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HIGHER EDUCATION SOLUTIONS NETWORK - ANNUAL REPORT (FY 2013)

Massachusetts Institute of Technology—MIT
Comprehensive Initiative on Technology Evaluation (CITE)
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Acronyms

AMPS	Academic Media Production Services
CII	Center for Accelerating Innovation and Impact
CITE	Comprehensive Initiative on Technology Evaluation
CTL	Center for Transportation and Logistics
DUSP	Department of Urban Studies and Planning
EECS	Electrical Engineering and Computer Science
ESD	Engineering Systems Division
HESN	Higher Education Solutions Network
HST	Health Sciences and Technology
IAP	Independent Activities Period
IDC	International Development Conference
IDIN	International Development Innovation Network
IR	Intermediate Result
IST	Information Services and Technology
MIT	Massachusetts Institute of Technology
MOOC	Massively Open Online Course
MOU	Memorandum of Understanding
MechE	Department of Mechanical Engineering
M&E	Monitoring and Evaluation
OAA	Office of Acquisition and Assistance
ODL	Office of Design and Learning
OSP	Office of Sponsored Programs
OST	Office of Science and Technology
PSC	Public Service Center
RA	Research Assistant
SSRC	Sociotechnical Systems Research Center
SUTD	Singapore University of Technology and Design
TA	Teaching Assistant
TOR	Terms of Reference
TPP	Technology and Policy Program
UNICEF	United Nations Children's Fund
UROP	Undergraduate Research Opportunities Program
USAID	United States Agency for International Development
WFP	World Food Programme
3S	Suitability, Sustainability and Scalability

Executive Summary

The Department of Urban Studies and Planning (DUSP), D-Lab, the Sociotechnical Systems Research Center (SSRC), the MIT Center for Transportation and Logistics (CTL) and the Public Service Center (PSC) are the main partners in CITE, a network of MIT faculty, staff, and students with expertise in technology design and testing, systems engineering, supply chains, community ethnography, institutional and public policy analysis, market systems analysis, and regional economics. CITE's goal is to develop a rigorous product evaluation method that will help development organizations make educated product deployment. Our evaluations will also allow the development community to analyze specific product applications leading to better, data-driven programmatic decisions and better overall product designs. By applying our evaluation method, CITE will help to identify the bottlenecks that prevent products from achieving measureable impact. CITE will house the results of its work in a dependable, web-accessible knowledge database that will inform the decisions of development practitioners and technology innovators.

This Annual Report details CITE's Year One objectives, associated activities, results, as well as overall program management.

The milestones for **Objective 1: Develop CITE's Institutional Structure including strong relationships with USAID, the HESN and partner development organizations**, included CITE's partnership with MIT's Office of Digital Learning in establishing a post-doc position to lead the efforts in developing an edX course, and exploring collaboration with UC Berkeley. To strengthen and align CITE's objectives and relationship with USAID, visits to USAID/Washington were made and visitors from Washington were welcomed at MIT during Year One. The highlight was the May 2013 high-level meeting between USAID and MIT, where on the evening of the first day, Dr. Alex Deghan, the Science and Technology Adviser at USAID spoke on "*The Future of Science & Technology in International Development*" with over 200 people in attendance. In addition, CITE developed a container WebCite, and is expected to be launched in November 2013.

The milestones for **Objective 2: Develop and apply the CITE "3-S" evaluation methodology through research involving case studies, courses, fieldwork, analysis and modeling** during Year One were the 3-S teams developing their testing and evaluation methodologies: The Suitability and Sustainability teams conducted field studies on solar lighting devices over the summer and are in the process of analyzing and synthesizing the results. The Scalability team focused on developing case studies to distill principles that form the basis of the scalability's evaluation methodologies.

The milestones for **Objective 3: Build a vibrant academic community (courses, students, faculty and staff) dedicated to technology evaluation for development** during Year One included CITE's course: ESD.S2011.S941: *Evaluating Technologies for the Developing World*, with 24 students in attendance. In partnership with MIT's Public Service Center (PSC), CITE recruited and placed 10 MIT undergraduate and graduate students with partner organizations in Boston, Washington, DC, Denmark, and Indonesia for the CITE-PSC internship during Summer 2013. The summer also included semi-monthly research meetings for faculty, staff and students. Before the Fall 2013 semester began, CITE hosted booths at various student orientations throughout campus. CITE's awareness is growing at MIT, and we have been able to recruit faculty both as staff as well as advisors, and students as RAs and interns.

Beyond these foundational activities, CITE continues to collaborate and align our work with the International Development Innovation Network (IDIN) to leverage the USAID cooperative agreements into a larger, campus-wide initiative for international development research at MIT in partnership with USAID, MIT Senior Administration, and MIT Resource Development.

Part I: Major Milestones and Events Completed

I.1. Milestones

Include a list and briefly describe the Milestones (i.e. achievement of an indicator as outlined in your M&E plan) that have been achieved during this fiscal year.

Program Management

The architecture for CITE 's responsible financial and program management is now in place: CITE's Year 1 Workplan and Budget were revised and approved by USAID; CITE has been in frequent communication with USAID/OST/HESN Monitoring and Evaluation coordinators and has submitted the final M&E Plan approved by USAID; and quarterly reports have been sent to USAID according to the timeline provided by the agency.

The Workplan for Year 2 was submitted to USAID according to the timeline on July 30th and we are currently awaiting approval.

Objective 1: Develop CITE's Institutional Structure including strong relationships with USAID, the HESN and partner development organizations

Office of Digital Learning and edX Fellow

To leverage cost sharing and tap into the expertise of MIT's Office of Digital Learning (ODL), a post-doc position to lead in the development of an edX course was announced. ODL agreed to fund the salary and office space for the edX post-doc. The job announcement has been posted in over a dozen employment websites, including MIT, Indeed.com and Glassdoors.com and an offer has been made to a possible candidate. Discussion has also started with UC Berkeley for possible joint-collaboration on a edX course (please

HESN Launch: November 2012

In November 2012, CITE attended the launch of the HESN in Washington, DC. As a result of the Launch, CITE was able to re-envision its First Year Workplan to better align with the overall goals of the program and to ask critical questions about the nature of the product evaluation tools and methods that would be useful to USAID.

USAID Visit to MIT: December 2012

In December 2012, CITE and IDIN hosted USAID for substantive discussions at MIT. This meeting allowed both the CITE and IDIN teams to discuss their respective Workplans and Monitoring and Evaluation Plans in detail with USAID representatives

USAID High-Level Visit to MIT: May 2013

CITE hosted a two-day high-level meeting between USAID and MIT on May 13-14, 2013. The USAID delegates, Dr. Alex Dehgan, Dr. Ticora Jones, and Dr. Amit Mistry from USAID's Office of Science and Technology, Higher Education Solutions Network met with MIT President Rafael Reif, other high-level MIT faculty and CITE and IDIN members. Dr. Alex Dehgan, the Science and Technology Adviser to the Administrator and Director at USAID gave a keynote speech in the evening of May 13th with over 200 people from MIT and the community in attendance.

Visit to SUTD: January 2013

In January of 2013, Derek Brine, Associate Director of CITE, and Dan Frey, faculty lead for CITE traveled to Singapore to participate in the Singapore University of Technology and Design Annual Design Summit and to present their draft white paper on technology evaluation, and explored the possibility of SUTD as being a hub location.

CITE Website

The CITE website will be one of the main communication tools that CITE uses to engage the larger development community and to spread the word about its work. CITE worked with MIT's Information Services & Technology (IST) to develop a website and tender the associated RFAs. CITE graphic identify has been designed (See Appendix D) and a container site has been developed and content is being generated and uploaded for a launch in mid-November.

Objective 2: Develop and apply the CITE "3-S" evaluation methodology through research involving case studies, courses, fieldwork, analysis and modeling

CITE Methodology Retreat

On December 20th, 2012 CITE leadership held the first CITE methodology retreat which brought together all faculty and staff on the CITE program. During the retreat CITE faculty and staff had an opportunity to interact directly with representatives of some of CITE's partners. As a result CITE gained a deeper understanding of our partner's needs (Please see Appendix C, *CITE Methodology Retreat Meeting Notes*).

Suitability Testing Development

During Y1Q4 the suitability team continued the first product family evaluation focusing on the technical and user testing of the various solar lighting options available in the Ugandan marketplace. Our technical team consists of graduate students, Amit Gandhi, Victor Lesniewski and Chris Pombrol; undergraduate student ChaCha Durazo; Professor Dan Frey; Former Technical Director and Vice President of Consumer Reports and current CITE advisor Dr. Jeffrey Asher; and CITE Associate Director Derek Brine. The goal of our study is to create a comparative evaluation that would be useful for practitioners trying to decide between purchasing various lantern models.

During Year I, the Suitability Team has analyzed field data taken from interviews with users and instrumented solar lanterns and designing use-based tests for the most critical solar lantern characteristics. The battery of tests completed include:

1. Time to charge
2. Time to discharge
3. Solar sensitivity
4. Water resistance
5. Brightness
6. Task Lighting Performance
7. Ambient Lighting Performance

The team is now in the midst of synthesizing the results of the tests into a comparative evaluation for presentation at USAID in mid November 2013. In addition our first practical evaluation led to the identification of several research avenues, which are in the process of being developed into research proposals.

Scalability Case Studies

The Scalability team focused its efforts in YI to develop case studies from which we can distill principles that form the basis of evaluation methodologies. The team consisted of summer interns, RAs, faculty, research staff and NGO partners. While several smaller cases were developed, efforts focused on the following in-depth studies:

- A longitudinal case focused on scaling up a network of suppliers for long lasting insecticidal nets (LLINs) with UNICEF.
- A teaching case focused on procurement strategies using a global network of suppliers for ready-to-use therapeutic food (RUTF) with UNICEF.
- A longitudinal case focused on product and supply chain design for food storage products with GrainPro, Inc.
- A cross-sectional case focused on channels to market and last mile delivery with Purdue Improved Cowpea Storage (PICS).
- An analytical case to test supply chain mapping and landed cost techniques for a diarrheal treatment kit (ORS-Zinc) currently under pilot in Zambia by ColaLife.

Sustainability team:

From July 7 to August 7, the Sustainability team, in parallel with the Suitability team, completed fieldwork in Uganda on solar lanterns. A principal goal of the fieldwork was to inform the evaluative approach and criteria for sustainability. The Team worked with DIV partner Solar Sister to understand how their business model has contributed to the diffusion of solar lanterns throughout Uganda and completed 80 interviews with Solar Sister entrepreneurs and key informant interviews with Solar Sister staff, local solar lantern suppliers, and other organizations with business models similar to Solar Sister's in order to understand the local context and market for solar lanterns.

Currently our team has completed the analysis based off of the fieldwork. The analysis focused on the financial, social, and organizational factors underlying Solar Sister's performance using a hybrid social enterprise business model. The team has also completed literature reviews of technology diffusion in developing countries, social networks and social network analysis, and theories of social and behavioral change. A report detailing the team's findings is in the process of being internally reviewed and finalized. A White Paper outlining the theoretical underpinnings of the team's approach and methodology is also in the process of being internally reviewed and finalized.

Prior to conducting field work in Uganda, the Sustainability team attended the 36th Water, Engineering and Development Centre (WEDC) International Conference in Nakuru, Kenya and networked with leaders in the field of water and sanitation, including other HESN partners such as UC Berkeley.

CITE Product Catalog

CITE has started to develop a catalog, which now includes over 150 products designed for the developing world in coordination and collaboration with USAID and other partner organizations.

Objective 3: Build a vibrant academic community (courses, students, faculty and staff) dedicated to technology evaluation for development.

CITE Course: ESD.S20/11.S941: Evaluating Technologies for the Developing World

The ESD.S20/11.S94I: Evaluating Technologies for the Developing World class, with 24 total participants, of which nine were non-registered students (Please see Appendix A course syllabus and Appendix B: student membership) was offered in Spring 2013. The class was co-taught by Professors Bish Sanyal and Oli deWeck. The class was also planned and attended by Derek Brine, Jennifer Green and Jarrod Goenzel. The four class teams gave their final presentation to the class, where Alex Dehgan, Ticora Jones and Amit Mistry from USAID were in attendance.

International Development Night

On April 13, 2013, MIT hosted International Development Night (IDNight) in collaboration with the Harvard International Development Conference (IDC). The event brought over 400 students from MIT and other neighboring universities, and provided an opportunity to showcase and recruit student for CITE.

CITE-PSC internship

CITE-PSC internship: In preparing for summer programming, CITE and the Public Service Center (PSC) announced a call for applications for USAID Community Partner Interns and USAID Program Development Interns (<http://web.mit.edu/mitpsc/whatwedo/cite-psc/index.html>) in late March 2013. CITE-PSC received 21 applications, and five undergraduates and five graduate students completed their internships and fellowships in Boston, Washington, DC, Denmark, and Indonesia with our partners.

CITE Summer semi-monthly research meeting

CITE Summer Research semi-monthly meeting series ran from June 20 to with a kickoff meeting highlighting the two teams (Suitability Team and Sustainability Team) leaving for Uganda in July to work on solar lanterns. A total of five summer research seminars were held.

Student Recruitment

Student Orientations: CITE hosted booths at several Fall 2013 student orientations at MIT. As a result over 70 students signed up to be included on CITE's mailing list.

Research Assistants: CITE has hired five RAs during spring 2013; eight RAs during Summer 2013; and currently 14 RAs are working on CITE for the Fall 2013 semester (beginning 9/1/2013). Please see Appendix H for CITE RA listing.

Faculty Recruitment

Recruitment of additional faculty and staff: The Sociotechnical Systems Research Center recruited and hired Jonars Spielberg as a member of the Sustainability Team and their research. Doug Fearing, Assistant Professor at Harvard Business School, and Stan Finkelstein, Senior Research Scientist □ Engineering Systems Division and Harvard-MIT Division of Health Sciences & Technology □ Associate Professor of Medicine, Harvard Medical School agreed to actively participate as a member of the CITE Scalability team.

The following individuals have agreed to serve as CITE Sustainability Advisors:

- Stephen Connors, Regional Energy Alternatives Director, MIT Energy Initiative
- Prof. Gabriella Carolini, Assistant Professor, Department of Urban Studies and Planning, MIT
- Prof. Stan Finkelstein, Senior Research Scientist, Engineering Systems Division and Harvard-MIT Division of Health Sciences & Technology and Associate Professor of Medicine, Harvard Medical School

- Myra Foster, Public Health Promotion Specialist, Oxfam America
- Prof. Richard Larson, Mitsui Professor of Engineering Systems and Director, Center for Engineering Systems Fundamentals, MIT
- Susan Murcott, Senior Lecturer, Civil and Environmental Engineering, MIT
- Kenny Rae, Public Health Engineer, Oxfam America
- Dr. Afreen Siddiqi, Research Scientist, Engineering Systems Division, MIT

In addition, Dr. Richard Schuhmann, a Senior Lecturer/Short Subject Program Manager in the Gordon-MIT Engineering Leadership Program has been recruited as a voluntary team member.

1.2. Events

Include a list and briefly describe the major events (i.e. on-campus Launch, workshops, team meetings) that have been achieved during this fiscal year.

CITE Methodology Retreat; December 20, 2012: CITE leadership held the first CITE methodology half-day retreat which brought together all faculty and staff on the CITE program to discuss the program as a whole and strategize on the direction of the program.

CITE weekly meetings: In order to better align and coordinate the CITE's efforts, weekly meetings with the program managers and staff have been instituted. In addition, a monthly meeting with all key personnel and the RAs from the CITE program has been established to track progress of the deliverables as described in CITE'S workplan.

CITE Spring 2013 Class: The CITE seminar course, ESD.S20/11.S941 Evaluating Technology for the Developing World met weekly on Mondays from 3:30 – 5:00. During the class on February 19, 2013, Representatives from Oxfam America, Mercy Corps, Kopernik and Partners in Health joined in a panel discussion on products used in their development interventions. On May 6th CITE conducted a session on MIT International development Ecosystem where J-Pal, Tata Center, Legatum Center presented. For the final class presentation on May 13, 2013, Dr. Alex Deghan, Dr. Ticora Jones and Dr. Amit Mistry from USAID attended first-half of the session.

International Development Night: On April 13 2013, CITE hosted a booth at the MIT International Development Night (IDNight, where over 300 students from neighboring universities (Harvard, Dartmouth, Boston University, etc.) and community members gathered at the MIT Science Museum to see the various programs and clubs at MIT.

USAID visit & Launch of Speaker Series; May 23-14, 2013: The USAID delegates met with MIT president and other high-level MIT leadership and faculties during a two-day high-level meeting. Dr. Alex Deghan, the Science and Technology Adviser to the Administrator and Director at USAID gave a keynote speech in the evening of May 13th entitled, "The Future of Science & Technology in International Development: with over 200 people from MIT and the community in attendance

CITE Suitability bi-monthly retreats: The Suitability Team meets bi-monthly with the former Vice President and Technical Director of Consumer Reports to discuss research methodology and development of product testing.

CITE end of the semester review: On May 24, 2013, CITE hosted a half-day end of the Spring Semester meeting. Seventeen faculty, staff, and students attended the seminar where our year 1

deliverables and persons responsible based on recent feedback and discussions with USAID were reviewed and everyone's summer/research plans were shared.

CITE-PSC Internship orientation: On June 3, 2013, CITE-PSC Internship Program had a half-day Internship kick off meeting where the student interns and staff attended a session of logistics and explanation of case-study development.

CITE RA-Internship Summer 2013 bi-monthly research meetings: During the summer 2013 (June 20-August 8, 2013) CITE RAs and interns fathered twice a month to present their research topics and opened up the floor for discussion and improvement on their research methodology.

CITE administrative meetings: All the administrative and financial officers across the various CITE departments and programs gather every other month to review administrative issues.

CITE Fall 2013 Seminar: CITE core members and Fall RAs and interested members meet once a week for a two-hour seminar centered around evaluation and development of methodology around suitability, scalability and sustainability.

Scale-up Development Venture (SDV) Dinner: CITE participated in the SDV dinner in collaboration with D-Lab on Sept. 29 2013 with key international development student organizations in preparation for the SDV conference in February 2014.

