MID-TERM EVALUATION OF THE HIGHER ENGINEERING EDUCATION ALLIANCE PROGRAM (HEEAP)

FINAL REPORT

JUNE 2013

This publication was produced for review by the United States Agency for International Development. It was prepared by the Aguirre Division of JBS International.

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ACKNOWLEDGEMENTS

The research, data-gathering, analysis, and writing of this study took place from April 1 to June 30, 2013. A four-person team consisting of two engineering professors, an evaluation and training specialist, and a development specialist designed, carried out, and wrote the assessment.

- Mr. Andrew Gilboy, Team Leader, Associates for Global Change, Washington, DC
- Dr. Jane M. Fraser, Colorado State University-Pueblo, Pueblo, CO
- Dr. Pham Thi Hoa, International University/National University, Ho Chi Minh City, Vietnam
- Ms. Ngo Thi Thuan, Development Consultant, Hué, Vietnam

The team members spent 3.5 weeks in Vietnam in April 2013 gathering information and conducting interviews at the three target institutions selected for this evaluation. Each institution designated a staff member to handle the complicated scheduling task of organizing focus groups, key informant interviews with Rectors, Vice-Rectors, Deans, department heads, faculty and students. They also worked creatively to identify classes in progress where team members could conduct structured observations – some with HEEAP-trained lecturers and others with those not involved in HEEAP. We wish to acknowledge their commitment to allowing the team to spend two days at each institution and for arranging the complicated logistics.

Two USAID/Vietnam officials in particular provided crucial assistance to the team with documentation, names and contacts and insights on the HEEAP program: Randolf Flay, Program Officer, and Nguyen Thi Bich Thuy, the Assistance Officer's Technical Representative. Mr. Flay also synthesized USAID officials' comments into an organized format that enabled the team to digest comments and respond efficiently. At USAID Washington, the former AOTR for HEEAP, Eric Johnson provided critical background information prior to the team's visit on the project's evolution and made time available for a long telephone interview with the team that helped clarify many questions. He also reviewed the draft report meticulously offering his views and corrections, which has enhanced the report considerably. Arizona State University Vice-President Jeffrey Goss and his staff arranged for a day-long visit to the Tempe campus and provided documentation to the team during the field visits.

Special thanks go to Sharika Bhattacharya at the Aguirre Division of JBS International, who was available at all times, despite the eleven hour time difference, to assemble data, manage the online survey in both English and Vietnamese, produce data tables and oversee the final report formatting and processing. Without her attentiveness and commitment, the team would have been hard-pressed to complete the work within the short time in the field.

ACRONYMS AND ABBREVIATIONS

ABET	Accreditation Board for Engineering and Technology
ADB	Asian Development Bank
ASU	Arizona State University
AUN	ASEAN University Network
C-COM	Champion Committee
CDIO	Conceive-Design-Implement-Operate
CTTC	Cao Thang Technical College
CTU	Can Tho University
DUT	Da Nang University of Technology
EE	Electrical Engineering
ESL	English as a Second Language
GDA	Global Development Alliance
GDVT	General Department of Vocational Training, MOLISA
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Development Assistance)
GV	Government of Vietnam
HEEAP	Higher Engineering Education Alliance Program
HUST	Hanoi University of Science and Technology
HCMUT	Ho Chi Minh City University of Technology
HCMUTE	Ho Chi Minh City University of Technical Education
HVCT	Ho Chi Minh Vocational College of Technology
IUH	Industrial University of Ho Chi Minh City
KSA	Knowledge, skills, attitudes
M&E	Monitoring and Evaluation
ME	Mechanical Engineering

MOET	Ministry of Education and Training
MOLISA	Ministry of Labour, war Invalids, and Social Affairs
MOU	Memorandum of Understanding
PSU	Portland State University
TA	Teaching Assistant
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

The Higher Engineering Education Alliance Program (HEEAP) aims to transform engineering education in Vietnam from what is described as "passive, theory-based instruction to active, project-based instruction" with the goal of producing "work-ready" graduates for the country's booming high-tech sector. This formative evaluation was conducted in April, 2013 and explored three areas: a) project achievements, b) project monitoring and evaluation and c) contributions of the Global Development Alliance to program results.

The project design emerged in 2009 from Intel's commitment to assist with engineering education reform in Vietnam, which correlated with USAID's higher education strategy. A Global Development Alliance was concluded in 2010 and USAID awarded a cooperative agreement to Arizona State University to implement the 3-year project, which complemented existing collaboration between Intel and ASU. The USAID HEEAP component was part of a multi-decade effort, also called HEEAP or "the Alliance," to attain the objectives cited above. In considering an evaluation of USAID's HEEAP, it is useful to take note of the overarching goals and achievements as well as USAID's contributions to HEEAP in addition to the project under review.

The principal development intervention employed to achieve HEEAP's goals was annual training sessions on active learning and curriculum design. Three cohorts totaling 123 Vietnamese lecturers were selected to attend a 6-week training program in Arizona each summer from 2010 to 2012. Intel selected five Vietnamese universities with graduate engineering programs the first year, and added three vocational/technical colleges in 2011. A separate program was designed for the vocational faculty who also participated in training at ASU. Only mechanical and electrical engineering faculty could apply for HEEAP training in the United States, which was expanded to include electronics for the three vocational colleges.

Three related interventions were designed to assist training participants with promoting changes at their home institutions: a) a faculty reform project conducted by small groups that were formed during the training and completed after the participants returned; b) a mentoring system established in conjunction with the faculty projects to support the change process HEEAP aimed to achieve at each university; and c) a component for leadership outreach and socialization to aid institutional reform. A corollary objective of HEEAP was to help Vietnamese institutions advance toward international accreditation through the Accreditation Board for Engineering and Technology (ABET).

The evaluation, termed a "mid-term evaluation," was conducted at the end of the first HEEAP project. The intent was to produce a forward-looking assessment whose findings and recommendations could be incorporated into follow-on programs. The Scope of Work (SOW) identified three focus areas for evaluation:

1. ***Project Achievements.*** The success of HEEAP in advancing cutting-edge instruction, providing a relevant and up-to-date curriculum, improving undergraduate learning outcomes, and garnering institutional support for such reforms. The approach advanced by HEEAP was tightly aligned to the Accreditation Board for Engineering and Technology (ABET);

2. ***Project Monitoring & Evaluation.*** How results achieved by the program are seen and measured by program funders and stakeholders and whether or not current project indicators best reflect the performance of the project; and

3. ***Global Development Alliance.*** The contributions of the GDA structure to program results over and above the results that could have been achieved by USAID funding alone.

The SOW directed the team to conduct a "robust" evaluation of the HEEAP program based on triangulation of information sources, including a) documents reviewed, b) surveys and interviews, and c) classroom and campus observations.

The evaluation used Kirkpatrick's Four Levels of Evaluation as the framework within which questions were developed for the various instruments administered. Only three of the eight higher education institutions were visited due to time and resource constraints, all of which were in the two largest cities: Hanoi and Ho Chi Minh City. Two day site visits at each institution resulted in organizing 25 key informant interviews, nine classroom visits, and nine faculty focus groups. Classes taught by faculty from engineering departments not eligible for HEEAP training were observed, and these "non-HEEAP" faculty were interviewed in focus groups, which served as a mini-control group to data collection from former HEEAP participants. In addition to on-site interviews and focus groups, the evaluation included an online survey of the 123 Vietnamese returned participants from all eight institutions, for which the response rate was an impressive 75%.

Major Findings (see details at end of each section in Chapter IV)

- Faculty members returning from HEEAP-sponsored ASU training found the program highly useful and reported having applied active learning in their institutions.
- HEEAP's goals align well with objectives of the partners and stakeholders; Intel views HEEAP positively and integral to its strategy for Vietnam higher education.
- Individual changes at the scale achieved (6.8% of faculty trained) will not result in larger-scale institutional change without strong follow-up support. Although faculty did individually apply new active learning techniques acquired at ASU upon their return, they had insufficient support to share their experiences beyond themselves or a small group of peers.
- Because HEEAP had trained a small percentage of faculty at the five universities and three vocational colleges, only by leveraging the impact of that training *from individual to institutional change* will HEEAP make a significant, sustainable difference in the teaching methods used in engineering education at these target institutions. In terms of inducing change at the other estimated 130 Vietnamese institutions teaching engineering at either undergraduate or graduate levels, the impact would be insignificant. Only through a solid strategy to disseminate the results of active teaching to those not trained by HEEAP will the project produce enduring change in engineering education.
- The HEEAP project had raised awareness of ABET requirements among HEEAP participants, but the meaning of ABET or how it could be applied remained unclear to roughly half of the HEEAP participants.
- Associating English language competency with acquiring skills in active learning confused and weakened the outcomes anticipated from training. English fluency was primarily a requirement set by the training, which filtered out potentially strong participants less exposed to English while diluting the training effectiveness by teaching active learning in a foreign language. Separating English from training objectives would open up opportunities for more creative ways to implement HEEAP training.
- Follow-up to leverage impact was weak: Monitoring and Evaluation reports dwelled on inputs rather than on progress indicators and results, and effective mentoring was not integrated into post-training support.

- The HEEAP GDA mechanism was effective, meeting the objectives of both partners and satisfying USAID's expectations.
- The GDA mechanism enabled USAID to divide responsibilities for reaching shared project goals with a more flexible private sector partner. The resulting partnership added value and enhanced the likelihood of greater impact.

Major Recommendations (see Chapter V for details and complete list)

A. LEVERAGING IMPACT

1. Interaction with target institutions

- *More in-country activities.* At each institution, design activities in-country that expand on existing activities to promote changes in teaching techniques.
- *Continue training faculty in active learning*. Individual faculty have acquired new knowledge through HEEAP training, which has been found to be relevant to their needs.
- *Increase in-country support for greater faculty communication about teaching methods.* Findings underscored the lack of effective support to faculty after they returned.
- *Create and tailor change management strategies to each institution's particular challenges.* Without a strategy that reflects the particular context of each institution, and activities designed for each one, inducing institutional change will be difficult.
- *Increase dialogue among target institutions.* Promote more active communication to share successes and challenges faced in implementing teaching reforms.

2. English in HEEAP's strategy

- *Distinguish between goals to improve English proficiency from active learning.* Findings clearly show that acquiring English proficiency requires approaches significantly different from those used to introduce active learning. For example, the objective below calls for HEEAP activities clearly related to producing graduates prepared for a high-tech work place.

  Objective 1: Graduates have English proficiency and are more work-ready.

  Objective 2: Student learning increased with improved teaching

  Develop activities within HEEAP's scope specifically designed to improve the English speaking capacity of students of HEEAP engineering faculty. At the same time, assist the eight institutions with offering specialized English courses for faculty.

3. Training Location and Training Language

- *Design new active learning courses in Vietnamese.* To accelerate the application of active learning beyond HEEAP-trained faculty, design programs in Vietnamese similar to the ASU training but to be conducted in Vietnam. Engineering courses in Vietnam are overwhelmingly taught in Vietnamese. Acquiring the skill to use active learning in English, only to apply it in Vietnamese, adds unnecessary constraints to impact.
- *Intersperse training in active learning with practice.* Adults learn by doing (experiential learning). Faculty will learn faster and better by returning to the classroom to experiment with new active teaching techniques, and then returning to the training course to share experiences with peers. This is not possible when all training is conducted in the United States.

4. Training Approach

- *Select only Vietnamese faculty who excel in training courses in Vietnam for training in the United States.* Conduct the majority of training in Vietnam and select leaders who emerge from that training for a U.S. Training of Trainers (TOT) course in active learning. Upon return to Vietnam, they become co-trainers for the Vietnamese-language courses in active learning.

- *Organize workshops in Vietnam* throughout the year on specific active learning topics that faculty request.

5. Mentoring

- *Establish a dynamic mentoring program between ASU faculty and Vietnamese counterparts.* The HEEAP Scope of Work states that "the central component of HEEAP is faculty training and mentorship" (C.4). Strong in-country support from a HEEAP office will be needed to build a real mentoring program with ASU faculty. Also, Vietnamese faculty who have become leaders in active learning techniques can become mentors to their peers, in which case language barriers to mentoring disappear.

- *Access expertise from Vietnamese NGOs and consulting firms.* To leverage and sustain impact, HEEAP should build partnerships with Vietnamese organizations in implementing the project. Such an initiative responds to USAID FORWARD, an initiative spearheaded by USAID Administrator Rajiv Shah.

6. Implementing active learning

- *Encourage education leaders to address systemic policy issues that currently impede application of active learning in Vietnam.* Many faculty members pointed to major constraints in the institutions and in Vietnam's educational policies that posed real challenges to their use of active learning techniques in classrooms.

7. Accreditation

- *Consider the development of a Vietnamese accreditation body for engineering education.* While ABET accreditation may be an appropriate goal for some programs at universities in Vietnam, other countries have developed their own accreditation bodies.

B. TRACKING IMPACT

1. Monitoring and Evaluation

- *Conduct M&E more frequently using Vietnamese resources.* Monitoring should be continuously conducted by local experts in Vietnam, and implemented close to the target institutions.

- *Involve the Quality Assurance (QA) departments in more depth and consistency*. Each target institution has some sort of department that oversees quality within the institution, which is a requirement for accreditation, whether national or international. HEEAP should more closely integrate its M&E with existing M&E systems through a uniform M&E framework and standards, even though significant performance weaknesses exist in the QA departments.

- *Increase information sharing and collaborative planning with stakeholders.* HEEAP should find new ways beyond the C-COM and occasional conferences and emails to share successes and challenges faced in implementing teaching reforms among all eight institutions.

- *Drive decision-making with data from M&E activities linked to indicators.* The value added from M&E is at the decision-making level, to transition from the learning stage to the decision stage, providing justifications for project modifications throughout HEEAP's lifespan.

C. STRENGTHENING PUBLIC-PRIVATE PARTNERSHIPS

- *Create a strong in-country presence to manage a complex project.* Although the creation of a well-staffed HEEAP office is planned, the principal reason should be to bring the management of project activities closer to the target population.
- *Identify new ways to build on the accomplishments of HEEAP.* Locating more HEEAP activities in Vietnam as recommended elsewhere will have a snowball effect of attracting new partners.
- *Improve project management by creating a technical steering committee.* Improve HEEAP achievements by creating a Technical Steering Committee to provide Vietnamese-sensitive input and serve as a mechanism where management issues can be addressed.

I. INTRODUCTION

This report is divided into five sections: **Introduction**, **Project Description** (providing background on HEEAP's development and other related projects), **Methodology** (outlining the evaluation technical approach), **Data Analysis and Findings** (reporting data collected and information gathered grouped by topic, each followed by a finding supported by the data), and **Recommendations** (categorized by the three major evaluation themes and organized according to the Findings). The Scope of Work, survey instruments, project documents and other information are included in comprehensive Annexes at the end of the report.

II. PROJECT DESCRIPTION

The Higher Engineering Education Alliance Program (HEEAP) aims to transform engineering education in Vietnam from what is described as "passive, theory-based instruction to active, project-based instruction" with the goal of producing "work-ready" graduates for the country's booming high-tech sector.

HEEAP is the first of three Global Development Alliances (GDAs) from USAID/Vietnam intended to induce changes in higher education that help promote economic growth. The second GDA is the Vocational and University Leadership Innovation Institute (VULII), which expands on HEEAP by targeting university administration and operations. The third GDA is the Social Work Education Enhancement Program (SWEEP) which employs interventions similar to HEEAP, but aimed at transforming social work education in different target institutions.

Prior to USAID's involvement, the concept for HEEAP was initiated by Intel's assessment of human resource constraints it would likely face in building a high-tech manufacturing facility in Vietnam. Recognizing its short-term need for engineering graduates with the right "soft skills" to work with Intel, the company selected a group of young Vietnamese candidates and financed their entire undergraduate education in engineering at Portland State University (PSU). That first group will return soon to Vietnam and jobs at Intel. Although an expensive undertaking, this serves a short-term need for Vietnamese engineers fluent in English, able to work in teams, resourceful in resolving problems, anxious to learn and innovate, and committed to helping Intel build a first-rate work force.

Recognizing its longer-tem challenges, Intel began designing an intervention that would reform how Vietnamese students learn engineering. Intel's ideas sprang from a limited number of studies about Vietnamese tertiary education, in particular one focusing on engineering education completed in 2007. HEEAP was seen as a systemic response to a national problem impeding young Vietnamese from being competitive in the modern high-tech workforce. The new project would seek to reform two of the numerous engineering fields (mechanical and electrical) at five top universities in Vietnam. In year two of HEEAP, three vocational colleges were added as an effort to help provide engineering *technicians* for the Vietnamese human resource base, adding electronic and software engineering as a third field eligible for HEEAP training.

In 2009, USAID issued an Annual Program Statement, a procurement announcement to which a number of U.S. institutions responded. In June 2010, USAID signed a Cooperative Agreement with Arizona State University in Tempe, Arizona to implement HEEAP over the course of three years. An MOU was subsequently signed describing the respective roles and financial contributions from USAID, Intel and ASU. The new partnership trio built on previous activities funded by Intel and implemented by ASU, which facilitated rapid trust building and communication essential to a successful GDA.

The principal intervention employed to induce changes at the five universities was faculty training. In the first year, 25 Vietnamese faculty were selected from the five original target institutions to travel to ASU for a 6-week program on curriculum design and active learning. In the second year, three vocational colleges were added and a group of faculty from those institutions was invited to Arizona for a shorter 4-week program tailored to their needs. A new group of university lecturers also travelled to the United States for the 6-week program.

The third cohort of Vietnamese training participants from all eight institutions attended training at ASU in 2012. Several conferences and seminars were held in Vietnam, designed and delivered by ASU, to address specific topics of active learning (for example, how to apply the new teaching techniques to large classes) and to promote communication among returned participants. Two major components in the HEEAP design that aim to support changes in higher education in Vietnam are mentoring and faculty institutional projects. The former assigned ASU professors to various faculty projects and to individual Vietnamese training participants. The faculty projects were initiated during the training program and were expected to be implemented the first year after the faculty returned. Small groups of faculty were formed around a project theme during the training at ASU.

Although the principal GDA partner for USAID is Intel, additional corporate partners joined the "Alliance", primarily contributing laboratory equipment in great need at the target institutions. Siemens, Danaher Corporation, and Honeywell are currently part of the Alliance, although the responsibility for HEEAP management rests with Intel and USAID, and ASU as the implementing agency.

III. METHODOLOGY

To present findings that are evidence-based and data-driven, quantitative and qualitative information was collected and triangulated to minimize subjectivity. *Appreciative Inquiry* guided all questions, both in the survey and especially in focus groups, to drive respondents towards solutions rather than problem identification. A description of appreciative inquiry is included in the Annex for those unfamiliar with this approach.

A methodological framework was used in the evaluation to maintain focus on the objectives and enhance the analysis of data. Data collection instruments were developed within the parameters of the framework to avoid unnecessary (and costly) data collection or confusion in the data collection process. The instruments were developed with the intention of avoiding excessive questions, and unclear evaluation objectives or the lack of a guiding framework, and followed a tested evaluation approach. The methodological framework used is described below, followed by scope and activities of this evaluation.

Although the bulk of the project lent itself to the Kirkpatrick framework described below, the GDA element was best captured through key informant interviews with project managers at the three partner institutions (Intel, USAID and ASU) most closely involved in implementation and funding. Since training was not employed to develop or maintain the alliance, the evaluation framework did not apply.

Donald Kirkpatrick's Four Levels of Evaluation (Kirkpatrick, 2006)[1] allows assessment teams to view training impact through a prism that gives structure and soundness to the journey. This tested framework is simple yet adaptable to a variety of settings, including those in developing countries. The evaluation "hierarchy" – with the individual at the base and the institution at the top – supplies a tool to begin the search for impact from training and allows for add-ons and adaptations along the way. The Kirkpatrick methodology easily guides the development of a concise and targeted survey instrument by enabling the designers to aim questions at four levels.

[1] Kirkpatrick, D.L. & Kirkpatrick J.L. (2006). *Evaluating training programs* (3rd ed.). San Francisco: CA. Berrett-Koehler Publishers, Inc.

1. ***Reaction*** - the trainee's impression of the program; the level of satisfaction with the course, trainer, pace of instruction, content and materials
2. ***Learning*** - the acquisition of knowledge, skills and attitudes (KSA) from the training
3. ***Application*** - the performance of the trainee on the job following the application of KSA
4. ***Results*** - changes that the trainee's performance brought to the organization

The brief descriptions of the four evaluation levels that follow are intended for readers unfamiliar with the approach.[2]

KIRKPATRICK'S EVALUATION MODEL

Data gathered at ***Level One (Reaction)*** tells us the minimum amount of information needed to assess a training program. If the trainees judged the program "very satisfying," we can safely eliminate an important obstacle to obtaining results from training: displeasure with the training received.

If the trainees were satisfied with the program, did they learn anything? A ***Level Two (Learning)*** inquiry helps determine whether skills and/or knowledge were acquired, and/or whether attitudes changed during the training program. Without this transfer, impact cannot occur. If the transfer is noted, then a performance change *could* occur if KSA were applied in the workplace.

The ***Level Three (Application)*** question asks that if skills were acquired during training, were they subsequently used (applied) in the workplace? Without application, human performance change is hypothetical and KSA remain within the individual. Training is limited to a "feel-good experience" that does not lead to institutional impact, but might appear useful to the participant.

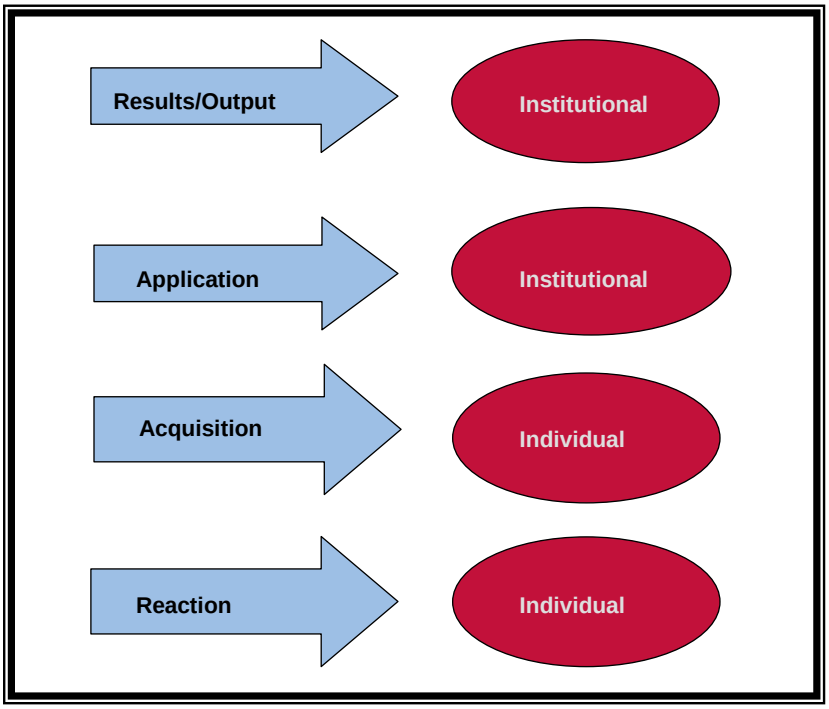
The ***Level Four (Results)*** question seeks to determine whether any performance changes at the organizational level resulted from the application of skills in the workplace. Although Results is the highest evaluation level, it is infrequently documented in institutional assessments or evaluations.

