D-Lab

Annual Report 2014-2015

D-LAB IN THE NEWS 2014-2015

D-Lab students, fellows, researchers, and staff are regularly covered in the news media. During 2014-2015, D-Lab was covered 57 times in news outlets ranging from the New York Times to Fast Company, from The Times of India to El Comercio, Peru.

D-Lab alumni Diana Jue (left) and Jackie Stenson (right) of Essmart were named by Forbes Magazine to their "30 Under 30" list in the social entrepreneur category.

Following is a list of articles from news organizations, university news services, organization editorials, and more. See d-lab.mit.edu/news

An outpouring of creativity at a design summit—**Cali Department of Environmental Management**

Lean and Mean(ingful): social intrapreneurship in the public sector—**Virgin Unite**

MIT spinout Sanergy targeting clean sanitation for all of Kenya (and beyond)—**BetaBoston**

Ethical 3D printing begins with plastic waste pickers—**New Science**

Design: where dollars are scarce and need is great—**Marketplace Morning Report, APM**

Scale-Ups Fellow: Are You 3D-Printing with Fair-Trade Filament?—**MIT Slice**

Zubaida Bai | A pack of good health—**Wall Street Journal/Live Mint**

UTEC and MIT develop innovation projects in Peru— **El Comercio, Peru**

We're in this Together: With the Practical Impact Alliance, MIT building broad network to support BoP enterprise development—**Next Billion**

Innovation Within Reach—**New York Times**

Garbage in, Money Out: My Stroll With Bilikiss Adebiyi-Abiola—**Huffington Post**

Putting Waste to Good Use—**The New Indian Express**

The Augumented Infant Resuscitator: Refining a hackathon invention to reduce infant mortality at scale— **Healthy Newborn Network**

Unlikely Startup Connects India's Garbage Dumps to 3-D Design—**Wall Street Journal, India**

D-Lab's Amy Smith joins Bill Gates on a panel addressing innovation—**MIT News**

MIT D-Lab promotes rural community innovations in Guatemala with Soluciones Comunitarias—**MIT News**

Scale-Ups Fellow: Nigerian recycling initiative proves it's not all about hi-tech solutions—**The Guardian**

Engineering Trash into Treasure—**MIT K-12 Video**

Ten global organizations join MIT D-Lab's Practical Impact Alliance—**MIT News**

D-Lab Scale-Ups fellows to tackle irrigation in India and grain storage in Zambia—**MIT News**

Shoes for Kenyans Afflicted by Jigger Infection—**3DPrinter.com**

Scale-Ups Fellow: Yough grad could make worldwide health impact— **Pittsburgh Tribune-Review**

D-Lab offers hands-on lessons in meeting energy needs—**Energy Futures**

Scale-Ups Fellow: Turning Trash Into Treasure—**Fast Company**

D-Lab Alumni Diana Jue & Jackie Stenson: Forbes 2015 30 Under 30: Social Entrepreneurs—**Forbes**

Products of Progress: From bike-mounted maize shellers to solar lamps, startup brings more efficient tools to rural Tanzania—**MIT News**

MIT-USAID program releases pioneering evaluation of solar lanterns—**MIT News**

MIT launches a Consumer Reports for the developing world—**BostonBeta**

The entrepreneurs helping girls in the developing world—**BBC**

Bringing "everyone wins" recycling to Nigeria—**MIT News**

The startup True Moringa was inspired by the African Tree, Moringa—**Bay State Banner**

D-Lab team disseminates poverty alleviation technologies— **University of Botswana**

Innovation in the making—**MIT News**

MIT Grad's Mission: Build A Wheelchair that Works Anywhere—**WGBH**

Farmers Can Shell Coffee in a Fraction of the Time With this Bike-Powered Machine—**Smithsonian.org**

MIT Scaling Development Ventures: Bridging innovation and impact—**MIT News**

Taking action in Africa—**MIT News**

The Innovative OS That'll Bring PCs to the Developing World—**Wired**

Giving newborn babies 'air' to breathe—**BBC**

How to Attract Female Engineers—**New York Times**

A breath of fresh air: D-Lab scales up cleaner cooking solutions—**MIT News**

Champions Of Rubbish: Wecyclers Lead Revolution For Waste Recycling In Lagos—**Entertainment Express**

New laboratory in Ghana to test cookstoves—**SciDevNet**

'Farmer-preneurs' improve crops in Southern Africa— **UC Davis Today**

Global development summit to aid Kuthambakkam's health issues—**The Times of India**