I.3. Publications

I.4. Communications

Date	Source	Media	Title/Link
11/8/2012	The Boston Business Journal	eNews	"MIT anti-poverty initiative lands \$25 million grant" on November 8, 2012" http://www.bizjournals.com/boston/news/2012/11/08/mit-gets-25m-grant.html
11/8/2012	Boston Herald	Print	"MIT winds USAID award to help developing countries"
11/8/2012	The MIT News	eNews	"Bringing the world to Innovation" http://web.mit.edu/newsoffice/2012/going-inside-d-lab-at-mit-1108.html
11/8/2012	The MIT News	eNews	"MIT a linchpin of major new USAID program: http://web.mit.edu/newsoffice/2012/usa-id-grant-technology-for-the-poor-1108.html
11/8/2012	e! Science News	eNews	"MIT a linchpin of major new USAID program" http://esciencenews.com/sources/mit.reserach/2012/11/08/mit.a.linchpin.major.news.usaid.program
11/8/2012	Science Magazine	eNews	"A 'DARPA' approach to U.S. foreign aid" http://news.sciencemag.org/scienceinsider/2012/11/a-darpa-approach-to-us-foreign-a.html#.UKPMmNketxc.email
11/9/2012	The Boston	Print and eNews	"MIT wins USAID award to help developing countries" http://www.boston.com/politicalintelligence/2012/11/09/mit-wins-

	Globe		usaid-award-help-developing-countries/iszwXIHqWbShp8cBmtnbIL/story.html
11/13/2012	The Tech	eNews	“\$25 million for international development initiatives” http://tech.mit.edu/V132/N53/dlab.html
	MIT campus	Poster	Course advertisement was posted throughout the MIT Campus
May 2013	BNID website	Website	Announcement of Dr. Alex Deghan’s lecture on Boston Network for International Development website: http://bnid.org/node/9442
May 2013	Facebook : various sites	Website	Announcement of Dr. Alex Deghan’s lecture on Boston Network for International Development website: MIT IDEAS Global Challenge: https://www.facebook.com/mitglobalchallenge/posts/10100313000421644 D-Lab: https://www.facebook.com/events/520201248045448/ SOCENTech https://www.facebook.com/socentech/posts/586772458008060
April 20-May 13	MIT campus	Posters, video banners	Dr. Alex Deghan’s lecture advertisement was posted throughout the MIT Campus
Summer 2013-ongoing	MIT PSC website	Website blog	Rafa Rahman, CITE’s summer internship blog: http://mitpsc.mit.edu/blog/current-summer-13-rafa-rahman/

Part 2: Description of Key Activities

2.1. Annual Objectives

List, according to your workplan, the objectives you aimed to complete during this fiscal year. Include your numbering system to allow for referencing your workplan.

The three objectives that were outlined in CITE’s Year 1 Workplan are:

Objective 1: Develop CITE’s Institutional Structure including strong relationships with USAID, the HESN and partner development organizations

Objective 2: Develop and apply the CITE “3-5” evaluation methodology through research involving case studies, courses, fieldwork, analysis and modeling

Objective 3: Build a vibrant academic community (courses, students, faculty and staff) dedicated to technology evaluation for development.

2.2. Summary of Key Activities and Outcomes

Provide a description of key activities undertaken in this fiscal year and what the outcomes were/are. Please be exhaustive and include all activities and how they measure against the objectives you established. Indicate if there are any activities that are no longer on schedule and your plan for ensuring completion.

As indicated in Part I.I Milestones, the architecture for responsible financial and program stewardship is in place. CITE's Year 1 Workplan was revised and submitted for approval from USAID in Spring 2013; CITE has been in frequent communication with USAID/OST/HESN Monitoring and Evaluation coordinators and submitted the final M&E Plan for approval; and quarterly reports have been sent to USAID according to the timeline provided by the agency.

The Workplan for Year 2 was submitted to USAID accordingly to the timeline on July 30th and we are currently awaiting approval.

Objective I:

Develop CITE's Institutional Structure including strong relationships with USAID, the HESN and partner development organizations

As indicated in Part I.I Milestones, the following are the detail summary of our key objectives and outcomes under Objective I:

Office of Digital Learning and edX Fellow

To leverage cost sharing and tap into the expertise of MIT's Office of Digital Learning (ODL), a post-doc position to lead in the development of an edX course was announced. ODL agreed to fund the salary and office space for the edX post-doc. The job announcement has been posted in over a dozen employment websites, including MIT, Indeed.com and Glassdoors.com and an offer has been made to a possible candidate.

HESN Launch: November 2012

In November 2012, CITE attended the launch of the HESN in Washington, DC. As a result of the Launch, CITE was able to re-envision its First Year Workplan to better align with the overall goals of the program and to ask critical questions about the nature of the product evaluation tools and methods that would be useful to USAID. CITE was also able to envision interesting collaborations with other HESN members that may not have come to bear without such a venue for all HESN members to exchange ideas. Finally, the launch provided an effective mechanism for CITE and IDIN to engage MIT's Senior Administration through high-level talks with the USAID Administrator, the Secretary of State, and the Assistant to the President for Science and Technology.

CITE's delegation to the Higher Education Solutions Network launch event included CITE Director Bish Sanyal, Program Manager Derek Brine, Project Managers Jennifer Green and Jarrod Goentzel, Professor Amos Winter and students Amit Gandhi, David Taylor, Stephen Maouyo and Hisham Bedri. MIT Senior Administration delegates included Dean of Undergraduate Education Daniel Hastings, Provost Chris Kaiser, and Director of the MIT Washington Office, Bill Bonvillian.

USAID Visit to MIT: December 2012

On December 17th and 18th, CITE and IDIN hosted USAID for substantive discussions at MIT. This meeting allowed both the CITE and IDIN teams to discuss their respective Workplans and Monitoring and Evaluation Plans in detail with USAID representatives. Further, the meeting gave the MIT teams the opportunity to ask questions about the goals of the HESN and to learn more about how to engage with USAID given its internal structure and operation. Lastly, the MIT and USAID teams held a strategy session to explore ways in which the USAID cooperative agreements can be leveraged to create a more focused international development research agenda at MIT. It was concluded that the teams would aim to hold high-level talks (USAID and MIT senior administration level) at MIT in April of 2013, during the

Rethink Relief conference. In the intervening time the teams will coordinate to prepare their respective administration representatives and develop an agenda for the talks.

USAID attendees included Agreement Officer's Representative, Jessica Rosen; Activity Manager, Dr. Ticora Jones; and Office of Science and Technology COO, Michele Schimpp.

Visit to SUTD: January 2013

In January of 2013, Derek Brine, Associate Director of CITE, and Dan Frey, faculty lead for CITE traveled to Singapore to participate in the Singapore University of Technology and Design Annual Design Summit and to present their draft white paper on technology evaluation. During the trip, Derek met with faculty and researchers at SUTD's Opportunities Lab (O-Lab), with expertise and interest in product evaluation in order to build relationships with like-minded researchers in Southeast Asia. The relationship with SUTD continues to evolve and could result in a hub location.

USAID High-Level Visit to MIT: May 2013

CITE hosted a two-day high-level meeting between USAID and MIT on May 13-14, 2013. The USAID delegates, Dr. Alex Dehgan, Dr. Ticora Jones, and Dr. Amit Mistry from USAID's Office of Science and Technology, Higher Education Solutions Network met with MIT President Rafael Reif and other high-level MIT faculties. Side meetings were arranged with core members from CITE and IDIN teams. Dr. Alex Dehgan, the Science and Technology Adviser to the Administrator and Director at USAID gave a keynote speech in the evening of May 13th with over 200 people from MIT and the community in attendance.

USAID Visit: July/August 2013

From July 29-August 1, 2013, Jarrod Goentzel visited and had side meetings with various groups at USAID to identify specific topics for collaboration (please see list below) and presented an overview of the CITE program at a brown bag lunch that was attended by 15 USAID Staff (8/1/13). In addition, Jarrod participated at the Saving Lives at Birth event (7/31/13).

- Ticora Jones, USAID/OST: topics included HESN collaboration, private sector partnerships, etc.
- Elizabeth Skewgar, USAID/BFS: topics included food/ag products and technologies, mission engagement, etc.
- Christine MacAulay, USAID/PPL/LER: topics included evaluation approaches, uses, partner engagement, etc.
- Armand Lanier, Teresa Trusty, Alex Riehm, USAID/OST/IDEA: topics included innovative technologies, mission engagement, etc.
- Joe Wilson, Claire Perkins, Callie Raufs-Wang USAID/GH: topics included key commodities for health, diagnostic technologies, last mile initiatives, etc.
- Michele Schimpp, USAID/OST: topics included product prioritization, innovation catalog, private sector engagement, etc.

CITE Website

The CITE website will be one of the main communication tools that CITE uses to engage the larger development community and to spread the word about its work. MIT's Information Services & Technology (IST) worked with CITE in developing a website and help to tender the designers for the website and CITE identity logo. To date, a container site has been developed and content is being generated and uploaded for a launch in mid-November. CITE is exploring a possible partnership with another similar organization to create a new, improved web portal that product users and international

development practitioners can consult for superior information and evaluations on product options for those living in poverty.

A design RFP was tendered and Alphabetic, LLC was selected to design the CITE graphic identity/logo. A final logo was selected in August 2013 and is included in Appendix D.

Objective 2:

Develop and apply the CITE “3-S” evaluation methodology through research involving case studies, courses, fieldwork, analysis and modeling

As indicated in Part I.1 Milestones, the following are the detail summary of our key objectives and outcomes under Objective 2:

CITE Methodology Retreat

From 9:00am to 1:00pm On December 20th, 2012 CITE leadership held the first CITE methodology retreat which brought together all faculty and staff on the CITE program. During the retreat CITE faculty and staff had an opportunity to interact directly with representatives of some of CITE’s partners. As a result CITE gained a deeper understanding out partner’s needs (please See Appendix C for meeting notes).

Case study development

The entire CITE team developed a Case Study Template (Appendix E) for summer interns to use. It consisted of a clear process, suggestions on how to conduct empirical research as a basis for theory building, and a template for their final deliverable. Case studies are one of the main tools CITE will use for understanding what has and hasn’t worked in testing, implementing and supporting products in the developing world.

Suitability Testing Development

During Y1Q4 the suitability team continued the first product family evaluation focusing on the technical and user testing of the various solar lighting options available in the Ugandan marketplace. Our technical team consists of graduate students, Amit Gandhi, Victor Lesniewski and Chris Pombrol; undergraduate student ChaCha Durazo; Professor Dan Frey; Former Technical Director and Vice President of Consumer Reports and current CITE advisor Dr. Jeffrey Asher; and CITE Associate Director Derek Brine. The goal of our study is to create a comparative evaluation that would be useful for practitioners trying to decide between purchasing various lantern models.

Toward these ends we have taken the following steps:

1. Reviewed existing testing methods for solar lighting options

A careful review of existing testing methods helped to inform our team of where they were lacking and how we can add value.

2. Developed a set of field information gathering protocols based on initial work done by Amit Gandhi in Ghana

One of the students on the project, Amit Gandhi, conducted an initial pilot study of solar lighting products in Ghana as part of his Master’s thesis research. This involved interviewing users about their usage patterns and gathering information about the activities for which the products are used. Our

current research team leveraged that knowledge in developing our test methods for solar lighting in Uganda by using his findings as background for user interviews and protocol development.

3. Purchased and instrumented 50 lanterns with accelerometers, voltage and current sensors and data logging equipment

Our research team purchased and instrumented 50 solar lighting products to take with them to the field for gathering real user data to assist in our comparative evaluation of solar lighting products in Uganda. The two models selected were those that were most popular with Solar Sister buyers: the d.light S20 (formerly the Kiran) and the Barefoot Firefly Mobile. These instrumented lanterns were distributed to solar lighting users for a period of two weeks recorded data useful in discerning their use pattern including when the lights are on, off or charging and whether they are moving . The team used this data to help design the testing regimen and to provide scores for solar lighting products in various performance categories measured in the lab.

4. Developed a set of lab testing protocols

Our team has now completed characterizing and testing the selected solar lighting models in the laboratory. These include:

Model	Manufacturer
S2	d.light
S20	d.light
S300	d.light
SunKing Pro	Greenlight Planet
SunKing Solo	Greenlight Planet
SunKing Eco	Greenlight Planet
Unite to Light	Unite to Light
WakaWaka Power	WakaWaka
WakaWaka Light	WakaWaka
Firefly Mobile	Barefoot Power
ASE	

From the field data and interviews we determined which lighting characteristics were likely important ones to test. This includes their time to charge, time to discharge (usable light), sensitivity to the sun, resistance to water damage, brightness, task lighting performance and ambient lighting performance.

5. Developed a sensory testing panel protocol

Beyond technical testing, our team is also focusing on the interaction between solar light models and their users. We will be consulting with a sensory panel testing expert and an ophthalmologist to develop a series of tests to gauge user’s performance in the light of various solar lantern models as a way of differentiating between their usability. These may be modified versions of standard eye tests, such as the Snellen Eye Chart or Ishihara Color Blindness test as well as performance on simple tasks such as reading, sorting or completing puzzles.

6. Developed user-based protocols

In the process of developing the test methods, we have identified a set of organizational protocols to put in place.

Product Pedigree: Developing a set of protocols for ensuring that models purchased are properly marked, labeled, and sourced.

Market Studies: Most important to our future method is finding a way to conduct a thorough market analysis prior to starting an evaluation to determine the most prevalent models available in a marketplace. We are currently evaluating the feasibility of tasking a single person to lead this effort given its importance.

Sensory Panel Development: Integrating sensory panels into our testing will be a significant component of user testing as we develop our methodology.

Use of Experts: The CITE suitability team will develop a reliable cadre of experts from which to draw in order to inform the development of laboratory and sensory testing by tapping the MIT Alumni Network.

We hope to use our pilot examination of solar lighting devices to formalize our suitability test methodology by incorporating it as an example in our white paper. In addition, the learning from this initial pilot evaluation will be parsed into a series of research briefs which will outline the research agenda for CITE suitability going forward.

Scalability

The Scalability team focused its efforts in YI to develop case studies from which we can distill principles that form the basis of evaluation methodologies. The team consisted of summer interns, RAs, faculty, research staff and NGO partners. While several smaller cases were developed, efforts focused on the following in-depth studies:

- A longitudinal case focused on scaling up a network of suppliers for long lasting insecticidal nets (LLINs) with UNICEF.
- A teaching case focused on procurement strategies using a global network of suppliers for ready-to-use therapeutic food (RUTF) with UNICEF.
- A longitudinal case focused on product and supply chain design for food storage products with GrainPro, Inc.
- A cross-sectional case focused on channels to market and last mile delivery with Purdue Improved Cowpea Storage (PICS).
- An analytical case to test supply chain mapping and landed cost techniques for a diarrheal treatment kit (ORS-Zinc) currently under pilot in Zambia by ColaLife.

The case studies will be used to add details to a preliminary outline of the Scalability Concept Paper to form a complete draft during the Fall 2013 semester.

Additional research on scalability spanned a combination of group brainstorming, individual collaboration and related project work. Group brainstorming at the CITE methodology and ongoing discussions among the research team led to an extensive list of questions that form the basis for data collection in scalability evaluations. Additionally, summer interns used this detailed list of questions in developing their case studies.

Two related projects contributed to development of a value chain analysis approach. First, collaboration with World Food Programme to evaluate market supply of key commodities (e.g., cereals, pulses, salt, sugar) for voucher programs in Darfur continued with field data collection of traders in Sudan. Analysis of the data will be completed in December 2013. Second, collaboration with GlaxoSmithKline in Southern Africa led to a thesis on the value chain two essential medicines in Zambia and Zimbabwe.

The Scalability team also developed some preliminary supply chain mapping techniques and technologies that were tested on several of the detailed CITE Scalability case studies and on the related work with WFP on food commodities in Sudan.

Sustainability

During the Summer the Sustainability team placed extensive effort in preparing for the summer fieldwork, including scheduling with the DIV partner Solar Sister, drafting of research plans and protocols, COUHES certification and training by all members of the team, meetings with the Suitability team to align the efforts during the field work in Uganda, and arranging all logistics for both the Sustainability and Suitability teams.

From July 7 to August 7, the Sustainability team, in parallel with the Suitability team, completed fieldwork in Uganda. A principal goal of the fieldwork was to inform the evaluative approach and criteria for sustainability. The Team worked with DIV partner Solar Sister to understand how their business model has contributed to the diffusion of solar lanterns throughout Uganda. To better understand the dynamics, the Team developed a five-page semi-structured interview, which was then piloted and finalized in Uganda. Six sections—background information, household monetary and spending habits, entrepreneurship background, decision-making processes, on-the-job experiences and community engagement—comprised each interview. In total, the team completed 80 interviews with Solar Sister entrepreneurs—women (and some men) who sell solar lanterns in their local communities. The team also completed key informant interviews with Solar Sister staff, local solar lantern suppliers, and other organizations with business models similar to Solar Sister’s in order to understand the local context and market for solar lanterns.

Currently our team has completed the analysis based off of the fieldwork. The analysis focused on the financial, social, and organizational factors underlying Solar Sister’s performance using a hybrid social enterprise business model. The team has also completed literature reviews of technology diffusion in developing countries, social networks and social network analysis, and theories of social and behavioral change. A report detailing the team’s findings is in the process of being internally reviewed and finalized. A White Paper outlining the theoretical underpinnings of the team’s approach and methodology is also in the process of being internally reviewed and finalized. The fieldwork in Uganda and subsequent research is expected to lead to the publication of two to three journal articles.

WEDC conference

Prior to conducting field work in Uganda, the three-person Sustainability team MIT Student Tessa Skot, Sustainability researcher Jonars Spielberg, and lead by Jennifer Green attended the 36th Water, Engineering and Development Centre (WEDC) International Conference in Nakuru, Kenya. The theme was: “Delivering Water, Sanitation and Hygiene Services in an Uncertain Environment.” The team networked with leaders in the field of water and sanitation, including other HESN partners such as UC Berkeley. The Team gained new insights about key approaches and methodologies, including behavioral and evaluative models, as applied to the water and sanitation sector.

To supplement their learning, the Sustainability team is participating in a System Dynamics course 15.871, Introduction to System Dynamics, taught by John Sterman at the MIT School of Management. The skills and techniques learned in the course will be applied directly to the team’s modeling, analytical and evaluative efforts.

A new RA has joined the Sustainability team: Maimuna (Maia) Majumder, an PhD candidate. She comes to MIT from Tufts University, where she earned a B.S. in Engineering and an MPH in Epidemiology and Biostatistics. Co-founder and CEO of the Village Zero Project, a non-profit humanitarian research organization that aims to track the spread of endemic cholera in her native Bangladesh. Research interests lie at the intersection of large-scale engineering systems and infectious disease management.