Change attributed to training at Level 2 is *individual impact* and at Levels 3 or 4 is *institutional impact*. Figure 1 below portrays the relationship between individual and institutional impact. The left arrows display the essence of the evaluation levels: reaction (or satisfaction), acquisition of KSA - knowledge, skills and new attitudes - (or learning), application of KSA in the workplace, and results/output (or impact). A trainee is satisfied with the "learning environment" or program (Level 1), learns something new and presumably useful (Level 2), and returns to the workplace to apply what was learned (Level 3). After a lapse of time, the institution increases its output as a result of the trainee's application of what was learned (Level 4).

Kirkpatrick's model to evaluate the impact of training is still used today in the U.S. and in worldwide organizations. Definitions abound about what these terms mean, but fundamentally, they adapt easily to diverse environments. Kirkpatrick's legacy was a de-emphasis on the individual as the level of measurement for changes attributable to training, in favor of the application of the benefits of training to organizational output.

2. Further information can be found online on several training-related websites (American Society for Training and Development, International Society for Performance Improvement, etc.).

Figure1: Kirkpatrick's Four Evaluation Levels



A. PRINCIPAL EVALUATION QUESTIONS

The evaluation, termed a "mid-term evaluation," was conducted at the end of the first HEEAP project. The intent was to produce a forward-looking assessment whose findings and recommendations could be incorporated into follow-on programs. As it turned out, USAID designed and funded a complementary project (VULII), which began in October 2012 prior to the end of what some refer to as HEEAP 1.0 (the first HEEAP project and the focus of this report). VULII is intended to respond to unmet capacity-building needs that had been revealed over the course of implementing HEEAP.

It was recognized that impediments to achieving HEEAP's goals (transforming engineering education in the target institutions to produce work-ready graduates for industry) were also affected by administrative constraints at the institutions as well. The VULII project design focused on building the internal institutional capacity in quality control, monitoring impact and leadership that would complement the follow-on to HEEAP, referred to as HEEAP 2.0, whose direct responsibility shifted from the USAID/Intel/GV partnership to Intel and the GV. The value added of this final evaluation would therefore aim to improve "HEEAP 2.0," as it came to be called.

The Scope of Work (SOW) identified three focus areas for evaluation, each suggesting a series of questions for the evaluation team to consider (see Annexes for SOW containing all evaluation questions):

1. ***Project Achievements.*** The success of HEEAP in advancing cutting-edge instruction, providing a relevant and up-to-date curriculum, improving undergraduate learning outcomes, and garnering institutional support for such reforms. The approach advanced by HEEAP was tightly aligned to the Accreditation Board for Engineering and Technology (ABET);
2. ***Project Monitoring & Evaluation.*** How results achieved by the program are seen and measured by program funders and stakeholders and whether or not current project indicators best reflect the performance of the project; and
3. ***Global Development Alliance.*** The contributions of the GDA structure to program results over and above the results that could have been achieved by USAID funding alone.

Under each of these subject areas, the suggested questions, which are included in the Annexes, guided the team throughout the fieldwork. The team referred to these questions repeatedly to ensure that data collection efforts were correlated to specific questions that interested the client, USAID and indirectly, Intel.

The SOW directed the team to conduct a "robust" evaluation of the HEEAP program based on triangulation of information sources, including a) documents reviewed, b) surveys and interviews, and c) classroom and campus observations.

Under the first focus area, questions revolved around whether the project met its targets, encountered difficulties in training, mentoring, leadership development or institutional reform, and advanced a "sustainable, ABET-style approach to improved instruction." It included the following: Did HEEAP result in improved undergraduate learning outcomes and institutional reform? Were program activities sustainable beyond USAID's involvement? How were Vietnamese participants selected? On what basis were changes in HEEAP, if any, instituted, and what was the impact?

The second focus area looked at a critical component of any development project: monitoring results obtained along the way and evaluating their impact. It included the following: How were results measured by the project and presented to donor/partners? Was the approved M&E plan effective? How was information used by program implementers, donors and stakeholders? Was the results framework useful and were indicators appropriate? How has the private sector measured and understood the program's results, if any?

The third area departs from typical evaluation targets in that it points to HEEAP as an example of USAID's Global Development Alliance (GDA) efforts. This type of USAID-funded project is a partnership with a private-sector entity, in this case Intel, where both partners agree to provide funding to reach goals that respond to the respective interests of each partner. USAID is particularly interested in understanding the differences and the impact of a GDA project compared to a classic development project where USAID is the sole donor. A series of questions was identified to help USAID learn about implementing a GDA, from whether the partnership structure contributed to program results to whether the program can be scaled up and sustained if USAID assistance decreases.

B. SCOPE AND LIMITATIONS

The scope of the evaluation was its principal limitation. Of the eight institutions hosting HEEAP activities, the assessment team visited only three: two universities (HUST in Hanoi and HCMUT in Ho Chi Minh City) and one vocational/technical college (HVCT in Ho Chi Minh City). Time and budgetary constraints drove USAID to reduce the scope so that sufficient depth and objectivity could be assured within a three-week field visit.

Target institutions were not selected using a standard technique, such as basing the choices on location (south/central/north), size of student population, number of engineering fields, number of faculty, etc. These types of sampling strategies may have enabled the team to present findings that were more

representative. The two universities selected were considered among the finest engineering schools in Vietnam, both located in the country's two largest cities, and the one vocational college chosen likewise was known as one of the best in its group, also located in a major urban area. The sampling lacked a smaller, less well-equipped institution located in an area far from major urban centers. Time and budget constraints restricted the team to these three institutions selected by the donor.

Despite this limitation, the team was able to include data from the five institutions not visited by conducting an online survey consisting of 15 questions organized according to Kirkpatrick's framework described above. Interestingly, faculty respondents from the institutions not visited by the evaluation team responded at a higher rate than those from the three visited institutions, providing the team with valuable insights to compare with data gathered from face-to-face encounters with key individuals at the visited institutions in Hanoi and Ho Chi Minh City.

Each institution visited cooperated fully in arranging focus groups with faculty, classroom observations, and key informant interviews. Three classes at each campus were observed: two HEEAP classes and one non-HEEAP class, totaling nine classroom observations. At the team's request, the selection of the non-HEEAP classes to visit was random in that the team was given several classes to choose from, given the exigencies of scheduling. Non-HEEAP classes were engineering classes that had no connection with the HEEAP project, and thus served as a mini-control group. Given the time constraints of spending a maximum of two days on each of the three campuses, it was not possible to produce statistically significant data from so few classroom observations. Even though it was not possible to draw conclusive findings from such a small sampling of classrooms, the observations offered valuable insights to classroom dynamics that complemented information gathered through focus groups.

In regards to documentation, the team had access to quarterly reports, the M&E plan, annual workplans, MOUs, some website and promotional materials, USAID agreements, and a small amount of financial information. Accessing information from ASU was more challenging. The principal sources of project information during the first two weeks of fieldwork were the quarterly reports, which the team scoured for data and indications of project achievements. The M&E sections consisted mostly of narratives with insufficient primary supporting data, limiting the team to analysis conducted by ASU. The faculty project reports, a key element of post-training impact, were not made available, although references were made to abstracts of these reports on the website. At the end, the team was able to review project proposals but not completed project reports. Two days prior to the end of fieldwork, the team obtained limited access to the site where the daily training programs at ASU organized for the three Vietnamese cohorts could be viewed for the first time. To determine the extent to which post-training mentoring occurred, the team was limited to relying on responses to the online survey; there was no access to the HEEAP websites to determine the degree to which participants were communicating with each other after participating in training and returning to Vietnam.

C. INTERVIEWS AND SITE VISITS

A set of instruments was designed to collect data from the following:

- Key informants, located at the three institutions, two GDVT ministries (MOET and MOLISA) in charge of education and vocational training, at USAID/Vietnam and USAID/Washington, Intel Vietnam and ASU
- HEEAP and non-HEEAP faculty at the three institutions
- HEEAP and non-HEEAP students
- HEEAP and non-HEEAP classrooms
- Faculty trained at ASU over three years (123 participants)

Data Sources

- Key Vietnamese informants 25
- Faculty Focus Groups 6
- Student Focus Groups 9
- Returned Trained Faculty (online survey) 123
- Key U.S. informants 9

Key informants were Rectors, Vice-Rectors, engineering department heads, faculty, students, project managers and coordinators from the institutions, ASU and the HEEAP office, MOET and GDVT. The team interviewed faculty and students (non-HEEAP) who were *not* associated with HEEAP at each institution to serve as a mini-control group. Nine classroom observations were conducted, also of both HEEAP and non-HEEAP classes. At ASU, the team met engineering professors who conducted training for the Vietnamese faculty as well as the Dean of the School of Engineering.

In addition to the people interviewed or surveyed (listed above), the team adapted a quantitative classroom observation tool to use in visiting classes within the three institutions. This tool enables the observer to check off characteristics that describe the level of active learning occurring in the visited classroom. This method promoted objectivity in observations by clearly identifying what was, or was not, happening during the course of a single class. The team observed nine classes divided between those taught by HEEAP faculty and those taught by non-HEEAP faculty. During five-minute observation segments, the team member conducting the observation checked off boxes on the type of interaction occurring, if any, between lecturer and student, whether students were listening or talking among themselves, and the methods the lecturer was using (lecturing, questioning and lecturing, group work, case studies, etc.) to impart knowledge. Content was not the focus of the classroom observation tool. Since classes were taught primarily in Vietnamese, most observations were conducted by the team's Vietnamese members. The team spent several hours reviewing the observation sheets and quantifying the results to formulate findings. Given the number of classrooms visited, no statistically significant finding could emerge solely from the classroom observations. However, they provided useful insights as to the difficulties encountered, in particular by HEEAP faculty, of introducing active learning in their classrooms. (The two tools used are included in the Annexes).

In an effort to obtain the most accurate information, Vietnamese was the preferred language for all data gathering with the exception of the following, which were conducted in English: faculty focus groups and most key informant interviews. Vietnamese was preferred at the single vocational/technical college visited.

In addition to surveying those associated and not associated with HEEAP, the team visited laboratories at each institution where some equipment had been provided by HEEAP. The purpose of these visits was to judge whether the equipment was appropriate and being used.

D. ONLINE SURVEY

The online survey was intended to reach the institutions not visited and to supplement qualitative data gained from interviews and focus groups. In addition to a few questions gathering basic information about the respondent, 15 questions were developed in an attempt to determine the extent of impact resulting from HEEAP interventions at Kirkpatrick Levels 3 (Application) and 4 (Impact/Results). A few questions addressed levels 1 (Satisfaction) and 2 (Acquisition of KSA), primarily to establish a context for the respondent.

Yes/No questions were followed by a request for examples. This enabled the team to apply grounded analysis to answers, a technique that allowed the team to avoid false positives – a "yes" where the example offered disproves the affirmation. For example, question 10 asked:

> *Have you changed your teaching methods because of participation in the HEEAP training at ASU? Y N*
>
> *10a. If yes, please list up to THREE ways your teaching has changed*:

If a respondent answered "yes" and gave as an example a teaching method that was not taught at ASU during the training program, the team can change the answer to "no" using grounded analysis.

This technique increased the credibility of participant answers by forcing them to provide concrete examples to justify their affirmative answer. Other text entries contained comments and suggestions

that could be reviewed for insights into impact. These open-ended answers were organized to facilitate rapid reading and analysis by the team. In some cases, the analysis of the text answers was quantitative. For example, when participants wrote similar or identical answers to questions, they were grouped during the analysis, and then arranged according to the frequency with which they were cited. The results from this type of analysis are included in several sections of the report and provide a quasi-quantitative analysis of answers to open-ended questions.

The online survey was created in English and translated into Vietnamese by an outside translator with accuracy verified by the two Vietnamese team members. Once translated, the survey was put on Survey Monkey in Vietnamese only. Emails inviting potential participants to take the survey were sent to each individual who participated in faculty training. The ASU database of trainee information was up-to-date and allowed the JBS home office to broadcast 123 emails to faculty at the eight institutions with few non-delivery messages. By the deadline ten days later, 92 (75%) of the 123 participants had returned completed surveys, a return rate that enabled the team to rely heavily on its analysis of the survey. Various methods were used to generate this high return rate, including follow-up emails to all 123 participants three days before the deadline, telephone calls and emails to contacts at the five institutions not visited to encourage faculty to respond, and reminders made at faculty focus groups. The fact that the survey was in Vietnamese also facilitated a high return rate, in particular for those respondents from the vocational/technical colleges who were trained at ASU in Vietnamese rather than in English. Open-ended answers were translated into English so that the two U.S. team members could analyze the results along with the two Vietnamese team members. The team applied a quantitative measure to the text answers by grouping them into themes and calculating the number of responses for each.

Based on an analysis of the profile of respondents (gender, location, cohort, etc.), the team concluded the following:

- There was little bias in the sampling by characteristic, location, gender, and cohort.
- There was a high return rate.
- The quantitative and qualitative data obtained can supplement other data gathering.
- Answers to open-ended questions presented both qualitative and quantitative data.
- This was the only source of data representing faculty trained at ASU from all eight institutions.

The English version of the online survey is included in the Annexes.

E. DOCUMENT REVIEW

The team reviewed project documents, Memoranda of Understanding, HEEAP Quarterly Reports, the HEEAP Final M&E Plan, GDA reports sent by USAID Washington, Work Plans, ASU training programs, some curricula obtained from the target universities and additional studies on higher education and engineering education in Vietnam. The two Vietnamese team members provided the expatriate team members with vital context and information about Vietnamese higher education that supplemented hard information at hand.

References or in some cases copies of these documents are included in the Annexes.

IV. DATA ANALYSIS AND FINDINGS

A. IMPACT

1. Active Learning: Did participants acquire the knowledge and skills needed?

The HEEAP participants understood that an objective of HEEAP was to help them learn active learning methods. In response to the prompt "Please list below ONE of HEEAP's objectives," a majority of responses (77.2%) described innovative and active teaching methods. Other frequent responses were

teaching soft skills (15.2%) and producing work ready graduates (13.0%), also HEEAP objectives. Only three people gave an answer that was not a HEEAP objective; for example, integrating technology into teaching.

In question 5, we asked HEEAP participants to rate the usefulness of each component of the training:

> *5. Please rank the usefulness of the following topics that you were taught during the HEEAP training at ASU to your work at your institution. Select a number from 1 to 4 representing your opinion below each topic. If you did not have one of the topics, please select "NA" for "Not applicable".*

The first table below shows that all components of the training were rated as useful or highly useful by between 87% and 99% of those responding. Women found all the topics more useful than men, except for Developing Strong Experiments and Analytical Thinking, but even for that topic, 90% of the women found the topic Useful or Highly useful.

Table 1. Faculty perspectives on usefulness of HEEAP training topics

Training Components	Useful	Highly Useful	Useful and Highly Useful
New Instructional Methods for Engineering Instruction	29%	70%	99%
Project Methods and Approaches	51%	47%	98%
Instructional Assessment and Evaluation	44%	53%	97%
English and Communication Skills for Engineers	38%	57%	94%
Business Communication and Leadership	49%	41%	90%
Multidisciplinary Approaches to Engineering Education	51%	39%	89%
Developing Strong Experiments and Applied Analytical Thinking	55%	31%	87%

Table 1a. Male faculty perspectives on usefulness of HEEAP training topics

Training Components	Useful	Highly Useful	Useful and Highly Useful
New Instructional Methods for Engineering Instruction	31%	67%	98%
Project Methods and Approaches	50%	46%	96%
Instructional Assessment and Evaluation	40%	55%	95%
English and Communication Skills for Engineers	31%	58%	89%
Business Communication and Leadership	45%	43%	88%
Multidisciplinary Approaches to Engineering Education	45%	40%	85%
Developing Strong Experiments and Applied Analytical Thinking	49%	49%	98%

Table 1b. Female faculty perspectives on usefulness of HEEAP training topics

Training Components	Useful	Highly Useful	Useful and Highly Useful
New Instructional Methods for Engineering Instruction	26%	74%	100%
Project Methods and Approaches	50%	50%	100%
Instructional Assessment and Evaluation	50%	50%	100%
English and Communication Skills for Engineers	37%	53%	90%
Business Communication and Leadership	57%	39%	96%
Multidisciplinary Approaches to Engineering Education	60%	37%	97%
Developing Strong Experiments and Applied Analytical Thinking	68%	23%	90%

The component New Instructional Methods for Engineering Instruction included project-based learning, active learning, ABET alignment of curriculum drivers for change, establishing relevance, integrated curriculum, adapting to learning styles, problem based instruction, showing concern for students, and integrating applied soft skills. This component drew the highest "usefulness" rating, possibly due to it carefully addressing major needs of the Vietnamese participants.

> *"HEEAP gave us a goal. Before HEEAP, we didn't know. HEEAP has had a big impact."*
>
> (Faculty lecturer/HEEAP Participant)

The above answers respond to Kirkpatrick Level 2 (Acquisition of KSA). If Vietnamese trainees had not learned the Knowledge, Skills and Attitudes during the HEEAP program designed by ASU with input from Intel and USAID, they could not return to their institutions to apply active learning. However, HEEAP is seeking to make *institutional* changes beyond the individual's acquisition of new KSA; follow-up to ensure application in Vietnam is critical for the project to achieve its goals.

The analysis of the results above is limited by the team's inability to determine exactly which components of the training were presented to each university and vocational cohort. We do know that some of the components listed above were not given to the vocational faculty cohorts. We believe that the *New Instructional Methods for Engineering* module was one of the components included in the training for all five cohorts (three university and two vocational), which could bias the results toward participants rating that component as useful.

Finding: A high percentage of HEEAP participants found the training conducted at ASU in active learning methods to be useful and highly useful.

2. Active Learning: Did participants apply the knowledge and skills acquired?

Three survey questions sought to identify what HEEAP participants were able to *apply* at their institutions:

> *8. Did you apply any of these topics in your work in Vietnam?*
> *8a. If yes, please list the THREE that you applied the most:*

8b. If no, please tell us the reasons you were not able to apply the skills and knowledge you learned at ASU.

Respondents were given a list of topics, categorized by the components of the training. Most respondents answered using topics copied from the provided list (included in the Annexes). Each main topic below included sub-topics (not shown) related to the main topic which could be selected by respondents. The following tables calculate responses only from the main components, within which respondents could choose several sub-topics:

Table 2. Faculty reports of HEEAP topics applied at institutions

Training Components	N	%
New Instructional Methods	95	36.3%
English and Communication	54	20.6%
Project Methods and Approaches	44	16.8%
Instructional Assessment and Evaluation	46	17.6%
Multidisciplinary Approaches to Engineering Education	13	5.0%
Business Communication and Leadership	5	1.9%
Developing Strong Experiments and Applied Analytical Thinking	5	1.9%
Total	262	100.0%

Note: Total refers to total number of responses, not participants. Each participant could select multiple options.

Table 2a. Male faculty reports of HEEAP topics applied at institutions

Training Components	N	%
New Instructional Methods	67	38.3%
English and Communication	34	19.4%
Project Methods and Approaches	29	16.6%
Instructional Assessment and Evaluation	29	16.6%
Multidisciplinary Approaches to Engineering Education	9	5.1%
Business Communication and Leadership	2	1.1%
Developing Strong Experiments and Applied Analytical Thinking	5	2.9%
Total	175	100.0%

Note: Total refers to total number of responses, not participants. Each participant could select multiple options.

Table 2b. Female faculty reports of HEEAP topics applied at institutions

Training Components	N	%
New Instructional Methods	28	32.2%
English and Communication	20	23.0%
Project Methods and Approaches	15	17.2%
Instructional Assessment and Evaluation	17	19.5%
Multidisciplinary Approaches to Engineering Education	4	4.6%
Business Communication and Leadership	3	3.4%
Developing Strong Experiments and Applied Analytical Thinking	0	0.0%
Total	87	100.0%

Note: Total refers to total number of responses, not participants. Each participant could select multiple options.

New Instructional Methods again topped the list with 91 mentions of that component or some topic included within that component.

Faculty focus groups reinforced the finding that faculty applied methods they learned in the training, including using video demonstrations in class; asking questions at the start of a new topic to prepare students for the material; assigning and grading more homework; having students do projects and presentations; shifting away from a sole emphasis on tests to including projects, presentations, and other activities in grades; creating an online forum for students to ask and answer questions; using team building exercises; and increasing eye contact with all students. They also reported other activities such as opening up labs for student use outside of lab hours, a practice they observed at ASU.

Only four respondents (three men and one woman) to question 8 indicated they were unable to apply any of the topics. All four respondents cited large classes as a reason for this; one (male) respondent mentioned the lack of classroom equipment and the limited English skills of students.

Faculty focus groups also cited large class size as an obstacle to applying the methods they learned. Many of the active learning methods have been widely and successfully applied in large classes, and the training was changed in 2011 to respond to this need, but HEEAP participants still struggled with applying active learning in classes with many students. Classroom design was another obstacle; desks could not be moved for group work, and windows had no curtains so students have trouble seeing videos and other presentations.

Some lecturers reported that students were focused on grades, accustomed to passivity, and sometimes resist the new methods. Some called for synchronization (the adoption of new methods in all classes at once) so that students are not confused by the different methods of teaching and grading in different classes. However, faculty at HVCT said that their students were focused more on learning, not on grades.

Finding: Faculty members returning from HEEAP-sponsored ASU training found the program highly useful and reported having applied active learning in their institutions.

2a. Follow-on impact: Faculty Projects

The faculty projects are an integral and vital component of the HEEAP project. Returning faculty members can remain engaged with colleagues who also participated in the ASU training, but also focus on activities that would result in a significant change at the university or college. Faculty projects are a vehicle that can channel individual change towards institutional change. If faculty projects were to achieve their objectives, for instance curriculum reform or the development of a new curriculum, HEEAP would contribute significantly to the change process.

