Engineering Higher Education Transformation in Vietnam

Bringing together government, academia, and industry to modernize Vietnamese public higher education in engineering

EXECUTIVE SUMMARY
In working to transform engineering higher education in Vietnam, the involved parties must have asked themselves several times, “what were we thinking?” because the effort, which ultimately became known as Higher Engineering Education Alliance Program (HEEAP), involved overcoming huge hurdles around advancing systemic changes in leadership, faculty, teaching methodology, curriculum, and standards-based outcomes.

In an almost unheard-of move for any company in the world, Intel Vietnam elected to achieve this transformation by investing in the national higher education system rather than taking a more traditional role and partnering with just one or two universities to supply the company with graduates. As HEEAP has evolved, the Vietnamese government has become a key resource partner for the effort which is facilitating the transformation of engineering education in Vietnam. Recent expansion of the HEEAP program has improved government and academic leadership development, which is further accelerating the positive impact that the effort is having in Vietnam.

The First Few Years
When Intel was evaluating sites for a new test and assembly facility in the Asia-Pacific region in 2005, Vietnam landed on the short list. So a corporate team flew to the country to do due diligence, interviewing companies and universities, and looking into a variety of factors that included labor code, education system, education pipeline, and labor environment. By the time Intel completed negotiations with Vietnam and announced its intentions to build there, the team knew that both Intel and the government would need to make significant investments in workforce development.

The immediate challenge was an environment where the curriculum was outdated, universities were centrally managed, and student learning was primarily passive. There was little to no active, student-centered teaching, no classroom teams, no...
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In order for HEEAP’s impact to go beyond transforming higher engineering instruction and the quality of its engineering graduates, the entire higher education system in Vietnam needed to be reevaluated.

Jeffery Goss, ASU Associate Vice Provost, Vietnam/SE Asia Programs

HEEAP encouraged active learning including classroom presentations in English by the students.

EXECUTIVE SUMMARY
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The challenge of transforming engineering education was huge—not so much because it was an engineering problem but because it was an education problem with fundamental changes needed in governance, curriculum and faculty. Within Vietnam’s higher education institutions, decision making was typically compartmentalized between departments, and faculty and Deans had little exposure to university-wide planning and decision making. Solving these challenges would take some time...and the clock was ticking. Intel’s need for qualified engineers was imminent. Intel knew they would not have success at hiring Vietnamese in the U.S. and then sending them to Vietnam, because of trust issues. So to recruit Vietnamese nationals, Intel initially put a scholarship/study abroad program in place for students who had already completed their first couple of years of college in Vietnam. Scholarship recipients would go to the US and complete their degrees and get exposure to more project-based education.

Upon graduation, they would have to work for Intel for three years, which is a common practice in Southeast Asia. Intel decided to send all the students to Portland State University (PSU) because it had an excellent engineering program and was near an Intel site so that the students could also experience Intel at the same time. 26 students participated in 2009, the first year of the Intel Vietnam Study Abroad Program. Another 24 were involved the following year. The last year included 21 students.

Launching HEEAP
Although the scholarship program with PSU was working because there was accountability due to Intel having signed contracts with government and universities, Intel wanted to do something more transformative. Intel shared its vision to transform all areas of engineering education in Vietnam—including policy, leadership, faculty development, labs, curriculum, teaching methodology and accreditation—with Arizona State University (ASU). Intel’s vision resonated with ASU. The university’s New American University (ASU) model—which focuses on leading change and developing use-inspired research, increasing access to educational resources, and engaging and creating impact on a global scale—was to play an important role in developing a program to deliver transformative higher education change in Vietnam.

In December 2009, ASU and Intel submitted a proposal to the United States Agency for International Development (USAID), who also had an interest in investing in education in Vietnam. The proposal, which was the foundation for what was to become HEEAP and the centerpiece of Intel’s revised strategy to address its workforce problems by pushing systemic institutional change in Vietnamese higher education, called for funding a program to train Vietnamese faculty in U.S. engineering content and pedagogy. Initial funding included $2M from USAID and $2.4M from Intel. ASU also contributed 5.5M.

While imposing a solution upon Vietnam would not have met with success, the country was receptive to the collaborative approach. They had been struggling with what was essentially an effort to move from an agriculture-based economy to a knowledge-based economy. At the university level, they had began pursuing more of a standards-based approach and accreditation with ABET®. So when, in 2010, the ASU-Intel-USAID alliance proposed a demonstration project with five universities in Vietnam who were committed to higher education reform, the government gave its support—a significant first step, as it provided the necessary go-ahead to begin changing important aspects of the system. The alliance kicked things off with a leadership workshop for members of MOET, university rectors, vice-rectors, and deans.