CITE Product Catalog

CITE has started to develop a catalog, which now includes over 150 products designed for the developing world. Data in the catalog includes the name of the product, the manufacturer, technical specifications and any technical performance data that can be found. These products will be parsed into the different typologies developed in conjunction with the sustainability team and further data is now being added by the scalability team on sourcing and manufacturing. The catalog will form the basis of data for the CITE website and a main way for practitioners to interact with CITE in the future.

We are currently recruiting student product researchers and are in talks with Tim Hsaio at USAID in order to put resources towards developing the catalog.

Objective 3:

Build a vibrant academic community (courses, students, faculty and staff) dedicated to technology evaluation for development.

As indicated in Part I.1 Milestones, the following are the detail summary of our key objectives and outcomes under Objective 3:

CITE Course Development

Professor Bish Sanyal, Professor Oli DeWeck, Derek Brine, Jennifer Green and Jarrod Goentzel helped develop the content of the Spring 2013 Semester Course: ESD.S20/11.S941: Evaluating Technologies for the Developing World. The group decided the course would consist of a series of lectures, discussions and presentations by MIT faculty and staff, CITE's partners and the students themselves, each designed to build upon the CITE evaluation method or to provide practical context and background for MIT researchers with an anticipation of 25-30 student participating.

CITE Course: ESD.S20/11.S941: Evaluating Technologies for the Developing World

The ESD.S20/11.S941: Evaluating Technologies for the Developing World class was offered in Spring 2013 on Mondays from 3:30pm to 5:00pm with 24 total participants, including nine who were non-registered students (Please see Appendix A for the syllabus and Appendix B: student membership). Professors Bish Sanyal and Oli de Weck co-taught the class, and Derek Brine, Jennifer Green and Jarrod Goentzel helped to plan the course. Five graduate research assistant (RA) and one teaching assistant (TA) were hired to support the work of CITE and ESD.S20/11.S941 seminar. This course focused on working within the constraints and problems faced by development agencies, governments, NGOs, and entrepreneurs. Specifically, students were expected to develop evaluation plans for several products, each identified by CITE's organizational partners (USAID, Partners in Health, Mercy Corps, Oxfam America, UNICEF, WFP and International Rescue Committee and Kopernik). The four partners and the products that were selected include:

Partner	Product	Location
Kopernik	Biomass Cookstove	Indonesia

Kopernik	Nazava Water Filter	Indonesia
Mercy Corps	Tofu Vacuum Cooker	Indonesia
Oxfam America	DelAgua Water Testing Kit	Senegal/Various
Partners In Health	Medical Waste Incinerators	Haiti

On February 19, 2013, representatives from Oxfam America, Mercy Corps, Kopernik and Partners in Health joined in a panel discussion on products used in their development interventions. Each partner was paired with a team of students to create an evaluation protocol for a product with which the organization is currently grappling. The students worked closely with each of the partners and met with headquarters and/or field staff on a regular basis.

Each student team completed a 3S (Suitability, Scalability, Sustainability) evaluation design for a product during the semester. The four class teams gave their final presentation to the class, where Alex Dehgan, Ticora Jones and Amit Mistry from USAID also attended on the last day of class.

As part of the extension of the class, two debriefs were presented to our partners. On May 17, 2013, eight students from the ESD.S20/11.S941 class and the Sustainability lead, Jennifer Green made a trip to Oxfam America's headquarters in Boston's North End to present their findings and recommendations from their research. Three of the projects from the class were presented: Biomass Cookstove; DelAgua Water Testing Kit; and the Nazava Water filter. On June 13, 2013, the Kopernik student team presented to Kopernik, Indonesia's field and project officers via SKYPE from Boston on their findings and recommendations on the Nazava Water Filter. In the audience were Professor Dan Frey at Kopernik, Indonesia and Derek Brine SKYPEing in from Boston.

International Development Night

On April 13, 2013, MIT hosted International Development Night (IDNight) in collaboration with the Harvard International Development Conference (IDC). The event brought a host of diverse audience interested in international development to share ideas and learn about MIT international development technologies and projects. CITE hosted a booth at this two-hour social and informal information session. Over 400 people, including students from MIT and other neighboring universities took part in the

CITE end of the semester review

On May 24, 2013, CITE hosted a half-day end of the Spring Semester meeting. Seventeen faculty, staff, and students attended the seminar where our year 1 deliverables and persons responsible based on recent feedback and discussions with USAID were reviewed and everyone's summer/research plans were shared.

CITE-PSC internship

In preparing for summer programming, CITE and the Public Service Center (PSC) announced a call for applications for USAID Community Partner Interns and USAID Program Development Interns (<http://web.mit.edu/mitpsc/whatwedo/cite-psc/index.html>) in March 2013. Despite the late announcement for the CITE-PSC internship (most Summer internship are announced in December of the previous year), the response was positive: CITE-PSC received over 100 requests for applications, and 21 applications were received. CITE and PSC selected six undergraduates and five graduate students for placement in Boston, Washington, DC, Indonesia and Denmark with our partners: USAID/Global Health, Kopernik, Mercy Corps and UNICEF. Unfortunately one undergraduate dropped out after the second week of internship due to misaligned expectations. One of the MIT-USAID/GH interns blog post can be viewed on the PSC website: <http://mitpsc.mit.edu/blog/current-summer-13-rafa-rahman/#>. The

following is a summary table of where the 10 student internships went and what they did over the summer:

CITE Summer 2013 Internship and RA travel

Name	MIT affiliation	Destination	Dates	Purpose
International				
Sara Lynn Hess CITE-PSC Intern	MIT Graduate Student Masters in Urban Planning	Denmark	6/16-7/14	To work with UNICEF Procurement office and develop case studies on supply chain process
Abir Liben CITE-PSC Intern	MIT 2nd year Undergraduate Major: Urban Studies & Planning	Indonesia	7/2-8/1	To work with Kopernik in identifying comparable products utilized by Kopernik and develop case studies.
Ting Mao CITE-PSC Intern	MIT 4 th year Undergraduate Major: Economics and Management Science	Indonesia	7/4-8/1	To work with Kopernik in identifying comparable products utilized by Kopernik and develop case studies.
Tessa Skot— RA	MIT Graduate Student Masters: Mechanical Engineering	Kenya, Uganda	6/28 - 8/7	To attend WEDC Conference in Nakuru, Kenya. To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Amit Gandhi— RA	MIT Graduate Student	Uganda	7/6 – 8/7	To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Victor Lesniewski— RA	MIT Graduate Student	Uganda	7/6 – 8/7	To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do

Name	MIT affiliation	Destination	Dates	Purpose
				capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Jessica Beth Press-Williams CITE-PSC Intern	MIT 1 st year Undergraduate Major: Mechanical Engineering	Indonesia	7/10-8/16	To work with Mercy Corps in identifying comparable products utilized by Mercy Corps and their clients, and develop case studies.
Morgan Edwards	MIT Graduate Student PhD: Engineering Systems Design	Indonesia	7/10-8/16	To work with Mercy Corps in identifying comparable products utilized by Mercy Corps and their clients, and develop case studies.
Domestic				
Rafa Rahman CITE-PSC Intern	MIT Undergraduate Student Major: Biological Engineering, 2Y	USAID/GH Washington, DC	6/3-8/12	To work with USAID/Global Health in identifying comparable products utilized by in developing countries from USAID's product list, and develop case studies.
Bryan Ranger CITE-PSC Intern	MIT Graduate Student PhD: Health Sciences & Technology	USAID/GH Cambridge	6/3-8/20	To work with USAID/Global Health in cataloguing USAID's product list used in developing countries.
Cauam Ferreira Cardoso RA/CITE-PSC Intern	MIT Graduate Student PhD: Urban Studies & Planning	CITE-PSC program development Cambridge	6/3-8/31	To work with CITE members in exploring ways to engage the MIT student community; to help in preparation of a partnership meeting to be held at MIT.
Sydney Beasley CITE-PSC Intern	MIT Undergraduate Student Major: Civil and Environmental Engineering, 4Y	CITE-PSC program development Cambridge	6/17 - 8/12	To work with CITE members in exploring ways to engage the MIT student community; to help in preparation of a partnership meeting to be held at MIT.
Elizabeth Resor CITE-PSC Intern	MIT Graduate Student Master in City Planning	Cambridge	7/10-8/30	To work with a few organizations on case studies focused on food/grain storage.

On June 3, 2013, CITE-PSC had a half-day orientation where the student interns and staff attended a session of logistics, overseas pre-departure information and explanation of case-study development. An MIT Stellar site was created for the groups for sharing documents, travel info and communication.

Harvard IDC and provided an opportunity to showcase and recruit students for CITE.

CITE RA-Internship Summer 2013 semi-monthly research meetings

During the summer 2013 (June 20-August 8, 2013) CITE RAs and interns gathered twice a month to present their research topics and opened up the floor for discussion and improvement on their research methodology. The following are the dates for the semi-monthly summer research meetings:

- June 20: Kickoff meeting highlighting the two teams (Suitability and Sustainability Teams) leaving for Uganda in July to work on solar lanterns
- July 11: Cauam Cardoso and Sydney Beasley, CITE-PSC Program Development Interns presented their student engagement strategy to the group
- July 25: Rafa Rahman and Bryan Ranger presented their summer USAID/GH internship projects .
- Aug 8: Karthik Rao Cavale and Atul Pokharel (both DUSP RAs) will present their summer research projects to us. Karthik: Development Engineering at MIT; Atul: "Towards a new class on learning from evaluation (based on the evaluation of old technologies)

Student Recruitment

Student Orientations: CITE hosted booths at several Fall 2013 student orientations at MIT. As a result over 70 students signed up to be included on CITE's mailing list.

- Academic Expo (8/27/2013)
- Activities Midway (week of 8/26/2013)
- Graduate School Council Booth: (week of 8/26/2013)
- Go Global Fair (9/10/2013)

CITE-PSC Internship Dinner: On September 11, 2013, CITE took part in the annual PSC internship dinner with approximately 40 people in attendance. CITE and PSC have a collaboration on the summer internship program, and this event was another opportunity for CITE to promote the activities to the students.

DUSP-PSC Internship Luncheon: On September 18, 2013, DUSP and PSC hosted a lunch that brought together DUSP graduate students on internship opportunities at MIT. Four DUSP students were featured, of whom one was Sara Hess, CITE-PSC summer intern. CITE was also given an opportunity to feature it's programs and student engagement opportunities.

CITE Research Assistants: CITE RAs are an integral part of program. Each of the department/centers that makes up CITE—DUSP, CTL, D-Lab and SSRC—each recruit research assistants to help in the respective research. In year 1, CITE hired a total of 12 students who were either an RA or a teaching assistant, and worked anywhere from a semester to the academic school year or for the summer three-month period, and hired at 50% or 100% RA-ship (a normal 100% RA-ship equal to 20 hours/week work).

For the 2013 Fall academic year (beginning September 1, 2013), 14 RAs are working on CITE programmatic matters, of which two RAs are being paid by another program (leveraged cost to CITE) and two RAs are funded by DUSP (cost sharing). Please see Appendix H for the RA listing.

Faculty Recruitment

Recruitment of additional faculty and staff: The Sociotechnical Systems Research Center recruited and hired a new staff, Jonars Spielberg as a member of the Sustainability Team and their research. Jonars was enrolled in the ESD.S20/11.S941: Evaluating Technologies for the Developing World class and was already familiar with the content of CITE.

There are many faculty and senior staff interested in the 5 technical disciplines (water, sanitation, energy, health, agriculture) and issues of Sustainability in a development context at MIT. The Sustainability team approached many of these people and asked them to be "CITE Sustainability Advisors," which provides an opportunity for them to be involved in the CITE project at a low level of effort and also provide CITE researchers and fellows access to subject matter experts in the technical disciplines. The following individuals have agreed to serve as CITE Sustainability Advisors:

- Stephen Connors, Regional Energy Alternatives Director, MIT Energy Initiative
- Prof. Gabriella Carolini, Assistant Professor, Department of Urban Studies and Planning, MIT
- Prof. Stan Finkelstein, Senior Research Scientist, Engineering Systems Division and Harvard-MIT Division of Health Sciences & Technology and Associate Professor of Medicine, Harvard Medical School
- Myra Foster, Public Health Promotion Specialist, Oxfam America
- Prof. Richard Larson, Mitsui Professor of Engineering Systems and Director, Center for Engineering Systems Fundamentals, MIT
- Susan Murcott, Senior Lecturer, Civil and Environmental Engineering, MIT
- Kenny Rae, Public Health Engineer, Oxfam America
- Dr. Afreen Siddiqi, Research Scientist, Engineering Systems Division, MIT

In addition, Dr. Richard Schuhmann, a Senior Lecturer/Short Subject Program Manager in the Gordon-MIT Engineering Leadership Program has been recruited as a voluntary team member.

Doug Fearing, Assistant Professor at Harvard Business School, and Stan Finkelstein, Senior Research Scientist □ Engineering Systems Division and Harvard-MIT Division of Health Sciences & Technology □ Associate Professor of Medicine, Harvard Medical School agreed to actively participate as a member of the CITE Scalability team.

Starting Fall 2013, Professor Eric Klopfer (Director of the MIT Scheller Teacher Education Program (<http://education.mit.edu>) and the Director of the The Education Arcade (<http://educationarcade.org>)) with the Department of Urban Studies & Planning is working with RA Stacey Allen.

Part 3: High Value Areas of Collaboration [HVAC] (Lab-to-Lab)

Provide a brief overview to summarize how you've engaged with your fellow Development Labs and what the outcomes of such opportunities have been. Feel free to include everything from site visits to collaborating on projects. We are particularly interested to learn what results of these engagements have been and how they have impacted your ability to be more successful in your work.

3.1. Data

Using the table below as the “summary table,” construct a narrative here describing your Lab’s engagement with data over the past fiscal year. This can include a description of the goals outlined in your workplan and the outcomes from these collaborations.

Partner	Completed / Ongoing Activity [Indicate tie to activity number]	Outcome(s)
Michigan State University	Visit to MSU by Jarrod Goentzel on July 16-17, 2013	Meetings with researchers to explore data sharing, decision support processes, and food/ag product prioritization and evaluation. Key meetings with Charles McKeown, Dave Weatherspoon, Eva Almenar, David Tschirley

3.2. Solutions (Creation, Testing, Scaling)

Using the table below as the “summary table,” construct a narrative here describing how you have engaged with other Development Labs around solutions.

Partner	Completed / Ongoing Activity [Indicate tie to activity number]	Outcome(s)
UC Berkeley	Field visit planned to UC Berkeley by Bish Sanyal and Derek Brine on Oct 9 -12 2013.	CITE and DIL exploring substantive collaboration on testing DIL projects, development of journal, edX course, or development of a minor.

3.3 Student Engagement

Using the table below as the “summary table,” construct a narrative here describing how your Lab is promoting student engagement among the other Labs.

Partner	Completed / Ongoing Activity [Indicate tie to activity number]	Outcome(s)

3.4. Co-Location of Resources

Using the table below as the “summary table,” construct a narrative detailing your efforts to co-locate or leverage resources with other Labs to maximize your impact.

Partner	Completed / Ongoing Activity [Indicate tie to activity number]	Location (City and Country)	Outcome(s)

Part 4: Intra-Development Lab/ University Engagement

Provide a brief overview to summarize how you've engaged with the partners that make up your Development Lab (in your consortium or on your campus). We are particularly interested to learn how you are embodying the multidisciplinary approach of the HESN and what the results of these engagements have been.

4.1. Interdisciplinary Collaboration

Describe how your Development Lab is networking across your own campus and among your partners to promote interdisciplinary activities and opportunities.

As highlighted in Parts 1 and 2, collaboration has been initiated with the MIT Public Service Center (PSC) to create CITE-PSC internship program. The USAID Community Partner Interns are graduate or undergraduate students who will serve as summer interns with CITE partner organizations, such as USAID, Mercy Corps, UNICEF, and Kopernik. Cambridge-Boston and Washington, DC paid internships may be full-time or part-time for 10-12 weeks during the summer. The work will provide support for CITE's organizational partners in Indonesia and Uganda. Full-time internships for 4-6 weeks are also available in Indonesia. Travel, accommodations, and living expenses will be covered through an internship stipend. The USAID Program Development Fellowship will offer graduate and undergraduate students the chance to become part of the CITE program development team. Students will work on campus with CITE staff and faculty to develop and implement programming that engages MIT students and others in CITE's work, which may include a conference, lectures, web site, and more. A call for application yielded 21 applicants by April. A total of ten students were selected as a CITE-PSC intern (please see Part 3.3 student engagement for more information). US-based and overseas internships will begin in June and will end by late August.

The Sustainability Team is also involved with LAUNCH Initiative, which is under contract to NASA (Department of Aeronautics and Astronautics, MIT) and NIKE (Sloan School of Management, MIT).

As mentioned in Part 1, the Sustainability Team has created an "CITE Sustainability Advisors" from multiple departments, Initiative and Centers: MIT Energy Initiative, Department of Urban Studies and Planning, Center for Engineering Systems Fundamentals, Engineering Systems Division, Harvard-MIT Division of Health Sciences & Technology, Civil and Environmental Engineering, and representatives from Oxfam America.

CITE has received funding from the MIT office of Digital Learning to recruit a postdoctoral fellow to develop the edX course for offer in Fall 2014. An offer has been made to the selected candidate and CITE management awaits response.

CITE explored how to engage directly with the MIT Industrial Liaison Program (ILP), which is the links between various disciplines at MIT and nearly 200 corporations worldwide. See details below.

4.2. Partner Engagement

Describe how you have been engaging your partners through your Development Lab. Include the addition of any new partnerships and describe the types of interactions you have undertaken. If your Development Lab consists of a consortium, please describe how you have worked with the other institutions in the consortium, in addition to other external partners.

CITE has engaged its partners through the CITE course: ESD.S20/11.S941: Evaluating Technologies for the Developing World. In particular, on February 19, 2012, representatives from Oxfam America, Mercy Corps, Kopernik and Partners in Health joined in a panel discussion on products used in their development interventions. Each partner was paired with a team of students to create an evaluation protocol for a product with which the organization is currently grappling. The four partners and the products that were selected include:

Partner	Product	Location
Kopernik	Biomass Cookstove	Indonesia
Kopernik	Nazava Water Filter	Indonesia
Mercy Corps	Tofu Vacuum Cooker	Indonesia
Oxfam America	DelAgua Water Testing Kit	Senegal/Various
Partners In Health	Medical Waste Incinerators	Haiti

The students worked closely with each of the partners and met with headquarters and/or field staff on a regular basis.