Each participant trained at the ASU program was required to participate in an *institutional change project* after returning to Vietnam, as stated in the first Quarterly Report:

> *Ongoing mentoring and coaching sessions will continue between the faculty through digital media technologies such as web-conferencing tools and/or videoconferencing through IP. The objective of these mentoring and coaching sessions is to support the Vietnamese faculty in the development and implementation of their change projects. After the Tet Holiday, we will begin monthly project status reporting by faculty to document progress and address any implementation issues. All projects and deliverables (materials, syllabi, and instructional labs) will be shared across all five schools through an open source portal accessible through the HEEAP.org web site. Faculty will also complete a formal research paper at the conclusion of their project documenting both quantitative and qualitative data analysis measuring impact as aligned to HEEAP project objectives.* (HEEAP Quarterly Report, Sep-Dec 2010)

The evaluation team set out to discover the impact of the faculty projects first by obtaining copies of the final reports, or descriptions of results they engendered, and second, by including a question in the online survey to all training participants. The survey produced the most valuable results, as the team was unable to access the full faculty project reports.

While the program was designed to have all participants work on a project and be mentored, the survey results raised questions about whether these steps actually occurred. Of the 86 respondents to Question 6 ("After you returned to Vietnam, did you work on an Institutional Faculty Project that you started at ASU?"), 19 (22% of 86) answered negatively - a figure the team found high. Some faculty may have moved to an administrative position (e.g., department head, dean, or chair) and may not have participated, but the number of negative responses is too high for that explanation to be plausible. Despite careful wording in the survey, perhaps some respondents failed to understand the question (or did not recognize "institutional project") and mistakenly answered "no." However, if the answers were valid, having 22% of the returned participants not complete a required part of the HEEAP experience was noteworthy.

Table 3. Faculty reports of participation in Institutional Faculty Projects

	Number	Percent
Yes	67	77.9%
No	19	22.1%
Total	**86**	100.0%

The rate of participation in projects was higher for men (82.5%) than for women (69.0%); higher for vocational institution faculty (81.8%) than for university faculty (75.9%); and higher for the first cohort (93.8%) than for the other two cohorts (73.7% and 76.5%). All of those who participated in a project rated it as "useful" or "highly useful", and 56.1% reported it was "highly useful." The "highly useful" rating was higher among men (59.6%) than women (47.4%); higher for university faculty (62.5%) than for

vocational faculty (44.4%); and higher for the 2011 cohort (70.4%) than for the other 2010 and 2012 cohorts (46.7% and 42.3%).

We cannot conclusively report that all faculty projects occurred, were completed, contributed to HEEAP's goals, or had an impact at the eight institutions. The HEEAP country manager provided the team with a hard copy of what was referred to as a "faculty project report" (the Can Tho curriculum redesign described in Section 5 below) which did not contain the format or level of analysis expected. The team was unable to review other faculty reports that were to have been completed by the project teams from the 2010 cohort. According to the HEEAP Quarterly Report, Oct-Dec 2010, there was one project at each institution, with two projects at CTU, for a total of six projects. One year later, the Oct-Dec 2011 report stated: "Completed papers will be published on the HEEAP Web site by May 1st [2012] for review by peers and also submitted to professional journals and magazines with a focus in engineering and engineering education." The Oct-Dec 2012 Quarterly Report stated: "The first cohort of HEEAP faculty recently submitted their final project reports." The project by the 2010 HCMUT cohort was reported in a paper presented at the March 2013 HEEAP-sponsored conference held at Can Tho University. That paper ("New Assessment and Learning Methods for Electrical Engineering Courses at HCMUT" by Pham Dinh Truc and Hoang Trang) was written by two HEEAP participants, not the group that was to have completed a faculty project. The report concluded: "The application of the new pedagogical methods and Rubric assessments has improved the learning environment of senior students at The Faculty of Electrical and Electronic Engineering, HCMUT." The team remained unclear as to whether this presentation was, or was derived from, a faculty report.

2b. Follow-on impact: Mentoring

Since mentoring was already identified as one of the key techniques to ensure impact after the trainees return to Vietnam, the team sought to discover the role mentoring played post-training. Mentoring was also linked to the faculty projects.

In response to survey question 7 ("Since you returned to Vietnam, have you worked with anyone at ASU?"), 75 out of 90 (83.3%) said "Yes." The rate was higher for women (90.3%) than for men (79.3%); higher for vocational (91.2%) than university (78.2%); and increased with each cohort (73.3% for the 2010 cohort, 81.6% for 2011, and 89.2% for 2012). It is important to note that the vocational colleges had higher percentages of women in the survey population and that no vocational college faculty participated in the 2010 ASU program.

Since mentoring calls for more contact than once or twice per year, answering the question affirmatively does not indicate whether mentoring actually occurred. There is also a built-in bias to answer "yes" if the respondent was satisfied with the ASU program. The follow-up question was designed to lead the respondent towards answering the more significant question that triangulates or grounds the previous closed-ended question.

Those answering "Yes" were asked: "If yes, how often have you communicated with the ASU person, either by email, website, text/chat, video conference, telephone/Skype, etc.?" The answers for the two questions (whether and how often communication occurred) are shown in two categories in the following table:

Table 4. Faculty reports on frequency of communication with ASU mentors

"If yes, how often have you communicated with the ASU person, either by email, website, text/chat, video conference, telephone/Skype, etc.?"	**N**	**%**
No, Once and Occasionally (once or twice per year)	64	70.3%
Frequently (at least once per month), Very Frequently (weekly)	27	29.7%

Table 4a. Male faculty reports on frequency of communication with ASU mentors

"If yes, how often have you communicated with the ASU person, either by email, website, text/chat, video conference, telephone/Skype, etc.?"	**N**	**%**
No, Once and Occasionally (once or twice per year)	40	65.6%
Frequently (at least once per month), Very Frequently (weekly)	21	34.4%

Table 4b. Female faculty reports on frequency of communication with ASU mentors

"If yes, how often have you communicated with the ASU person, either by email, website, text/chat, video conference, telephone/Skype, etc.?"	**N**	**%**
No, Once and Occasionally (once or twice per year)	25	83.3%
Frequently (at least once per month), Very Frequently (weekly)	5	16.7%

These results confirm what the team had been hearing during focus groups and interviews: that significant mentoring was not occurring. The percent reporting *frequent* or *very frequent* interaction was only 29.7%. While some faculty reported that questions sent to their mentors were answered ("I asked for material and got it"), their mentors did not initiate contact frequently. Mentoring requires frequent communication in both directions – with the mentor initiating communication even more important than responding. Others reported contact with HEEAP staff, but not with faculty, which should not be considered mentoring.

It is likely that mentoring was explained and established during the training program, and that mentors were duly associated with each faculty project, or with individual participants. The survey reported that a majority of faculty respondents contacted their ASU mentors via email with questions, to respond to surveys from ASU, or with information about their own projects on individual research or study abroad. However, mentoring requires continuous organizational support to have an impact, as well as a strong commitment from the mentor, which the team did not observe.

2c. Follow-on impact: Website

Also, according to the HEEAP Quarterly Report, Sep-Dec 2010:

> *In addition, a new HEEAP web site version was launched on January 30th [2011]. This site will provide more information about the outcomes and events support HEEAP. For example, project success stories will be featured on the site as well as information for current and future faculty and institutional partners. In addition, an open source portal will provide HEEAP faculty and C-COM members access to all faculty project materials including syllabi, content, and other materials for information sharing and leverage by all five institutions. The site will also be used and networked with resource partners to recognize their contributions, but to also solicit new resource partners. The site can be accessed at www.heeap.org.*

The team could not gain access to this website beyond the public area and was unable to confirm its usefulness as a medium for exchange of information among participants. Survey respondents and participants in faculty focus groups did not spontaneously mention using this website. The website could serve as one of the principal vehicles by which faculty across the eight institutions could exchange information with peers about experimenting with active learning, obstacles encountered, and strategies developed to improve the teaching of engineering. In focus groups, faculty members expressed a strong desire to network with other faculty members and with other institutions regularly, but the mechanisms supporting increased interaction were adequate.

Finding: Individual faculty members did apply new active learning techniques acquired at ASU upon their return, but had insufficient support (for faculty projects, mentoring or communication among HEEAP faculty) to share their experiences beyond themselves or a small group of peers. Even though some changes were introduced (a new curriculum, for instance) without follow-on impact support, individual changes will not be translated into larger-scale institutional change.

3. Obstacles to Leveraging Impact

Overworked Faculty: Over the long run, while participants reported that they were able to apply new methods, many expressed doubts about their ability to sustain the changes. For example, while the $5,000 HEEAP stipend for each returned participant to hire Teaching Assistants (TAs) reduced workload somewhat (especially with assigning and grading homework), and enabled faculty to try new methods, the stipend lasted for only one year. When the support ended, lecturers reverted to their previous workload without the TA, and discontinued use of some active learning methods (e.g., frequent small tests). Other methods require additional work upfront; for example, having students do presentations, but may become easier and require less time by the lecturer in the second and third applications.

> *"New methods take time – videos, preparation, and evaluation take much more time. Students have to work hard every week, not just study for the exam."*
> (HEEAP Returned Faculty)

Structural and Systemic Obstacles: One key informant told us not to expect faculty members to change in one year, a view MOLISA informants supported with similar comments. Institutional and even national support was needed to accelerate change; an ambitious idea to some observers, given what they consider a conservative government unaccustomed to rapid adjustments to meet the needs of a fast-paced economy. Policies regarding salaries need reform to reduce the common practice of lecturers teaching courses at other institutions or holding a second job. All focus group participants agreed that while the new teaching methods were excellent, the methods demanded considerably more work and time than simple lecturing. In short, applying new teaching methods competed with faculty needs and time constraints.

Many faculty members said that the motivation to change and to continue to change was personal: "[The] difficulty in spreading methods is that the University doesn't have the right policies to

encourage." However, one chair said, "It needs an emphasis by each professor rather than a movement." The evaluation team heard more about obstacles to reforming teaching, both structural and systemic, at universities visited than at the vocational/technical college visited.

In all three institutions visited, the faculty not associated with HEEAP who were interviewed as a mini-control group showed great interest in the HEEAP program and many were eager to participate in the training. Some had applied to the program, but were rejected because they were not in the targeted departments of mechanical, electrical or electronic/software engineering.

Finding: Institutional and policy obstacles impeded HEEAP faculty from applying new teaching methods; addressing these obstacles was beyond the reach of the HEEAP project.

4. Impact on student outcomes and graduating work-ready engineers

The HEEAP training at ASU focused on transferring knowledge and skills to apply active learning in the classroom with the goal of improving the soft skills of graduates, thereby enabling them to become work-ready engineers for Vietnam's rapidly changing economy. The objectives were complementary: improve the quality of engineering teaching by applying active learning while imparting soft skills to students so they become technically-competent and able to work in a high-technology work place in Vietnam.

The evaluation did not spend time and resources to show that student learning increased when active learning was applied. Research strongly supports that the increased use of active learning improves student outcomes. Prince (2004)[3] reviewed the literature on the effectiveness of various types of active learning, specifically in engineering education, including cooperative learning, collaborative learning, and problem-based learning; and concluded, "Although the results vary in strength, this study has found support for all forms of active learning examined." Moreover, "teaching cannot be reduced to formulaic methods and active learning is not the cure for all educational problems. However, there is broad support for the elements of active learning most commonly discussed in the educational literature and analyzed here" (Prince, 2004).

> *"Student performance has definitely gotten better. In past students [were] passive. Intially students were afraid. As they see more lecturers change, less so."*
> (Faculty lecturer/HEEAP Participant)

Because of these findings from the research literature, and because the project has not been in place long enough to have produced a large enough number of graduates who learned by way of new active learning methods, the team did not to seek evidence that active learning improved student outcomes. From student and faculty interviews, however, the team heard anecdotally that active teaching aroused student interest in learning, along with increasing interaction among students, and between students and faculty. The team is convinced that student learning will indeed increase where active learning is used, a view amply supported by research.

> *"HEEAP needs synchronization – apply methods in all classes at once. Students are confused because standards of grading are different. Make all instructors do it the same way, using the same standard."*
> (HEEAP returned faculty)

Nonetheless, the team noted that faculty applying active learning reported many examples of students' increased abilities in soft skills, such as presentations, group work, posing questions and taking initiatives to identify resources and solve problems. Some of the classes observed also demonstrated that these soft skills were becoming part of student behavior, although the changes could not be solely attributed to HEEAP.

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[3] Prince, M. (2004). Does active learning work? A review of the research. *The Research Journal for Engineering Education, 93*(3), 223 – 231.

Finding: The evaluation did not seek evidence showing HEEAP's impact on student outcomes because research strongly supports the plausible positive correlation between increased use of active learning techniques and student learning; if those outcomes include soft skills, they too will improve when integrated into curriculum and transferred through active learning.

5. Impact on extent of knowledge of ABET

The online survey included questions about the respondents' application of ABET standards:

> 12. Have you applied ABET concepts in your teaching?
> 12a. If yes, please describe how.
> 12b. If no, please explain why.

While 59 respondents answered "yes", that they had applied ABET concepts in their teaching, a grounded analysis found that only 37 respondents provided convincing examples of how they did so. The remaining 22 did not answer or gave an answer that did not reflect ABET concepts.

Table 5. Faculty reports on application of ABET concepts to teaching

Yes	59	Valid "how"	37	Yes
		Not a valid "how"	12	Imputed "No"
		Blank	10	Imputed "No"
No	22	No	22	
Total	**81**	**Total**	**81**	

After applying grounded analysis and adjusting the final tally, the team concluded that only 37 (45.7%) were applying ABET concepts in their teaching, and 54.3% had not. For men, 50% had applied ABET concepts, while only 36% of women had done so, according to survey data (not shown here).

Table 5a. Faculty reports on application of ABET concepts to teaching: Adjusted through grounded analysis

	Number	Percent
Yes	37	45.7%
No	44	54.3%
Total	**81**	**100.0%**

Answers validating the "yes" included:

- I have applied ABET standards to set specific goals and the assessment criteria for each course Include the outcomes standard of the ABET
- When designing the syllabus, each content and specific activities are described to know which standards students will achieve

- When assessing students based on ABET standards to know what standard the students can achieve
- Developing the learning outcome for the course based on the criteria of ABET
- Rebuilding syllabus
- Sending survey questionnaire to the enterprises for the list of graduated students; change the teaching methods in accordance with social needs

The following were cited examples of applying ABET but were assessed as invalid in that they had nothing to do with ABET concepts, thereby allowing the team to change their answer from "yes" to "no":

- Always set achieved goals that students understand what knowledge and how to apply that knowledge
- Teaching in active method, students study actively
- Build Rubric to evaluate
- Rubric evaluation for student activities

For the respondents who indicated that they had not applied ABET concepts in their teaching, four respondents reported that the concepts were difficult to apply in a vocational college; four cited insufficient knowledge of ABET; one reported that he or she would try; and one cited large classes and a lack of time.

The team reviewed several revised syllabi from Can Tho University and found that the new syllabi were of high quality and clearly reflected ABET requirements and approach. For example, the syllabi stated learning objectives that were directly linked to ABET outcomes. The team believed this may have been a "faculty report" but was unable to confirm this notion.

Finding: The HEEAP project had raised awareness of ABET requirements among HEEAP participants, but either the meaning of ABET or how it could be applied remained unclear to roughly half of the HEEAP participants.

6. Impact on women

The HEEAP project increased the participation of university women as participants in the ASU training substantially from the first cohort (17%), to the second cohort (33%), and sustained that increase in the third cohort (30%). The vocational colleges achieved an even higher percentage in their first cohort (43%) and increased it even more in the next cohort (52%). Project managers achieved these results through improved recruitment and careful selection of candidates. This achievement is noteworthy in that female engineers – whether graduates or undergraduates – make up fewer than 30% in any engineering specialty in Vietnam. The addition of electronics as a third eligible field, where more women are found, helped increase the number of women participants. Refer to the annexes for details on the number of women participating in HEEAP by cohort and by institution.

Several answers to survey questions showed differences between men and women HEEAP participants. Women were less likely than men to report having worked on a faculty project, with 31.0% of women and 17.9% of men reporting they had not worked on a project:

Table 6. Faculty reports of participation in projects: By gender

	Total N	Total %	Male N	Male %	Female N	Female %
Yes	67	77.9%	46	82.1%	20	69.0%
No	19	22.1%	10	17.9%	9	31.0%
Total	**86**	**100.0%**	**56**	**100.0%**	**29**	**100.0%**

Perhaps as a consequence of women being less likely to work on a faculty project, their interaction with ASU was also less than for men, with 83.3% of women and 65.0% of men reporting low levels of interaction, as shown below.

Table 7: Faculty reports of interaction with ASU: By gender

	Total N	Total %	Male N	Male %	Female N	Female %
No, Once, Occasionally (once or twice per year)	64	70.3%	39	65.0%	25	83.3%
Frequently (at least once per month), Very Frequently (weekly)	27	29.7%	21	35.0%	5	16.7%

Faculty focus groups did not cite differences between men and women, but when asked about the numbers of female students and faculty, both men and women lamented the low numbers and reported that they were working to recruit more women. The Intel women's scholarships for vocational/technical colleges were a response to the demand for mechanisms to increase female enrollment in engineering. Following guidelines from USAID and with support from Intel, HEEAP sought to select women candidates for the ASU training, which increased markedly from the first cohort to the third.

The team heard anecdotally (from HVCT leadership) that HEEAP's efforts to increase women in engineering had a profound impact on that institution. Since mechanical and electrical engineering were the two "HEEAP-eligible" engineering fields, there were stiff challenges in recruiting women into those two male-dominated, "hands-on" fields where discrimination was rife. The HEEAP initiative to increase female numbers at the vocational level, which is more accessible to female students than the universities, may result in female students recognizing their right to choose engineering and the advantages that would accrue in terms of their career opportunities.

Finding: While there was some evidence of differences among men and women in terms of some HEEAP activities (e.g., faculty projects), these differences were not statistically significant, possibly due to the small number of women in the HEEAP targeted engineering fields. HEEAP had no mandate to correct major disparities in university admissions to engineering; it could only support limited efforts to attract female students to vocational colleges (which are more accessible by women when financial assistance is provided, as it is from Intel) and to give preference to female applicants for U.S. training.

7. Overall impact on university-based engineering education

One of the goals of HEEAP, as a project and as a USAID GDA model, is to establish a model of public-private collaboration that is innovative, brings new resources to the table *and* can be sustained and replicated (*scaled-up*). These goals are clearly set out in the USAID Cooperative Agreement included in the Annexes. The challenge is establishing mechanisms beyond training faculty that can promote the changes the program strives to achieve. Primary among them is a *change strategy* tailored to each of the eight institutions that is developed by the local institution with help from external organizational development specialists. Training by itself does not lead to institutional change; change champions inside an organization push reforms that training helps articulate and propose. Other strategies that enhance replicability and scalability of HEEAP include outreach to new and influential audiences about HEEAP advances, public relations to present an active face linked to Vietnamese objectives (such as high-tech employment opportunities, building a revitalized Vietnamese economy, contributing to established national goals, etc.), and an effective and vibrant mentoring program for returned faculty. Although the HEEAP project managers did not identify or help create change management entities within each targeted institution, they did raise awareness in Vietnam of HEEAP's objectives and successes, often at the highest levels of government.

Understanding the direct impact of HEEAP beyond the individual Vietnamese participants trained, or the eight institutions selected, is key. One way to measure that impact, or estimate the possibility of wider impact, is to know the proportional size of the HEEAP-trained population to a larger group. Obtaining accurate data to carry out this calculation was difficult, specifically for the following key groups:

- Mechanical and electrical engineering faculty in the eight HEEAP institutions
- Engineering faculty in the eight institutions
- Mechanical and electrical engineering faculty in all universities and vocational colleges in Vietnam
- Engineering faculty in all institutions teaching engineering in Vietnam

The HEEAP Country Manager provided us with 2011 data on the numbers of engineering faculty at the five HEEAP universities. These data were validated by comparing with numbers collected from the key informant interviews with department heads and deans at two of the five universities. Of the 123 HEEAP participants, 77 were from the five institutions; the following table shows that these 77 make up only 6.8% of *all electrical and mechanical engineering faculty* at the eight institutions, and only 2.1% of *all engineering faculty* at the eight institutions.

Table 8. Number of engineering faculty at HEEAP universities

	EE	ME	EE+ME	All
CTU	21	30	51	234
DUT	99	46	145	392
HCMUT	140	95	235	878
HCMUTE	91	86	177	878
HUST	272	258	530	1373
Total			**1138**	**3755**
77 faculty as % of total			6.8%	2.1%

If all HEEAP faculty trained in active learning applied all of what they learned without strong follow-on support, the impact would be limited to a small percentage of engineering faculty, as shown above. However, if there were ample support activities, in particular those responding to a change management strategy, HEEAP accomplishments could begin to have a greater impact in Vietnam.

Finding: Because HEEAP had trained a small percentage of faculty at the five universities and three vocational colleges, only by leveraging the impact of that training *from individual to institutional change* will HEEAP make a significant, sustainable difference in the teaching methods used in engineering education at these target institutions. In terms of inducing change at the other estimated 130 Vietnamese institutions teaching engineering at either undergraduate or graduate levels, the impact would be insignificant unless reforms can be promoted internally in each institution in an systemic manner. Also, a solid strategy to disseminate the results of active teaching to those *not* trained by HEEAP would help further change in engineering education to a greater audience.

8. Impact of equipment and software donations

University lecturers agreed that modern equipment is important. Equipment and software donated by HEEAP to the two universities visited appeared to be used well. In one case, equipment donated through HEEAP by a company was of limited use due to some missing components. The number of software licenses can be an issue; without enough licenses the software cannot be used in the way that lecturers want. One dean said, "The money was not that much but very critical. This was very needed equipment. They are intensively used."

Other equipment and software donated by non-HEEAP companies and purchased by the universities were also significant. So far, there have been no donations to the three vocational colleges.

Finding: Donated equipment and software were welcomed and used well.

9. Selection of Vietnamese candidates for U.S. training

Key informants cited English proficiency, PhD degree, and interest as the three selection criteria for training participation. One key informant said the recommended candidates were chosen to fit their institution's strategy by giving priority to people with responsibility for curriculum redesign: "They will affect the school." The team did not find any criteria beyond these three general ones mentioned in interviews. No documentation of selections was reviewed. Overall, it appeared that the selection process resulted in participants who were highly motivated to change and were receptive to learning and applying new teaching concepts.

The rationale for the selection criteria was not clear. Why is preference given to applicants with a PhD? Should the project give priority to faculty members who have not travelled outside Vietnam? Most faculty interviewed had benefited from overseas training in Japan, Australia, France, Singapore, Germany, Italy, Belgium, South Korea and Thailand. Should candidates with less exposure to different teaching methods be sought?

