and conditions for collaboration with industry
  - Tijssen (2007) on University's entrepreneurial culture
  - Van Looy et al. (2004) on University research orientation
  - Barbara Sporn (1999) on university and structure
  - Molas Gallart et al. (2002) on University and research relevant to industrial demand

- Changes in Intuitional Culture
- Means of TER Communication
- Interpersonal Tools
- Investment
- Key Actors

5 Variable Groups
- Key Actors
- Investment
- Interpersonal Tools
- Means of TER Communication
- Changes in Intuitional Culture

Research Process, Analysis and Findings

- Qualitative Analysis (document survey and interview)
- Quantitative Analysis (field survey)

5 Variable Groups
- Key Actors
- Investment
- Interpersonal Tools
- Means of TER Communication
- Changes in Intuitional Culture

Research Process

- Phase 1: Qualitative analysis by documents search and in-depth interviews.

Variables:
- Key actors, investments, interpersonal tools, means of TER communication, and changes in intuitional culture.

Analysis

- Data Description
  - Academic degree of respondents
    - Undergraduate students: 2,637
    - D.Sc.: 41
    - Ph.D: 127
    - MA: 606
    - BA: 804
    - Total: 4,215

Data Description

- Academic Ranks of Respondents
  - Undergraduate Students: 2,784
  - Professors: 19
  - Associate Professors: 41
  - Senior Lecturers: 324
  - Lecturers: 473
  - Assistant Lecturers: 154
  - Master Students: 420
Data Description

Job Description of respondents
- Teaching only: 171
- Research only: 3,075
- Teaching and Research: 679
- Administration Only: 176
- Administration and Teaching: 114

Number of Years of Working Experience
- Less than two years: 745 (17.7%)
- From 2 to 5.9 years: 2,131 (50.6%)
- From 6 to 9.9 years: 993 (23.6%)
- More than 10 years: 346 (8.2%)
- Total respondents: 4,215

Basic Function of the University
- Training only: 357 (8.5%)
- Research only: 66 (1.6%)
- Training and Research: 3,792 (90.0%)
- Total respondents: 4,215

Table 1. Means and standard deviation for five survey items on investment for UICs

<table>
<thead>
<tr>
<th>Item</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration with industry as strategy of the university</td>
<td>1</td>
<td>5</td>
<td>3.76</td>
<td>.840</td>
</tr>
<tr>
<td>Current Collaboration with industry</td>
<td>1</td>
<td>5</td>
<td>3.91</td>
<td>1.125</td>
</tr>
<tr>
<td>Collaboration with industry benefit from research</td>
<td>2</td>
<td>5</td>
<td>4.16</td>
<td>.544</td>
</tr>
<tr>
<td>Collaboration with industry as mission of the university</td>
<td>2</td>
<td>5</td>
<td>3.67</td>
<td>.616</td>
</tr>
<tr>
<td>Investment on collaboration with industry</td>
<td>2</td>
<td>5</td>
<td>3.84</td>
<td>.762</td>
</tr>
</tbody>
</table>

Table 2. Means and standard deviation for five survey items on key actors for UICs

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect of Deans on the board to the collaboration with industry</td>
<td>4.04</td>
<td>.466</td>
</tr>
<tr>
<td>Effect of Rector to the collaboration with industry</td>
<td>4.10</td>
<td>.447</td>
</tr>
<tr>
<td>Effect of Faculty to the collaboration with industry</td>
<td>3.87</td>
<td>.566</td>
</tr>
<tr>
<td>Effect of Personnel division to the collaboration with industry</td>
<td>3.57</td>
<td>.613</td>
</tr>
<tr>
<td>Effect of other functional division to the collaboration with industry</td>
<td>3.50</td>
<td>.615</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>4,215</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Means and standard deviation for five survey items on institutional adjustment for UICs

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitate for collaboration with industry</td>
<td>4.22</td>
<td>.707</td>
</tr>
<tr>
<td>Assessment of collaboration with industry</td>
<td>3.84</td>
<td>.732</td>
</tr>
<tr>
<td>Collaboration with industry as mission of the university</td>
<td>3.97</td>
<td>.816</td>
</tr>
<tr>
<td>Collaboration with industry as strategy of the university</td>
<td>3.76</td>
<td>.840</td>
</tr>
<tr>
<td>Sector Manager (top executives, sector, and faculty)</td>
<td>4.01</td>
<td>.409</td>
</tr>
</tbody>
</table>
Findings

1. Key actors: rector, top executive board and faculty, academics, and academic degrees: different views towards key actors groups (by academic level, ranks, by universities and by regions).

2. Institutional culture: mission, strategy, investments, senior managers, facilitator: different views towards institutional cultural changes (by academic level, ranks, by universities and by regions).

3. Inter-personal tools: seminar, consultation and other networks : different views towards inter-personal tools (by academic level, ranks, by universities and by regions).

4. TER Communication: telephone, publication and email : different views towards TER communication (by academic level, ranks, by universities and by regions).