As part of the extension of the ESD.S20/11.S941: Evaluating Technologies for the Developing World class, there were two class debrief and presentations to our partners. On May 17, 2013, eight students from the ESD.S20/11.S941 class and the Scalability lead, Jennifer Green made a trip to Oxfam America's headquarters in Boston's North End to present their findings and recommendations from their research. Three of the projects from the class were presented: Biomass Cookstove; DelAgua Water Testing Kit; and the Nazava Water filter. On June 13, 2013, the student team presented to Kopernik, Indonesia's field and project officers via SKYPE from Boston on their findings and recommendations on the Nazava Water Filter. In the audience were Professor Dan Frey at Kopernik, Indonesia and Derek Brine SKYPEing in from Boston.

Further, two members from Oxfam America have joined the "CITE Sustainability Advisors" team.

CITE is currently working to develop a strategy for working with both existing and new partners. Through our interactions with our current partners it has become evident that a clear engagement model is essential to a healthy and productive relationship. Such a model will outline the roles and responsibilities of both CITE and the organizational partner and spell out expected outcomes in detail. Our model will be flexible enough to accommodate the individual needs of each partner, but at the same time will establish a baseline for our each working relationship. We hope to develop this model over the next six months. Jarrod Goentzel is leading this effort.

To that end, key CITE personnel and faculty have made trips to visit Kopernik, UNICEF and WFP. In-depth, in person conversations with these partners have helped to identify promising areas of collaboration and approaches to structuring the relationship. For example, UNICEF has identified several promising internal organizational units with whom to engage. These include the Innovation Unit, the Quality Assurance Centre, the Health Technology Centre, the Medicines & Nutrition Centre, Procurement and Supply Chain Optimisation and Strengthening. A promising group to engage with WFP is the Internal Review Committee, which evaluates products that are used in its programs. Finally, Kopernik has identified several promising technologies to evaluate in Indonesia and we are working with them to further explore the possibility of conducting an in-depth technical evaluation with them.

CITE proposes the following four levels to engage partners as part of our partner engagement strategy:

- I. Development of individualized partnership agreements with each NGO

2. Signing of a standard Memorandum of Understanding (MOU) to define the general conditions and Terms of References (TORs) to outline roles in specific collaboration activities. NOTE: MOUs were actively in progress with WFP and UNICEF, and TORs were developed for summer interns with UNICEF, Mercy Corps, and Kopernik.
3. Formation of an NGO or industry consortium to support select CITE activities
4. Working with partners to raise outside funding for specific evaluation projects and infrastructure

Each of these models has its own advantages and drawbacks. For instance, if CITE evaluates products that an NGO is currently uses and finds them technically unsuitable, that information may be difficult for that NGO to act upon. In addition, if CITE goes after specific funding opportunities with its partners, it must find a way to remain independent. The model we develop must address these and other issues.

To that end, an important component of partner engagement includes in-person and online meetings. CITE currently is planning a roundtable meeting with core partners and a broader conference inviting active and potential partners later in the academic year. Both of these events will happen in Year 2 (October 2013 – Sept. 2014).

Beyond developing our partnership model, several new efforts were initiated to engage new organizations in CITE's work:

- CITE leaders met with the Executive Director of the MIT Industrial Liaison Program (ILP), which is dedicated to creating and strengthening mutually beneficial relationships between MIT and corporations worldwide. Plans were outlined to engage the liaison officers who work with the 190 companies involved in ILP and to create a conference that would actively engage the private sector in CITE efforts.
- CITE presented its project at the annual partner meeting for the MIT Center for Transportation & Logistics (CTL); CTL has 45 partner companies.
- The CITE Scalability team established a new partnership with MGH's Center for Global Health and was successful in receiving a CAMTech Innovation Award, which is designed to provide one year of development/commercialization support for an innovative medical technology that can significantly improve health in low- and middle-income countries. Active discussions are underway to identify how to align the CAMTech work with CITE efforts.
- Two CITE-PSC program development interns have been working closely with CITE staff to begin planning of a partner workshop at MIT designed to bring the CITE partnership model into focus.

The following partners were engaged during the past fiscal year:

Partner	Partner Type (Funded/ Unfunded)	Location (City and Country)	Outcome(s)
Mercy Corps	Unfunded	Washington, DC; Portland, Oregon	Coordination and discussion for ESD.S20.11.S941 class and internship possibilities
Mercy Corps	Unfunded	Jakarta, Indonesia	Placement of two student interns during summer 2013 (5 weeks)
Kopernik	Unfunded	Bali, Indonesia	
Kopernik	Unfunded	Bali, Indonesia	Placement of two student interns during

Kopernik	Unfunded	Bali, Indonesia	summer 2013 (5 weeks) Prof. Dan Frey visited Kopernik In June Professor Dan Frey traveled to Indonesia and met with Kopernik and with USAID/Indonesia. As a result, CITE is exploring how our next product evaluation could be conducted in collaboration with USAID in Indonesia and in partnership with Kopernik.
Partners in Health	Unfunded		Participated in the spring course, supporting a student project team
Oxfam, America	Unfunded		
World Food Programme	Unfunded		Jarrold Goentzel visited the Logistics Development Unit in Italy to outline engagement in Year 2, including interaction with the WFP Internal Review Committee, which evaluates products for WFP programs.
UNICEF	Unfunded		Sara Hess, MIT master's student, spent four weeks at the UNICEF Supply Division offices in Copenhagen, Denmark, and developed a case study on Long Lasting Insecticidal Nets (LLINs). Jarrold Goentzel visited the UNICEF Innovation and Supply Division teams in Copenhagen to outline plans for engagement in Year 2.
Solar Sisters	Unfunded		

4.3. Student Engagement

Describe how you have been engaging students on your campus and your partners' campuses (if applicable). For example, include any information on fellowships, internships, or new course offerings. If any activities were previously described in the "Description of Key Activities Section," please include them but reference the description in Part I.

As mentioned in Part I and 2, on April 13, 2013, MIT hosted International Development Night (IDNight) in collaboration with the Harvard International Development Conference (IDC). The event brings a host of diverse audience interested in international development to share ideas and learn about MIT international development technologies and projects. CITE hosted a booth at this two-hour social/information session. Over 300 people, including students from MIT and other neighboring universities took part in the Harvard IDC.

As mentioned in Part I and 2, ESD.S20/11.S941: Evaluating Technologies for the Developing World, a weekly seminar with 15 registered students and 9 non-registered students in attendance was co-taught by Professor Bish Sanyal and Professor Oli deWech. The Spring 2013 course consists of a series of lectures, discussions and presentations by MIT faculty and staff, CITE's partners and the students themselves, each designed to build upon the CITE evaluation method or to provide practical context and background for MIT researchers. In addition CITE has benefitted extraordinarily by having Dr. Jeffrey Asher, Former Technical Director and Vice President of Consumer Reports, as an advisor to the class and the teams.

Students in the course worked with MIT faculty and staff and produced an in-depth evaluation proposal for a product or technology identified in collaboration with one of CITE's partners (please see below). The students worked with those partners to map their product evaluation needs.

Partner	Product	Location
Kopernik	Biomass Cookstove	Indonesia
Kopernik	Nazava Water Filter	Indonesia
Mercy Corps	Tofu Vacuum Cooker	Indonesia
Partners In Health	Medical Waste Incinerators	Haiti
Oxfam, USA	DelAgua Water Testing Kit	

CITE Summer 2013 Internship and RA travel

Name	MIT affiliation	Destination	Dates	Purpose
International				
Sara Lynn Hess CITE-PSC Intern	MIT Graduate Student Masters in Urban Planning	Denmark	6/16-7/14	To work with UNICEF Procurement office and develop case studies on supply chain process
Abir Liben CITE-PSC Intern	MIT 2nd year Undergraduate Major: Urban Studies &	Indonesia	7/2-8/1	To work with Kopernik in identifying comparable products utilized by Kopernik and develop case studies.

Name	MIT affiliation	Destination	Dates	Purpose
	Planning			
Ting Mao CITE-PSC Intern	MIT 4 th year Undergraduate Major: Economics and Management Science	Indonesia	7/4- 8/1	To work with Kopernik in identifying comparable products utilized by Kopernik and develop case studies.
Tessa Skot— RA	MIT Graduate Student Masters: Mechanical Engineering	Kenya, Uganda	6/28 - 8/7	To attend WEDC Conference in Nakuru, Kenya. To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Amit Gandhi— RA	MIT Graduate Student	Uganda	7/6 – 8/7	To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Victor Lesniewski— RA	MIT Graduate Student	Uganda	7/6 – 8/7	To work with Solar Sisters (USAID/DIV partner) to implement field evaluation; interface with USAID mission, HESN partners and other stakeholders; identify comparable products available in-country and obtain samples; map product distribution network using handheld GPS and Google Earth; do capacity mapping of Solar Sisters and develop list of needed/desired training opportunities; document field work with daily blogs, photos, videos, etc..
Jessica Beth Press- Williams CITE-PSC Intern	MIT 1 st year Undergraduate Major: Mechanical Engineering	Indonesia	7/10- 8/16	To work with Mercy Corps in identifying comparable products utilized by Mercy Corps and their clients, and develop case studies.
Morgan Edwards	MIT Graduate Student PhD: Engineering	Indonesia	7/10- 8/16	To work with Mercy Corps in identifying comparable products utilized by Mercy Corps and their clients, and develop case studies.

Name	MIT affiliation	Destination	Dates	Purpose
	Systems Design			
Domestic				
Rafa Rahman CITE-PSC Intern	MIT Undergraduate Student Major: Biological Engineering, 2Y	USAID/GH Washington, DC	6/3- 8/12	To work with USAID/Global Health in identifying comparable products utilized by in developing countries from USAID's product list, and develop case studies.
Bryan Ranger CITE-PSC Intern	MIT Graduate Student PhD: Health Sciences & Technology	USAID/GH Cambridge	6/3- 8/20	To work with USAID/Global Health in cataloguing USAID's product list used in developing countries.
Cauam Ferreira Cardoso RA /CITE-PSC Intern	MIT Graduate Student PhD: Urban Studies & Planning	CITE-PSC program development Cambridge	6/3- 8/31	To work with CITE members in exploring ways to engage the MIT student community; to help in preparation of a partnership meeting to be held at MIT.
Sydney Beasley CITE-PSC Intern	MIT Undergraduate Student Major: Civil and Environmental Engineering, 4Y	CITE-PSC program development Cambridge	6/17 - 8/12	To work with CITE members in exploring ways to engage the MIT student community; to help in preparation of a partnership meeting to be held at MIT.
Elizabeth Resor CITE-PSC Intern	MIT Graduate Student Master in City Planning	Cambridge	7/10- 8/30	To work with a few organizations on case studies focused on food/grain storage.

Student Orientations: CITE hosted booths at several Fall 2013 student orientations at MIT. As a result over 70 students signed up to be included on CITE's mailing list.

- Academic Expo (8/27/2013)
- Activities Midway (week of 8/26/2013)
- Graduate School Council Booth: (week of 8/26/2013)
- Go Global Fair (9/10/2013)

CITE-PSC Internship Dinner: On September 11, 2013, CITE took part in the annual PSC internship dinner. Since CITE and PSC have a collaboration on the summer internship program, this was another opportunity for CITE to promote the activities to the students. Approximately 40 people participated.

DUSP-PSC Internship Luncheon: On September 18, 2013, DUSP and PSC hosted a lunch that brought together DUSP graduate students on internship opportunities at MIT. Four DUSP students

were featured, and one was Sara Hess, CITE-PSC summer intern. CITE was also given an opportunity to feature its programs and student engagement opportunities. Approximately 60 students attended the information session.

Scale-up Development Venture (SDV) Dinner: CITE participated in the SDV dinner in collaboration with D-Lab on Sept. 29 2013 with key international development student organizations in preparation for the SDV conference in February 2014.

CITE Research Assistants

CITE RAs are an integral part of program. Each of the department/centers that makes up CITE—DUSP, CTL, D-Lab and SSRC—each recruit research assistants to help in the respective research. In year 1, CITE hired a total of 12 students who were either an RA or a teaching assistant, and worked anywhere from a semester to the academic school year or for the summer three-month period, and hired at 50% or 100% RA-ship (a normal 100% RA-ship equal to 20 hours/week work).

For the 2013 Fall academic year (beginning September 1, 2013), 14 RAs are working on CITE programmatic matters, of which three RAs are being paid by another program (leveraged cost to CITE) and two RAs are funded by DUSP (cost sharing). Please see Appendix H for a chart of the RAs on the CITE Program. Details regarding the work of the RAs will be detailed in Y2Q1 report.

CITE Student Intern/Student Engagement Coordinator

Sydney Beasley, an MIT Undergraduate has been working with CITE members since the summer, and extending into Fall 2013 in exploring ways to engage the MIT student community and help in preparation of a partnership meeting to be held at MIT.

4.4. Student Highlights

Use this space to highlight and exciting student participation in the activities of your Lab in a format that could be used in HESN newsletters. This might include student research activities in-country and awards related to the work of your Lab. These vignettes are meant to be student-centric and illustrate the robust student engagement of the Lab (i.e. travel/exchanges, independent research projects, developing a new technology), and should not include Lab-driven student activities (i.e. coursework) which would be detailed in Section 4.3.

Uganda Solar Lighting Field Test By Jonars Spielberg, CITE Sustainability

Over the course of four weeks this past summer, the CITE Sustainability Team interviewed 80 women and men throughout Uganda. Our research goal in talking to these men and women was to learn about their experiences selling solar lanterns in their local communities, and to understand the opportunities and challenges they face.

In a country where 90% of people lack access to electricity, and where 75% of rural households use tadoobas (small wick lamps fueled by kerosene, which can be dangerous and are often unreliable), light—and the technology that provides it—is a precious commodity. Solar Sister, a USAID/DIV Stage 2 grantee and our partner in Uganda, aims to replace tadoobas with solar lanterns by recruiting and training entrepreneurs in villages and communities throughout Uganda and beyond. Because small-scale, household solar (“pico”) lanterns have been on the market for a relatively short period, about five years, knowledge about the technology has yet to penetrate fully into rural areas in East Africa.

Solar Sister Entrepreneurs (SSEs) devote considerable amounts of time and effort educating their friends, families, neighbors, colleagues, and community members about solar lanterns. Because few people have solar lanterns and because many prefer like the technology over kerosene lamps, especially those models that can charge mobile phones, the potential sales opportunities are high. Yet, many challenges impede sales prospects. Chief among them is price. Because solar lanterns are a new technology, efficiencies in manufacturing and distribution at scale have yet to be fully realized. The SSEs we interviewed cited additional challenges, including travel and transportation issues, finding and convincing customers, and increasing competition from other suppliers. Despite these challenges, SSEs continue to sell solar lanterns, relying on local knowledge and the added layer of trust that comes with selling through personal social networks.

Our team lead, Jennifer Green, has considerable experience working in the developing world. But for Tess Skot, a Master’s student, and myself, this was our first foray into on-the-ground development work. For us, the experience proved invaluable. Not only will our time in Uganda help solidify our research methodology, goals and objectives as we move forward, but it also drove home for me the importance of fieldwork. A project like CITE, which evaluates technologies designed to address critical development challenges, depends heavily on information. Without talking to the SSEs—learning about their lives, listening to their struggles and their strategies for overcoming them, walking the same dirt roads and paths they must travel to sell lanterns—our research would have been nearly impossible, and not nearly as rich.

I’ll never forget a response I got during my very first interview. It was dusk and I was sitting on a wooden bench outside the office of a Rotary Club building, interviewing Betty. When I asked her, “What does being an entrepreneur mean to you?,” she answered, “It means moving step by step from where you are to where you want to be.” CITE wants to create robust, rigorous technology evaluations that

will impact decision-makers to make smarter investments and purchases; that is where we want to be. Talking to people like Betty is the first step to getting there.

UNICEF supply Division, Copenhagen

By Sara Hess, CITE-PSC Summer Intern

Sara Hess held a four-week CITE-PSC summer internship with the UNICEF Supply Division based in Copenhagen, Denmark, where she developed a case study on the scale up of Long Lasting Insecticidal Nets (LLINs).

Sara was quickly integrated into the malaria unit team in the UNICEF Health Technology Center and joined the weekly team meeting, where everyone in the group provided updates on their work sending LLINs to locations throughout the developing world. She had the opportunity to meet one-on-one with several members of the UNICEF Supply Division staff discussing a whole range of issues related to LLINs including product specifications, quality testing, supply chain, distribution, LLIN suppliers, value for money, and cash flow issues that can impact procurement. Sara had a true “hands on” experience when the head of quality testing provided her with a brief LLIN demo, where she noted that the net had an unpleasant smell and feel. At the end, Sara was pleased with how her knowledge of LLINs has expanded from being non-existent almost a month ago to the point where she could explain the LLIN manufacturing, procurement, and distribution processes.

Some additional highlights outside her core work included a tour of UNICEF’s automated warehouse, working with Supply Division colleagues representing more than 70 nationalities, and attending the inauguration of the UN City – a new building which brings eight UN agencies together under one roof – which was attended by the Queen of Denmark, the Prime Minister of Denmark, the Mayor of Copenhagen, and UN Secretary General Ban Ki-Moon.

Please provide a brief paragraph on each student or group of students you highlight. You may also provide links to supporting information (i.e. blog posts, press releases, photos).

Please refer to CITE’s website (going live November 14, 2013) Notes from the Field for blogs from CITE’s summer interns’ blogs: <http://cite.mit.edu>

Rafa Rahman’s blog—summer internship at USAID/GH—can also be viewed at: <http://mitpsc.mit.edu/blog/current-summer-13-rafa-rahman/>

Sara Hess is currently enrolled in the Master’s in City and Regional Planning program at MIT, where she is a member of the International Development Group. After completing her bachelor’s in economics at Wellesley College, she spent two years traveling the world as an international cost-of-living analyst for Associates for International Research, Inc. (AIRINC). In her role at AIRINC, she visited more than 35 countries, primarily within the developing world. Following AIRINC, Sara worked for two years as a research associate and case writer for the Harvard Business School. She has also worked as a freelance business writer for the Oxford Business Group focusing on Latin American markets. Sara is excited to

be participating as a CITE intern at the UNICEF headquarters in Copenhagen this summer where she will be analyzing the organization's procurement process.