A major prerequisite for faculty to be selected was having a level of English proficiency sufficient for undertaking a six-week intensive training course in English. Although a by-product for anyone traveling to the United States is an improvement in English fluency, HEEAP's objective was different: to improve student learning and produce work-ready graduates for high-tech industries by using active teaching methods in engineering education. Improved English may be the result of spending time in the United States, but the team questioned whether this requirement was selecting out future leaders and highly-innovative faculty who had never had an opportunity to improve their English in Vietnam.

Given that some level of English proficiency was a requirement for being selected to participate in the ASU training, how can HEEAP assist promising applicants who fulfill all other criteria but need a boost to

meet English language requirements in order to be eligible? (See the section on recommendations for options to resolve this problem).

Finding: The selection process has resulted in choosing participants highly motivated to learn and apply new techniques, but the rationale for the criteria is not clear; including English competency as a selection filter could limit otherwise highly-qualified applicants from consideration.

10. Prior awareness of active learning in Vietnam

> *"It is harder to teach with the new methods. You must find projects for students – it takes more time. With the old, you can lecture, then leave and work for a company."*
> (HEEAP Returned Faculty)

Many HEEAP participants were aware of active learning methods before HEEAP arrived in Vietnam. Lecturers knew of active learning methods but may not have recognized them as such. All but one university lecturer interviewed had obtained a PhD overseas (in Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Korea, Russia, Singapore, Sweden, Thailand and the United States) and most were exposed to methods of teaching that went beyond classical lecturing. Their contact with their host universities continued after they return to Vietnam. Non-HEEAP faculty members interviewed were also familiar with active learning and could describe its concepts. Whether they apply active learning is unknown, but they were certainly aware of it prior to HEEAP's arrival.

In addition to overseas exposure, pedagogical methods were taught to all Vietnamese university lecturers prior to being licensed by MOET. While the training covered active learning methods, it apparently did not include practicing the methods.

HEEAP added value by giving the lecturers specific methods to apply active learning and greatly helped increase confidence.

Other comments include:

- "HEEAP is so welcome because it coincides with our vision. We need a renovation in the way to teach. We lack methods."
- "It's not like you were blind and now eyes are open. Sometimes we were not sure [about using active learning methods]. With experience, now we know."
- "HEEAP significantly increases the process of active learning and teaching application nationwide".

> *"With HEEAP, we get better, faster."*
> (Faculty lecturer/HEEAP Participant)

Besides having prior knowledge of active learning, many faculty members were also already motivated to change their methods of teaching before HEEAP. One department had received its Asean University Network (AUN) QA certificate, but the review stated that their teaching methods needed improvement. One lecturer said, "We are talking about teaching methodology all the time, not just because of HEEAP." However, they noted their lack of knowledge of methods and techniques.

In student focus groups, students of both HEEAP and non-HEEAP faculty showed awareness of the soft skills required by industries, and were aware that the soft skills learned in the university program do not meet industry requirements. This statement could be evidence of diffusion of HEEAP training or of prior knowledge by HEEAP and non-HEEAP faculty of the importance of soft skills.

Other programs were pursuing goals similar to those of HEEAP. The HCMUT department of mechanical engineering participates in a MOET-funded program to implement a Conceive-Design-Implement-Operate (CDIO) framework for engineering education that is used by a worldwide network (see www.cdio.org and Phan *et al.*).

The CDIO Initiative

- is rich with student projects complemented by internships in industry.
- features active group learning experiences in both classrooms and in modern learning workshops/ laboratories, and rigorous assessment and evaluation processes. (http://www.cdio.org/benefits-cdio)

> *"The purpose of CDIO is the same as HEEAP. We train lecturers. We invite teaching specialists from overseas. Fifty percent of faculty are aware of CDIO and start teaching differently."*
> (Faculty lecturer/HEEAP Participant)

CDIO workshops (for example, by Peter J. Gray, PhD, Director of Academic Assessment, *United States Naval Academy)* have included topics on active learning and the creation of learning objectives. CDIO also funds faculty members for several years to implement such changes, with a total stipend lower than Intel's but available over three instead of one year. In student focus groups, students at HUST and HCMUT were more familiar with CDIO than with ABET.

Other collaborations (for example, with the University of Illinois and the University of New Mexico) have provided information to Vietnamese university partners on active learning methods and ABET. Other donors have provided on-site training at vocational colleges that includes many aspects of active learning, such as German assistance to HVCT (GIZ-funded) for 10 years that appeared to have fundamentally changed the teaching practices and curriculum to incorporate many active learning techniques. HUST even has a center for training in the English language that could be integrated into HEEAP selection strategies to attract the best faculty in engineering for U.S. training.

> *"Before HEEAP, we talk, they listen. Now we know how to effectively transfer knowledge to students."*
> (Faculty lecturer/HEEAP Participant)

Active learning already occurs in labs in universities and in vocational colleges. The emphasis in the vocational colleges on practical training means that students already engage frequently in hands-on learning. One faculty member at a vocational college said he had been using active learning methods before HEEAP, but that his ability to do so improved after training.

Key informants at MOLISA talked about funding from the Asian Development Bank for the Skills Enhancement Project (2010-2015) and other project funding from many countries that have improved technical training at the vocational colleges and that have also focused on soft skills. They reported that since 2006, higher education policies in Vietnam have encouraged active learning through the combination of theory and practice. They stated that their approach is to learn from the different strengths of many countries, and to adopt the features that are suitable to Vietnam: "HEEAP is one more experience."

There was no evidence that HEEAP had leveraged the participants' prior awareness of active learning in the design of HEEAP training, or that HEEAP had tailored its selection process or post-training activities to attract financial or other support from existing programs with similar goals being implemented in Vietnam. Early HEEAP documents describing the context for active learning in Vietnam typically painted a picture devoid of active learning or of any awareness of its link to future economic growth. In contrast, the team found ample evidence of a number of programs with which HEEAP could collaborate to leverage impact.

Finding: HEEAP participants (and other non-HEEAP faculty) had awareness and some knowledge of active learning before HEEAP training and have access to other resources to support its application; HEEAP implementation could build on this prior knowledge and collaborate on activities with other entities at HEEAP institutions.

11. Two goals

Because an expressed outcome of the HEEAP training was to improve English fluency for faculty, participants were selected in part because of their English competency. The ASU training for university faculty was conducted in English and the training for the two vocational/technical cohorts was conducted in English with Vietnamese translation. The focus on English skills as a prerequisite for training created obstacles to achieving the goal of implementing active learning.

Several cases were observed where faculty members who might otherwise have been selected based on their desire and potential to be change agents were rejected due to a lower level of English competency. This selection criterion may conflict with the need to select faculty who could have significant impact, whether through the classes they teach or through their influence on other faculty.

The requirement of English proficiency was particularly difficult for the vocational cohorts. The Oct-Dec 2011 Quarterly Report stated that because "English proficiency was not as strong compared to the University track faculty," participants were required to communicate only in English; and "a simultaneous interpreter was leveraged as a coach and facilitator of English based presentations and group work." While the report also stated that "the agreement with the Rectors is for them to annually have nominees in future cohorts go through English training before nominating them to HEEAP," the July-Sep 2012 Quarterly report stated: "The 2012 Vocational cohort's English capabilities appeared less advanced than the first HEEAP Vocational cohort." Again, an interpreter was used.

Because of the emphasis on English, university faculty showed a preference to first apply active learning in classes where English was the language of instruction. The April-June 2011 Quarterly Report stated:

> *Many faculty in the 2010 cohorts implemented change projects in MOET funded Advanced Program courses. We viewed this as a good starting point to adapt new approaches in these small, English based courses. But, we need HEEAP to reach across the entire mainstream curriculum and programs to impact larger populations of students and faculty. Thus, the 2011 faculty will be instructed all projects must be developed outside of the MOET Advanced Programs on their campuses and leverage from the 2010 faculty their "lessons-learned" to now move the new active and team/project based learning across the curriculum and mainstream courses for the majority of students.*

Since most courses were still taught in Vietnamese (instruction in English was only allowed in special classes), more impact would be achieved by encouraging faculty members to implement active learning in classes where Vietnamese is the language of instruction, which would be the vast majority.

Finding: Associating English language competency with acquiring skills in active learning confused and weakened the outcomes anticipated from training; separating these goals would open up opportunities for more creative ways to implement HEEAP training.

12. Designing a program for impact and change

The evaluation questions began with the desire to understand "how and to what extent has HEEAP advanced a sustainable, *ABET-style* approach to improved instruction, relevant and up-to-date curriculum, improved undergraduate learning outcomes, and institutional support for such reforms" (RFTOP no. SOL-486-13-0000023, emphasis added).

An ABET-style approach starts with the creation of program educational objectives, which are broad statements of what graduates are expected to attain within a few years of graduation and which are based on the needs of the program's constituencies. In order to achieve these objectives, the program was designed so that students obtain certain knowledge and skills by the time they graduate. The program must engage in continuous improvement, using feedback loops from various sources. The faculty, facilities, and institutional support must be adequate.

Nothing in the ABET criteria specified how the curriculum was to be taught. However, achieving some of the outcomes was difficult using only lectures. For example, outcome (k), which was "an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice," would best be taught by including opportunities for students to practice using those techniques, skills, and tools. Providing students with appropriate design experience would be impossible to achieve using only lectures.

Thus, ABET-style implied a specific set of standards and a way of thinking about engineering education that was focused on constituencies, objectives, outcomes, and continuous improvement, not on specific teaching methods. Other standards are similar to ABET, such as those from AUN and CDIO. Through the Washington and Sydney Accords, ABET also recognizes accreditation in other countries as essentially equivalent to ABET accreditation, making possible the creation of standards in Vietnam that could eventually be recognized by ABET.

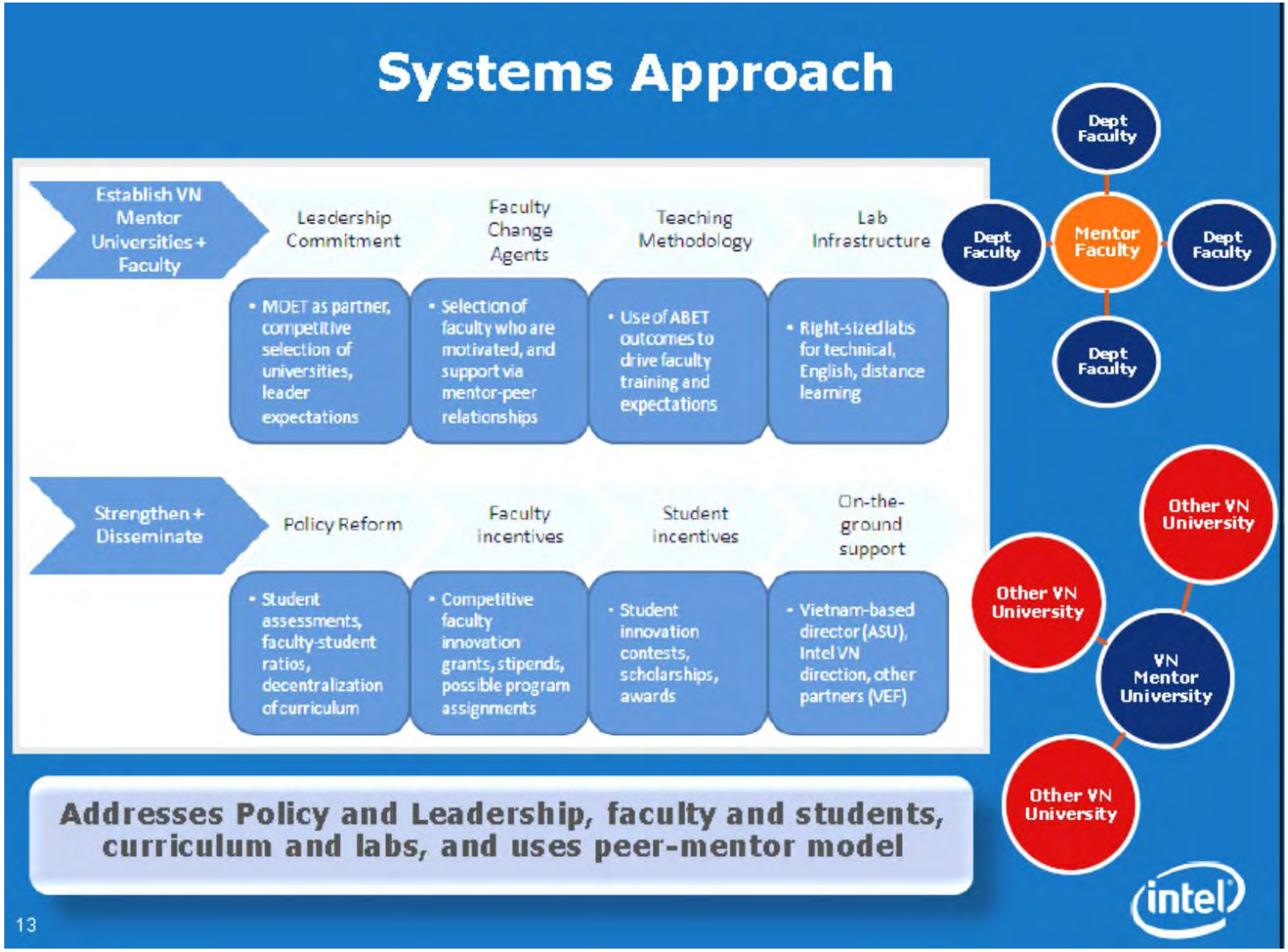
Helping an institution create an ABET-style approach thus involves large changes in thinking, in policy, and in attitudes. Every change has to start somewhere, but no evidence emerged to demonstrate that HEEAP leaders have enunciated a design for change and thus for impact. Put in the words of capacity-building, there was no *change management strategy* at each institution whereby HEEAP slowly and quietly supported the changes called for by referring to the ABET standard. The new VULII program apparently addresses some of these needs.

For example, the finding that the 77 HEEAP participants made up 6.8% of the entire electrical and mechanical faculty at the five institutions and 2.1% of faculty from all ten or so engineering departments, suggested that having substantial impact requires a strategy for supporting these 77 faculty members. They need help in applying their knowledge and also in being change agents within their institutions. Another example is that the practical nature of teaching in a vocational college environment requires an approach to increasing student learning that differs from the more theoretical style found at university engineering programs. Requiring students to demonstrate their understanding of a principle through a hands-on exercise would already be routine at vocational colleges; how should HEEAP be designed to add value in that environment?

An October 2010 presentation by Rick Howarth, former General Manager of Intel Products Vietnam, included the following graphic, which uses a Systems Approach to changing engineering education in Vietnam. While this figure is at a high level, a similar approach might have helped to design the HEEAP program for more impact.

Finding: The HEEAP project had no clear strategy to promote institutional change at the eight target institutions; change was largely based on the work of individual trained faculty, sometimes working in small groups, but generally not; to instigate major reforms in teaching style and curriculum.

Figure 2. A systems approach to changing engineering education in Vietnam



B. MONITORING AND EVALUATION

Monitoring and evaluation (M&E) are key ingredients to achieving results from external interventions in organizations and to promoting institutional change. They also serve as the principal buoys guiding the project ship away from risk and toward its destination. Along the way, accessing information from frequently collected project impact indicators, leadership can adjust the course by introducing corrective measures and testing new ideas that can resolve the constraints highlighted by M&E. Lastly, M&E provides donors, supporters, stakeholders and clients with information about the project's achievement of anticipated results. Interestingly, this last reason is often considered the only M&E goal, so producing an M&E Plan or a quarterly report of progress towards meeting targets becomes a burden for project managers, rather than a major source of vital information.

With these contributions from M&E in mind, how did HEEAP use information about the project?

1. Alignment of HEEAP goals with partner goals

The HEEAP project has supported the strategic goals already enunciated by some of the institutions, such as to seek ABET accreditation. One non-HEEAP department at HCMUT was planning to apply for ABET accreditation in 2013 with other departments also working toward such accreditation.

As a corollary to Intel's multi-billion dollar investment in Vietnam, it has articulated a strong commitment to building local talent by integrating American-style engineering education into Vietnam's higher education institutions. Intel strongly believes in US education, known for its emphasis on application of theoretical knowledge to practical settings. As a first step, and to accelerate the hiring of qualified Vietnamese engineers and technicians, Intel sent 70 Vietnamese students for an undergraduate engineering education at Portland State University (the Intel Vietnam Scholars program). The program has been a resounding success, with its future graduates, who are guaranteed a job at Intel, performing at high academic levels. Intel's strategy dovetails with both the HEEAP project goals, to which Intel was a contributor, and with Vietnam's national educational goals, as articulated by MOET's 2020 vision.

Intel's goal is nothing less than an ambitious "educational transformation." Recognizing that Intel cannot continue to send scores of young Vietnamese to the U.S. for an engineering degree, for financial as well as other reasons, the company developed a multi-faceted medium- and long-term strategy. HEEAP is part of that strategy to stimulate major changes in the way engineering is taught in Vietnam in order to deliver to work-ready engineering graduates.

USAID/Vietnam's country strategy focuses on higher education for many reasons, including its congruence with goals of the government of Vietnam and the US government, the opportunity to leverage private money, and the critical role higher education plays in advancing economic growth. Specific USAID/Vietnam goals include improved faculty development, improved teaching methods, and improved curriculum, all of which are addressed by HEEAP.

> *"Intel is not just here to recruit. Vietnam needs a strong public education system."*
>
> (Rick Howarth, former General Manager of Intel Products, Vietnam)

Based on interviews with officials from the two relevant Ministries in the Government of Vietnam (MOET and MOLISA), from USAID Vietnam and USAID Washington, and from Intel, the HEEAP Alliance partners expressed overall satisfaction with the project's progress toward reaching its objectives and contributing to each partner's objectives.

Finding: HEEAP's goals align well with objectives of the partners and stakeholders; Intel views HEEAP positively and integral to its strategy for Vietnam higher education.

2. Measuring and promoting institutional change

The M&E plan, entitled "HEEAP Program Monitoring & Evaluation Plan (Revised 9/27/10)" and included in the annexes, was submitted by ASU to USAID and Intel early-on in the project. Its purpose, like all M&E Plans in development projects, was to establish indicators and targets that could be tracked as the project unfolds.

Unlike most M&E Plans, the HEEAP document contained no baselines or targets. Many indicators (such as "number of participants in HEEAP training programs at ASU, and virtual") measured inputs rather than results. Achieving such indicators is no indication that any change will occur; it only indicates that a training program was executed with participants. Even with an indicator to track whether the participants learned what was being taught, the acquisition of knowledge, skills and attitudes (KSA) was at Kirkpatrick Level 2 – the individual. That an individual learned something is important for the project, but only to the extent that the application by that individual leads to a change in the workplace, or in the institution (Level 3). Tracking the application resulting from a training program was the principal interest in an M&E Plan. In this respect, the faculty project reports provided ways to monitor institutional change, but they were not supported adequately by follow-on activities to ensure completion, dissemination to others, and publication of their efforts; nor was the impact of completed project reports assessed, in terms of leading to increased student learning or a change in teaching methods.

The implementation of M&E in HEEAP relied on U.S.-based specialists making periodic visits to Vietnam to implement surveys and classroom observations. Monitoring and evaluation is best conducted by people knowledgeable of the local context and fluent in local languages. The vast majority of development projects hire local M&E specialists whose job is to track change and provide constant guidance to the change agents on adjusting strategies to increase impact. M&E is a circular loop, from monitoring to understanding root causes to analyzing the lessons learned to making adjustments, and can only be effectively done when evaluators are close to the daily challenges obstructing change. In this respect, HEEAP did not involve Vietnamese specialists on a regular, sustained basis to liaise with all eight institutions.

Work Plans differ from M&E Plans in that they outline, generally for the year to come, the activities being planned that address each project objective and indicate how each activity will move the indicator closer to the specified target. After the partners agree on a Work Plan, the project's managers conduct quarterly checks to see how the project is measuring up against each indicator. Although the process is simple in terms of measuring, much like viewing an odometer and assessing progress toward the destination (while always keeping an eye on available fuel – or resources), the analysis is complex. What caused the project to fall short of reaching a particular target during the last quarter? What were the principal reasons for lower-than anticipated results? What can be done to adjust activities to reach targets? Why did the project exceed expectations for certain targets?

With the annual Work Plan, a solid M&E foundation with correct indicators, and quarterly reviews of progress, a development project can navigate its way through the challenges with far more success than one with unclear objectives or a reliance on input indicators. The latter often gives the incorrect impression to donors and project managers that progress is being made, for example, because people are trained or classrooms renovated, but inputs are not results. Therefore counting inputs does not imply results are being attained. Only by tracking the application of lessons from training (Levels 3) and the changes that might be occurring inside institutions (Level 4) can impact be known.

In the four HEEAP Work Plans reviewed, the activities proposed were not linked to expected outcomes, results, or to indicator targets. In essence, they were implementation plans, which were helpful in laying out the sequencing of activities over the course of 12 months but not in measuring progress.

Finally, there was no Performance Measurement System (PMS) for each institution that was coordinated with the Change Management Strategy to guide the reforms that HEEAP hoped to induce. Although some might see these as empty bureaucratic requirements, they are essential tools used by performance improvement specialists in corporations to promote organizational change in departments, branches, and divisions with outsourcing partners. Change requires constant support that is close to the individuals impacted by change in order to overcome constraints and resistance to change; a PMP and a change management approach provide that. HEEAP did not follow best practices for capacity building in terms of managing the change process to increase the likelihood of achieving sustainable reforms in engineering education in the target institutions.

Finding: The HEEAP M&E and Work Plans did not measure results and thereby provided insufficient systematic support for institutional change.

3. Measuring Results

Despite the previous finding that the M&E and Work Plans did not provide project managers with the tools they needed, HEEAP did monitor activities through the quarterly reports. For example, the activities addressing Project Objective A ("Develop and advance interdisciplinary, applied curricular and instructional methods in engineering") were implemented as planned. The quarterly reports consistently reported on the results of pre- and post-surveys of participants' knowledge, as called for in the M&E plan. For example, the Oct-Dec 2012 Quarterly Report stated:

> *Responses to the question, "describe the role of a global engineer," were more elaborate in the post-training survey compared to the pre-training survey. Responses included things such as "social responsibility and ethics," "systems thinking," "life-long learning," "leadership," "ability to work in multidisciplinary teams," "creativity," and "entrepreneurship."* (Level 2)

However, no evidence could be found that the review described in element 2.2 of Project Objective A, Result 2 of the M&E plan was conducted: "Rubric-driven review engineering curricular materials at the beginning of each faculty development program cycle and again 9 months after return to Vietnam." (This would have measured a Level 3 impact.)