Table 4. Means and standard deviation for five items on interpersonal tools for UICs

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seminar as a means to promote collaboration with industry</td>
<td>4.15</td>
<td>.697</td>
</tr>
<tr>
<td>Consultation as a means to promote collaboration with industry</td>
<td>4.13</td>
<td>.685</td>
</tr>
<tr>
<td>Meetings as a means to promote collaboration with industry</td>
<td>3.77</td>
<td>.766</td>
</tr>
<tr>
<td>Professional Network as a tool to promote collaboration with industry</td>
<td>3.92</td>
<td>.634</td>
</tr>
<tr>
<td>Other Networks as a tool to promote collaboration with industry</td>
<td>3.08</td>
<td>.660</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>411</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Means and standard deviation for five items on TER as means of communication for UICs

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chat as a tools to communicate with industry</td>
<td>2.98</td>
<td>1.057</td>
</tr>
<tr>
<td>Publication as a tools to promote collaboration with industry</td>
<td>3.61</td>
<td>.787</td>
</tr>
<tr>
<td>Email as a tools to promote collaboration with industry</td>
<td>3.56</td>
<td>.949</td>
</tr>
<tr>
<td>Telephone as a tools to promote collaboration with industry</td>
<td>4.13</td>
<td>.729</td>
</tr>
<tr>
<td>Video conferencing as a tools to promote collaboration with industry</td>
<td>1.65</td>
<td>.663</td>
</tr>
<tr>
<td>Valid N (listwise)</td>
<td>411</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Comparing means of investment and key actors by academic degrees

Table 7. Comparing means of interpersonal tools and TER as means of communication by academic degrees
Findings

5. Types of universities: technology and engineering, unique specialization, regional universities, two national universities.

Table 8. Comparing means of investment by universities

Table 9. Comparing means of key actors by universities

Table 10. Comparing means of interpersonal tools by universities

Table 11. Comparing means of TER as means of communication by universities

Findings

6. Locations: Hanoi, Ho Chi Minh City, industrial zone (Binh Duong), economic focal region (Thai Nguyen, Hue, Danang).
Table 12. Comparing means of institutional changes by universities

Table 13. Comparing means of key actors by universities

Table 14. Comparing means of interpersonal tools by universities

Summary of findings:
1. Key actors: rector, top executive board and faculty, academics, and academic degrees: different views towards key actor groups (by academic level, ranks, by universities and by regions).
2. Institutional culture: mission, strategy, investments, senior managers, facilitator: different views towards institutional cultural changes (by academic level, ranks, by universities and by regions).
3. Interpersonal tools: seminar, consultation and other networks: different views towards inter-personal tools (by academic level, ranks, by universities and by regions).
4. TER Communication: telephone, publication and email: different views towards TER communication (by academic level, ranks, by universities and by regions).
5. Types of universities: technology and engineering, unique specialization, regional universities, two national universities.
6. Locations: Ha Noi, Ho Chi Minh City, industrial zone (Binh Duong), economic focal region (Thai Nguyen, Hue, Danang). And,
7. Budget for promoting collaboration with industry.

Model Building

Variables:
- The key variables are:
  1. Dependent variable, i.e. the collaboration between university and industry (UICs).
  2. Independent variables are contributive factors for the collaboration, i.e. budget (B), location (L), specialization of universities (S), facilitators (F) and number of research projects collaborated with industry (R).
- Dependent Variable (composite indicators of items 3 to 7 (current collaboration, benefit, mission, strategy, investment, senior managers, interpersonal tools, and TER communication))
- Independent Variables (budget, location, specialization of universities, facilitators, number of research projects collaborated with industry and academic foundation).
Model pattern:

Y1 (uic1) = β0 + β1 (budget) + β2 (location) + β3 (specialization) + β4 (# research projects) + β5 (aca foundation) + u

Y2 (uic2) = β0 + β2 (budget) + β3 (specialization) + β4 (# research projects) + β5 (aca foundation) + u

Y3 (uic3) = β0 + β1 (budget) + β2 (location) + β3 (specialization) + β4 (# research projects) + β5 (aca foundation) + u

Y34 (uic34) = β0 + β1 (budget) + β2 (location) + β3 (specialization) + β4 (# research projects) + β5 (aca foundation) + u

Where:

- Y1 is the collaboration between university and industry in university 1;
- Y2 is the collaboration between university and industry in university 2;
- Y3 is the collaboration between university and industry in university 3;

Model pattern:

β1 is the average budget allocated for research at the university for 5 years from 2000-2005,

β2 is the location of the university,

β3 is the classification of the university whether the university is the specialization or conventional university,

β4 is the number of research projects that the university has collaborated with industry,

β5 is the academic capacity (number of PhD degree holders, Prof and Asst Prof, and number of MA and PhD students trained) the university has, and

β6 is the facilities (laboratories, libraries, and research centers) of the university.

U is the error term.

Model pattern:

Model pattern:

Implication

Where:

- X1 is the frequency of current collaboration of the uni.(item#3),
- X2 is the frequency of benefits earned from the collaboration (item#4),
- X3 is the investment on collaboration with industry (item#5),
- X4 is the emphasis of collaboration with industry as the mission of the Uni. (item#6),
- X5 is the consideration of collaboration with industry as the strategy for development of the Uni. (item#7),
- X6 is the composite indicators of top executives, rector, director board and faculty as key actors promoting collaboration with industry at uni. (item#8,9,10),
- X7 is the composite indicators of inter-personal tools, and
- X8 is the composite indicators of TER means of communication.
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