Jonars B. Spielberg is a research staff member at MIT's Sociotechnical Systems Research Center (SSRC). At CITE, he is providing broad support to the Sustainability team. His academic background is in interdisciplinary approaches to understanding complex problems, ranging from international development, governance and public policy, and human-environment systems. Prior to joining SSRC and CITE, Jonars was a Graduate Fellow at Boston University's Frederick S. Pardee Center for the Study of the Longer-Range Future, where he researched strategies for providing clean water and sanitation to poor urban communities in Asia. He holds a Bachelor's degree in International Relations from Michigan State University, and a Master's degree in International Relations and Environmental Policy from Boston University.

Part 5: USAID Engagement and Travel

5.1. USAID/Washington Interactions

Outline your interactions and engagement with USAID Washington staff during this fiscal year. Explain the a) purpose of the engagement; b) what was discussed or accomplished; and c) any follow-up items that resulted. You may wish to organize this section by the Bureaus/Independent Offices you interfaced with.

HESN Launch: November 2012

In November 2012, CITE attended the launch of the HESN in Washington, DC. As a result of the Launch, CITE was able to re-envision its First Year Workplan to better align with the overall goals of the program and to ask critical questions about the nature of the product evaluation tools and methods that would be useful to USAID. CITE was also able to envision interesting collaborations with other HESN members that may not have come to bear without such a venue for all HESN members to exchange ideas. Finally, the launch provided an effective mechanism for CITE and IDIN to engage MIT's Senior Administration through high-level talks with the USAID Administrator, the Secretary of State, and the Assistant to the President for Science and Technology.

CITE's delegation to the Higher Education Solutions Network launch event included CITE Director Bish Sanyal, Program Manager Derek Brine, Project Managers Jennifer Green and Jarrod Goentzel, Professor Amos Winter and students Amit Gandhi, David Taylor, Stephen Maouyo and Hisham Bedri. MIT Senior Administration delegates included Dean of Undergraduate Education Daniel Hastings, Provost Chris Kaiser, and Director of the MIT Washington Office, Bill Bonvillian.

USAID Visit to MIT

On December 17th and 18th, CITE and IDIN hosted USAID for substantive discussions at MIT. This meeting allowed both the CITE and IDIN teams to discuss their respective Workplans and Monitoring and Evaluation Plans in detail with USAID representatives. Further, the meeting gave the MIT teams the opportunity to ask questions about the goals of the HESN and to learn more about how to engage with USAID given its internal structure and operation. Lastly, the MIT and USAID teams held a strategy session to explore ways in which the USAID cooperative agreements can be leveraged to create a more focused international development research agenda at MIT. It was concluded that the teams would aim to hold high level talks (USAID and MIT senior administration level) at MIT in April of 2013, during the

Rethink Relief conference. In the intervening time the teams will coordinate to prepare their respective administration representatives and develop an agenda for the talks.

USAID attendees included Agreement Officer's Representative, Jessica Rosen; Activity Manager, Dr. Ticora Jones; and Office of Science and Technology COO, Michele Schimpp.

- May 13-14, 2013: Alex Dehgan made visit to MIT with his USAID/OST/HESN team
- June 17, 2013: Amit Mistry, CITE's AOR was at MIT in June and the CITE team had a in-person session to review programmatic issues.

Weekly calls with USAID/OST/HESN; AO Mr. Rod Watson

Weekly phone call with USAID/OST/HESN AOR, Dr. Ticora Jones (until May 2013) and CITE's AOR, Dr Amit Mistry were conducted to help guide CITE faculty with the initial implementation of CITE and aligning CITE's objectives with HESN's results framework.

Two supplemental cooperative agreement-related conversations were conducted with the Agreement Officer, Mr. Rod Watson in addition to weekly phone calls. On March 21, 2013, a lengthy phone conversation was conducted with MIT (CITE, IDIN, OSP), USAID's Office of Acquisition and Assistance (OAA) officer, Mr. Rod Watson, and USAID/OST/HESN representative Ms. Michelle L'Archevequ. Previously submitted questions regarding contracting and budget were addressed, and outstanding questions were recorded for OAA and HESN to answer at a later date. On May 1, 2013, a follow up conversation to the March phone-call with AO Mr. Rod Watson and USAID/OST/HESN to address outstanding questions regarding our cooperative agreement.

HESN Lab Directors Convening April 2013

In preparation for the April HESN Lab Directors Convening, key USAID personnel have been identified and contacted to establish side meetings to create linkages and explore collaboration especially with Development Innovation Ventures (Armand Lanier, Peter Khaemba) and with various Grand Challenge teams (Ku McMahan and Karen Clune).

USAID hosted a HESN Development Lab manager's meeting from April 1-3, 2013. Bish Sanyal, Derek Brine, Jarrod Goentzel, and Jennifer Green participated in all or part of the three-day meeting.

USAID/OST/DIV

Multiple phone conversations have been exchanged with Mr. Armand Lanier, Senior Regional Development Advisor USAID/IDEA/DIV and the CITE Team to create a linkage and support from USAID's Development Innovation Ventures. As a result of the discussions, DIV's partner, Solar Sisters were introduced to the CITE team to collaborate on conducting evaluation in Uganda over the summer. In addition, the Sustainability Team has been conversing with Mr. Will Schmitt, USAID/OST regarding the LAUNCH Initiative.

Other USAID conversations

We have had supplemental conversations during as well as outside our conference call with other key personnel at USAID:

- H. Timothy Hshia, Innovation & Acceleration Advisor to collect information on the products and technology they use in their programs (product database);
- Avery Ouellette, USAID/ODP/PSA on how USAID interacts with private sector partners, what USAID look for in terms of sustainability and scalability, and any recommendations for firms MIT should reach out to.
- Karen Clune, Callie Raulfs-Wang, Joe Wilson, Thomas Zearley: USAID/GH: multiple conversations were conducted in Spring 2013 to help align and set up two MIT student internships with USAID/Global Health. One internship was virtual (based in Cambridge) and another student worked half of the time from home and the other half at USAID/Washington.

USAID/Washington Visits

- June 24, 2014: Bryan Ranger, MIT PhD Graduate student working with USAID/Global Health made a one-day trip to USAID/Washington to meet USAID/Global Health Center for Acceleration Innovations and Impact team, and align with the other MIT student intern working with USAID/GH.
- June 3-August 8: Rafa Rahman, MIT undergraduate and CITE-PSC intern began her internship with USAID/Global Health's Center for Accelerating Innovation and Impact.
- July 29-August 1, 2013: Jarrod Goentzel: USAID visit and side meetings with various groups at USAID to identify specific topics for collaboration; participated at the Saving Lives at Birth event (7/31/13); presentation during a USAID brownbag lunch. The following is a list of people who he met at USAID:
 - Ticora Jones, USAID/OST: topics included HESN collaboration, private sector partnerships, etc.
 - Elizabeth Skewgar, USAID/BFS: topics included food/ag products and technologies, mission engagement, etc.
 - Christine MacAulay, USAID/PPL/LER: topics included evaluation approaches, uses, partner engagement, etc.
 - Armand Lanier, Teresa Trusty, Alex Riehm, USAID/OST/IDEA: topics included innovative technologies, mission engagement, etc.
 - Joe Wilson, Claire Perkins, Callie Raufs-Wang USAID/GH: topics included key commodities for health, diagnostic technologies, last mile initiatives, etc.
 - Michele Schimpp, USAID/OST: topics included product prioritization, innovation catalog, private sector engagement, etc.
- August 12, 2013: Rafa Rahman and Bryan Rager Summer internship debrief and brown bag presentation

USAID Interview Campaign

Finally, Kendra Leith and graduate student Kate Mytty have engaged in a campaign of interviews with key stakeholders at USAID in order to understand how technology is tested and used in USAID programs. Working with Dr. Amit Mistry the team identified ~30 individuals to contact and interview. The results will inform the selection of CITE's next evaluation projects.

Congressional Engagement

CITE and IDIN have reached out to Rep. Joe Kennedy’s office to schedule a possible talk at MIT as the next installment of the Technology and Development Lecture Series.

5.2. USAID Mission Interactions

Outline your interactions and engagement with USAID Mission during this fiscal year. Explain the a) purpose of the engagement; b) what was discussed or accomplished; and c) any follow-up items that resulted. Please organize this section by the countries you interfaced with.

- USAID/Indonesia: email coordination in June; CITE Summer interns Morgan Edwards and Jessica Press-Williams briefing in July, 2013
- USAID/Indonesia: In June Professor Dan Frey traveled to Indonesia and with the USAID mission in Jakarta (Ali Dougherty). As a result of this meeting CITE is exploring how our next product evaluation could be conducted in collaboration with USAID in Indonesia and in partnership with Kopernik.
- USAID/India: Professor Bish Sanyal met with Dr. Sheila Desai at USAID/India and to discuss possible collaboration and help identify key hub locations in India. Follow up conversation/email has been exchanged in September to coordinate another face-to-face discussion at the HESN November TechCon and a visit by Dr Desai to MIT in December 2013.

5.3. Travel

Using the table below, list the trips that were taken by members of your Development Lab over the past fiscal year.

The following travel (domestic and international) using HESN funding occurred during the past fiscal year:

Location (City and Country)	Number of Travelers	Partner(s) Engaged (If applicable)	USAID Engagement (If applicable)	Outcome(s) & Next Steps
Washington, DC November HESN Launch	11 (DB, BS, JG, JG, DF,AG, SM, DT, HB, AW, CK,)	HESN Labs		Members from the CITE team attended the launch of the HESN in Washington, DC
Washington, DC April HESN Lab meeting	5 (DB, BS, JG, JG, DF)	HESN Labs		Possible collaboration talks were discussed with members from UC Berkeley, Duke, Makerere and MSU
Copenhagen, Denmark	2	UNICEF		Development of case study on LLIN/Bednets

Brindisi, Rome	1	WFP		Met with the Logistics Development Unit to scope partnership activities
Washington, DC	1		USAID/Global Health and USAID/OST	Rafa Rahman, MIT student intern created case study on Malaria rapid diagnostic test and IUD
Washington, DC	1		USAID/GH; USAID/OST	MIT PhD candidate, Bryan Ranger traveled to meet USAID and align with Rafa Rahman on their summer internship
Bali, Indonesia	2	Kopernik		Summer Interns Ting Mao and Abir Liben produced two case studies on Kopernik distributed technologies: water filter and cook stove that CITE will use as a base for possible future evaluation.
Jakarta, Indonesia	2	Mercy Corps	USAID/Indonesia	Summer Interns Jessica Press-Williams and Morgan Edwards produce one case study on Tofu and Tempeh cookers with Mercy Corps.
Nakuru, Kenya	3			Trip to WEDC water and sanitation conference. Follow-up with key contacts to inform CITE's evaluations within these product families
Uganda	3	Solar Sisters; Makarere		Sustainability field evaluation via Interviews with Solar Sister (USAID/DIV partner) staff and entrepreneurs; experience will inform future evaluations.
Uganda	2	Various Solar Sister		Trip to gather

		sites, Makerere		technical lantern use data via interviews and instrumentation.
Delhi, India	1		USAID/India	
Washington, DC	1		USAID/GH; USAID/OST	MIT PhD candidate, Bryan Ranger traveled to meet USAID and align with Rafa Rahman on their summer internship
East Lansing, Michigan	1	Michigan State		Explore HESN collaboration regarding data sharing and methodology co-development
Washington, DC	2		USAID/GH; USAID/OST	MIT students Rafa Rahman and Bryan Ranger presented their summer internship projects at USAID; next steps: discuss with USAID/GH and USAID/OST about next year's summer internship placements
Washington, DC	1		USAID-various department; plus brown bag presentation	Jarrold Goentzel: had side meetings with various groups at USAID to identify specific topics for collaboration & attended Saving Lives at Birth. 7/29-8/1/2013. Please see Part 5 for details.

Part 6: Monitoring & Evaluation

6.1. Progress Narrative

Indicate whether the Lab is on or off track as far as M&E targets with regard to (1) overall Lab progress for the year and (2) and for the current reporting period (quarter). If off track, please provide an explanation and mention whether and how the Lab will get back on track.

Meeting our targets

For the most part, we met our targets for the year. We were on track for all of our indicators except for “ratio of total value of outside resources utilized to the dollar value of USAID investments”. This is because the program has only been up and running for nine months. Thus, we were not able to cost-share and leverage as many funds as we projected for the first year. We will make up the difference over the course of the grant. The targets have been adjusted to address this issue.

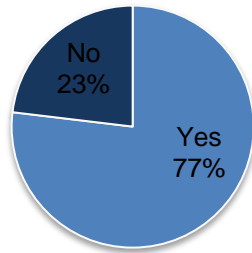
In many cases, we exceeded our targets for the year. For instance, the target for students serving as CITE fellows, interns, research assistants, teaching assistants and undergraduate researchers was 8 students, but we had 21 students in these roles. We also projected that 12 students would take the class this year, but 15 students registered and enrolled. We also had more requests for evaluations than we expected. In addition, 21 students participated in short-term practica or field experiences, but we anticipated that only seven students would participate. We also anticipated only having four students serving as fellows in developing countries, but we had seven.

Gathering feedback on student experience and learning

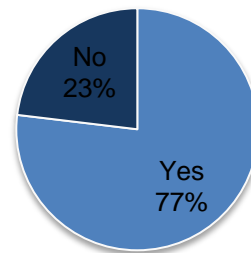
As part of our monitoring and evaluation plan, we also collected feedback on the summer internship and research assistantship program in the following areas: trip preparation (when applicable), safety and logistics (when applicable), resources, goals and expectations, learning or changes that occurred in the students, and the overall experience. Thirteen of the seventeen students completed the survey for a response rate of 76%, which indicates that the responses are fairly representative of the group as a whole. This survey provided us with valuable feedback on what worked well about the intern/RA program this year and what we should change for the future. We will incorporate this feedback and make the appropriate changes. The evaluation also shed some light on the effects of the program on the students.

Many of the students said that they would be able to apply this experience to their academic and professional careers. Eleven of the twelve students that responded to these questions said that they would be able to apply this experience to their careers.

Will you be able to apply this experience to your academic career?



Will you be able to apply this experience to your professional career?



Reflecting on the experience, students recognized that it would be relevant to their academic and professional careers. One student indicated that the subject material was directly related to his/her academic work. Another student said that it was a wonderful introduction to international development fieldwork and that s/he will build upon the skills learned this summer. Another student indicated that s/he is likely to apply for jobs that the partner organization after graduation. Another student also recognized the importance of collaborating with multi-cultural people through this experience. One student also said that the evaluation skills gained through this experience would be relevant for almost any job in the future. Another student indicated that the experience was useful for building his/her international network in the field of technological innovation in the developing world.

For some of the students, the program broadened their perspective and helped them understand the issues in context. They also indicated that this would be relevant for their academic or professional careers. One student said that this experience broadened his/her perspective on the environmental impacts of energy technologies. Another student also indicated that it broadened his/her perspective on technology, recognizing that it is important to focus on how technological innovation can shape society as well as the technical details. Another student said that this experience gave him/her a better perspective on engineering challenges. One student also indicated that the experience helped him/her think about the problems in context.

The program also had some influence on future career plans. More than half of the students (7/13) said that they would be more likely to pursue a career in international development compared to before this intern/RA experience. In addition, five of the thirteen students said that they would be more likely to pursue a career in product design. Three students also indicated that they would be more likely to pursue a career in product evaluation.

6.2. Monitoring & Evaluation Issues

Note any data collection or quality challenges, staff and sub-partner training on data quality protocols/methodologies, anticipated revisions needed to indicators or out year targets, changes to assumptions in the Labs' logic model, or other M&E issues.

Note any data collection or quality challenges, staff and sub-partner training on data quality protocols/methodologies, anticipated revisions needed to indicators or out year targets, changes to assumptions in the Labs' logic model, or other M&E issues.

Changes in targets

As described above, we were not able to meet the target for “ratio of total value of outside resources utilized to the dollar value of USAID investments”. However, we have taken steps to make up ground and meet the targets over the course of the project. Please refer to the table below for the updated targets.

Given that this is the first year and we are still developing the methodology for completing the evaluations, the data collection was fairly straightforward and simple for the indicators with targets for FY13.

Changes to an indicator

Even though it is a Network indicator, we are still not convinced that number of citations is a good measure of our work, as much of our work will be used by practitioners, not academics. The consensus in the group is that we would like to remove the indicator. However, we felt like the other indicators for objective one have already been used in other sections of the M&E plan. For instance, a more appropriate indicator might be: # of evaluations completed (which is different from the number of products evaluated as technologies evaluated represent individual products rather than product evaluation families) or # of white papers, articles, assessments, analyses, and evaluations on development challenges, innovations, technologies, approaches, and contexts (drafted with human, financial, or institutional resources contributed by CITE) published in targeted fora and publications OR provided to USAID operating units, CITE partners, and the broader development community.

Collecting quality data from the students

When collecting data from students about their internship/RA experience, we were only able to collect information at the end of the experience using qualitative methods. In the future, we would like to collect data before and after the experience to measure change. We would also like to identify specific learning objectives for the class and the practica and measure them before and after the program, using both qualitative and quantitative data.

6.3. Update on Performance Indicators

Below are the updates on the performance indicators for Year I. A full M&E report was submitted along with this Annual Report to document the full set of performance indicators as detailed in the M&E Plan.

Please fill in the table below with your Development Lab’s goal and objective level indicators. Columns that do not yet apply may be deleted for the purposes of this report (e.g. actuals for future fiscal years).

Lab Ref.	Performance Indicator	FY12 Baseline	FY13 Target	FY 13 Actual	FY14 Target	FY15 Target
Ref #	Indicator	Year 0	FY13	FY13	FY14	FY15
Gin1	# of transformative innovations and technologies evaluated by CITE with human, financial, or institutional resources contributed by CITE	0	0	0	2 pilot families (5-10 products per family)	2 families (5-10 products per family)

Gin2	Ratio of total value of outside (non-USAID) resources utilized to the dollar value of USAID investments	0	21%	15%	25%	27%
Oin1	# of citations of white papers, articles, assessments, analyses, and evaluations (drafted with human, financial, or institutional resources contributed by CITE) on development challenges, innovations, technologies, approaches, and contexts in targeted fora/publications/projects	0	0	0	1	2
O2in1	# of stakeholders engaged in problem solving with CITE (disaggregated by partnership type)	0	1	9	3	3
O2in2	# new development related classes or disciplines created by university departments with human, financial, or institutional resources contributed by CITE	0	1	1	1	1
O2in3	# of MOUs or other agreements signed with the public sector, private sector, local community partners and CITE	0	0	0	1-2	1-2
O2in4	# of hubs created with human, financial, or institutional resources contributed by CITE	0	0	0	0	1

Part 7: Lessons Learned / Good Practices

Reflect on Parts 2-6 above and indicate if there are any “Lessons Learned” or “Good Practices” that emerged and discuss them. Include your recommendations for your team and the broader network for future engagements.