There was little evidence that progress was measured toward the following outputs found in the M&E Plan:

- Project Objective B: "Develop students' applied engineering knowledge and skills,"
- Project Objective C: "Expand institutional capacity to support engineering faculty,"
- Project Objective D: "Increase number of work-force ready, qualified engineers."
- The capstone projects, other projects, or student assignments, as described in the M&E plan for Project Objective B.

HEEAP monitoring and evaluation was performed by ASU staff, not by the QA staff at each institution.

Finding: Despite its shortcomings in terms of measuring impact, the M&E plan appeared not to have been fully implemented even when measuring whether planned activities occurred.

4. Using information from M&E

The HEEAP training was modified at least once to reflect participant views of the training they received. In response to participants' requests for techniques to use in large classes, the course design was changed to incorporate this request in the following year. There were few other examples the team identified where monitoring led to improvements in the program. According to the Sep-Dec 2012 Quarterly Report, "the M&E team analyzed and reported the findings from the mentoring needs survey. Recommendations for structuring mentoring activities were provided to program leadership and staff."

No action on those recommendations was reported in that Quarterly Report, but perhaps it is too soon to expect action. However, given our previous findings on the low level of communication between ASU faculty and HEEAP participants after returning to Vietnam, it appears as if no changes were made in the mentoring component as recommended.

Finding: The inadequate M&E system and link to project decision-making resulted in missing some opportunities for improvement, such as with mentoring.

5. Donor awareness of HEEAP results

As mentioned above, the key use of information produced by effective monitoring is for project decision-makers. However donors also need accurate data showing whether the projects they fund are achieving results anticipated. Intel Vietnam needs information to justify its significant funding level for HEEAP to corporate officers, as well as for accountability within Intel Vietnam. Likewise, USAID uses project monitoring information to justify continued funding, report to USAID Washington on Mission program results and to answer inquiries from the Government of Vietnam and others (Congress, NGOs, etc.), in addition to justifying future USAID/Vietnam program modifications.

What information did the two major HEEAP sponsors have about the project's impact results? The key informants at Intel were able to cite detailed quantitative results from their program at Portland State University, including the participants' grade point averages, but did not demonstrate similar knowledge of HEEAP's impact on engineering education. Similarly, the MOLISA officials interviewed were aware of the goals and accomplishments of other projects (for example, one funded by the Asian Development Bank), but knew less about HEEAP, with the exception that it had high-level public support.

Although the USAID official most familiar HEEAP was no longer in Hanoi, and the Mission Director had changed, the HEEAP project submitted no annual report summarizing results obtained over the previous year. Quarterly reports were submitted and the fourth quarter report doubled as an Annual Report. Although GDA practice is to require annual reports, the Mission's cooperative agreement did not call for more than an Annual Work Plan (in addition to the quarterly reports), leaving USAID somewhat uninformed about the actual ongoing impact of HEEAP on measurable changes in engineering education at the target institutions.

Finding: Infrequent reporting on project achievements and an emphasis on inputs over results provided inadequate impact reporting to donors, government and less than a full and accurate picture of program achievements.

C. PUBLIC PRIVATE PARTNERSHIP STRUCTURE

The primary data-gathering sources used in exploring the questions posed about the public-private sector were key informant interviews and a review of relevant documents. The team interviewed Intel officials in Vietnam who have been closely involved with HEEAP since its inception and a USAID official with in-depth knowledge of GDAs and in particular, with the USAID-Intel partnership. Information gathering came from the USAID's GDA website, a review of documents about GDAs sent to the team by USAID Washington, and a review of the MOU with Intel.

1. The GDA HEEAP Model: Matching donor objectives

The Annual Program Statement (APS) of 2009 described the criteria and methods for partnerships to be established between USAID and international development partners. The criteria were formulated clearly and the USAID-Intel partnership fulfilled all the requirements and expectations listed below:

- Bring significant new resources, ideas, technologies
- Minimum of 1:1 leverage in cash funding
- In-kind services (equipment, services, etc.) important and to be monetized

- Dynamic partnership possibly starting small and evolving over time as trust built
- Operating in countries with USAID presence or non-presence interest
- Correlates with USAID's strategic objectives for the country in question
- Establish up front the respective development interests of each partner
- GDA seeks new relationships beyond traditional ones
- Fairness and transparency to guide USAID in its search for partners
- Involve local leaders and partners, both men and women, in project

(Ref: FY2009 Annual Program Statement, No. 09-232, pp 6-7)

The most critical of the expectations above are that the Alliance bring new ideas, build new relationships between USAID and non-traditional partners, and be guided by the complementary interests of both partners. In other words, HEEAP should respond directly to Intel's objectives as well as USAID's, a requirement that could be problematic for a partnership between a government agency promoting economic and social development, and a U.S. multinational promoting an activity in an emerging economy expected to add to the company's shareholder value and contribute to its vision and mission in Vietnam. As a newcomer to Vietnam, Intel's objectives might not have dovetailed with USAID's objectives had the company not developed a progressive strategy to work with local leaders to improve the quality of Vietnam's engineering graduates.

> Intel's strategic objectives for Vietnam are underpinned by a simple statement made by the company's Vietnam General Manager:
>
> *"Our work in Higher Education is motivated by a vision much bigger than staffing a factory. This is about giving back to Vietnam, creating an education system that will sustain economic growth and transform Vietnam from an agricultural-based to a knowledge-based economy."*
>
> (Rick Howarth, November 2010)

Such an ambitious strategic vision for Vietnam fit well within USAID's objectives for higher education, as stated in its Country Development Strategy, 2011-2014:

> *The goal of the education strategy is to improve the quality of Vietnamese higher education. The primary strategic approach will be to strengthen the human and institutional capacity of Vietnamese higher education institutions to develop and deliver education, training and applied research programs that underpin economic growth; responsive to the needs of the private sector; and conducive to increased employability for the recipients of higher education.* (p. 22)

The fact that both partners shared fundamental goals for Vietnam paved the way for developing an effective working relationship. Many obstacles remained, however, that could have aborted the takeoff early-on, such as the practical modalities of operationalizing the alliance. In the case of this GDA, USAID sought an implementing partner able to manage both USAID funds and Intel's contributions in a coordinated fashion. This GDA model did not co-mingle funds into a single account from which disbursements were made to support activities agreed upon in annual Work Plans. Instead, USAID entered into a separate agreement with Arizona State University, which had competed for the award against other bidders, to implement specific activities of the overall Alliance project. Intel provided funds to ASU to implement complementary activities managed by ASU. In reviewing this approach, the team found no major constraints in this dual management structure in terms of financial accountability and project implementation.

Intel's initial analysis of Vietnam's human resource base in the technical fields it considered critical demonstrated the shortage of local engineers with the type of profile the company would need for decades to come. Intel described the type of engineering graduate it needed: "Vietnamese graduates", they stated, "should …

- have strong technical skills, especially in mechanical and electrical engineering.
- be innovative, intellectually curious, and able to work collaboratively on teams.

- have a professional level in English."

To arrive at a place where Vietnamese graduates had the profile Intel and other industries in Vietnam desire, USAID and Intel formed an agreement. Its primary goal was for the parties to "transform existing theory-based Electrical and Mechanical Engineering curricula into a strong hands-on degree, in which graduates are ready to perform effectively in the 21st century workplace." This led to a series of interventions by the project's implementing agency, ASU, consisting mainly of training and mentoring at eight institutions in two of roughly ten engineering fields.

Finding: The HEEAP GDA mechanism worked well, meets the objectives of both partners and satisfies USAID's expectations**.**

2. The GDA model compared to a traditional USAID approach

Given the project's complexity in terms of selection, visa processing and pre-departure orientation for 123 candidates to attend U.S.-based training, and the need for dynamic follow-up for post-training support, HEEAP needed a permanent in-country staff member knowledgeable about USAID regulations (ADS 253 in particular) and proper pre-departure preparation for participants. Moreover, post-training follow-up and support required a Vietnamese staff member to cement mentoring relationships with ASU, conduct on-going monitoring of faculty progress in making changes to the institution's curriculum, leverage impact beyond the trainee's themselves to promote institutional reform, and feed recommendations to modify the project along the way based on close observations and communication with returned faculty.

Had the project not been a GDA, USAID would have typically required a local project office to implement a complex activity at eight local institutions with roughly 25 participants traveling to the U.S. per year, among other activities. The extent that the Alliance diluted USAID's requirement for a stronger local management capacity was difficult to determine. It was possible that USAID had less influence over the project implementer since, in effect, the project reported to two funders – Intel and USAID; or Intel and ASU together opted to downplay the role a permanent in-country presence would play in order to maximize funding for training. If the decision was made on the latter rationale, it ignored decades of lessons learned in development project implementation that emphasizes the central role in-country management plays in achieving results in developing-country environments.

The Alliance recognized this drawback in 2012, and in 2013, a more robust HEEAP local presence was being implemented. However, this was perhaps in response to the promise of increased numbers of faculty scheduled to be trained in the U.S. (proposed under HEEAP 2.0 at 125 compared to 25 per year), rather than a recognition of the need to monitor far more closely any changes being made or attempted by returned faculty. Frequent visits to Vietnam by the ASU project director were insufficient to effectively leverage the impact individual faculty might have on their institutions. Moreover, the project's progress was monitored in-country and in-depth only once per year, as shown in Section IV.B (Monitoring and Evaluation), which limits the value of M&E to a once-per-year event. Conducting surveys remotely more frequently from the U.S. may collect information of interest to decision-makers, but the impact of having in-country Vietnamese M&E specialists interacting with change agents at the target institutions is lost.

Finding: The project's implementing agency, ASU, opted for minimal in-country presence for the first two years that limited Vietnamese involvement in project management, especially regarding follow-on activities that might leverage impact.

Communication among the partners is typically a challenge for GDA models. It is no secret that the organizational culture, and accompanying vocabulary and expectations, of corporations and government differ. Each has some contrasting constituencies, the former being primarily internal (home office) and external shareholders, and the latter being Washington (USAID, Congress) and the tax-paying public.

They share similar constituencies in Vietnam (higher education institutions, government ministries) and are both sensitive to public opinion and civil society groups. Because of these multifarious internal and external forces affecting decision-making, USAID and its private-sector partner can encounter challenges in finding common ground on some questions. For example, USAID/Vietnam has specific branding requirements for all projects, which Intel found challenging to understand, especially in cases where Intel preferred not to tout the company name.

The speed in which decisions and funding commitments are made typically causes discomfort between the two partners. A corporation's decision tree is simpler, results in relatively rapid commitments and takes less time for funding to follow. USAID, as a government agency in a developing country, often relies on financial and legal support from a regional office far away, slowing decision-making to a speed to which corporations are unaccustomed. Although the GDA mechanism can reduce the typical time lag between project conception and implementation, it remains a source of friction between the two parties. Developing a joint MOU that meets the legal expectations and requirements of both partners with such different organizational cultures is also a challenge, although USAID has developed templates and boasts a decade of GDA implementation experience that has facilitated these agreements.

Navigating between the partners is the implementing agency, in this case Arizona State University. In a GDA, it must report to two bosses – Intel and USAID. Intel and ASU have an ongoing relationship beyond HEEAP, which influences its actions. ASU also has on-going agreements with USAID in Vietnam and other countries, as well as activities funded by other U.S. Government agencies. How the implementing partner negotiates between the two partners is a key element in the success of a GDA project. In the case of HEEAP, ASU avoided major pitfalls by maintaining strong lines of communication. The reality that the implementing partner shares reporting relationships with two donors challenges USAID managers inexperienced with such an arrangement. Furthermore, the fact that the HEEAP project was designed prior to USAID being involved was unusual and called for a new kind of communication between USAID and ASU. In short, USAID's management influence over the implementing partner was significantly reduced due to the GDA, despite the funding committed to HEEAP. For example, HEEAP did not provide monitoring and evaluation information to USAID in the format or frequency normally required for a non-GDA USAID-funded project. In turn, USAID had less maneuverability in enforcing USAID compliance as a partner in a GDA.

Finding: Because donors share responsibility for a project achieving agreed-upon goals, neither can insist on a project management style that fits only one partner. In this space, HEEAP's implementing partner navigated the donor relationships well.

3. Added value of a GDA

Resources. Perhaps the most striking difference between a GDA and a classical USAID project is its ability to attract significant financial resources from the private sector, and occasionally from the host country's public sector. Because the HEEAP project objectives were attractive to other high-tech industries in Vietnam in terms of addressing their human resource constraints, and because of the credibility Intel brought to the initiative, other corporations were able to contribute significant funds or equipment to HEEAP target institutions. The GDA enabled the implementing partner to approach other companies to provide much-needed equipment to the target institutions, which otherwise would have required major additional funds. By 2013, the following corporations had contributed equipment including software to the university laboratories, with additional equipment for vocational colleges anticipated in 2013: Siemens, Danaher Corporation, Honeywell and Cadence Software. The estimated value of all the partner contributions, as of 2013, reached $40 million, dwarfing USAID's funding of several million dollars for HEEAP and VULII.

In response to an evaluation question, the team verified that equipment contributed by the partners was in use in the three universities visited and observed that it was being appropriately used, maintained and much appreciated.

Sustainability. USAID projects are limited to three to five year lives. Although sustainability is variously defined, it generally includes continuing the services being rendered in some way beyond the lifespan of the project. In the case of this GDA, with Intel able to pledge support over a much longer timeframe than USAID, the GDA has, in effect, increased the likelihood of the HEEAP project's achievements (and corollary projects coming online or other activities already producing results) being extended for many years, if not decades. Intel's multi-billion dollar investment in Vietnam will continue far beyond the limit of today's USAID activities. Clearly the GDA partnership has provided the key element to sustaining and ensuring the reform of engineering education in Vietnam for many years.

Replicability or Scale Up. If the project achievements are sustained in large part due to Intel's long-term commitment, supported by new partners joining the alliance periodically, and if the project improves over time, it is a candidate for either being replicated or expanded. Reaching only five universities and three vocational colleges, HEEAP affects, as explained in Section IV.A.4, a small fraction of potential targets in Vietnam. It could be established at other universities and colleges in other cities selected according to various criteria (nearby high-tech employment demand, readiness of higher education institution to embrace the change from lecturing to active learning, support from local industry, etc.). A new set of donors might be attracted to fuel the change at those institutions, using the HEEAP model, modified to fit local circumstances, as a guide. With over 100 higher education institutions with engineering programs, and a population of roughly 90 million, Vietnam has ample space for replicating a version of HEEAP.

Scaling up the HEEAP project is easier and would bring about accelerated change. Below are options for relatively easy expansion of existing HEEAP interventions:

- Shift from targeting only mechanical and electrical (and now electronic) engineering to other departments (transportation, chemical, etc.)
- Supporting further graduate studies to the PhD level for top HEEAP candidates (see the number of faculty participants in ASU training without PhDs)
- Expanding vocational college areas targeted to include departments other than the current three

Flexibility. As a government agency that is managing complex development interventions across scores of cultures and situations, USAID cannot easily fund some components of a GDA that its private-sector partners are well-suited to take on. For example, HEEAP partners recognized that returned faculty had little time available to implement some of the changes mandated by active learning. Faculty held outside jobs to augment their meager income or taught large classes of over 100 students. Intel, as a private company, was able to quickly administer an annual supplement of $5,000 to each returned faculty member that provided the resources needed (e.g., teaching assistants) and the time to focus on making changes. Recognizing that trying active learning required considerably more preparation and work (especially grading papers and multiple exams), the stipend addressed a major constraint quickly and effectively. USAID would have had difficulty managing this component of HEEAP given its internal administrative limitations and time needed to process payments to individuals, even if ultimately processed through the implementing partner.

Finding: The GDA mechanism enabled USAID to divide responsibilities for reaching shared project goals with a more flexible private sector partner. The resulting partnership added value and enhanced the likelihood of greater impact.

V. RECOMMENDATIONS

The recommendations below are directly derived from the Findings in Section IV and are organized into three categories that reflect the major evaluation themes (explained in Section III.B.1). Further details on each recommendation are found under the appropriate finding.

A. LEVERAGING IMPACT

1. Interaction with target institutions

- *More in-country activities.* At each institution, design activities in-country that expand on existing activities that promote changes in teaching techniques. Faculty members not trained by HEEAP have also been exposed to active learning through other ways. HEEAP can collaborate with these projects to greatly expand impact beyond HEEAP's immediate targets.

- *Continue training faculty in active learning*. Individual faculty have acquired new knowledge through HEEAP training, which has been found to be relevant to their needs.

- *Increase in-country support for greater faculty communication about teaching methods.* Findings underscored the lack of effective support to faculty after they returned, either to share experiences with peers at their institutions or with HEEAP faculty at other institutions.

- *Create and tailor change management strategies to each institution's particular challenges.* Without a strategy that reflects the particular context of each institution, and activities designed for each one, inducing institutional change will be difficult.

- *Adapt equipment and software contributions to each institution's needs.* To do this effectively, a regular, consistent interaction can be designed implemented by Vietnamese HEEAP staff for the eight institutions.

- *Increase dialogue among target institutions.* Promote more active communication to share successes and challenges faced in implementing teaching reforms.

2. English in HEEAP's strategy

- *Distinguish between goals to improve English proficiency from active learning.* Findings clearly show that acquiring English proficiency requires approaches significantly different from those used to introduce active learning. For example, the objective below calls for HEEAP activities clearly related to producing graduates prepared for a high-tech work place.

  Objective 1: Graduates have English and are more work-ready.

  Objective 2: Student learning increased with improved teaching

  Develop activities within HEEAP's scope specifically designed to improve the English speaking capacity of students of HEEAP engineering faculty. The project should work closely with existing English language programs on campuses to link their English as a Second Language (ESL) approach to the demands for graduates to be "work-ready." HEEAP should avoid establishing new U.S.-directed ESL programs and work instead with existing Vietnamese capacity to bring about more sustainable and immediate results.

  At the same time, assist the eight institutions with offering specialized English courses for faculty. In organizing a tailored English program to support HEEAP objectives, consider these activities:

  - Establish an English for Engineers program using existing modules
  - Strengthen existing on-campus English language programs
  - Select faculty participants for U.S. training six months in advance, with English proficiency as a secondary criteria, and enable faculty to improve their English proficiency levels prior to departure
  - Support a change in national policy to allow English to be used in classrooms in engineering
  -

3. Training Location and Training Language

- *Design new active learning courses in Vietnamese.* To accelerate the application of active learning beyond HEEAP-trained faculty, design programs in Vietnamese similar to the ASU training but to be conducted in Vietnam. Findings revealed an awkward situation where vocational college faculty members were trained in the US in Vietnamese via interpreters and university faculty were trained in English. In some cases cited by returned faculty where the interpreters at ASU managed English better than Vietnamese, the result would impede learning. Far greater impact can be obtained by running a similar training course in Vietnam and in Vietnamese, perhaps at a location away from one of the eight institutions where faculty can attend intensive courses in active learning. Engineering courses in Vietnam are overwhelmingly taught in Vietnamese. Acquiring the skill to use active learning in English, only to apply it in Vietnamese, adds unnecessary constraints to impact.

> *"Vietnam is not like ASU – class size is difficult, students are not the same. The culture is different here."*
> (HEEAP Returned Faculty)

- *Adapt active learning models to Vietnamese culture.* With thousands of years of history and many leadership and learning models to draw from, Vietnam offers HEEAP countless opportunities to teach active learning using Vietnamese models and examples.

- *Intersperse training in active learning with practice.* Adults learn by doing (experiential learning). Faculty will learn faster and better by returning to the classroom to experiment with new active teaching techniques, and then returning to the training course to share experiences with peers. This is not possible when all training is conducted in the United States.

4. Training Approach

- *Select only Vietnamese faculty who excel in training courses in Vietnam for training in the United States.* Conduct the majority of training in Vietnam and select leaders who emerge from that training for a U.S. Training of Trainers (TOT) course in active learning. Upon return to Vietnam, they become co-trainers for the Vietnamese-language courses in active learning.

- *Organize workshops in Vietnam* throughout the year on specific active learning topics that faculty request. There is considerable expertise that HEEAP can tap in Vietnam to implement the active learning modules in Vietnamese, with initial oversight by U.S. experts. Eventually, the TOT leaders returning from U.S. training can replace the U.S. consultants in managing the in-country training.

5. Mentoring

- *Establish a dynamic mentoring program between ASU faculty and Vietnamese counterparts.* The HEEAP Scope of Work states that "the central component of HEEAP is faculty training and mentorship" (C.4). Strong in-country support from a HEEAP office will be needed to build a real mentoring program with ASU faculty. Mentoring can begin in the U.S. but has to be sustained from Vietnam, otherwise it disappears. U.S. faculty are busy, often oriented toward their research and may consider mentoring a low priority. Also, Vietnamese faculty who have become leaders in active learning techniques can become mentors to their peers, in which case language barriers to mentoring disappear.

- *Develop Vietnamese translations for concepts related to active learning.* To help ground active learning in the Vietnamese context, practices and language have to be carefully presented. Terms such as "project-based learning" and "cooperative learning" should have agreed upon Vietnamese equivalents to help local faculty grasp the meanings. An example from the United

States is the Kapiolani Community College in Hawaii where Native American concepts and words were developed for a nationally known in-service learning program.

- *Access expertise from Vietnamese NGOs and consulting firms.* To leverage and sustain impact, HEEAP should build partnerships with Vietnamese organizations in implementing the project. Such an initiative responds to USAID FORWARD, an initiative spearheaded by USAID Administrator Rajiv Shah to shift assistance programs from heavy reliance on U.S. expertise to greater emphasis on working with existing local government and civil society organizations. The USAID Forward Progress report for 2013 states:

  > *As a cornerstone of our reform agenda, we have begun a critical shift in the way we administer our assistance, placing a greater emphasis on public private partnerships, channeling funding to local governments and organizations that have the in-country knowledge and expertise to create sustainable change, and expanding our partner base to include all voices—from faith-based organizations and diaspora organizations to small businesses."* (p.14)

6. Implementing active learning

- *Encourage education leaders to address systemic policy issues that currently impede application of active learning in Vietnam.* Many faculty members pointed to major constraints in the institutions and in Vietnam's educational policies that posed real constraints to their use of active learning techniques in the classroom. HEEAP can address these systemic and policy impediments through engaging leadership and supporting change management strategies at each institution.

7. Accreditation

- *Consider the development of a Vietnamese accreditation body for engineering education.* While ABET accreditation may be an appropriate goal for some programs at universities in Vietnam, other countries have developed their own accreditation, and 15 countries (including Korea, Malaysia, and Singapore) recognize these accreditations as equivalent. See http://www.washingtonaccord.org/Washington-Accord/signatories.cfm. The Sydney accord provides similar recognition for engineering technology accreditation.

