CDIO IMPLEMENTATION AT VNU-HCM: From Pilot to Widespread Implementation

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(The CDIO Asian Regional Meeting, KIT, March 24-26, 2014)
1. A model framework for widespread implementation of CDIO

2. An implementation roadmap of the model framework

3. The CDIO pilot implementation and results

4. The generalized common frameworks

5. The widespread implementation of CDIO at VNU-HCM

6. Conclusions
Vietnam is integrating into global economy, it faces a grand challenge of transforming a very young population into a skilled labor force.

**BUT**

education system has not kept up with society needs and demand for global integration.

This transformation requires **curriculum reform** for entire education system.

**VNU-HCM plays a pioneer role in the reform process**
VNU-HCM

- Largest and most prestigious University System in Vietnam
- System with 6 member Universities
- 6,000 Staffs
- 55,000 Undergraduate Students
- 10,000 Graduate Students
CDIO APPROACH

CDIO – An Innovative Education Initiative
Conceive-Design-Implement-Operate

build model framework

widespread implementation

develop seven-year plan to nucleate implementation of the framework at strategic departments (2010-2017)
1. A model framework

Widespread implementation at other universities

3rd Stage

Use the pilot implementation → develop generalizable solutions

2nd Stage

Adapt CDIO principles systematically → reform the curriculum of strategic departments

1st Stage
1. A model framework

1. Involvement of other relevant stakeholders

2. Adaptation of CDIO Syllabus and implementation of CDIO Standards

3. Strategies to manage the change process and overcome the barriers

4. Funding and policy support

5. Broad dissemination of implementation materials and results

- Engaged MOET in our CDIO implementation ➔ encouraged VNU-HCM to take the leadership role
- Assembled consortium of strategic departments within VNU-HCM
- Established collaboration with peer universities
- Involved of industry and alumni partners

...
1. A model framework

1. Involvement of other relevant stakeholders

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5. Broad dissemination of implementation materials and results

- Customizing CDIO Syllabus ➔ learning outcomes meet highest international standards while still satisfying the specialized requirements of Vietnam

- Integrating the CDIO Standards into our program evaluation process ➔ evaluate the extent of CDIO implementation...

4/7/2014
1. A model framework

- 1. Involvement of other relevant stakeholders
- 2. Adaptation of CDIO Syllabus and implementation of CDIO Standards
- 3. Strategies to manage the change process and overcome the barriers
  - + getting off to the right start
  - + building momentum in core change activities
  - + institutionalizing change
- 4. Funding and policy support
- 5. Broad dissemination of implementation materials and results

- Change management strategies based on CDIO 12 key success factors of 3 phase of change:
4/7/2014

1. A model framework

- Allocated funding to support activities at the VNU-HCM System, university, and department levels:
  - for common activities that are important to participating universities
  - for participating faculty members time and conduct activities
- Invited CDIO experts to serve as our advisor and to teach workshops
- Conduct yearly review to evaluate the progress and achievements

1. Involvement of other relevant stakeholders
2. Adaptation of CDIO Syllabus and implementation of CDIO Standards
3. Strategies to manage the change process and overcome the barriers
4. Funding and support policy
5. Broad dissemination of implementation materials and results
1. A model framework

1. Involvement of other relevant stakeholders
2. Adaptation of CDIO Syllabus and implementation of CDIO Standards
3. Strategies to manage the change process and overcome the barriers
4. Funding and policy support
5. Broad dissemination of implementation materials and results

- Translated CDIO book into Vietnamese and gave it for free to universities attending the workshops to promote CDIO in Vietnam

- Hosting CDIO website makes available in Vietnamese the Syllabus, Standards, lessons learned and solutions to common implementation problems

- Committed resources to “train the trainers”
2. An implementation roadmap of the model framework

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<td>Preparation for implementation</td>
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<td>Pilot implementation at two strategic departments</td>
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<td>Development of generalizable solutions</td>
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<td>Widespread implementation</td>
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3. The CDIO pilot implementation and results

Pilot implementation and evaluation at two strategic departments:

1. Department of Mechanical Engineering
   - University of Technology

2. Department of Information Technology
   - University of Science
### 3. The CDIO pilot implementation and results

<table>
<thead>
<tr>
<th>Standards</th>
<th>At University Department Level</th>
<th>At VNU-HCM System, and National Level</th>
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<tbody>
<tr>
<td>Std 1-2</td>
<td>new program LOs &amp; integrated curricula</td>
<td>• CDIO Book translated, published</td>
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<td>Std 3</td>
<td>new introductory courses</td>
<td>• CDIO implementation materials published</td>
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<td>Std 4</td>
<td>new Design-Implement courses</td>
<td>• National CDIO Workshops 2010 (sponsor)</td>
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<td>Std 5</td>
<td>retasked and new CDIO workspaces</td>
<td>• National CDIO Conference 2012 (hosted)</td>
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<td>Std 6</td>
<td>active learning (AL) and experiential learning applied</td>
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<td>Std 7-8</td>
<td>faculty members trained on using Constructive Alignment Principles to design, develop, and assess AL in large classes</td>
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<td>Std 9-10</td>
<td>- students assessed on CDIO skills - self-evaluated programs</td>
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<td>Std 11-12</td>
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### 4. The generalized common frameworks

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<th>Standards</th>
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| Std 1-2   | • CDIO Syllabus customized for MechE programs  
           • CDIO Syllabus customized for CS, CE, and IT programs | • Guidelines for CDIO-Based Program and Course Design and Development |
| Std 3     |                                 | • Guidelines for Outcome-Based Program and Course Design and Development |
| Std 4     | • Intro. Course to Engineering  
           • Intro. Course to CS, CE, and IT | • The Syllabus Framework for Introductory Course |
| Std 5     | D-I courses for MechE program | • Faculty Training Courses: Using Constructive Alignment Principles to design, develop, and assess AL in large classes |
| Std 6     | CDIO workspaces for MechE Department | |
| Std 7-8   |                                 | |
| Std 9-10  |                                 | |
| Std 11-12 | Guidelines for LOs Assessment for MechE programs | |
5. The widespread implementation of CDIO at VNU-HCM

CDIO Adoption and Adaptation

- Uni. of Technology
  - MechE Department Since 2010
  - 10 more departments Since 2013, 2014

- Uni. of Science
  - IT Department Since 2010
  - ICT Department Since 2013

- Uni. of IT
  - 2 Departments since 2013
  - 3 more Departments since 2014

- Uni. of Economics and Laws
  - Int. Business Department since 2013

Since 2010
- IT Department
- MechE Department
- Int. Business Department

Since 2013
- ICT Department
- Chemistry Department
- 2 Departments
- 3 more Departments
6. Conclusion

- implementation of the framework
- piloting CDIO at two departments within VNU-HCM
- engaging MOET to promote CDIO in Vietnam
- disseminating implementation materials

-potential to facilitate parallel development and sharing of resources and ideas
- Make impact on national effort to accelerate curriculum reform through widespread implementation of CDIO

Meet the demand for Vietnam’s integration into the global economy
Thank you!