Partner engagement

Involving our partners in a substantive way (i.e. by having them engaged in student projects and by hosting interns in the summer) has been pivotal in developing relationships with our partners. However, CITE recognizes the importance of developing a more formal partnership engagement model and will be taking steps to define that model in Y2Q1.

It is important to have clear, written objectives that our partners and students can read and understand to avoid confusion and align expectations.

The space that the CITE team has been given to engage with and explore opportunities with USAID staff has been invaluable in identifying possible collaborative opportunities. Our researchers are responsive to this type of latitude and are happy to be working closely with USAID staff. In practice, spontaneous network forming is a good pathway to successful relationship building.

CITE has learned that it is extremely important to create a clear, streamlined communication channel with USAID. MIT encourages students to be pro-active and empowers them to seek information directly. However, in the case with USAID, CITE will have all students go through CITE’s AOR should they need to contact USAID offices, bureaus or missions.

Face to face meetings are essential to understanding the mission and expertise of each individual lab. Additional efforts (e.g. visiting the labs and the connections made) will expedite collaborations. So too will assistance from USAID in pairing labs working on complementary problems.

From our experience in Uganda, CITE learned that working with on-the-ground partners for evaluations takes substantial time, effort and planning. Frequent and consistent communication was key in getting the information and data our researchers needed for their work. Identifying partners as early as possible and engaging with them directly will help ensure the success of future evaluations.

Inter-departmental/3S Coordination

Coordination between the 3S—suitability, scalability, and sustainability, which are housed at different departments, is a challenge. Frequent communication (email and phone calls) needs to be supplemented with regular face-to-face meetings in addition to dedicated time spent on specific research.

Product testing

Technical evaluation, especially along the axis of suitability, needs extensive infrastructure and support to complete rigorous testing.

Student engagement

CITE has also learned that it is extremely important to engage students early in their time at MIT. The timing of the Cooperative Agreement from USAID made it difficult to recruit students and research assistants for the spring of 2013. At MIT most graduate students already have funding for the year by the September/October, as such we have been in a better position to recruit students in year 2.

Part 8: Appendix

Please use the Appendix to attach any documents, figures, etc. that help to illustrate your progress or key activities. There is no page limit to this section, but please be selective with the materials you include and reference them in your narrative. If you have nothing to add, please delete this section.

Appendix A: CITE Seminar syllabus

ESD.S20/11.S941: Evaluating Technologies for the Developing World Introduction

In partnership with the U.S. Agency for International Development's (USAID) Higher Education Solutions Network (HESN), MIT has established the Comprehensive Initiative on Technology Evaluation (CITE). This seminar will serve as a forum for developing and testing CITE's product evaluation methodologies and for engaging with USAID and other development organizations to refine and later implement those methods.

Led by faculty from Engineering Systems Division and Urban Studies and Planning, this seminar will analyze various evaluation methodologies, incorporating knowledge and techniques from a range of disciplines including Systems Engineering, Institutional Analysis, Experimental Design, Supply Chain Analysis and Community Development. Sessions will explore methods of evaluation from various disciplinary and applied fields to ensure that products designed for international development are suitable, scalable and sustainable. Guest lecturers and panelists include, Dr. Jeffrey Asher, Former Technical Director and Vice President of Consumer Reports and representatives from each of CITE's organizational partners. Dr. Jeffrey Asher will serve as a technical advisor to students and will attend the class regularly.

The course will focus on working within the constraints and problems faced by development agencies, governments, NGOs, and entrepreneurs. Specifically, students will be expected to develop evaluation plans for several products, each identified by CITE's organizational partners (USAID, Partners in Health, Mercy Corps, Oxfam America, UNICEF, WFP and International Rescue Committee and Kopernik). Each student team will complete a 3S (Suitability, Scalability, Sustainability) evaluation for the same product in two separate contexts during the semester and will present their findings and proposed refinements of the methodology in midterm and final presentations. Based on performance in the course there are several ways for interested students to stay involved in the CITE effort including funded research positions.

Course Administration

Professors: Bish Sanyal (sanyal@mit.edu), Oli de Weck (deweck@mit.edu) TA: Stephen Maouyo (maouyo@mit.edu) □ Class site: <http://stellar.mit.edu/S/course/ESD/sp13/ESD.S20/> □ Schedule: Mondays, 3:30-5:00, Room 4-149

Prerequisites

Students are expected to have an interest in and familiarity with poverty alleviation, international development and/or products intended for the poor. As such, preference will be given to students with either an undergraduate degree in an engineering discipline, OR who have taken ANY of the following courses: Any D-Lab course, 11.005, 11.701, 16.810J, ESD.283, 2.007, 2.009, 14.003. Students may also request permission of the instructors if they meet none of the aforementioned prerequisites.

Class attendance and participation

Attendance in the class sessions will be taken and will count towards the final grade.

In addition, active participation in the class sessions and group project will also count towards the final grade. The participation grade will be based on:

1. Active participation in class discussions.

2. Team member (peer) evaluations.

This course is an opportunity to actively engage in a new research initiative at MIT funded by USAID. As such, course lectures and the work that follows are critical for successful development of the CITE research program. It is our hope that students who enroll in the course will become long-term participants with CITE.

Student Team Project

The principal student deliverable for this course is a two part group project. CITE's organizational partners have each proposed one or more products that they would like evaluated that will form the basis of this group project during the semester. On or before February 25th, students will rank order the potential products on which they would like to work, and be divided into project teams.

Each team will be assigned one product and receive background information regarding the product, including the sponsoring partner and two contexts in which the product has been or will be deployed. In class sessions three, four, and five, students will be introduced to the 3-S (Suitability, Scalability, and Sustainability) evaluation framework. Each team will choose one of the two provided contexts and use the week following those sessions to perform a preliminary evaluation of their product with respect to the 3-S topic presented that week. In completing their preliminary assessment, the teams are expected to consult with both the faculty presenters and partners on each segment of evaluation. On April 1st, each student team will make a brief, integrated presentation on the assessments that they have completed that highlights the results of their evaluation, their proposed changes to the evaluation method and the overlaps between the 3S's.

During the remainder of the semester, teams will be expected to integrate the methodologies discussed and developed in the class sessions into a Product Evaluation Plan for their product within the second context provided by their development organization partner. The Product Evaluation Plan will consist of:

1. Research on:

- a. The problem which the product addresses
- b. The context/country/region/marketplace in which the product will be employed (social context, cultural context, environmental context)
- c. The product model(s) to be evaluated

2. Proposed evaluation methodology

3. Proposed testing to be completed with approximate costs, timeline, resources required and any technical drawings

4. Proposed field testing sites and partnering plans with the local USAID mission and CITE organizational partner (including contacts).

5. As applicable, any preliminary 'proof of methodology' testing

Teams will submit a final Product Evaluation Plan of no more than 30 pages (excluding appendices which may include draft interviews and surveys, results of interviews, physical test rig designs, supply chain maps, sustainability rating procedures, etc). Teams will present their plans to faculty, staff, classmates and development organization

partners during an extended class session on May 13th (3:30pm – 6:30pm)

Meetings, Management and Resources

Each team will work with the course faculty and staff to develop their work and starting the week of February 25th) will schedule four one hour meeting times outside of class with their respective CITE organizational partner, the first of which should take place between February 25th and March 1st. The remaining three meetings will take place (1) after the preliminary evaluation; (2) during the creation of the Product Evaluation Plan; and (3) within the week preceding final presentations. The team's discussion will include reviewing progress, gathering information, allocating work, setting goals and communicating major issues or roadblocks. Outside of this meeting, the team will also be expected to independently consult with the faculty and staff from each of the 3S areas to develop their plan.

The D-Lab shop and shop Manager, Jack Whipple, will be available to students in the course for thinking through physical testing apparatus design (and possible construction). In addition, each student team will receive a small budget to cover testing materials and setups required to complete their preliminary methodological proof testing work, as needed.

Final Presentations

The May 13th class will be public sessions attended by CITE's organizational partners and members of the MIT community during which student teams present their Project Evaluation Plans.

Readings

Readings for each week will be posted to the course site. Students are expected to have read and be prepared to discuss readings for each week before coming to class. New readings, supplied by faculty, partners, as well as students themselves, will be added to the resource base for the CITE initiative throughout the semester. A partial reading list can be found below.

Exams

There will be no exams in the course.

Grading

Attendance 10% Participation 10%

3S Assignments 15% Product Evaluation Plan 40% Final Presentation 25%

Detailed Schedule

Session 1	February 11 th	<i>Course Overview and Introduction to the USAID Higher Education Solutions Network (HESN) and the Comprehensive Initiative on Technology Evaluation (CITE)</i> Speakers: Profs. Bish Sanyal and Oli De Weck <i>Adapting the Consumer Reports Method to Emerging Countries</i> Guest Speaker: Dr. Jeff Asher, Former Technical Director and Vice
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		President of Consumer Reports
Session 2	February 19 th	NGO Panel: Challenges in Product Deployment Moderator: TBA Speakers: TBA
Session 3	February 25 th	<i>Scalability: What is it? What methodologies would be appropriate to evaluate scalability?</i> Speakers: Prof. Steve Graves; Dr. Jarrod Goentzel, Director, MIT Humanitarian Response Lab Student teams formed and posted
Session 4	March 4 th	<i>Suitability: What is it? How do we measure it? What methodology do we propose?</i> Speakers: Prof. Dan Frey; Prof. Amos Winter; Derek Brine, Program Manager, CITE
Session 5	March 11 th	<i>Sustainability: How do you create technologies that are sustainable? What are the barriers to sustainability? How can they be evaluated?</i> Speakers: Prof. Oli de Weck; Jennifer Green, Research Scientist, SSRC Scalability Assessment Due
Session 6	March 18 th	<i>What will it take to scale and institutionalize assessment of products for international development?</i> Guest Speakers: Dr. Jeff Asher, Consumer Reports; Noha El-Ghobashy, Iana Aranda, Engineering for Change Suitability Assessment Due
Session 7	April 1 st	<i>How can we integrate the 3S methodology?</i> Student, Faculty and Staff discussion and reflection. Sustainability Assessment Due
Session 8	April 8 th	Mid Term Presentations
Session 9	April 22 nd	<i>The Higher Education Solutions Network and the Importance of CITE</i> Speaker: Dr. Ticora Jones, USAID
Session 10	April 29 th	<i>CITE and Development Practitioners</i> Speaker: Prof. Bish Sanyal

		5 Minute Group Updates
Session 11	May 6 th	MIT's International Development Ecosystem Speakers: J-Pal, Tata, Legatum Center, Public Service Center, Others
Session 12	May 13 th 3:30pm – 6:00pm (Extended Session)	Public Event: Group Project Presentations

Reading List

Introduction

"Consumer Reports: How We Test." *Consumer Reports Testing*. N.p., n.d. Web. <<http://www.consumerreports.org/cro/about-us/whats-behind-the-ratings/testing/index.htm>>.

Smillie, Ian. *Mastering the Machine Revisited: Poverty, Aid and Technology*. London: ITDG Pub., 2000. 69-103.

Suitability

Bilger, Burkhard. "Hearth Surgery." *The New Yorker* 21 Dec. 2009: 84-97. □ Garvin, David A. "What Does 'Product Quality' Really Mean?" *Sloan Management Review*

26.1 (1984): 25-43.

Griffin, Abbie and Albert L. Page. "PDMA success measurement project: Recommended measures for product development success and failure." *Journal of Product Innovation Management* 13.6 (1996): 478-496.

Henard, David H. and David M. Szymanski. "Why Some New Products Are More Successful Than Others." *Journal of Marketing Research* 38 (2001): 362-75.

Stellar, Daniel. "The PlayPump: What Went Wrong?" *State of the Planet*. The Earth Institute, 1 July 2010. Web. <<http://blogs.ei.columbia.edu/2010/07/01/the-playpump-what-went-wrong/>>.

Sustainability

The 2011 CSO Sustainability Index for Sub-Saharan Africa. Washington, D.C.: United States Agency for International Development, 2011.

Anand, Sudhir, and Amartya Sen. "Human Development and Economic Sustainability." *World Development* 28.12 (2000): 2029-049.

Andreas, Georgoulis, Jill Allen, Libby Farley, John Kher Kao, and Irina Mladenova. "Towards the Development of a Rating System for Sustainable Infrastructure: A Checklist or a Decision-Making Tool?" *Proceedings of the Water Environment Federation*. 2 (2010): 379-91.

Arrow, K. J., Partha Dasgupta, Lawrence H. Goulder, Kevin J. Mumford, and Kirsten Oleson. "Sustainability and the Measurement of Wealth." (No. w16599). National Bureau of Economic Research, 2010.

Human Development Report 2011: Sustainability and Equity-A Better Future for All. New York: United Nations

Development Programme, 2011.




The Changing Wealth of Nations. Washington, D.C.: World Bank, 2011. □ Singh, Rajesh Kumar, H. R. Murty, S. K. Gupta, and A. K. Dikshit. "An Overview of

Sustainability Assessment Methodologies." *Ecological Indicators* 9 (2009): 189-212. **Scalability**

Goentzel, Jarrod, Erin Sullivan, and Rebecca Weintraub. "The Global Health Supply Chain." *Cases in Global Health Delivery* (2011): Harvard Business Publishing.

Shook, John, and Mike Rother. *Learning to See: Value Stream Mapping to Create Value and Eliminate Muda*. Brookline: Lean Enterprise Institute, 1999.

Appendix B: Membership in ESD/S20.11.S940

Name	Registration Status 	Block 	Visible 
Al-Haque, Shahed	Non-Registered	n/a	No
Asher, Jeffrey	Non-Registered	n/a	No
Beane, George Holton	Registered	Block	No
Bedri, Hisham	Registered	Block	No
Beeler, Michael Francis	Non-Registered	n/a	No
Cardoso, Cauam Ferreira	Registered	Block	No
Chen, Annie	Registered	Block	No
Do, Sydney	Registered	Block	No
Edwards, Morgan Rae	Registered	Block	No
Gautam, Sanjay Kumar	Registered	Block	No
Gorbaty, Emily	Registered	Block	No
Grau Serrat, Victor	Non-Registered	n/a	No
Ho, Alan	Registered	Block	No
Ho, Koki	Non-Registered	n/a	No
Jeunnette, Mark N	Registered	Block	No
Kerdpairoj, Prad	Non-Registered	n/a	No
Markgraf, Claire	Registered	Block	No
Mkrtchyan, Armen	Registered	Block	No
Skot, Tessa	Registered	Block	No
Spielberg, Jonars	Non-Registered	n/a	No
User, Provisional	Non-Registered	n/a	No
Willemann, Simmy	Registered	Block	No
Yap, Nicole	Registered	Block	No
Yow, Wei Quin	Non-Registered	n/a	No

Appendix C: CITE Methodology Retreat Meeting Notes

First CITE Methodology Retreat

December 20, 2012

Composed by Derek Brine

ACTION ITEMS AT END OF DOCUMENT

Participants:

First Name	Last name	Position	Institution	Email
Derek	Brine	Program Manager, CITE Project Manager, Suitability, CITE	MIT	brine@mit.edu
Xavier	de Souza Briggs	Professor, Urban Studies and Planning	MIT	xbriggs@mit.edu
Oli	de Weck	Professor, Engineering Systems Division	MIT	deweck@mit.edu
Mike	Delaney	Director, Humanitarian Response Department	Oxfam America	MDelaney@oxfamamerica.org
Doug	Fearing	Professor, Harvard Business School	Harvard	dfearing@hbs.edu
Dan	Frey	Professor, Mechanical Engineering	MIT	danfrey@mit.edu
Amy	Glasmeier	Professor, Urban Studies and Planning	MIT	amyglas@mit.edu
Jarrold	Goentzel	Project Manager, Scalability, CITE	MIT	goentzel@mit.edu
Victor	Grau-Serrat	Co-Director, D-Lab	MIT	victoris@mit.edu
Steve	Graves	Professor, Sloan School of Management	MIT	sgraves@mit.edu
Jennifer	Green	Project Manager, Sustainability, CITE	MIT	jlgreen@mit.edu
Shanti	Kleiman	Policy Analyst	Mercy Corps	skleiman@dc.mercycorps.org
Jon	Lascher	Haiti Program Manager	Partners in Health	jascher@pih.org
Bish	Sanyal	Director, CITE	MIT	sanyal@mit.edu
Sally	Susnowitz	Director, Public Service Center	MIT	susnowit@mit.edu

Amos	Winter	Professor, Mechanical Engineering	MIT	awinter@mit.edu
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Practitioner's Panel:

Shanti Kleiman, Mercy Corps:

Often we rely on external expertise and lack the ability to compare (or even find) all the options. It is difficult to choose between them for impact.

Mercy Corps is mostly concerned about whether there will truly be an impact for the beneficiaries.

Some of the factors that we need to take into consideration are customs, tax duties, supply chain, technical feasibility etc. These are called the *enabling environment*. Mercy Corps tries to identify the bottlenecks.

Practitioners need a tool that helps compare solutions and make decisions based on projected impact, while understanding the risk.

Mike Delaney, Oxfam America:

The road to development is littered with good intentions and failed infrastructure. The 3S Framework feels right, but we should remain flexible.

Our beneficiaries often find or develop their own appropriate technology – we can take look to those techniques to build a methodology. Need to allow for entrepreneurship on a local level.

Oxfam sees this as an opportunity to bridge humanitarian response and development. Humanitarian investment is very short – huge investment with no lasting return. CITE can take advantage of this investment by making sure the investment is spent on products that will assist in the development effort.

Technologies that we use are so context specific. Ethiopia alone has so many contexts within itself. A major question is **how will the CITE methodology deal with the varying contexts we find in the places where we work?**

Oxfam needs products that can withstand robust use – by adults and children – and that are simply introduced and demonstrated, including easy training, accessible replacement parts, and cost vs. scale. How long it will hold up is critical.