B. TRACKING IMPACT

The section above addresses how HEEAP can leverage impact with improved management and creative mentoring. The section below focuses on measuring impact, which, when implemented effectively, can leverage impact as well.

1. Monitoring and Evaluation

- *Conduct M&E more frequently using Vietnamese resources.* Monitoring should be continuously conducted by local experts in Vietnam, and implemented close to the target institutions. Evaluations can be the quarterly gathering of data that correlate directly to the HEEAP M&E Plan and annual Work Plans. Complete data tables that show the numbers and percentages of respondent answers should be reported to financing partners and government.

- *Involve the Quality Assurance (QA) departments in more depth and consistency*. Each target institution has some sort of department that oversees quality within the institution, which is a requirement for accreditation, whether national or international. Given the weaknesses in the HEEAP M&E strategy and implementation noted elsewhere in this report, HEEAP should more closely integrate its M&E with existing M&E systems through a uniform M&E framework and standards, even though significant performance weaknesses exist in the QA departments.

- *Increase information sharing and collaborative planning with stakeholders.* In response to comments to the evaluation team from leadership at the three institutions visited, HEEAP should find new ways beyond the C-COM and occasional conferences and emails to share successes and challenges faced in implementing teaching reforms among all eight institutions.

- *Drive decision-making with data from M&E activities linked to indicators.* The value added from M&E is at the decision-making level, to transition from the learning stage to the decision stage, providing justifications for project modifications throughout HEEAP's lifespan.

C. STRENGTHENING PUBLIC-PRIVATE PARTNERSHIPS

- *Create a strong in-country presence to manage a complex project.* Although the creation of a well-staffed HEEAP office is planned, the principal reason should be to bring the management of project activities closer to the target population. The calculation should not be more training with less administrative overhead. Decades of development experience demonstrates the importance of management to achieving sustainable results, and to integrating local expertise into the project. A local office staffed by qualified Vietnamese experts will leverage impact, feed quality M&E data to decision-makers and provide a critical in-country presence that can help expand the GDA.

- *Identify new ways to build on the accomplishments of HEEAP.* Locating more HEEAP activities in Vietnam as recommended elsewhere will have a snowball effect of attracting new partners.

- *Improve project management by creating a technical steering committee.* Many capacity building projects form a high-level oversight committee similar to HEEAP's C-COM that meet occasionally during the year. The purpose of such a group is to maintain communication with stakeholders at the highest level at Ministries, USAID and the Embassy, and corporate partners. A technical steering committee comprised of university and college leaders not on the C-COM, HEEAP project leaders in Vietnam and overseas, and project managers from USAID and Intel, can meet every two months, or more frequently at certain periods, to create policies that enhance the project, such as a selection criteria for overseas training or faculty stipends, and to oversee project achievements. The HEEAP project office would serve as a secretariat for the technical committee.

VI. ANNEXES

A. Data Collection Instruments
B. Scope of Work
C. MOU among Intel, USAID, and ASU
D. HEEAP Program M&E Plan
E. Statistics on universities participating in HEEAP
F. Description of Affirmative Inquiry

ANNEX A: DATA COLLECTION INSTRUMENTS

ONLINE FACULTY SURVEY

Information About Your U.S. Training Program

1. When did you travel to Arizona State University for the HEEAP Training?
   - o 2010
   - o 2011
   - o 2012

2. Please select a number below on a scale from 1 to 4 that represents your opinion.

	Strongly disagree	Disagree	Agree	Strongly agree
The HEEAP Program Objectives were clear to me prior to my leaving for the U.S.	O	O	O	O

3. Please list below ONE of HEEAP's objectives.

4. Please select a number below on a scale from 1 to 4 that represents your opinion.

	Strongly disagree	Disagree	Agree	Strongly agree
I was satisfied with the ASU Training Program.	O	O	O	O

5. Please rank the usefulness of the following topics that you were taught during the HEEAP training at ASU to your work at your institution. Select a number from 1 to 4 representing your opinion below each topic. If you did not have one of the topics, please select "NA" for "Not applicable".

   NOTE: We have left the topics below in the original English to help you remember them.

   5a. English and Communication Skills for Engineers

   Examples of topics
   1) Audience Analysis
   2) Organization of ideas and preparing the body of a speech
   3) Evidence: presenting facts and statistics in a meaningful manner
   4) Introductions and Conclusions
   5) Visual aids and multimedia presentations
   6) Delivery skills and technical presentations
   7) Reducing communication apprehension

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5b. New Instructional Methods for Engineering Instruction

Examples of topics
1) Project Based learning
2) Active Learning
3) ABET Alignment of Curriculum
4) Drivers for Change
5) Establishing Relevance
6) Integrated Curriculum
7) Adapting to Learning Styles
8) Problem-based Instruction
9) Showing Concern for Students
10) Integrating Applied Soft Skills

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5c. Multidisciplinary Approaches to Engineering Education

Examples of topics
1) Adaptation to Various Learning Styles
2) Multidisciplinary Topic Organization
3) Effective Teaming

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5d. Developing Strong Experiments and Applied Analytical Thinking

1) Demonstrate how sequential experimentation is used in building knowledge and understanding of how complex systems work.
2) Show how statistical and process-oriented thinking can guide the experimental planning process to produce the most effective experimental strategy.
3) Teach the fundamental concepts of methodologies of Design of Experiments (DOX) in a straightforward manner, allowing participants to master the techniques.

4) Demonstrate how most of the major software packages (Minitab, JMP, Design-Expert) can facilitate effective implementation of experiment design through applied labs and analysis of "real" data.

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5e. Project Methods and Approaches

1) Criterion referenced project oriented approach
2) Working with effective teams
3) Outcome based project approach
4) Analyzing performance problems

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5f. Business Communication and Leadership

1) Leadership and Emotional Intelligence
2) Communications in multicultural environment
3) What makes a leader?
4) Planning for the whole enterprise
5) Build curriculum model to expose students to multi-cultural/multi-geographical issues through global design course models where Vietnamese, ASU and PSU students work collaboratively via distance learning technologies

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

5g. Instructional Assessment and Evaluation

1) Describe process for assessing student learning
2) Write measureable, course-level learning outcomes
3) Critique course-level learning outcomes
4) Integrate learning outcomes into a course syllabus
5) Link appropriate teaching strategies with learning outcomes
6) Match appropriate assessment measures with learning outcomes
7) Describe purpose of project evaluation
8) Describe process of project evaluation
9) Describe formative and summative evaluation approaches and their uses

10) Identify components of basic project evaluation plan
11) Write clear and measurable project objectives
12) Link appropriate evaluation measures with evaluation questions and project objectives
13) Design basic evaluation plan for HEEAP project

1 = Not useful at all
2 = Not useful
3 = Useful
4 = Highly useful
NA = Not applicable

After You Returned to Vietnam

6. After you returned to Vietnam, did you work on an Institutional Faculty Project that you started at ASU?

O Yes
O No

6a. If yes, please indicate how useful your Institutional Faculty Project was in your work at your institution in Vietnam.

Not useful at all	Not useful	Useful	Highly useful	N/A
O	O	O	O	O

7. Since you returned to Vietnam, have you worked with anyone at ASU?

O Yes
O No

7a. If yes, how often have you communicated with the ASU person, either by email, website, text/chat, video conference, telephone/Skype, etc.?

O Once only
O Occasionally (once or twice per year)
O Frequently (at least once per month)
O Very frequently (weekly)
O Other (please indicate): _____

7b. If no, please comment: _____

8. Please look at the list of topics that you were taught at ASU listed below and answer the question at the end.

English and Communication Skills for Engineers
1) Audience Analysis
2) Organization of ideas and preparing the body of a speech
3) Evidence: presenting facts and statistics in a meaningful manner
4) Introductions and Conclusions
5) Visual aids and multimedia presentations
6) Delivery skills and technical presentations
7) Reducing communication apprehension

New Instructional Methods for Engineering Instruction
1) Project-based Learning
2) Active Learning
3) ABET Alignment of Curriculum
4) Drivers for Change
5) Establishing Relevance
6) Integrated Curriculum
7) Adapting to Learning Styles

8) Problem-based Instruction
9) Showing Concern for Students
10 Integrating Applied Soft Skills

Multidisciplinary Approaches to Engineering Education
1) Adaptation to Various Learning Styles
2) Multidisciplinary Topic Organization
3) Effective Teaming

Developing Strong Experiments and Applied Analytical Thinking
1) Demonstrate how sequential experimentation is used in building knowledge and understanding of how complex systems work.
2) Show how statistical and process-oriented thinking can guide the experimental planning process to produce the most effective experimental strategy.
3) Teach the fundamental concepts and methodologies of Design of Experiments (DOX) in a straightforward manner, allowing participants to master the techniques.
4) Demonstrate how most of the major software packages (Minitab, JMP, Design-Expert) can facilitate effective implementation of experiment design through applied labs and analysis of "real" data.

Project Methods and Approaches
1) Criterion referenced project oriented approach
2) Working with effective teams
3) Outcome based project approach
4) Analyzing performance problems

Business Communication and Leadership
1) Leadership and Emotional Intelligence
2) Communications in multicultural environment
3) What makes a leader?
4) Planning for the whole enterprise
5) Build curriculum model to expose students to multi-cultural/multi-geographical issues through global design course models where Vietnamese, ASU and PSU students work collaboratively via distance learning technologies

Instructional Assessment and Evaluation
1) Describe process for assessing student learning
2) Write measureable, course-level learning outcomes
3) Critique course-level learning outcomes
4) Integrate learning outcomes into a course syllabus
5) Link appropriate teaching strategies with learning outcomes
6) Match appropriate assessment measures with learning outcomes
7) Describe purpose of project evaluation
8) Describe process of project evaluation
9) Describe formative and summative evaluation approaches and their uses
10) Identify components of basic project evaluation plan
11) Write clear and measurable project objectives
12) Link appropriate evaluation measures with evaluation questions and project objectives
13) Design basic evaluation plan for HEEAP project

Did you apply any of these topics in your work in Vietnam?

O Yes
O No

8a. If yes, please list the THREE that you applied the most:

8b. If no, please tell us the reasons you were not able to apply the skills and knowledge you learned at ASU.

9. Have you been able to share anything you learned at ASU with your colleagues?

   O Yes
   O No

   9a. If yes, please explain below how you shared what you learned:

   9b. If no, please explain why:

10. Have you changed your teaching methods because of participation in the HEEAP training at ASU?

    O Yes
    O No

    10a. If yes, please list up to THREE ways your teaching has changed:

    10b. If no, please explain why:

11. Have you noticed any changes in student performance?

    O Yes
    O No

    If yes, please list the MOST IMPORTANT change you have observed:

12. Engineering accreditation (ABET) provides a framework for the training you received at ASU. Have you applied ABET concepts in your teaching?

    O Yes
    O No

    12a. If yes, please describe how:

    12b. If no, please explain why.

Your Views on HEEAP

13. What are the most positive aspects about HEEAP? Please list up to 3 below:

14. If you have any recommendations on how HEEAP can be improved, please share them with us below:

15. If you have any other comments, please share them with us below.

Information About You

Gender:

- O Male
- O Female

Age: _____

What is your engineering field (electrical, mechanical, other): What is the highest degree you have obtained?

- O Bachelor's
- O Master's
- O PhD

Other _____

What is the name of your current higher education institution? Please select from below:

- O Da Nang University of Technology (DUT)
- O Ho Chi Minh City University of Technology (HCMUT)
- O Ho Chi Minh City University of Technical Education (HCMUTE)
- O Can Tho University (CTU)
- O Hanoi University of Science and Technology (HUST)
- O Industrial University of Ho Chi Minh City (IUH)
- O Ho Chi Minh Vocational College of Technology (HVCT)
- O Cao Thang Technical College (CTTC)

Other _____

What position do you currently hold at your institution?

How many years have you been teaching engineering?

Thank you very much for your participation!

INTERVIEW PROTOCOL

KEY INFORMANT INTERVIEW GUIDE

UNIVERSITY ADMINISTRATION
(Rector, Dean, Dept Head)

Interviewer _____ Date _____

Person Interviewed _____ Gender: M__ F __

1) How long have you been in your current position?

2) Tell me about your university /department?

- Number of students in engineering
- Engineering specialties taught
- Number of undergraduates / graduates / females
- Number of engineering faculty

3) Are you familiar with HEEAP? Have you traveled to the U.S., as a participant or in your current position?

- How many faculty have gone to the US under HEEAP?
- Have you seen any changes because of HEEAP? If yes, what have you seen?
- If HEEAP did not exist do you think these changes would have happened?
- How has your faculty reacted to HEEAP?
- Have you noticed any change in student performance because of HEEAP?
- Tell us about the equipment that has been donated through HEAPP. Was there training associated with the equipment given?

4) What has your role been in disseminating HEEAP at your university?

5) How did you institution nominate faculty for HEEAP?

6) Are you familiar with ABET?

7) Do you or others ever meet to discuss the HEEAP project?

8) Has there been equipment provided under HEEAP to your university?

9) Do you have any recommendations on how HEEAP might improve?

FOCUS GROUP GUIDES

FOCUS GROUP GUIDE
FACULTY - HEEAP

Interviewer _____ Date _____

No. of Faculty attending FG: _____

Pre-program

1. Why did you want to participate in the HEEAP training at ASU?

The Program at ASU

2. What were the goals?

3. What did you expect would happen at the training program before you arrived?

4. What happened at ASU – did it meet your expectations?

5. Did the ASU training program reach its goals?

6. Were there benefits you gained from the program?

7. Were there disadvantages or weaknesses?

Post Program

8. Have you applied what you learned at the training? If yes, how? What were the results?

9. Have you shared with others what you learned at the workshop? If yes, how? What is the result?

10. Have there been obstacles to your applying knowledge?

11. Are you familiar with ABET Accreditation?

12. Have you worked with anyone at ASU since you returned? If yes, how? What is the result?

13. Do you have any recommendations to improve the effectiveness of the program?

FOCUS GROUP GUIDE
FACULTY – NON-HEEAP

Interviewer _____ Date _____

No. of Faculty attending FG: _____

1. What skills or knowledge are important for graduates to have?

2. Compare teaching engineering with teaching other topics.

3. Do you have difficulties in teaching engineering? If so, what difficulties. Do engineering faculty members need to change their teaching methods?

4. How do students learn best? Which teaching methods are best for students?

5. What support do faculty members need to be effective teachers?.

6. Have you heard about the HEEAP program? If yes, how? What did you learn about it?

7. Are you familiar with ABET Accreditation?

FOCUS GROUP GUIDE
STUDENT –- HEEAP (2) and NON-HEEAP (1)

Interviewer _____ Date _____

Group ("before/after"/HEEAP/non-HEEAP) _____

1. Do you find engineering difficult?

2. How can you learn best in class?

3. What do companies want in an engineer after graduation?

4. When you took _____ [name the class subject, not the teacher] in 20__, what was it like? Describe the teaching you observed.

5. Have you heard about ABET Accreditation?

Thank you very much

OBSERVATION PROTOCOLS

HEEAP EVALUATION
STRUCTURED CLASSROOM OBSERVATIONS

FORM # _____

INSTRUCTIONS: This form is designed to obtain a consistent sample of classroom interactions in different contexts. In each class observed, 5-minute observations are to be made and the appropriate categories ticked.

How to use the form:

- First, complete the information in the heading section. Note the time you start observing and record it on the form.
- Then focus on the lecturer/professor and record a 1 for the first interaction observed. Tick the teacher column if the teacher initiates the interaction or the student column if a student initiates the interaction. Select the appropriate gender for the student.
- Tick all of the relevant boxes across the first observation row. Select one type of interaction from the columns with these titles:

questions:	interrogative requiring an answer
explain:	gives details on a specific theme
orders:	tells receiver(s) to do something
dictates:	read/talks for transcription/copying
praises:	recognition of accomplishment(s)
punishes:	physical or verbal actions of show disapproval of incorrect behavior

- In the receiver columns at right, tick the recipient of the interaction – group, student male or student female, or the teacher. Record if the reaction is verbal or non-verbal – or no response.
- Record separate interactions (defined as change of person or subject) with consecutive numbers over the 5-minute observation period, recording all appropriate information related to each interaction.
- Don't rush: it is better to record all information for each interaction than to leave interactions with incomplete data.
- Use the "comments" section to describe the context of the observation (e.g. what the teacher is teaching and where s/he is located in the class)

Remember:

- **This form focuses only on interactions that include the teacher. Strictly student-to-student interactions are not recorded.**

HEEAP STRUCTURED CLASSROOM OBSERVATIONS

University Name: _____ Level (3rd, 4th, graduate, etc.) _____ HEEAP? ___ non-HEEAP ____

Observer:_____ Date: _____ Faculty Name: _____ Gender: M___ F ___

Large class _____ Small class (under 10) _____ Group Work? Y ___ N ___

Interaction	**Initiator**			**(ignore column)**					**Teacher's Behavior**						**Receiver**				**Receiver's Behavior**		
# (every 5 min)	Teacher [1]	Student M [2]	Student F [3]						Questions [1]	Explains [2]	Orders [3]	Dictates [4]	Praises [5]	Punishes [6]	Teacher [1]	Student M [2]	Student F [3]	Group [4]	Responds V [1]	Responds NV [2]	Does Not Respond [3]

V=verbal, NV=non-verbal

Comments/Context :

HEEAP EVALUATION
OBSERVATIONS OF 'BEST PRACTICES' IN A UNIVERSITY CLASSROOM
(To be completed at the end of the lesson)

University _____ HEEAP __ Non-HEEAP __

Faculty Name _____ Gender: M ___ F ___

Student Level (3rd, 4th, Grad) _____

Observer _____ Date _____

Indicator	**Observed [1]**	**Not Observed [0]**
Instruction		
1. The lecturer/professor shows evidence of prior class planning. The lecturer/professor has prepared materials for the class period.		
2. Materials related to the class activities are ready. The students have materials related to the class activity.		
3. The lecturer/professor explains the goal and purpose of the class lesson to the students.		
4. The lecturer/professor models the task that the students are to perform (e.g., predicting before reading, using sounds to spell, etc.).		
5. The lecturer/professor begins the class activity with questions that review previous activities and draw on the prior knowledge of the students.		
6. The content prepared by the lecturer/professor is consistent with the purpose and goal of the lesson.		
7. The lecturer/professor asks questions of different types to encourage students to answer using critical thinking skills.		
8. The lecturer/professor presents content in a way that is connected with the subject taught.		
9. The lecturer/professor stimulates discussion on topics that go beyond factual information.		
Grouping and Feedback		
1. The lecturer/professor facilitates work in groups when appropriate.		
2. The lecturer/professor works with student groups at different levels of difficulty based on the knowledge of the students.		
3. The lecturer/professor gives different assignments based on the learning needs of the students when appropriate.		
4. The lecturer/professor provides students with corrective feedback and positive support as necessary.		
Gender		
1. Are female students actively involved? 2. Does the learning environment support female student involvement?		
Classroom Management		

Indicator	**Observed [1]**	**Not Observed [0]**
1. The lecturer/professor organizes class time so that a majority of the students are involved during the observation.		
2. The lecturer/professor promotes an effective classroom climate through positive and respectful actions, attitudes and gestures.		
3. The lecturer/professor consistently reminds the students of the classroom rules and expectations.		
Use of Physical Space	**YES**	**NO**
1. Does the classroom support a good learning environment?		
2. Is the lecturer/professor moving around the room?		

Comment on Lesson by Observer:

ANNEX B: SCOPE OF WORK

RFTOP no. SOL-486-13-0000023

SECTION C – STATEMENT OF WORK

C.1 TITLE

Mid-Term Evaluation of USAID/Vietnam's "Higher Engineering Education Alliance Program" (HEEAP), implemented by Arizona State University.

C.2 INTRODUCTION

USAID/Vietnam plans to use the GEM II BPA to undertake a mid-term evaluation of the "Higher Engineering Education Alliance Program" (HEEAP) implemented by Arizona State University (ASU) in partnership with Intel Corporation. The program aims to transform engineering education in Vietnam from passive, theory-based instruction to active, project-based instruction and produce work-ready graduates for Vietnam's rapidly growing high-tech manufacturing sector.

HEEAP is the first of three Global Development Alliances (GDAs) in Higher Education pursued by USAID/Vietnam. The other two GDAs are The Vocational and University Leadership Innovation Institute (VULII) and the Social Work Education Enhancement Program (SWEEP).

VULII, which is also being implemented in collaboration with ASU and Intel, builds on HEEAP by expanding reforms made in engineering classrooms to the broader enterprise of university administration and operations. VULII is part of a larger suite of investments by donors, the private sector, and the Government of Vietnam (GVN) in HEEAP. While the USAID cooperative agreement with ASU that founded HEEAP and funded it for the past 2.5 years comes to an end in 2014, the HEEAP movement will continue with other resources, including the USAID VULLII award.[4]

SWEEP is being conducted with San Jose State University and Cisco Systems. The SWEEP program takes a similar approach to social work education improvement as HEEAP does to engineering education improvement, but with different institutions.

VULII and SWEEP are the next generation of USAID/Vietnam investments in higher education GDAs and the mission will use the findings, conclusions and recommendations of this evaluation of HEEAP to inform the management of these programs and future Higher Education programmatic decision making. In this sense, while the HEEAP evaluation comes near the end of USAID's cooperative agreement with ASU for HEEAP, it is a mid-term evaluation as it will (1) inform continued efforts being made in the HEEAP movement/project by others – including Intel and the GVN; (2) inform USAID/Vietnam's management of its new, but similar GDAs; and (3) inform USAID's future higher education programming.

C.3 OBJECTIVE

[4] HEEAP is a reform movement based at eight Vietnamese colleges and universities, not a time-bound project or cooperative agreement.

The objectives of the evaluation include assessing:

1. The success of HEEAP in advancing cutting edge instruction, relevant and up-to-date curriculum, improved undergraduate learning outcomes, and institutional support for such reforms. The approach advanced by HEEAP is tightly aligned to the Accreditation Board for Engineering and Technology (ABET);
2. How results achieved by the program are seen and measured by program funders and stake holders and whether or not current project indicators best reflect the performance of the project; and,
3. The contributions of the GDA structure to program results over and above the results that could have been achieved by USAID funding alone.

C.4 BACKGROUND INFORMATION

As Vietnam moves from lower to middle-income country status, its higher education system is under immense pressure to meet the needs of the rapidly changing economic landscape. Unfortunately, in its current state, it is not up to the task. Based on a 2008 assessment and in close collaboration with the USAID/Washington private sector partnership advisors, USAID/Vietnam released an Annual Program Statement (APS) in 2009 to fund a program that would improve the quality of higher education in Vietnam by strengthening the human and institutional capacity of Vietnamese higher education institutions to deliver education, training and applied research programs that underpin economic growth, are responsive to the needs of the private sector, and are conducive to increased employability for the recipients of higher education.