Putting people before buildings—**MIT News**

Vision Talk: Kwami Williams—**MIT Tech TV**

Shaking Up the Status Quo in Nepal-**New York Times**

Creating a Level Playing Field for Social Innovators in Africa—**Stanford Social Innovation Review**

Local Beauty and Health Startup Aims to Improve Economy in Ghana—**Boston Magazine**

Massachusetts and UN allies in innovation—**Universidad Nacional de Colombia**

Elaine Kung '15 awarded $5,000 by MIT Tau Beta Pi to improve design of compost toilets—**MIT News**

Teaching development skills on three continents—**MIT News**

Angles on Water and Food: On the Ground—**MIT Spectrum**

MIT researchers develop the world's first USB-powered mobile stethoscope—**BetaBoston**

D-Lab and Tata Center team wins $100K Vodafone award for mobile stethoscope—**MIT News**

D-Lab Scale-Ups awards $100,000 to five social entrepreneurs—**MIT News**

Social enterprises empower communities—**MIT News**

d-lab.mit.edu/news

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THE D-LAB YEAR
A REVIEW IN SNAPSHOTS: 2014-2015

JULY 2014

Design summit in Tanzania

Fifty aspiring designers, inventors, and innovators from around the world came together to create low-cost, practical technologies with the potential to alleviate poverty for this International Development Innovation Network design summit.

Comparative Fuel Study, Haiti

Carbon Roots International, the producer of Chabon Vet charcoal briquettes made from sugarcane bagasse, invited D-Lab's Dan Sweeney to do a comparison of their fuel and conventional fuels used in Haiti.

D-Lab Launches the MIT Practical Impact Alliance

Leaders from international corporations, foundations, nongovernmental organizations, and social enterprises became the founding members of D-Lab's newly launched MIT Practical Impact Alliance.

D-Lab's Amy Smith Joins Bill Gates On Panel

D-Lab founder Amy Smith joined Bill Gates,' Arunachalam Muruganantham, known for designing a, low-cost machine for making sanitary napkins in India; and Francis Collins, director of the National Institutes of Health, on a panel addressing innovation.

Creative Capicity Building program in Guatemala Launched

In October, D-Lab began work with Guatemalan social enterprise Soluciones Comunitarias (SolCom) to develop scalable, market-based, local community innovations intended to alleviate some of the causes of endemic poverty in rural areas of Guatemala.

D-Lab User Research Framework Published

D-Lab Scale-Ups published an in-depth guide on how to create a qualitative research plan and approach cross-cultural interviews, observation, and immersion activities as well as how to implement D-Lab's co-design method.

Rethink Relief, Pader, Uganda

Rethink Relief, a design summit intended to bridge the gap between short-term humanitarian relief and long-term development provided an opportunity for participants to create technology solutions hand-in-hand with refugees in post-conflict northern Uganda. Rethink Relief is partially supported by IDIN.

Scaling Development Ventures

The third annual MIT Scaling Development Ventures conference, this year titled, "Bridging Innovation and Impact" drew over 275 participants from around the world.

Student January Fieldwork

Over MIT's Independent Activities Period in January, more than 30 D-Lab students travelled abroad - to six different countries in Latin America and sub-Saharan Africa to work with community partners on projects ranging from the design of composting toilets to agricultural processing devices.

$100K for mobile pulmonary disease diagnostic device

The D-Lab-based Mobile Technology group won this prestigious Vodafone award for developing a low-cost solution for diagnosing pulmonary disease that employs a mobile stethoscope.

D-Lab Alumni Exceed 1,800

Every year, D-Lab hosts a graduation reception for students who have taken one or more D-Lab classes, done a research project or independent study, or engaged with the program in some other way. With 2015 graduates, the total D-Lab alumni count exceeded 1,800.

Five New Scale-Ups Fellows

Five social entrepreneurs were chosen for yearlong fellowships, tailored mentoring, and a $20K award. Fellows this year are working in Brazil, Ethiopia, and India, Tanzania, and Uganda.

JUNE 2015

FROM THE DIRECTORS

Greetings from MIT D-Lab!

This year's annual report highlights many of D-Lab's activities over the last year including teaching classes at MIT, mentoring social entrepreneurs, conducting field trainings, organizing global co-design summits, supporting research groups, offering youth programs, and partnering with NGOs, government agencies, industry and more. These activities took place across 25 countries, involved over 250 students and engaged more than 600 members of the International Development Innovation Network. What held it all together? Our strong sense of mission and our shared set of values that bring meaning and cohesion to the work we do.