Jon Lascher, Partners In Health:

Solution evaluation is crucial – but keep in mind the question is: what is an ‘appropriate technology’? ‘Technology’ is defined differently by different people. Ex. Cholera vaccine is defined as technology by PIH. This is critical because it affect policy.

Successful evaluation should help CITE's partners to win these policy debates based on a thoughtful methodical, analysis. Another key question here is: do we overemphasize risk in international development? And, if so, how do we get over that?

For example when PIH introduced the Cholera vaccine some policymakers thought it would not work, that people would riot. The vaccine takes two courses and they said that the completion rate would be below 40%. Using some ICT/tablet computer technology PIH achieved a completion rate of 91%. How could we have predicted this result ahead of time to ease people’s fears? Can we do it by reducing risk with thorough evaluation? Having a peer review or a panel is important to this as well.

Discussion

Local production and linking people with seed capital and investment is critical. How could CITE achieve this through evaluation? →Perhaps use the CITE Hubs to attract investment

ICT/Mobile is the definition of technology 50% of time as cited by Mercy Corps field teams.

Practitioners need decision making tool – one that helps laypeople make decisions easily since they are maxed out on time. Technology aggregators do exist such as Appropedia, Technology Exchange Laboratory etc, however practitioners do not have time energy or resources to sift through 40 page reports and need customized solutions evaluation of risks and benefits.

CITE needs to make this tool actionable and based on solid contextually specific data.

Field program managers would be the ones to use it. In Ethiopia, she had money to spend on technology but didn’t know where to start of have a system for thing it through. At the same time there were time pressures and Mercy Corps needs to show results in order to get further funding.

PIH has very limited resources for funding for technology outside health. So if a non-health related product is desperately needed to complement the health work ex. Water treatment solutions – A fast decision making tool is needed.

Another question that CITE might be able to take on is: **What are the best practices for rolling out technology?**

Case Study Groups:

Suitability	Scalability	Sustainability
Derek	Jarrold	Jennifer
Dan	Doug	Amy
Amos	Steve	Xav
Victor	Sally	Oli
Shanti	Jon	Mike

*Bish visited all groups.

*****PLEASE SEE APPENDIX I FOR SMALL GROUP NOTES*****

Small Group Report Out

Key takeaways from small group sessions:

- I. Need to determine how much to focus on research vs. immediate need of practitioners to have decision making tools.

2. Evaluations can address constraints and develop coefficients that result in some kind of scoring. Solutions need to qualify and subsequently score.
3. Financial viability of a solution is important.
4. The suitability team had a challenge staying solely on suitability and instead focused on decoupling the problem and the solution.
5. Need to be careful to define a program scope that contains research and application without being too broad.
6. Bish was struck by the rigor of each conversation. Connecting them will be the biggest challenge. We should ask ourselves whether the 3S framework is the best way to slice the problem given our goal and resources.
7. There is a balance between local context. Are we going to get deep into the criteria locally or will people provide information.
8. The inputs that we are looking at are coming from somewhere. We have to think about how we are going to sample products so we address the needs of all of our partners given limited resources.
9. In trying to go through the process we kept asking ourselves: is the problem framed the right way?
10. Can we borrow different methodologies from chemical production, philosophy, medical authorization, insurance, etc. in a similar way that J-PAL borrowed from medicine and applied RCT to economics?
11. Who owns the information that we need? Where do the inputs reside?
12. Should we separate out these facts under 3S or not? Practical application for starting to work in the spring – recently there was funding for purchasing 4 incinerators. Could we have developed a method for incinerators?
13. CITE needs to decouple a problem statement from a solution. This will help to define the space for new solutions as well.
14. How do we generalize an evaluation? Through a method. We can define several ‘key context variables’ – specific drivers that can be modeled.
15. Generally there aren’t evaluations one two or three years on. This data is often in practitioners’ heads. How do we access this for sustainability?

Afternoon Discussion

Topic: Should we tackle a small number of technologies in depth or a larger number of technologies at a higher level?

We cannot say in advance we know what we’re going to do. However, practitioners say there is a need for a decision making tool. Some useful characteristics would include:

1. Allowance for space for contributor to get and give information
2. Should be ‘fast’ and focus on the impact of the solution, product or technology
3. Should target program or project managers
4. Should help

We need more information from our partners to make a plan on how we will go forward that can scope a problem that has a research focus as well as a practical focus.

To do this work, students should be partnered/embedded with our partner organizations – an internship. They need a framework that they can follow: questions, protocols etc.

We will also need some resources – data technical archivist for this project, web based platform that would support the work of CITE. We can then get feedback on the tools on a quarterly basis from the partners by showing them our methodology and tools, i.e. we can present what that platform would look like or what the process would be for identifying the right product/solution.

Topic: We said that we would create 2 Technology Evaluation Hubs – what form would be useful? Where should they be placed? How should we fund them?

Typically 60-65% of humanitarian/development money goes into 18 countries. All Horn of Africa countries receive some of this money. Addis Ababa does initially seem like a good choice since the African Union is there and it is located in the region receiving the largest amount of humanitarian assistance.

India could be a candidate with USAID's vast network and MIT's Tata initiative.

There is a case to be made for placing a hub into a country that doesn't have the humanitarian infrastructure that others do in order to be a magnet site.

We could tie into the EdX platform and do a HubX – worldwide presence and access.

Once we perform good work we will be able to leverage outside funding for the Hubs. There is a tradition of this here at MIT: SUTD, Saudi Arabia, Abu Dhabi etc.

Topic: How do we make global development a real priority here at MIT?

Create a Global Development Initiative that can be the focus of the Capital Campaign. The Campaign focuses on mission-driven research initiatives that have:

- a. Critical interest from all five schools
- b. Potential for donors
- c. Research interests consistent with MIT's moral values

To do this we need to:

1. Articulate how we will transform some aspect of education.
2. Have an impact in Africa, Latin America or Asia. Many faculty want to, however the resources are generally for developed countries (Singapore, Abu Dhabi, Saudi Arabia, and Portugal etc). With the help of the capital campaign, we could create a real presence in the developing world.
3. Start working with Jeff Newton and resource development to identify potential large donors.
4. Think carefully about the labs and the practitioners and how they will link to the initiative.
5. Form a consortium of partners in the form of letters of commitment. This can play to the "Mens et Manus" motto.

6. Create an advisory board.
7. Show a real plan for a self sustaining organization at the end of 5 years.

To support this effort, each one of the faculty to create a research statement and formulate several research questions they found important.

Action items

Task	Responsibility	Date
Develop course syllabus and send to potential speakers to arrange presentation dates	Bish Sanyal	26-Dec-12
Send information about the larger HESN	Derek Brine	31-Dec-12
Formulate a CITE research statement and three research questions that align with your current research and goals of the project as you understand them after having been at the methodology retreat. Send to Derek Brine.	Each MIT participant	15-Jan-13
Begin the process of setting up an online collaboration space and database architecture for our program	Jennifer Green	15-Jan-13
Develop a partner questionnaire and survey to gather data on the most useful information and tools for practitioners making decisions in the field.	Derek Brine, Jennifer Green, Jarrod Goentzel	31-Jan-13

Potential Strategic Directions

- Engage with Peace Corps to recruit Masters and PhD students
- Consult with JD Power and Associates, Consumer Reports, Which, Underwriter's Laboratory etc.

Appendix 1: Small Group Notes

Suitability Notes

Taken by Derek Brine

Sanitation Case:

Before jumping to the solution space (i.e. we need a new type of toilet) the most important aspect of suitability is to define the problem, then define the system. In the case of sanitation this includes asking:

What is the negative effect we are trying to address? → Is it access to sanitation facilities? Is it access to clean water? Is it re-contamination of clean water? Is it an issue of odor? Is it contamination of groundwater sources?

Once that has been identified, look to the system:

What are the failure points? → Do 20% of the toilets cause 80% of the problem? What infrastructure exists? Who are the stakeholders? What is the cultural climate, i.e. user preferences and practices? Who is willing to pay or contribute and why? What value is offered by different products and technology?

This problem and system definition allows us to define solution specifications that encompass not only technical targets, but also user preference targets, etc.

Ultimately, suitability really has to do not with solutions but with problem definition first then solution evaluation against the constraints of the problem. We can then evaluate a range of options that address:

1. Different technology “levels”, from DIY to developed product
2. Level of skill required
3. Extent of technical nature
4. Willingness to pay vs. willingness to contribute
5. Value proposition

Suitability Methodology Development:

What other fields can we borrow from?

1. RSM from chemical industry
2. Design of Experiments → R.A. Fischer
3. Thought Experiments:
 - a. Can we simply think a problem through and get the same results that J-Pal would get with 1/10 the time and 1/6 the resources? What tools would we need in order to do this? →
 - i. A method for determining the ‘right’ group, how to get all the factors on the table (Métis)
 - ii. HubX convenings/online convening tools and simulations → perhaps talk to Media Lab on this.
 - iii. A possible input would be proxy solutions similar to those that might be implemented in the field. Simulations could be run based on the results of those products: similar to Zephyr texting at MIT.
 - b. We could link each of the expert-identified factors to a risk level that would give practitioners a ‘contingency map’. We could then explore the concept of decision based on acceptable risk.
 - c. Ethnography from anthropology.
 - d. Progressive authorization from medical devices.

In this way, CITE can evaluate past, present and future solutions/products → blur the line between summative and formative evaluation

For our implementing partners the pressure for results is intense. After development of the design requirements and application of the methodology a practitioner’s tool would show how solutions meet the ‘ideal’ design requirements.

But what makes this process different from traditional design?

1. The comprehensive nature of the design requirements
2. The extreme resource constraints
3. The predictive nature and the distinct focus on societal impact that drives the development of the methodology.

Practically, this process needs to be designed into grants. We should work with our implementing partners ASAP to test out the first iteration.

Where do we get initial options for solutions? Perhaps from ideas that already seem somewhat successful. Perhaps some researchers from CITE can be integrated into the current testing that Mercy Corps or another partner does in order to understand how they currently evaluate solutions.

Scalability Notes

Taken by Jarrod Goentzel

- How does the product provide service profiles/requirements that best fit the labor context?
 - Match with skill sets
 - Compensation potential, livelihoods
 - Labor for maintenance may be more/less attractive than desludging
- Investment up front vs. labor over time – what is the right tradeoff?
- Cultural adoption for servicing process (*Suitability* for servicing?)
- Willingness to pay for desludging, capability to pay
- Hidden assets – prestige for having indoor toilet?
- Use for end product, use of byproducts
- What is the service model? Government service funded by taxes? Larger economic context.
- Local manufacturing capabilities, maintenance capabilities, ability to import parts, etc.
- What is the landed cost?
 - Product cost
 - Upstream costs
 - Manufacturing/assembly costs
 - Local manufacturing option
 - Transportation/import duties
 - Margins for wholesalers, etc.
 - Installation
 - Future servicing
- Process maps for
 - Installation
 - Service (emptying)
 - Maintenance
 - Flood mitigation
- Complexity of the manufacturing process
 - Manual labor, technical processes
 - Capital equipment, tools required
 - Potential for postponement to enable local manufacturing
 - Local resources: raw materials, vendors, service providers for outsourcing (manufacturing, transportation, distribution, installation, maintenance, etc.)
- Market potential, demand
 - Link to willingness to pay

- Demand over time – one time install or ongoing product demand?
- Regional demand potential beyond program area
- Should we have the manufacturer present the market research? How to deal with their bias (sales pitch) on the market potential?
- What is the information flow? How to ask for info from the organizations pitching the product?
- What failure modes/risks exist?
 - What is their risk mitigation plan?
- How do we evaluate the supply base for the product manufacturer?
 - How many tiers upstream?
 - How would we collect the data?
 - Would we simply evaluate their supplier selection approach?
- Input from *Sustainability* regarding environmental costs
- What is the nature of the supplier delivering the product? Centralized-decentralized continuum.
 - a global business/organization
 - a very local manufacturer/service provider
 - grassroots effort in each village to deploy appropriate technology
- Organizational scale up is different than community/grassroots scale up.
- What is our outcome?
 - Binary indicator (use/don't use)
 - Ordinal category
 - Continuous score
- Are characteristics constraints or coefficients?
 - Constraint
 - without satisfying, then the product is not recommended/considered
 - qualify the product
 - Coefficient
 - value used to create outcome score
 - quantify the impact
 - Maybe both
- What is the overall impact in picking winners and losers?
 - Do/should we help consolidate the market to enable scale?
 - Be careful about picking winners/losers. Need transparency.
 - Market consolidation/clustering would naturally lead to better evaluations.
- Uncertainty. Risk/reward.
 - What is our evaluation risk profile?
 - What is our bias?
- Extending to a higher level is easier
 - Removed from specifics, evaluate using ranges and tolerances
 - Listing requirements to scale
- What is the mix of current and future products/solutions that we should consider?
- Noticed several mobile technologies. Information technology also raised by NGOs. IT is different.
 - How do you deploy/update software?
 - How to achieve/maintain critical mass (more than price)
 - Rapid changes in market, technology churn
 - Standardization and data sharing are key
 - Training on software is part of the product/solution.
 - Consider implementation costs/time/processes.

- IT raises question: are technologies only for beneficiaries or also consider enabling technologies for program implementation?
- Decision making context for products
 - Which intervention is best? How do NGOs select amongst sectors?
 - Can Value for Money approaches be used in selecting technologies
- Should we help organizations design pilots? If yes, how?
 - Two goals?
 - To help them make a decision
 - To give us more info for improving evaluations
- Potential new info arising from the pilot:
 - constraints/coefficients
 - mitigating factors
 - unanticipated parameters
 - things we were wrong about in our evaluation
- First, we need to properly qualify any evaluation with assumptions used
- Other issues that could change the evaluation validity
 - New products/competitors
 - Incidents
 - Fuel cost, labor cost changes
 - Key component/commodity price shifts
 - Price/usefulness of by products (secondary revenue streams/livelihood improvements)

Sustainability Notes

Taken by Jennifer Green

- Choosing initial latrine design: is there an initial database of designs that we would go to? Can we have interactive database where you set a few key variables and it returns candidate designs? (example TRIZ database <http://www.triz40.com/>) Is there a way to transfer technologies from other contexts?
- Can we widen the design space from what NGO partner suggests (e.g., instead of latrine use composing toilet; is a permanent structure right design?)
- Tool for initial downselect: need easy to use tool to extract candidate technologies across wide range of options; how do we compare technologies across a wide range of contexts (e.g. diesel pumps work well in one context but not others; impacts of climate variation)
- Brief discussion on end product of “Sustainable Technology Decision Support System” similar to CCES/Saudi products
- Methodology for sustainability:
 - Need to look at Return on Investment from two sides: a) ROI for manufacturers; b) ROI for beneficiaries/users. Both a & b need to be positive to be sustainable
 - Difficulty in case of collective action – e.g., if there is a 90% adoption of a sanitation technology but 10% not adopting ruins public health for everyone, then does the adoption rate really matter?
 - Role of context: for suitability, we need to identify major factors of performance and then perform sensitivity analysis to show how they might be impacted by context;

- Perhaps we could look at “Design Reference Mission (DRM)” type approach used by NASA and evaluate technologies against a few specific contexts as case studies; and then identify the contingencies where the findings from the DRM doesn’t apply
- How do we take one context and identify what the key levers/criteria are? How do we detect whether contextual differences really matter?
- What is the durability of the social environment? Who do you need to buy into the solution? Are there lead adopters – or do you need buy-in from local authorities in order to proceed? We need to understand the local power structure – strength of public sector vs. civil society orgs and also find a way to get feedback from the poor.
- On latrine case study question #4: for the pilot evaluation, we need to make sure that the larger context is the same as the pilot context or else it may not work; maybe use Agent Based Modeling for use and adoption; however, this is deterministic so need to capture stochastics as well
- Case study #6: the best way to convince people that something works is through the use of a demonstration
- Tool development
 - Identify contextual specifics that will allow this technology to work (e.g. regions, cultures, geographical, environmental, etc)
 - Build tool (too many reports for practitioners; develop scorecard – see Water for People tool <http://www.waterreportingplatform.org/>)
 - Even providing insight into similar tech projects around the world would be helpful
 - Can we find a way to data mine the Development Experience Clearinghouse (DEC)? Might be a good UROP project
 - Also, how do we capture “craft knowledge” – all of the knowledge that is in the minds of technical experts in practitioner orgs?
- How do we identify technologies?
 - First, what is a technology/ Need taxonomy or ontology or Object Process Methodology (OPM) functional decomposition
 - Should we look at different technologies that exist elsewhere but could be adopted for the development context
 - Very different approach than local entrepreneurship
 - Understanding project failures and partial successes (e.g. arsenic in water supply in Bangladesh – have water but not good quality)
 - When reviewing technology evaluations, keep in mind that they can be highly influenced by point of view of the group paying for the evaluation
- Role of context:
 - For Pirogue case study, the key contextual characteristics were: urban slum; West Africa; flood prone; involved government; land rights issues; access; economic base – so which of the contextual criteria are key to the performance?
 - What are necessary but not sufficient conditions?
 - Would there be a high score on report, but too many disclaimers or limits to context in which the score is valid
 - Could be good role for models – identify 5-10 factors that make the biggest difference for each sector; then perform sensitivity analysis

Appendix D: CITE Logo



Appendix E: CITE Case Study Template

CITE Case Study Research Template

Background

Your task is to create a case study of a product or products that one of CITE's partner organizations uses to address a specific problem in a specific context. The information you gather will be critical to developing the methods that CITE

Use your powers of observation and inquiry to probe deeply into this issue. Ask questions. If you see a product being used in a certain way ask why. If you see a pattern of use, try to explain it through gathering information from users and our partner organizations. Note the contextual factors that might enhance or inhibit use of the product. Note the alternatives to the product that exist to address the same or a similar problem. Look into the acquisition cost, operation cost and any factors that might make the product difficult to use. Throughout the process remember to be thinking critically and from the standpoint of the user.