The shortcomings of the Vietnamese higher education system are myriad: insufficient institutional differentiation and autonomy, poorly trained and underpaid professors, outdated instructional methods, poor education management, and weak curriculum, among others. The demands of the highly competitive global economy require a mix of knowledge, skills, and abilities that are not consistently being developed by Vietnam's higher education system. No matter what standard one applies – supporting the achievement of next-stage economic growth, meeting labor market needs, providing access to underserved populations, fostering valuable research, generating a culture of innovation, collaborating effectively with the private sector - Vietnam's higher education institutions are not measuring up. Exceptions exist, but the general situation is sobering, and a variety of factors combine to constrain the quality and relevance of the system and its institutions.

Critical factors germane to this evaluation include:

1. <u>Lack of private sector involvement.</u> Although the GVN has supported forums aimed at fostering new approaches and practices in private sector integration, the vast majority of universities, colleges and post- secondary technical and vocational institutions do not actively collaborate with the private sector. Further, the ability of higher education institutions to conduct research and development for the government or private sector is severely limited, as evidenced by the dearth of patent applications and peer-reviewed research publications produced by Vietnamese scholars and universities.

2. <u>Weak quality of curriculum and instruction.</u> Higher education curriculum in Vietnam is often outdated, and reform is difficult to pursue or implement. Moreover, a large percentage of higher education institutions in Vietnam are mono-disciplinary institutions that focus on one

field of study and fail to address inter- disciplinary thinking and soft skills (teamwork, problem-solving, communication, English, etc.) that are valued by the private sector. What is taught is typically taught didactically with a premium placed on memorizing facts. The General Manager of a major multi-national corporation in Vietnam recently described his impression of the university classrooms he has visited in Vietnam:

> *One of the first things you will see is that the vast majority of the classes are taught in Vietnamese. You will also see that the classroom has very little to no interaction between students and the teacher. Teachers teach and students listen, but they do not challenge the teacher, ask clarifying questions or have opportunities to present their ideas in the classroom. You will also see that*
> *almost every class is an individual learning experience with very little team based activities and team based projects.*

The type of long-term economic and political growth that the U.S. Government envisions for Vietnam requires the right quantity and quality of human capital and mix. Dramatic reforms to the higher education system in Vietnam are needed to produce this human capital, but reform has been slow. Given the world class higher education system in the U.S., the vast experience of USAID in higher education development, and USAID's ability to leverage private sector resources, USAID was well-positioned to assist Vietnam with this development challenge.

The 2009 APS released by USAID received a robust response and the mission was able to sign a cooperative agreement (CA) with ASU for HEEAP in June 2010. The CA focused on advancing the electrical and mechanical engineering curricula of top technical colleges and universities in Vietnam to help Vietnam's education system develop a highly skilled technical workforce that will attract and sustain a healthy high-tech manufacturing industry in Vietnam. Engineering was attractive to the Mission and to the private sector, given that Vietnam's emerging high-tech industry has strong economic potential. With the right infrastructure and support, the country has the opportunity to develop a diverse and dynamic system that contributes to global productivity including technology manufacturing, research and development, and hardware/software design. HEEAP was funded to provide a framework that can be expanded with more institutions, more faculty and additional programming to match industry needs as it develops.

The central component of HEEAP (often referred to as "the Alliance Program") is faculty training and mentorship. In 2010-2012, 77 professors from eight Vietnamese colleges and universities attended a four to six weeks of training at ASU, where they prioritized reforms and worked together on curriculum design. After completing the training and gaining approval for their reform projects, these cohorts of faculty returned to Vietnam to implement changes in curriculum, design new courses and revamp labs based on improved teaching methods and new learning outcomes. Additional faculty will be trained in 2013. The Alliance provides project assistance and mentoring for faculty throughout the program. HEEAP also works with university leadership and the Ministry of Education and Training and the Ministry of Labor to support reform.

Beginning with five universities in 2010, the Alliance Program expanded in 2011 to include three vocational colleges. Applied technology programs at vocational colleges lack enough students to fuel the growing high- tech manufacturing industry, and the largest gap is among female graduates. In addition to the core HEEAP training and activities – which now spanned eight institutions, the technical/vocational track of the Alliance Program aimed to improve the perception of vocational programs and careers by targeting parents and students through an education awareness/media

campaign and scholarships to women who show academic promise and interest in technician careers.

Through a GDA approach, HEEAP endeavors to leverage the financial and technical resources of several industry partners. The main HEEAP industry partner is Intel Corp., which has had considerable involvement with the HEEAP design, start-up, management, and expansion. In addition to Intel – with whom USAID has an MOU regarding HEEAP – other private resource partners (Siemens, Danaher Corp, and Cadence Software) and the GVN have contributed significantly to HEEAP – though not codified through any agreement with USAID (i.e. no MOU).[5] While the model of multiple resource partners and significant host country support is lauded as a program model, there have been questions in the mission as to the best practices for managing a GDA structure where three (or more) partners are involved, particularly those of different institutional cultures and approaches and with varying levels of formal relationship with USAID.

Based on initial data and anecdotal success stories, HEEAP has been seen as a model program in the development sector. HEEAP has been lauded by the Mission, USAID/Washington and Secretary of State Hillary Clinton, who singled out the GDA with Intel and commended HEEAP for its success in collaboratively empowering the next generation of engineers with the skills to propel Vietnam to the global stage.[6]

C.5 STATEMENT OF WORK

The contractor must perform a robust evaluation of the HEEAP program, based on a triangulation of (1) project document review; (2) data collection through survey and interviews; and (3) classroom and campus observations. The evaluation questions must include, at a minimum:

C.5.1 Evaluation Questions

1. How and to what extent has HEEAP advanced a sustainable, ABET-style approach to improved instruction, relevant and up-to-date curriculum, improved undergraduate learning outcomes, and institutional support for such reforms;
    a. Has the program met its targets to date?
    b. Are completed program activities sustainable? Or are there sufficient sustainability plans in place?
    c. What difficulties were encountered in faculty training/mentoring, reform project assistance, and in leadership development, if any?
    d. On what basis were the participants chosen? Did the appropriate people attend trainings and seminars and if not, why not?
    e. How have program strategies and activities evolved over time? On what basis were changes in direction considered and decided? Is there any indication that changes improved/increased impact and results or if any changes had negative consequences for impact and results??

[5] USAID has typical project approval and agreement documents with the GVN for HEEAP, but no stand-alone agreement documenting the GVN's intention to invest in HEEAP.
[6] Intel Vietnam won the 2012 Secretary of State's Award for Corporate Excellence, based in large part on their support for HEEAP.

2. How were results/impact made by the program seen and measured by program funders and stake holders? What implications does this have for USAID/Vietnam's on-going higher education reform efforts?
    a. How have the respective partners monitored the quality and effectiveness of the activities?
        i. ASU
        ii. Intel
        iii. USAID
        iv. Other private sector
    b. Did the approved monitoring and evaluation plan provide a useful framework for activities?
    c. What information has monitoring produced and how has it been used?
    d. What challenges have ASU, Intel, and USAID encountered in their efforts to effectively monitor program activities?
    e. Has the results framework enabled a full and accurate picture of program achievements?
    What additional indicators might enhance the understanding of results achieved?
    f. How has the private sector measured and understood program results?

3. How has the GDA structure of the program contributed to program outcomes?
    a. What did partners other than USAID provide or contribute to the program (as program inputs), whether through direct financial resource, in-kind contributions, substantial involvement in project activities or other types of participation and engagement? What did USAID provide or contribute to the program?
    b. What outputs, outcomes, results and impacts can reasonably be attributed to each of the inputs provided by each of the partners – whether due to the impact of the input alone or the impact of the impact in conjunction with other inputs?
    c. What is different about the outputs, outcomes, and results of this program by virtue of it being an alliance?
    d. How was the design, implementation and management of this program different from programs traditionally developed and implemented by USAID?
    e. How (if at all) has use of an alliance changed the scale, efficiency, or effectiveness of the program?
    f. How has it changed the sustainability of the program's outcomes and impact?
    g. What opportunities were available or afforded by virtue of taking an alliance approach as opposed to a more traditional programming approach?

C.5.2 Methodology and Data Sources

The Contractor must review key programmatic and financial project documents provided by USAID/Vietnam, and ASU.

The Contractor must conduct a series of semi-structured key informant interviews including with:

- Present and past USAID/Vietnam mission staff involved in Education programming;
- Key project partners including select participants from no less than four of the partner universities (including no less than two universities and no less than two vocational colleges), GVN counterparts, Intel and one or more of the other corporate partners involved.

The Contractor must conduct a survey of students and/or faculty at HEEAP-partner institutions and similar non-partner institutions to determine HEEAP successes and/or shortcomings.

The Contractor must identify at least three target institutions (two universities and one technical college) and two comparison departments within two of the same institutions (one university and one technical college) and shall spend at least three days at each target department/institution and at least one day at each comparison department observing/evaluating these institutions to provide an element of comparison.

Comparison departments should be similar in nature to HEEAP's target departments (e.g. other types of engineering departments within the same institutions that are not targeted by the HEEAP alliance).

The Contractor will review assessments or evaluations of other higher education partnerships with similar agendas (e.g. faculty training and development.) USAID/E3/ED will assist in identifying relevant evaluations to review.

The Contractor can access information about the performance of HEEAP from the following sources. Written documents will be provided to the evaluation team well-prior to departure for Vietnam:

- The program approval, solicitation and cooperative agreement documents;
- Quarterly and annual reports;
- HEEAP staff in Arizona and Vietnam;
- Intel staff in Vietnam;
- Current and former USAID AOR and other staff;
- Participants in program activities and other beneficiaries and stakeholders, including GVN officials;
- The program website: www.heeap.org

C.5.3 Logistics

The Contractor is responsible for making all logistical arrangements for the team. All expatriate team members will need a valid visa prior to entering Vietnam. That includes full responsibility for, but not limited to, transportation, computers, organizing meetings and interviews, and implementing the proposed evaluation methodology.

USAID/Vietnam will assist in arranging meetings with key stakeholders identified by USAID prior to the initiation of field work. Additionally, USAID can also make recommendations on in-country lodging, if needed. USAID/Vietnam personnel will be made available to the team for consultations regarding sources and technical issues, before and during the evaluation process.

USAID representatives may accompany the evaluation team for some or all of the evaluation. The Contractor is expected to consider this when making logistical arrangements.

(End of Section C)

ANNEX C: MOU AMONG INTEL, USAID, AND ASU

PROJECT LEVEL MEMORANDUM OF
UNDERSTANDING AMONG
INTEL CORPORATION
AND
USAID/VIETNAM
AND
ARIZONA STATE UNIVERSITY

This Project Memorandum of Understanding ("Project MOU") is by and among the United States Agency for International Development ("USAID"), Intel Corporation ("Intel"), and the Arizona Board of Regents, on behalf of Arizona State University ("ASU") and is effective as of June 22, 2010 (the "Effective Date"). USAID, Intel, and ASU may be referred to herein by their respective names or as a "Party" or collectively as the "Parties".

I. **Background and Purpose:**

1.1 Shared Goals: The Parties share the common goal of collaborating with top technical Vietnamese universities in developing a highly skilled Engineering workforce that will attract and sustain a high-tech manufacturing industry.

1.2 The Project: This Project MOU sets forth the understandings and intentions of the Parties with respect to the Higher Engineering Education Alliance Program (HEEAP) activity located in Vietnam (the "Project").

1.3 Independent Parties: The Parties are entering into this Project MOU while wishing to maintain their own separate and unique missions and mandates, and their own accountabilities. The cooperation among the Parties outlined in this Project MOU is not to be considered or construed as a partnership or other type of legal entity or personality. Nothing in this Project MOU shall be construed as superseding or interfering in any way with other agreements or contracts entered into either prior to or subsequent to the signing of this Project MOU.

II. PROJECT DESCRIPTION:

2.1 Description: USAID, Intel, and ASU intend to collaborate to improve the engineering undergraduate learning outcomes and instructional approaches and pedagogy through an innovative and advanced faculty development program over the period June 22, 2010 -June 21, 2013. The faculty development program will take place within the context of a broad support infrastructure from Intel Corporation to the Vietnamese universities selected for this program.

2.2 Project Objectives: The activities described in this Project MOU will further the following objective(s) identified in the Global MOU between USAID and Intel:

- ☐ Accessibility: Creating opportunities for widespread ownership and use of affordable, fully capable personal computers (PCs);
- ☐ Connectivity: Expanding wireless broadband Internet access by leading ecosystem development and deployment of WiMAX technology;
- ✓ Education: Preparing students for success in the global economy through education
- ☐ programs, resources and technology;
- ☐ Content: Enabling locally relevant content, software applications, and services for new users and new usage models in emerging and developing economies.
- ☐ Other:

2.3 Problem Addressed by the Project: The Project is designed to address the problem described in this Section 2.3 by undertaking the activities described in Section 3.1. The Parties seek to transform the existing theory-based Electrical and Mechanical Engineering curricula into a strong hands-on degree, in which graduates are ready to perform effectively in the 21't century workplace.

2.4 Investment Promotion. Intel affirms that it is not reasonably likely to relocate jobs from the U.S. as a result of this activity.

2.5 Project Implementation Schedule:

Project Phase	Timeframe	Expected Achievements
Define objectives & scope project details	Nov-Dec, 2009	• Detailed project proposal with defined focus areas, budget, and deployment timeline.
Announcement & Selection	Jan-Mar, 2010	• Selection criteria for VN universities • Project announcement in Vietnam • Administrators Workshop • Selection of sponsored VN universities
Preparation & Development	Apr-Jun, 2010 Apr-Jun, 2011 Apr-Jun, 2012	• Identify and prepare faculty trainers • Select VN faculty • Design/develop six-week Faculty Institute • Design/develop hands-on **curriculum** and instructional lab component • Incorporate previous year's Best Known Methods **into next session**
Components 1 & 2 Deployment: Six-Week Training Program & Curriculum Design and Instructional Lab	Summer2010 Summer2011 Summer2012	• Implement **six-week** Faculty Institute and Instructional Labs
Component 3 Deployment: Faculty Mentor Program	Fall2010 Fall2011 Fall2012	• Implement Faculty Mentor Program and digital media/distance learning technology, implementing BKMs from previous year • Provide related lab infrastructure support (depending on needs by VN universities)

Project Phase	Timeframe	Expected Achievements
Component 4 Deployment: Implementation of New Instructional Pedagogy in Vietnam	Jan-Dec 2011 Jan-Dec 2012 Jan-Dec 2013	• VN **universities** implement new instructional pedagogy in their schools, implementing BKMs from previous year • Continue Faculty Mentor Program and digital media/distance learning technology • Provide on-site coaching in VN • Provide related infrastructure support (depending on needs by VN universities)
Dissemination & Sustaining	Ongoing	• Package and make accessible 6-week online course • Make available online coaching • Create Global Engineering Education Collaborative (GEEC)
Monitoring & Evaluation	Ongoing	• Baseline faculty relative to desired outcomes • Conduct M&E over life of the project

III. ROLES AND CONTRIBUTIONS OF THE PARTIES

3.1. Project Implementing Activities: It is the intention of each Party to conduct the activities and fulfill, directly or through one or more third parties, the roles and responsibilities voluntarily undertaken by them as described below.

Activity	**ASU**	**Intel**	**USAID**
Project Design	Create draft project architecture		- Review/feedback
HEEAP Program Development & VN Collaborating University Selection	- Design six-week institute at ASU, including faculty trainer selection - Co-lead university selection process - Lead VN faculty process selection process - selection process (from selected universities)	- Provide input to ASU on the institute curriculum - Co-lead university selection process - Participate as a reviewer selection process in the faculty selection process	- Fund associated costs for ASU. Per the Cooperative Agreement, USAID financial obligation is made as of June 22, 2010 and ends June 21, 2013. USAID is not obligated to reimburse to ASU cost incurred before or after these dates.
Component 1: Faculty Development Six-Week Training	- Prepare scalable training (for VN faculty sponsored by USAID grant, by Intel, and by own schools) - Subcontract with Portland State University to prepare and deliver portions of six-week training - Deliver scalable training, including accommodating visiting faculty and trainers – 2010, 2011, 2012 sessions	- Provide models of Intel collaboration with Higher Ed in curriculum design, research and student projects - Sponsor additional faculty from selected and other universities to attend HEEAP program - Provide modest faculty stipends for all VN participants - Contribution per Intel/ASU HEEAP Budget	- Funding to ASU for development and delivery of Component I (includes sponsorship of -30 Vietnamese faculty to attend, per HEEAP budget)

Activity	ASU	Intel	USAID
Component 2: Curriculum Design & Instructional Lab Component	- Prepare and deliver instructional methods curriculum and labs for VN faculty-2010, 2011, 2012 sessions - Provide tours of labs and methodologies (using simulated and actual classrooms) of how to integrate labs and applied research programs into the classroom	- Assess (with ASU and VN faculty) current and desired states of VN EE and ME Dept labs, and provide necessary lab donations to address a portion of needs (VN universities will also fund gaps) - Provide English-for – Engineering support, if needed. - Contribution per Intel/ASU HEEAP Budget	- Funding to ASU for development and delivery of Component 2 (per HEEAP budget)
Component 3: Faculty Mentor Program	- Identify mentor/protégé faculty pairs - Provide mentoring sessions in the US - Develop digital media and web-conferencing mentor tools - Provide on-going mentoring and coaching sessions online	- Sponsor Faculty mentor Pairing for on-site visits (US and VN) - Provide Distance Learning support to augment VN university investment in this area - Contribution per Intel/ASU HEEAP Budget	- Funding to ASU for development and delivery of Component 2 (per HEEAP budget)
Component 4: New Instructional Pedagogy in Vietnam	- Collaborate with VN universities in the instruction of courses via distance education and short on-site sessions in VN - Develop digital media and web-conferencing mentor tools - Provide on-going mentoring and coaching sessions online	- Augment the pedagogy via a) student scholarships and industry-sponsored Engineering contest, b) Faculty innovation grants. - Contribution per Intel/ASU HEEAP Budget	- Funding to ASU for support of Component 2 (per HEEAP budget)

Activity	ASU	Intel	USAID
Dissemination & Sustainability	Develop a national network of industry, universities, and government to support the underlying goals		
Monitoring & Evaluation		- Fund Monitoring & Evaluation, providing input on continuous improvement methods - Contribution per Intel/ASU HEEAP Budget	- Fund ASU M&E
Total Valuation **Year 1** **Year 2** **Year 3**	$173,429	**Gifts to ASU Foundation: $150,000** **Other Contributions to ASU: $1,400,000** **TOTAL Intel Contribution: $1,550,000**	$ 847,611

3.2 Amendments to this Project MOU: Additional contributions may be agreed upon by the Parties during implementation of the Project; any and all amendments to this Project MOU, including such additions of contributions and/or project information, shall be in the form of a written agreement signed by the Parties.

IV. COORDINATING COMMITTEE AND PROCESS: The Parties acknowledge that the successful implementation and conduct of the Project will require coordination among the Parties (and others). The schedule and responsibility for coordinating meetings, reports, and so on is as follows:

4.1. Committee Members: The Parties intend to form and participate on a Coordinating Committee to be comprised of those representatives identified in Annex 1, attached hereto. The representatives may change from time to time; a Party may notify the other Party(ies) of such changes by modifying and delivering a revised Annex 1 to the other Party(ies). The Coordinating Committee will endeavor to meet monthly and on an ad hoc basis, as necessary, to discuss Project activities, progress, and results and to address and resolve any Project issues and concerns. Parties may invite their implementing partners to participate on this committee in a non-decisional advisory capacity only.

4.2. Standard Agenda: A standard agenda for coordination meetings is included at Annex 1; however, the Parties will endeavor to provide each other with information that is necessary to facilitate the implementation of the Project even if the particular topic/issue is not included in the standard agenda.

V. PUBLICITY AND PUBLIC COMMUNICATIONS PLAN

5.1. Publicity: The Parties intent to establish a public communications program in accordance with Intel, ASU and USAID legal, policy, and procedural requirements which ensures that appropriate publicity is provided for all Project activities and that suitable attribution is given to each Party.

5.2. Observe Confidentiality: Subject to the laws that apply to each Party, the Parties will respect each other's confidentiality policies, with the mutual understanding that both Parties intend to publicize the Project and its objectives without disclosing any confidential or proprietary information of any Party.

5.3 Primary Point of Contact for Publicity: The Parties will provide each other a primary point of contact for all communications in regards to the Project and this Project MOU.

5.3.1 Primary Point of Contact for Publicity for USAID: (Richard Nyberg, Development Outreach and Communications Advisor, USAID/Vietnam, 2 Ngo Quyen Street, Hanoi, Vietnam. rnyberg@usaid.gov; phone: +84 4 3935-1249)

5.3.2 Primary Point of Contact for Publicity for Intel: Uyen Ho, Lotl2, Dl Road, Saigon Hi-Tech Park, District 9, Ho Chi Minh City, Vietnam, uyen.ho@intel.com, +84 8 3736-3166.

5.3.3 Primary Point of Contact for Publicity for ASU: Jeremy Fountain, Director of Marketing and Public Affairs – Ira A. Fulton Schools of Engineering, PO Box 87-9309, Tempe, AZ 85287-9309, jeremy.fountain@asu.edu, 1-480-727-8313

VI. PROJECT AND LOCAL CONTACTS

6.1. USAID: The primary point of contact and liaison to this Project from USAID is as follows:

Name: Howard Handler
Address: 2 Ngo Quyen Street, Hanoi, Vietnam.
Telephone: +84 4 3935-1244
Email:hhandler@usaid.gov

6.2. Intel: The primary point of contact and liaison to this Project from Intel is as follows:

Name: Roma Arellano
Address: Intel Corporation, 4100 Sara Rd, RR5-503, Rio Rancho, NM, 87124
Telephone: 505 893 0211
Email: roma.arellano@intel.com

6.3. ASU: The primary point of contact and liaison to this Project from ASU is as follows:

Name: Jeffrey S. Goss

Address: Arizona State University, Ira A. Fulton Schools of Engineering, PO Box 874411, Tempe, AZ
Telephone: 480 965 5466
Email: jeff.goss@asu.edu

6.4. Change Points-of-Contact: A Party may change its points-of-contact at any time by providing advance written notice to the other Party.