At D-Lab, our starting point is an unwavering belief in people's abilities to create solutions to solve their own problems and to participate in their own development. This is not a rebuke of charitable goodwill, but rather an affirmation that people, regardless of their socioeconomic status, education level, or place of birth, are resourceful and creative. We view poverty as a mutable condition, not a fixed characteristic of an individual, which is why we speak of people living in poverty rather than "poor people." We frame our work around providing opportunities for people-- be they at MIT or in a rural village-- to view themselves as changemakers, to develop their skills, and to engage with like-minded social innovators.

Further, we believe that engaging in the process of innovation can be as valuable as the tangible products of innovation. While we value the role technology can play in economic and social advancement, it is our commitment to collaborative design that may have the most meaningful impact. When we engage people in the design and creation of a tool or technology meant for their own use, we build individual capacity, a sense of agency and empowerment. What's more, when people experience the joy of creation, of seeing their ideas move from plan to prototype to real-world implementation, the world gains not only an innovation, but an innovator.

Finally, while working to play a part in relieving the burden of poverty experienced by so many in the world, we encourage each other to remain optimistic about what we can contribute. Our aim is to work with humility, empathy, and respect, whether we are teaching or learning, demonstrating or co-creating, in a classroom or in a cornfield.

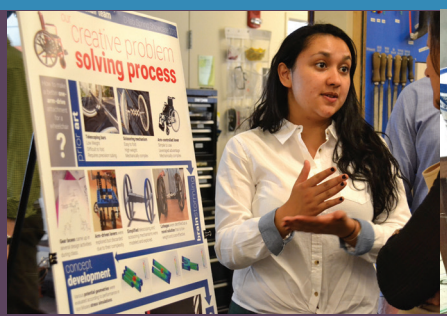
We hope you enjoy this year's annual report and discover the ways in which "mind, hand and heart" guide all that we do.

Amy Smith
Founder & Co-Director

Victor Grau Serrat
Co-Director

Kofi Taha
Associate Director

STUDENT ENGAGEMENT



HANDS-ON, PROJECT-BASED LEARNING IN REAL-WORLD SETTINGS

Students & Academics

Education is one of the three cornerstones of the D-Lab program (along with research, fieldwork). D-Lab students learn to design for and with people living in poverty, to prototype and implement inventive solutions to everyday challenges in the developing world, as well as to analyze and design supply chains in the developing world and to establish social ventures.

This year, 226 students were engaged in D-Lab through its courses, international field work, research opportunities, and independent studies.

A total of ten courses were offered including subjects in development, design, energy, supply chains, water and sanitation, waste and recycling, and school design—all focused on the developing world.

Attracting Female Engineers

An April 27 New York Times article by Lina Nilsson suggests that programs like D-Lab, that focus on societally meaningful work, attract women in significantly higher proportions. Nilsson notes that D-Lab is "one of the few engineering initiatives in the country that has a severalfold higher enrollment of women than men."

Of course D-Lab courses do not focus exclusively on engineering—they cover a wide range of engineering, business, and development topics. But we are always pleased to note that D-Lab attracts a lot of young women from the full spectrum of MIT majors. During the 2014-2015 academic year, seventy-two percent of students enrolled at D-Lab were women.

D-Lab takes pride in inspiring young women *and* men to tackle issues of poverty through engineering, co-design, research, and fieldwork.

D-Lab Student Projects

D-Lab students participate in real-world project teams. At the end of each semester, final student projects are featured in a showcase featuring presentations, posters, and prototype demonstrations. Students as well as people from the MIT community, Cambridge, and beyond typpically attend. Last year, the showcse drew more than 70 attendees for each event.

In addition to course participants, undergraduate researchers, working on mobile technology, biomass fuels, and education, present their work as well.