Approach

1. Complete a Desk Study
 - a. Work with your CITE advisor and partner contact to identify appropriate literature to review. As appropriate, access and review the CITE class reports.
 - b. Make initial contact with partner, as appropriate, to ask for general documents and readings that help identify products or deepen knowledge of selected products.
 - c. Conduct background research on the partner you are working with (e.g. study the partner's website; research their publications, etc.)
2. Define a product area on which you will focus based on the above research and produce a problem statement that succinctly defines the problem which your partner organization is trying to address and the constraints that they face.
3. Identify the solutions that are available to customers either through the partner or otherwise.
 - a. Identify previous program/product implementations or procurement processes (e.g. setting up framework agreement with supplier) with high impact for the partner (or a business venture product with high impact on profitability), readily available content and data, and good fit for the research objectives.
 - b. Understand the definition of product success or failure from the point of view of the organizational partner (project officers or employees) and the consumer/user.
 - c. Read up on previous implementation and/or evaluations of the product(s) you are focusing on and become familiar with the performance standards that exist in that product's domain.
4. Define a set of stakeholders for the product/program/process
 - a. Subject matter experts in the program area and in procurement/logistics
 - b. Implementers: project leads, field offices, partners, project managers

- c. Supply chain actors: producers/manufacturers, distributors, retailers, people who sell the product
 - d. Users: various sources of direct or indirect input (program monitoring & evaluation or other final reports, focus groups, surveys, online comments, interviews in the field where possible, ideally feedback based on using it for a period of time)
 - e. Manufacturers of products designed to address the issue you defined above.
5. Establish a plan to complete the case study (e.g. conducting interviews), working with your CITE and partner advisors to ensure feasibility.
6. Actively maintain field notes and systematically store documents
 - a. Type your notes/interviews and review them by the end of every day. Highlight good/usable quotes from your interviews.
 - b. Summarize key points in your notes to review with your advisor each week, or whenever you have regular meetings.
 - c. Store documents systematically (file names, directory structure, etc.) that is clear to all researchers involved.
 - d. Remember to submit your weekly field notes to MIT | CITE.
7. Analyze the notes and documents
 - a. Look for patterns, themes, etc., especially if you are developing case studies for more than one product.
 - b. Develop hypotheses and circulate among the research team for comments.
8. Submit rough draft (By August 15th, 2013)
 - a. This draft should have all content
 - b. Give at least one week for your advisor to review the draft for final approval
9. Submit final draft (By August 31st, 2013)
 - a. Use the template provided
 - b. Ensure proper citation for evidence, credits for pictures, etc.

Final Deliverable

This template is a guide to help you create a case study for MIT | CITE . Please note this is an initial outline and may be updated during the initial stages of your research. You are the expert! Please propose changes to this method as you see they would enhance the final product. Remember, your case study will address: Who (partner), What (product), When (the duration of your internship), Where (location), Why (a particular product/the need), and How (methodology). And, along these lines, you will be asking particular questions, collecting data and interviewing key stakeholders.

Abstract

Summary of key findings of your research. What patterns, processes or insights have you made that are particularly useful to developing a testing method for products designed for the developing world.

Context

The context should be based on the program/business opportunity defined by the product under consideration. It can be described at various levels:

- Geography
- Region
- Country
- Community

You will illustrate the product so that the reader can put the case study in context and also mention how the organization decided on the product they are distributing/using. This section will also describe technical details, such as the specification of the model/product; overall number of users of the product, location, etc.

Problem/Gap

The problem (gap) should be well defined by the product under consideration. It can be described at various levels:

- Sector (water, sanitation, energy, food, health, etc.)
- Application/Use/Function
- Technology(ies) required

Definitions of Success and Failure

- Understand the organizational partner's and the consumer's definition of success or failure for a product designed to address this problem. Knowing this will influence evaluation metrics for the product.

Methodology

This section describes how you went about answering the questions and gathering the data contained in the case study:

1. What was the size and nature of the stakeholder groups?
2. How were they selected?
3. Did you gain permission to observe people?
4. Did you complete the observations? Was it structured?
5. How did you carry out the observation? Were the interviews structured? Unstructured?
6. What assumptions have you made in collecting the data?

Implementation

This section outlines the specific program and method that the organization has used to implement the product in the field.

1. How does it work? How long has it been active?

2. Who are the key players?
3. How many units have been deployed and where? Has the partner measured the impact of the program and how?

Failure Modes, Choke Points and Limiting Factors

1. This section deals with the physical product that you are studying in the field and how the user interacts with that item. And presents such information as a physical description, common usage patterns, common failure modes, etc.
 - a. Ask: Who, When, Where, Why, & How (e.g. Who is using the product in the household? When is it used? Where do they put the product in their home? Why isn't the product being used? How is the product used? Is it used how it's intended to be used?) How did people decide to buy this product and where did they get their information? Where do they go to repair the product?

This section also identifies the issues that Partner Organization Employees face that make it difficult to evaluate the product's performance in the field; i.e. what are the limitations as an organization to conduct evaluations?

Analysis

Become familiar with standards (WHO, Household Water Treatment and safe storage Network; ASTM, etc.) or research other standards and see what they've done (see if standard reflects conditions in the field). Then compare and contrast the product and your situation with that of existing standard to understand where the current evaluation is falling short, especially as it is pertain to usage in the field for everyday usage. Consider such things as use patterns vs. the way in which the standard

Conclusions

- What are the key patterns, issues and needs you have identified through the course of your research. If you had to suggest research directions indicated by your field data, which CITE should pursue, what would they be?
- What are the key needs of the partner organization when it comes to product selection support and how could CITE address those needs?

General Tips

- There are three basic types of case studies: explanatory, exploratory, and descriptive. We aim to develop exploratory case studies. It should be more than descriptive, but may not be completely explanatory.
- The purpose is to build theory based on the case evidence, not to generalize across a population.
- The product is the unit of analysis. While the program or business venture may have many interesting aspects to consider regarding its success or failure overall, focus on the role of the product in the program or business success.

- Potential sources of evidence:
 - Documents (meeting agendas, reports, budgets, emails, etc.)
 - Information systems (transactions, timesheets, monitoring & evaluation data, etc.)
 - Interviews (open-ended or semi-structured)
 - Surveys (less likely during this short summer study)
- **TYPE AND REVIEW YOUR NOTES, ESPECIALLY INTERVIEWS, EVERY DAY.**

Appendix F: CITE Student Engagement Strategy

CITE Student Engagement Strategy

Purpose

The purpose of the Student Engagement Strategy is to ensure MIT students are meaningfully engaged with CITE and CITE's activities. This document outlines how students can increase their awareness of CITE, support CITE in numerous ways, and network with other students who are interested in technology and evaluation in the development context. CITE wants to cultivate an interest in technology evaluation for the developing world, as well as an interest in international development efforts on a larger scale, and student involvement is essential in developing a sustainable program.

Objectives

1. Build a community of students invested in technology, evaluation, international development and CITE as a program;
2. Develop a cadre of core students who meet on a regular basis that helps advance CITE's goals in a various ways
3. Involve students in direct CITE research as Research Assistants during the academic year or interns placed with CITE or CITE partners during IAP or Summer
4. Increase awareness of CITE on campus
5. Outreach to targeted Student Organizations at MIT
 - a. Global Poverty Initiative (collaborate with Poverty Action Week)
 - b. iHouse
 - c. International Development Club
 - d. Sloan entrepreneurs for International Development
 - e. Engineers without Borders
 - f. Globemed
 - g. MEET-Middle East Education through Technology
 - h. AITI: a multidisciplinary group that promotes development in emerging regions by cultivating young technology entrepreneurs.
6. Partnership with targeted International Development-focused Groups at MIT
 - a. Public Service Center (PSC)
 - b. Technology & Science Forum
 - c. D-Lab

Communication tools and channels

- Face-to-face channels of communications:
 - Regularly scheduled meetings with core students as “coffee hour” to share thoughts and ideas about technology, science, evaluation and international development, etc.
 - Once-a-month dinner to engage students in discussion on international development in collaboration with other International Development-focused groups at MIT
- Printed tools/report
 - Brochures
 - One-page flyer

- Websites and blogs
 - CITE's own website: <http://cite.mit.edu>
 - Other websites
 - PSC: <http://web.mit.edu/mitpsc/whatwedo/cite-psc/index.html>
 - D-Lab CITE's site: <http://d-lab.mit.edu/cite>
 - Other Student Organization's website
 - Blogs (on CITE's website, PSC's website, partner's website, etc.)
 - <http://mitpsc.mit.edu/blog/current-summer-13-rafa-rahman/>
- E-mails
 - E-mail updates
 - E-Newsletter for students
- Social Media
 - Facebook
 - Youtube
 - Videos of CITE work from summer internships, evaluations, etc.
- Video (to upload on Youtube or CITE's WebCITE)
- Collaboration with other MIT International Developed-related groups and Student Organizations

Stakeholder identification and analysis

Audience	Characteristics	Communication needs	Preferred media
General MIT Students		Need project updates; ways to get involved	Email; monthly E-newsletter
Student Task force/core students	Act as resource for CITE		Email; monthly newsletter; monthly meeting
Student Organizations	Act as resource for CITE		Special outreach— one-to-one communication via email
Other International Development Groups/Department/ Centers at MIT	Act as resource for CITE; Collaborate and/or sponsor events	Need to provide update and progression of Program	Special outreach— one-to-one communication via email or telephone

Appendix G: CITE Communication Strategy

Introduction

The objective of CITE's Communications Strategy is to disseminate and effect information sharing. This communications plan will allow CITE to educate and update key stakeholders as well as the larger audience on CITE's program and activities; and to maintain and influence stakeholders to participate through the avenues and forums provided.

Purpose

The purpose of the Communications Strategy is to contribute to the successful implementation of CITE with the right communication delivered to the right audiences at the right time.

Objectives

1. Enable Leadership Advocacy: Provide information to enable leaders to be advocates of CITE;
2. Build Synergy of CITE Team: Provide communication that helps build the team's effectiveness and knowledge of the program;
3. Increase CITE presence to key stakeholders: create awareness and understanding of CITE Program and activities (3S methodology, evaluations, case studies, etc.).
 - a. Donors
 - i. USAID
 - ii. potential new donors
 - b. HESN labs
 - c. Partners (NGOs, multilaterals)
 - d. MIT Community
 - i. Student engagement (separate strategy)
 - ii. Non-students
 - e. Development professionals
 - f. End users of Technology
 - g. Other

Communications tools and channels

- Face-to-face channels of communications:
 - Regularly scheduled meetings with core CITE Team and RAs
 - CITE weekly seminar starting 9/11 Weds 3-5pm
 - MIT student orientations (August of each year)
 - Grad Student Orientation Booth @ Graduate School Council
 - Academic expo (8/27; booth with D-Lab)
 - Activities Midway (week of 8/26; booth with PSC)
 - Student Task Force meetings: once/month
 - Conferences (presentations or posters at appropriate conferences)
 - Brown Bags (at USAID, other HESN partner)
 - MIT Science Museum "Soap Box"
 - Field trips (to appropriate sites to present and to learn, e.g. Consumer Reports)

- Printed tools/report
 - Case studies (technical briefs?)
 - Brochures
 - One-page flyer
 - USAID Quarterly Report
- Print media (articles in targeted media)
 - Newsletters contributions
 - Consumer International
 - MIT Faculty
 - E-Newsletter
 - Magazines
 - MIT Tech Review, etc.
 - local newspapers
 - interns home town newspaper, etc.
- Scholarly articles
 - White papers
 - Journals (list:)
- Websites and blogs
 - CITE's own website: <http://cite.mit.edu>
 - Other websites
 - PSC: <http://web.mit.edu/mitpsc/whatwedo/cite-psc/index.html>
 - USAID: <http://www.usaid.gov/hesn/mit>
 - Blogs (on CITE's website, PSC's website, partner's website, etc.)
 - <http://mitpsc.mit.edu/blog/current-summer-13-rafa-rahman/>
- E-mails
 - E-mail updates/E-Newsletter for students
 - E-wows to USAID (sporadic emails to USAID notifying CITE updates)
- Social Media
 - Facebook
 - Youtube
 - Videos of CITE work from summer internships, evaluations, etc.
- Video (to upload on Youtube or CITE's WebCITE)

Components of Communications Life Cycle and questions for CITE to consider

Topic	Questions/things to consider	CITE possibilities
Generate	1. What kind of information does CITE want to share? 2. Quantitative data? 3. Qualitative information? Where does this information come from? 4. Do we currently collect all the necessary data	1. results from evaluation 2. information from case studies 3. opportunities for MIT students
Capture	1. How do we plan to record and document the information?	1. student reports 2. photos, videos

	<ol style="list-style-type: none"> 2. Data forms and data system? 3. Photographs? 4. Interviews? 5. Case studies 	<ol style="list-style-type: none"> 3. case studies 4. Quarterly Reports to USAID
Synthesize	<ol style="list-style-type: none"> 1. How is the information linked to our organization's mission and/or project objectives and overall M&E plan and Information System? 2. To USAID's objectives? 3. Who will synthesize this information 	<ol style="list-style-type: none"> 1. CITE staff
Package	<ol style="list-style-type: none"> 1. How will we present the information to our various stakeholders 	<ol style="list-style-type: none"> 1. e-Newsletters 2. website
Share	<ol style="list-style-type: none"> 1. How and where will you disseminate our information/ 2. What methodology will CITE use to disseminate: A) speech at meetings? B) Fact sheets at media event? C) Website? D) Donor meetings? E) Scholarly articles? 	<p>Possible venues</p> <ol style="list-style-type: none"> 1. conferences 2. MIT Science Museum "Soap Box" 3. Technology & Culture 4. Faculty Newsletters 5. E-newsletter
Apply	<p>The goal of Sharing information is to communicate results, present the lessons we have learned, or the best practices we have established, applied on a larger scale to improve positive outcomes.</p> <p>Sharing new information and knowledge should be linked to its application to policy, program development and management, and improved service.</p>	

*adapted from USAID-sponsored AIDSTAR-Two's *Technical Notes: Developing and Implementing a communication Plan, July 2013*

Stakeholder identification and analysis

Audience	Characteristics	Communication needs	Preferred media
General MIT Students		Need project updates; ways to get involved	Email; monthly E-newsletter
Student Task force	Act as resource for CITE		Email; monthly newsletter; monthly meeting
MIT			Exploring ways through:

community			MIT Press;
Donor: USAID		Need to provide update and progression of Program	Weekly phone calls; quarterly reports; annual report; occasional "wows"
NGO & Multilateral	Partner to host our interns; have products that CITE can evaluate		

Collaboration:

USAID, HESN communications person (Alma)

Ellen @ MIT press

1. repurposing of articles written by MIT Press on CITE

Appendix H: CITE Research Assistants

First name	Last name	position	CITE acct	Dept	Degree	Sex	Y1: 11/2012-9/2013			Y2: 10/2013-9/2014		
							FA12	SP13	SU13	FA13	SP14	SU14
Stephen	Maouyo	TA/class dev	CITE P	ESD	M	M		TA	RA			
Cauam	Ferreira Cardoso	CITE-PSC/RA	CITE P	DUSP	PhD	M			X	X1		
Stacey	Allen	RA	CITE P	ESD	M	F				X		
Tania	El Alam	RA	DUSP	DUSP	M	F		X		X		
Atul	Pokharel	RA	DUSP	DUSP	PhD	M		-	X			
Karthik Rao	Cavali	RA	DUSP	DUSP	PhD	M		-	X			
Brittany	Montgomery	RA	DUSP	DUSP	PhD	F		-	-	X		
Anirudh	Rajashekar	RA	DUSP	DUSP	M	M		-	-	X		
Katherine	Mytty	RA	DUSP	DUSP	M	F				X		
Ellen	Chen	RA	DUSP	DUSP	M	F				X		
Akanksha	Raina	RA	DUSP	DUS	M	F				X1		
Ellen	Chen	RA	D-Lab	DUSP	M	F		X	-			
Amit	Gandhi	RA	D-Lab	MechE	M	M			X			
Chris	Pombrol	RA	D-Lab	MechE	M	M			X	X		
Victor	Lesniewski	RA	D-Lab	MechE	M	M			X	X		
Hisham	Bedri	RA	CTL	ESD	M	M	X1	X				
Thomas Henry	Marcil	RA	CTL	Meche	M	M	X1	X				
Maitagorri	Schade	RA	CTL	ESD	PhD	F	-	-	-	X		
Corinne	Carland	RA	CTL	ESD	M	F		-	-	X		
Tim	Breitbach	RA		ESD	PhD	M		-	-	X2		
Tessa	Skot	RA	SSRC	ESD	M	F		X	X			
Maia	Majumder	RA	SSRC	ESD	PhD	F		-	-	X		

Academic year 1: Sept. 1, 2012 to May 31, 2013

Academic year 2: Sept. 1, 2013 to May 31, 2014

Total students	2	5	8	14
Males	100%	40%	88%	36%
Females	0	60%	13%	64%

Legend: X1: department funded RA (cost share)
X2: self funded RA (leveraged cost)

Appendix I: CITE Fall 2013 Research Seminar schedule

Date	Topic 1 (45 min)	Presenter	Topic 2 (45 min)	Presenter	Readings
18-Sep	Intro to CITE	All			
25-Sep	Product Prioritization: What should matter?	Dan Frey/Derek Brine	Pugh Session 1	Dan Frey/Derek Brine	Background product information packet
2-Oct	Pugh Session 2	Dan Frey/Derek Brine	Pugh Session 2 continued	Dan Frey/Derek Brine	
9-Oct	Big E: Evaluation in International Development (RCT, M&E, etc.)	Kendra Leith	Case Study - bednets (UNICEF)	Sara Hess/Jarrold Goentzel	UNICEF case study
16-Oct	Suitability Definition and Methods	Dan Frey/Derek Brine	Solar Lighting Suitability	Dan Frey/Derek Brine	Solar Lighting Suitability Report Overview
23-Oct	Sustainability Definition and Methods	Jennifer Green	Solar Lighting Sustainability	Jennifer Green	Evolution of Diffusion and Dissemination Theory
30-Oct	Case Study - Tofu and Tempeh cooker	Morgan Edwards/Jessie Press-Williams	Case Study - food storage (GrainPro, PICS)	Elizabeth Resor/Jarrold Goentzel	Tofu and Tempeh Case Study; GrainPro Case Study; PICS Case Study
6-Nov	Reflect on preliminary research experiences	Group Discussion	Discuss updates to our research strategy	Group Discussion	
13-Nov	Report on summer internship	Rafa Rahman and Bryan Ranger	TBD		
20-Nov	USAID meeting - no session				
27-Nov	Thanksgiving - no session				
4-Dec	TBD		TBD		
11-Dec	Evaluation in Healthcare (e.g. ECRI, WHO, FDA)	Stan Finkelstein, Jeff Asher	Reflections and way forward for Spring Semester		