VII. INTELLECTUAL PROPERTY

It is intended that intellectual property produced under this MOU is, subject to 22 Code of Federal Regulations section 226.36 (Intangible property), subject to the following:

7.1 Pre-existing material: Each party retains ownership of and title to its pre-existing material. However, USAID is granted a royalty-free, irrevocable and nonexclusive right to use pre-existing material that is enhanced with USAID funds under the project, for Federal purposes, and to authorize others to do so.

7.2 Intel Material: Intel will own all branding, copyright, and usage rights for materials it develops without input from USAID or its partners under this MOU. Any additional uses of these materials beyond the scope of this MOU are subject to Intel's written license agreement or written approval.

7.3 ASU Material: ASU will own all branding, copyright, and usage rights for materials it develops without input from USAID or its partners under this MOU. Any additional uses of these materials beyond the scope of this MOU are subject to ASU's written license agreement or written approval.

7A Jointly-developed Intellectual Property: Intellectual Property resulting from the performance of the Project and created jointly by legal inventors who are ASU's employees and Intel's employees will be owned jointly by ASU, managed through AzTE, and Intel, subject to the provisions of 22 CFR section 226.36 (Intellectual property) for material developed with USAID funds.

7.5 Intention to License: Intel and ASU intend to provide a written, royalty-free license covering any preexisting material enhanced by USAID funds under the project to Vietnamese universities participating in the project and the Ministry of Education and Training (MOET) in Vietnam.

7.6 No Implied Rights: No license or any other right is granted or conferred by this MOU under any intellectual property rights now or hereafter owned or controlled by either party by implication, statute, inducement, estoppel or otherwise. The parties will enter into separate written agreements on a case by case basis as and when licences are required and/or intellectual property rights are created relevant to this MOU.

VIII. GENERAL RESPONSIBILITIES OF THE PARTIES

8.1. Cooperate: The Parties commit to cooperate and will endeavor to carry out in good faith the work as described in this Project MOU.

8.2. Amendments: This Project MOU may only be amended or modified through written agreement of the Parties.

8.3. Resolving Differences: During implementation, the Parties will strive to resolve any difficulties, problems or disagreements that arise regarding the Project and/or the terms and conditions in this Project MOU. The Parties agree that any difficulties, problems or disagreements should in no way adversely affect the stakeholders.

8.4. No Obligation of Funds: The Parties expressly acknowledge that this Project MOU is not an obligation of funds, nor does it constitute a legally binding commitment by any Party or create any rights in any third-party.

8.5. Term: This Project MOU shall begin on the Effective Date and shall expire on June 21, 2013 (the "Term"). The Term may be extended or modified by written amendment as provided in Section 8.2.

8.6. Termination: Any Party may terminate this Project MOU upon giving written notice to the other Party. The Parties will endeavor to give each other thirty (30) days written notice before termination. Any discontinuance shall be without recourse to either Party. The Parties will not be held responsible to each other for any delay, suspension or withdrawal of the implementation of the Project for any reason whatsoever.

In Witness Whereof, this Project MOU shall become effective as of the Effective Date provided that each Party acting through their duly authorized representatives has executed this Project MOU.

FOR THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

Mr. Francis A. Donovan

Mission Director
USAID/Vietnam

FOR INTEL CORPORATION

Mr. Rick Howarth

General Manager
Intel Products Vietnam

ARIZONA BOARD OF REGENTS acting for and on behalf of ARIZONA STATE UNIVERSITY

Mr. Dudley Q. Sharp
Assistant Director, Research Administration
Office for Research and Sponsored Projects Administration
Arizona State University

Witnessed By:

Stephen Feinson
Executive Director
Global Engagement
Arizona State University

Mr. Michael Michalak
United State Ambassador to Vietnam

ANNEX 1 TO PROJECT MOU (to be completed)

1. Coordinating Committee Members
2. Standing Agenda for Coordinating Meetings

Party	Member	Contact Info	Alternate	Contact Info
Arizona State University	Jeffrey Goss	Phone: 480 965-5466 E-mail: jeff.goss@asu.edu	Albert Filardo	Phone: 480 965-8967 E-mail: Albert.filardo@asu.edu
Intel	Roma Arellano	Phone: 505-720-4508 E-mail: Roma.arellano@intel.com	Trang Nguyen	Phone: (+84-8) 3 7363037 E-mail: thu.trang.nguyen@intel.com
USAID	Howard Handler	Phone: + (84 4) 3935 1244 E-mail: hhandler@usaid.gov	To be determined byUSAID	

Standard Agenda for Coordination Meetings:

- Members or alternates present
- Project Status-each member reports on their activity(ies)
- Project Issues
  - Potential ways to resolve
  - Select best way to proceed
- Upcoming activities (confirm, raise issues)
- Project MOU-does it need revising/amending/supplements?

ANNEX D: HEEAP PROGRAM M&E PLAN

HEEAP Program Monitoring & Evaluation Plan (Revised 9/21/10)

Project Objective A: Develop and advance interdisciplinary, applied curricular and instructional methods in engineering.

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
				Schedule	Responsible Party	Schedule	Responsible Party
RESULT 1: Develop faculty content knowledge and skills in advanced engineering.							
1.1 Increase faculty understanding of experimental methods	**Definition:** Understanding defined by knowledge of experimental methods and tools **Units:** Pre-test at beginning of each faculty development cycle and post-test at the end of the program	HEEAP Program Participants	Pre- & Post Tests	Pre-test at beginning of each faculty development cycle and post-test at the end of the program	ASU – M&E Team; HEEAP faculty	Annual Reports	ASU - Goss
1.2 Increase faculty understanding of engineering analytical methods	**Definition:** Understanding defined by knowledge of engineering analytical methods and tools **Units:** Pre-test at beginning of each faculty development cycle and post-test at the end of the program	HEEAP Program Participants	Pre- and Post-Tests	Pre-test at beginning of each faculty development cycle and post-test at the end of the program	ASU – M&E Team; HEEAP Faculty	Annual Reports	ASU - Goss
1.3 Increase faculty understanding of technical, business communication	**Definition:** Understanding defined by knowledge and application of technical communication strategies **Units:** % increase in score on pre- and post-test presentations and proposal	HEEAP Program Participants	Pre- & Post-Tests; review of grant proposal	Pre-test at beginning of each faculty development cycle and post-test/proposal at the end of the program; Rubric driven review of teaching materials 6 months after return to Vietnam	ASU – M&E Team; HEEAP faculty	Annual Reports	ASU - Goss

1.4 Increase understanding of the role of the global engineer	**Definition:** Understanding defined by knowledge of the role of the global engineer **Units:** % increase in score on pre- and post-surveys	HEEAP Program Participants	Pre- & Post-Surveys	Pre-survey at beginning of each faculty development program cycle and post-survey at end of program and again 6 months after return to Vietnam.	ASU – M&E Team; HEEAP faculty	Annual Reports	ASU – Goss

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
RESULT 2: Develop pedagogical skills for advanced engineering instruction.							
2.1 Increase in faculty understanding of applied teaching & learning strategies	**Definition:** Understanding defined by knowledge of Engineering teaching and learning strategies **Units:** % increase in score on pre- and post-surveys.	HEEAP Program Participants	Pre- & Post-Surveys	Pre-survey at beginning of each faculty development program cycle and post-survey at end of program and again 9 months after return to Vietnam.	ASU – M&E Team	Annual Reports	ASU - Goss
2.2 Increase in faculty application of applied teaching & learning strategies	**Definition:** Application defined by increased frequency of use the degree of usage of applied teaching & learning strategies in engineering curriculum **Units:** % increase of use and degree of usage of applied teaching and learning strategies in course materials	HEEAP Program Participants	Pre- & Post-review of curricular materials	Rubric-driven review engineering curricular materials at the beginning of each faculty development program cycle and again 9 months after return to Vietnam	ASU – M&E Team; faculty experts	Annual Reports	ASU - Goss
2.3 Increase in faculty confidence in using applied teaching & learning strategies	**Definition:** Confidence defined by perceived confidence in using diverse, applied engineering teaching and learning strategies **Units:** % increase in score on pre- and post-surveys	HEEAP Program Participants	Pre- & Post-surveys	Pre-survey at beginning of each faculty development program cycle and post-survey at end of program and again 9 months after return to Vietnam.	ASU – M&E Team	Annual Reports	ASU - Goss

Project Objective B: Develop students' applied engineering knowledge and skills

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
				Schedule	Responsible Party	Schedule	Responsible Party
RESULT 1: Increase students' applied engineering knowledge							
1.1 Increase students' understanding of engineering fundamentals	**Definition:** Understanding defined as knowledge of engineering fundamentals **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects (sample)	Capstone project at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss
1.2 Increase students' understanding of engineering systems and constraints	**Definition:** Understanding defined as knowledge of engineering systems and constraints **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects (sample)	Capstone project at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
RESULT 2: Increase students' applied engineering skills							
2.1 Increase students' ability to design robust engineering experiments	**Definition:** Ability defined as skill in designing robust engineering experiments **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects (sample)	Lab project or project-based assignment in upper division course or capstone project at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss
2.2 Increase students' ability to work in multi-disciplinary teams	**Definition:** Ability defined as skill in working as a member of a multi-disciplinary engineering team **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects (sample)	Lab project or project-based assignment in upper division course or capstone project at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss
2.3 Increase students' ability to communicate effectively	**Definition:** Ability defined as skill in communicating effectively in both written and verbal forms **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects and presentations (sample)	Project-based assignment in upper division course or capstone project and presentation at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss
2.4 Increase students' ability to analyze and interpret data	**Definition:** Ability defined as skill in analyzing and interpreting data **Units:** % of students who earn "meets" or "exceeds" expected score on capstone project (overall and by component)	Academic program graduates	Rubric driven review of capstone projects (sample)	Lab project or project-based assignment in upper division course or capstone project at end of students' engineering coursework	ASU Engineering Faculty	Annual Reports	ASU-Goss

Project Objective C: Expand institutional capacity to support engineering faculty

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
				Schedule	Responsible Party	Schedule	Responsible Party
RESULT 1: Improve support of Vietnamese engineering faculty							
1.1 Increase institutional leadership commitment toward faculty development programs and resources	**Definition:** Commitment defined as willingness to invest institutional resources in faculty development programs **Units:** % increase in willingness on pre- and post-surveys	Institutional leadership (Vietnam)	Survey	Annual survey of Vietnamese institutional leadership	ASU M&E	Annual Report	ASU-Goss
1.2 Increase financial support of faculty development programs	**Definition:** Financial support defined as investment in HEEAP training programs by higher education institutions and industry **Units:** % increase in # of industry investments and in $ amount of investments	Vietnamese Government and Industry Resource Investments.	Document review	Annual review of program documents, letters of support	ASU HEEAP Program leadership	Annual Report	ASU-Goss
RESULT 2: Develop institutional structures and processes for providing faculty development							
2.1 Increase opportunities for faculty development	**Definition:** Opportunities defined as expansion of faculty development training **Units:** # faculty trained (on-site and virtually) through ASU programs and "train-the-trainer" programs in Vietnam	Institutional leadership (Vietnam); HEEAP program leadership	Document Review	Annual review of program documents and institutional records	ASU M&E	Annual Report	ASU-Goss

Project Objective D: Increase number of work-force ready, qualified engineers

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
				Schedule	Responsible Party	Schedule	Responsible Party
RESULT 1: Increase percentage of program graduates described as "work ready"							
1.1 Increase number of engineering graduates who secure engineering-related employment immediately following graduation	**Definition:** Defined as securing engineering-related employment within 3 months after graduation with bachelor's degree in engineering **Units:** # engineering program graduates hired by local industry	Vietnamese faculty; academic program graduates; Assessment representatives at Vietnamese institutions	Survey	Survey of engineering faculty and program graduates	ASU M&E	Annual Report	ASU-Goss
1.4 % increase in employment rate of participating university mechanical & electrical engineering graduates within 6 months of graduation	**Definition:** Defined as % of mechanical and electrical program graduates employed within 6 months of graduation as compared to 2010 baseline **Units:** % increase in graduate employment post HEEAP program implementation as compared to pre-HEEAP program	Vietnamese faculty, academic program graduates, Vietnamese assessment liaisons	Survey	Baseline survey to be conducted in 2010 and survey to be administered again in 2010	ASU M&E; Vietnamese Assessment Liaisons	Annual Report	ASU-Goss
1.2 Increase program graduates' work-readiness	**Definition:** Work-readiness defined by employers' ratings of employee's engineering knowledge and skills (upon hire and 6 months after hire) **Units:** % increase in score on pre- and post-surveys	Engineering industry representatives	Survey	Survey baseline to be conducted in fall 2010 and again in 2012.	ASU M&E; Vietnamese institution assessment liaisons	Annual report	ASU-Goss

USAID Indicators

Objective E: Increase the number of partnerships and individuals trained through USAID funded partnerships and exchange programs

Performance Indicator	Indicator Definition	Data Source	Method of Data Collection	Data Compilation, validation, and analysis		Reporting	
				Schedule	Responsible Party	Schedule	Responsible Party
RESULT 1: Increase the number of host-country individuals trained as a result of USAID funded exchange programs and investments							
1.1 Number of host-country individuals completing USG-funded exchange programs conducted through higher education institutions	**Definition:** Defined as number of participants in HEEAP training programs (at ASU and virtual) **Units:** # participants	HEEAP program staff, Vietnamese institution assessment liaisons	Review of program records, documents	Quarterly review of HEEAP program, institutional documents/records	HEEAP program staff, leadership	Annual Report	ASU-Goss
1.2 Number of host-country individuals trained as a result of USG investments involving higher education	**Definition:** Defined as number of participants in HEEAP training programs (at ASU, virtual, train-the-trainer) **Units:** # program participants	HEEAP program staff, Vietnamese institution assessment liaisons	Review of program records, documents	Quarterly review of HEEAP program, institutional documents/records	HEEAP program staff, leadership	Annual Report	ASU-Goss
RESULT 2: Increase the number of higher education partnerships supported by USAID							

1.3 Number of higher education partnerships between U.S. and host country higher education institutions that address regional, national, and/or local development needs	**Definition:** Defined as number of institutional partnerships with strategic regional, national, or local development purposes **Units:** # of partnerships	HEEAP program staff, Vietnamese institution leaders	Review of program records, documents	Quarterly review of HEEAP program, institutional documents/records	HEEAP program staff, leadership	Annual report	ASU-Goss

ANNEX E: STATISTICS ON UNIVERSITIES PARTICIPATING IN HEEAP

Hanoi University of Science and Technology	**Professor**	**PhD**	**MSc**	**Total Staff**
Faculty of Electrical Engineering	18	53	30	155
Faculty of Electronics and Telecommunications	3	20	46	117
School of Information and Communication Technology	6	16	34	85
Faculty of Applied Mathematics and Informatics	7	22		56
School of Mechanical Engineering		80		258
Faculty of Text, Garment Technology, and Fashion Design	2	8	14	40
Faculty of Chemical Technology	22	46	25	170
School of Materials Science and Engineering	24	38		100
Faculty of Engineering Education	4	6	6	19
School of Environmental Science and Technology	4	17	26	77
School of Heat Engineering and Refrigeration	15	24	5	64
School of Biotechnology and Food Technology	20	34	22	75
School of Engineering Physics	20	32		78
School of Transportation Engineering	15	13	15	79
			Total Staff	**1373**

Ho Chi Minh University of Technology	**Professor**	**PhD**	**MSc**	**Total Staff**
Faculty of Electrical and Electronics Engineering				140
Faculty of Civil Engineering				189
Faculty of Computer Science and Engineering		25		80
Faculty of Applied Science	6	18	17	44
Faculty of Mechanical Engineering				95
Faculty of Chemical Engineering	5	25	49	96

Faculty of Materials Engineering	5	14		52
School of Industrial Management				60
Faculty of Environment	4	14	15	37
Faculty of Geology and Petroleum Engineering				49
Faculty of Transportation Engineering	3	5	17	36
			Total Staff	**878**

Danang University of Technology	**Professor**	**PhD**	**MSc**	**Total Staff**
Department of Electrical Engineering	5	16	20	62
Faculty of Electronics and Telecommunications		8	15	37
Faculty of Information Technology	2	1		28
School of Mechanical Engineering	3	5		46
Faculty of Chemical Engineering	2	8	17	35
Faculty of Water Resource Engineering	1	3	13	22
Faculty of Technical Education				27
Department of Environment				15
Faculty of Thermal and Refrigeration Engineering	4	9	7	20
Department of Civil Engineering		2	29	46
Department of Project Management				22
Faculty of Transportation Engineering	3	10	6	32
			Total Staff	**392**

Ho Chi Minh University of Technical Education	**Professor**	**PhD**	**MSc**	**Total Staff**
Faculty of Electrical and Electronics Engineering		6	50	91
Faculty of Printing and Media		1	5	21

Faculty of Information Technology		1	9	24
Faculty of Basic Science		3		29
Faculty of Mechanical Engineering		5	25	86
Faculty of Chemical Engineering		2	14	27
Faculty of Technical Education				17
Faculty of Automotive Engineering	1	3	18	42
Faculty of Civil Engineering and Applied Mechanics		8	30	43
Faculty of Text, Garment Technology, and Fashion Design				27
			Total Staff	**380**

Can Tho University	**Professor**	**PhD**	**MSc**	**Total Staff**
College of Engineering Technology				
Automation Technology				20
Mechanical Engineering				30
Civil Engineering				45
Communications and Computer Engineering				17
Chemical Engineering				23
Electrical Engineering				21
Industrial Management				9
College of Information and Communication Technology				
Information Systems				13
Computer Science				12
Network and Communications				17
Software Engineering				17
College of Environment and Natural Resources				
Environmental Engineering				10
			Total Staff	**234**

	Percent Women in Cohort			**All**
Institution	**2010**	**2011**	**2012**	
Can Tho University (CTU)	0	0	25	**11**
Da Nang University of Technology (DUT)	33	50	50	**44**
Ho Chi Minh University of Technology (HCMUT)	14	20	25	**20**
Ho Chi Minh University of Technical Education (HCMUTE)	14	50	33	**31**
Hanoi University of Science and Technology (HUST)	0	40	25	**27**
All	**17**	**33**	**30**	
Vocational Schools				
Cao Thang Technical College (CTTC)		14	44	**31**
Ho Chi Minh Vocational College of Technology (HVCT)		43	50	**46**
Industrial University of Ho Chi Minh City (IUH)		67	63	**65**
All		**43**	**52**	**35**[1]

[1]Note. This total is the average percent across all cohorts and all participating institutions.

ANNEX F: DESCRIPTION OF APPRECIATIVE INQUIRY

The Basis of the AI approach

Appreciative Inquiry (sometimes shortened to "AI") is primarily an organizational development method which focuses on increasing what an organization does well rather than on eliminating what it does badly. Through an *inquiry* which *appreciates* the positive and engages all levels of an organization (and often its customers and suppliers) it seeks to renew, develop and build on this.

The AI model is based on the assumption that the questions we ask will tend to focus our attention in a particular direction. Some other methods of assessing and evaluating a situation and then proposing solutions are based on a *deficiency* model. Some other methods ask questions such as "What are the problems?", "What's wrong?" or "What needs to be fixed?"

Instead of asking "What's the problem?", some other methods couch the question in terms of challenges, which AI argues maintains a basis of deficiency, the thinking behind the questions assuming that there is something wrong, or that something needs to be fixed or solved.[2]

Appreciative Inquiry takes an alternative approach. As a self defined "asset-based approach" it starts with the belief that every organisation, and every person in that organisation, has positive aspects that can be built upon. It asks questions like "What's working well?", "What's good about what you are currently doing?"[3]

Some researchers believe that excessive focus on dysfunctions can actually cause them to become worse or fail to become better.[4] By contrast, AI argues, when all members of an organization are motivated to understand and value the most favourable features of its culture, it can make rapid improvements.[5]

Strength-based methods are used in the creation of organizational development strategy and implementation of organizational effectiveness tactics.[6] The *appreciative* mode of inquiry often relies on interviews to qualitatively understand the organization's potential strengths by looking at an organization's experience and its potential; the objective is to elucidate the assets and personal motivations that are its strengths.

What distinguishes AI

The following table illustrates how AI supporters describe some of the distinctions between Appreciative Inquiry and approaches to organizational development not based on what they call positive potential:[7]

Problem Solving	Appreciative inquiry
Felt need, identification of problem(s)	Appreciating, valuing the Best of What Is
Analysis of Causes	Envisioning what might be
Analysis of possible solutions	Engaging in dialogue about what should be
Action Planning (treatment)	Innovating, what will be

Appreciative Inquiry attempts to use ways of asking questions and envisioning the future in-order to foster positive relationships and build on the present potential of a given person, organisation or situation. Appreciative Inquiry utilises a cycle of 4 processes, which focuses on what it calls:

1. **DISCOVER:** The identification of organizational processes that work well.
2. **DREAM:** The envisioning of processes that would work well in the future.
3. **DESIGN:** Planning and prioritizing processes that would work well.
4. **DESTINY** (or **DELIVER**): The implementation (execution) of the proposed design.[8]

The aim is to build - or rebuild - organisations around what works, rather than trying to fix what doesn't. AI practitioners try to convey this approach as the opposite of problem-solving

(Source: Wikipedia)

EIGHT PRINCIPLES OF APPRECIATIVE INQUIRY

1. THE CONSTRUCTIONIST PRINCIPLE ***Words create worlds***
Reality, as we know it, is a subjective vs. objective state. It is socially created, through language and conversations.

2. THE SIMULTANEITY PRINCIPLE ***Inquiry creates change***
Inquiry is intervention. The moment we ask a question, we begin to create change.

3. THE POETIC PRINCIPLE ***We can choose what we study***
Organizations, like open books, are endless sources of study and learning. What we choose to study makes a difference. It describes, even creates, the world as we know it.

4. THE ANTICIPATORY PRINCIPLE ***Image inspires action***
Human systems move in the direction of their images of the future. The more positive and hopeful are the image of the future, the more positive the present-day action will be.

5. THE POSITIVE PRINCIPLE ***Positive questions lead to positive change***
Momentum for large scale change requires large amounts of positive affect and social bonding. This momentum is best generated through positive questions that amplify the positive core.

6. THE WHOLENESS PRINCIPLE ***Wholeness brings out the best***
Wholeness brings out the best in people and organizations. Bringing all the stakeholders together in large group forums stimulates creativity and builds collective capacity.

7. THE ENACTMENT PRINCIPLE ***Acting "as if" is self-fulfilling***
To really make a change, we must "be the change we want to see". Positive change occurs when the process used to create the change is a living model of the ideal future.

8. THE FREE CHOICE PRINCIPLE ***Free choice liberates power***
People perform better and are more committed when they have freedom to choose how and what they contribute. Free choice stimulates organizational excellence and positive change.