Over fifty student teams were formed in D-Lab classes in 2014-2015. A sampling of D-Lab student projects follows:

- A means of fermenting cacao in small batches to make it possible for small farmers to sell rare varieties of cacao at higher cost, ***Puerto Rico***
- A device to allow riders who have only one arm to propel a wheelchair, ***Guatemala***
- A method to produce high-grade avocado oil at the village level, ***Tanzania***
- An energy assessment of an off-grid village, with a plan for bringing electric lighting options to community members , ***El Salvador***
- A solar cooker design to meet the needs of residents of the Andes, ***Peru***
- SoapMagic: Waterless Hand Hygiene, ***Ghana***
- Permaculture and Land Restoration, ***China***
- Mobile Fluorometer for Low-Cost Diagnostics, ***India***
- A quick and efficient method for processing organice waste and producing animal feed and compost using black soldier flies, ***Nicaragua***

A hallmark of D-Lab's student engagement is its hands-on approach. One of the most visible exercises D-Lab students engage in each year is the "charcoal burn." Several times a year, D-Lab instructors and staff engage students in the carbonization of agricultural waste, the first step in creating cleaner-burning charcoal briquettes for use in cookstoves.

New and Renewed

Pedro Reynolds-Cuéllar, who co-instructed D-Lab: Education last year, this year co-instructed D-Lab: Waste while taking on coordination of D-Lab youth programs. Matt McCambridge, a veteran designer of low-cost mobility devices, taught D-Lab: Design. Meanwhile, a course known as D-Lab: Biodiversity in the past, was overhauled and made its debut in the spring as D-Lab: Earth, a course exploring the intersection of conservation and human well being in less-industrialized regions.

WORKING WITH COMMUNITIES TO ADDRESS HARD PROBLEMS

Student Travel & Field Work

Over the course of the year, 49 D-Lab students traveled internationally to countries including Botswana, El Salvador, Ghana, India, Nicaragua, Peru, Tanzania, Uganda, and Zambia.

» In Latin America, four separate student teams benefited from the strong relationships developed with the nongovernmental organization ASAPROSAR in El Salvador and Peru's University of Technology and Engineering. D-Lab sent students to work with each of these partners in January and March for projects related to biogas, passive heating, solar cookers, sanitation, and more.

D-Lab built on long-standing relationships in Ghana by sending a team to work with MoringaConnect, a start-up that increases farmer income created by D-Lab alumni that continues to engage students on an annual basis. Students traveling to Uganda for the Development class participated in projects related to research scientist Dan Sweeney's work with alternative fuels and the D-Lab Scale-Ups Harvest Fuel Initiative.

Two trips were closely connected to International Development Design Summits (IDDS). A team traveled to Botswana to help community members prepare to host their first summit in August 2015. Another team traveled to Tanzania to follow up on projects begun in 2014.

Many students who are inspired by the work they begin on a D-Lab class trip continue their work with support from other MIT programs.

This year, six students were awarded funding from the MIT Public Service Center; one student won a Kelly Douglas Traveling Fellowship from the School of Humanities, Arts, and Social Sciences; two students won MIT Tau Beta Pi chapter fellowships. Additionally, three students received fellowships from the International Development Innovation Network (IDIN). Another five students participated in IDIN's design summits in Botswan, Colombia, and India (with funding from the MIT International Science and Technology Initiatives). And, two students received other IDIN funding to perform project follow-up in the field.

Looking Ahead

Looking ahead to the next academic year, D-Lab is planning for a bumper crop of courses including many new and revised courses. Ten courses will be offered in the fall of 2015 with an additional seven offered in the spring term. Matt McCambridge is reviving and revising D-Lab: Mobility; D-Lab: Prosthetics will be taught by a new team as well. D-Lab: Field Methods will be taught for the first time as well as a course to be called Innovation in Relief, Recovery, and

D-Lab Student Engagement by the Numbers 2014-2015

10	Subjects offered
186	Students enrolled
70%	Undergraduates
72%	Female students
49	Students traveled internationally
40	UROPs
3	Independent studies
10	Countries visited in Africa, Asia, Central America, & South America

Each year, dozens of D-Lab students travel to do international fieldwork related to their coursework or research projects. Above, a student group from D-Lab: Development in Tanzania during the January Independent Activities Period explores avocado processing with members of the local community.

D-LAB RESEARCH

DEVELOPING WORLD RESEARCH WITH FIELD PARTNERS

Field-based Studies & Research

D-Lab's research program has grown and solidified over the past year. D-Lab now boasts three research groups, research arms of each of its three subprograms, and a growing reputation as a thought—and practice—leader on the way studies are implemented and resarch conducted within communities in the developing world.

D-Lab's strengths are in needs assessment, product evaluation, and sector-specific applied research. Undergraduates, graduate students, and research staff are all engaged in the D-Lab research program. In addition to our research groups and areas, D-Lab offers resources such as research guides and frameworks.

d-lab.mit.edu/research-about

D-Lab's Dan Sweeney helped set up the D-Lab (pictured above) for research and instruction in improved cooking products at the Kwame Nkrmah University of Technology, Kumasi, Ghana.