Next came a focus on training faculty members that consisted of four key components:
1. A six-week training program at ASU
2. Curriculum design and instructional lab
3. Faculty mentor program
4. Implementation of new instructional pedagogy in Vietnam

The training introduced the Vietnamese faculty to new active learning teaching methodologies, approaches for designing multidisciplinary and problem-based curriculum, and processes that ensure revised curriculum aligns with ABET® outcomes. In addition to receiving instruction from ASU and PSU faculty and interacting with Intel engineering leadership and other industry partners, they received ongoing mentoring once they returned to teach in Vietnam. The six-week training also exposed the Vietnamese government and university and college leaders to strategies, developed by the faculty in the ASU University Design Institute, that could...

KEY CRITERIA FOR SUCCESS

• Government and university administration leadership commitment for systemic change
• U.S. Universities vision to embrace international students and invest in innovative programs
• In-country faculty who are open to new methods and passionate about transforming their education system
• Involvement from organizations like USAID and World Bank that provide entrée and credibility at senior levels of government
• Funding from industry and government

In-country faculty developed a new curriculum that aligned with ABET®. In-country faculty also received ongoing mentoring as they returned to their home institutions.

HEEAP-trained faculty Member Nguyen Bia Hai at Ho Chi Minh City University of Technical Education examines a student’s fuel injection project.
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HEEAP PARTNERS
Industry:
- Cadence Design Systems
- Danaher Corporation
- Intel Corporation
- Siemens Corporation

Government:
The United States Agency for International Development (USAID)
- Vietnam Ministry of Education and Training (MOET)
- Vietnam Ministry of Labour, Invalids and Social Affairs (MOLISA)

Academia:
- Arizona State University
- Portland State University
- Da Nang University of Technology
- Ho Chi Minh City University of Technology
- Ho Chi Minh City University of Technical Education
- Can Tho University
- Hanoi University of Science and Technology
- Ho Chi Minh City University of Industry
- Ho Chi Minh Vocational College of Technology
- Cao Thang Technical College

Why the expanded focus to leadership development? “Systemic change cannot occur without government support,” explained ASU’s Goss. “If the leaders responsible for ensuring transformative change are not equipped with the skills necessary to make strategic decisions, then it will be impossible for change to occur. Consequently, the decision to include leadership development as a component in the HEEAP expansion was simple. We need Vietnam’s academic and government leaders to be able to understand and support the steps necessary in this transformation.”

HEEAP Expansion
At an August 2012 event, partners ASU, Intel, the Government of Vietnam and USAID announced a HEEAP expansion where USAID/Vietnam Mission Director Francis A. Donovan explained, “USAID is pleased to collaborate with academia and private sector partners to assist Vietnam in addressing higher education needs as Vietnam enters a new phase of economic development...Today’s HEEAP’s expansion and the Government of Vietnam and the private sector’s investment in HEEAP signal that this program is on the right path.”

The expansion consists of six components:
- Leadership development
- Faculty development
- Curriculum, lab and infrastructure
- Distance education
- Diversity and instructional expert development, and
- English.

Plus it will initiate the implementation of the ABET criteria in the 2013 to 2017 timeframe.

HEEAP Expansion Overview
The partners will implement these six major components in the 2013 to 2017 timeframe:

Leadership Development: HEEAP has always included a leadership component whereby rectors, vice-rectors, and engineering department deans and assistant deans spend a week at ASU to understand their role as “champions” of the HEEAP vision and objectives. But because this one-week infusion is not sufficient for bringing about institutional change, HEEAP leadership development will be expanded to expose academic leadership to modern higher education administration models and innovative revenue models for the purpose of transforming their institutions into regionally and/or globally competitive institutions, and to influence higher education policy changes that will advance the economic development goals of the Vietnamese government.

Faculty Development: HEEAP expansion includes more training for faculty throughout the year, more in-country training to help proliferate the ASU-based immersion, and more strategies for overcoming Vietnam’s specific barriers.

Curriculum, Labs and Infrastructure: HEEAP’s curriculum design and instructional lab component doesn’t change in the expansion except to continue growing the industry alliance so that more donations of software, hardware, and training can be made to support the move to active learning. Additionally, academic partners have a key role in making infrastructural modifications to foster a positive learning environment. Such infrastructure might include building or improving labs and classrooms, installing technology, and expanding student services.

Distance Education: The goal of this component is to advance the use of technology to reach larger numbers of students, improve the effectiveness of large classes, and offer lifelong learning opportunities to nontraditional students. This component is one of the reasons that new companies are interested in joining the HEEAP Alliance, for it provides existing employers an outlet for extended education.

Diversity and Instructional Expert Development: A central theme running through HEEAP expansion is the need to increase the proportion of female student enrollments in engineering and applied technologies. One of the ways to achieve this is to improve the representation of females in faculty positions and other positions of leadership within academia. This component does so by building the bench of female professors and instructional experts.

English: In order for Vietnamese institutions to be regionally and globally competitive, they must undergo the transition to providing instruction in the globally recognized language of engineers. The goal of this component is to “Go English” within the engineering and applied technologies disciplines.

HEEAP website

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The commitment education transformation is becoming an integral part of the national agenda. The World Bank continues to consult on what the government needs to do to bring about a transformation in areas such as governance, policy, and decentralization. The HEEAP expansion is helping provide the how with its emphasis on training leadership. Ultimately, HEEAP will strengthen education and research collaboration, as well as business ties, between Vietnam and the United States. 

General Department of Vocational Training – Ministry of Labor, Invalid and Social Affairs, Intel, and industries partners, the HEEAP expansion will ultimately create a larger impact in Vietnam. Intel’s contribution was $7 million.

MOET Vice Minister Bui Van Ga described Vietnam’s perspective: “The Ministry of Education and Training of Vietnam is pleased with the outcomes of the HEEAP project so far. HEEAP has been a strong partner to support reforming the curriculum, and rapidly upgrading the training quality of several engineering departments in our top technical universities. This is the reason why we decided to support HEEAP expansion with our financial commitment.”

The U.S. Government also recognized the significant contribution that HEEAP was making in Vietnam. In 2012, Secretary of State Hillary Rodham Clinton presented the Award for Corporate Excellence (ACE) to Intel Corporation for the company’s participation in HEEAP and the related Intel Vietnam Study Abroad Program. The selection also recognized Intel’s environmental protection through the generation of electricity through solar power in Vietnam.

To sustain the impact and success of HEEAP long-term, ASU is continuing to seek new resources and partnerships with industry, government and foundations. They are establishing an in-country program office in Vietnam to facilitate new partnerships, engage the universities and colleges to support daily operations, and support the change project implementation in the institutions.

ASU will continue to update the HEEAP faculty on the latest teaching methodologies, innovative labs and classrooms, and modern curriculum resources. During their training at ASU, HEEAP faculty are exposed to Intro to Engineering labs, multidisciplinary collaborative classrooms, and ASU faculty with similar research interests. In the HEEAP expansion, ASU will develop expanded in-country training and outreach programs such as the recent first HEEAP Engineering Education Conference.

Building upon its past successes, HEEAP is moving into the next level and accelerating economic development by providing a more highly trained workforce in Vietnam to meet the growing needs of global high-tech industries. With the Vietnamese government stepping up its commitment, education transformation is becoming an integral part of the national agenda. The World Bank continues to consult on what the government needs to do to bring about a transformation in areas such as governance, policy, and decentralization. The HEEAP expansion is helping provide the how with its emphasis on training leadership. Ultimately, HEEAP will strengthen education and research collaboration, as well as business ties, between Vietnam and the United States.

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“Intel factory in Ho Chi Minh City is Intel’s seventh and largest assembly test facility in our global network. Today, thanks to HEEAP, we will have a continuing stream of high-quality engineering and technical graduates that will enable this facility to continue to produce mobile computing chipsets and microprocessors using the latest Intel chipset technologies.”

Rick Howarth
former Intel Vietnam general manager

During her visit to Hanoi on July 10, 2012, U.S. Secretary of State Hillary Clinton congratulated Ms. Pham Thanh My, the first female scholarship recipient under the Higher Engineering Education Alliance Program. 

“The leaders responsible for ensuring transformative change are not equipped with the skills necessary to make strategic decisions, then it will be impossible for change to occur.”

Jeffery Goss, ASU Associate Vice Provost, Vietnam/SE Asia Programs

For more information on HEEAP, go to www.heeap.org