Biomass Fuels & Cookstoves

The D-Lab biomass fuel and cookstove team, a Scale-Ups research initiative led by Dan Sweeney, PhD, has developed innovative methods for testing and evaluating biomass fuels and cooking technology in the lab and in the field, as well as at D-Lab in the "Burn Lab."

The team works closely with producers of alternative fuels in Africa, the Caribbean, and Central America, to seek lasting solutions to the environmental, health, and security dangers resulting from the use of wood and wood charcoal.

Projects from 2014-2015

» Field evaluation of alternative and traditional cooking fuels in Haiti (funder & partner: Carbon Roots International; location: Cap-Haïtien, Haiti)

» Charcoal briquette on-site quality testing protocol with partners in Uganda and Tanzania

» ISO technical committee to produce standards for clean cooking solutions (Oct 2014 meeting in Antigua, Guatemala)

» Harvest Fuel Initiative (location: Uganda, and Tanzania)

Publications

» Article accepted (IEEE Global Humanitarian Technology Conference): "Leveraging strengths of different stakeholders to improve and scale improved cooking products"

» Article in review (Renewable & Sustainable Energy Reviews): "Char fuel production in developing countries- A review of urban biowaste carbonization"

» D-Brief: Adoption of Agricultural Waste Charcoal Briquettes in Uganda: User Evaluation

Off-Grid Energy

D-Lab's Off-Grid Energy group, also a Scale-Ups initiative, led by Eric Verploegen, PhD, includes undergraduate and graduate students from MIT, Harvard, and Wellesley, as well as additional D-Lab staff.

D-Lab's approach to enabling access to modern energy in communities in developing countries includes:

» Energy needs assessment
» Technology evaluation
» Market deployment

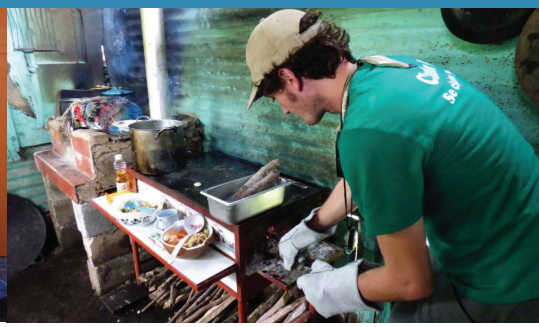
During 2014-2015, the group conducted a short study to determine the willingness of rural Moroccan households to pay for solar lanterns as an alternative to their existing lighting solutions.

The team has secured partnerships with a major energy company (TOTAL) and Al Amana and are in the process of launching the market test phase of the Morocco project.

The group also launched a project to develop a set of data collection tools for assessing the energy needs of a community and the infrastructure available to deliver appropriate solutions to meet these energy needs.

Their work to aggregate information about solar lighting products and distributors in easy-to-read comparative charts, allowing consumers to compare the features of products and make more informed purchasing decisions also took off this year and will be debuted online late fall of 2015.

The Off-Grid Energy group also develops curriculum to teach basic concepts about electrical circuits. Their first project was piloted at IDIN innovation centers in Arusha, Tanzania and Sao Paulo, Brazil.



NEEDS ASSESSMENT–USER RESEARCH–PRODUCT DEVELOPMENT

Local Innovation

The Local Innovation research group is a program of the International Development Innovation Network (IDIN, see pages 12-13). Led by Elizabeth Hoffecker Moreno, this group explores the role of local innovation and grassroots problem solving in improving community wellbeing and addressing development challenges associated with poverty.

Their research is organized into three areas:

Local Innovation Processes and Ecosystems
Increasing our understanding of how local innovation works and how innovation processes and ecosystems can be described, mapped, and analyzed.

Development Impacts of Local Innovation
Investigating the development impacts of local innovation, helping us understand why and how local innovation matters.

Enabling and Scaling Local Innovation
Exploring the role that global networks play in enabling local innovation and spreading the development impact of local solutions and approaches.

Current Projects

Local Innovation Ecosystems: *How can we identify and represent the elements that contribute to local innovation processes as well as the nature of relationships between those elements?*

Learning from Local Innovators: *What can we learn about how local innovation works from people who are directly engaged in local innovation processes?*

Local Innovation Index: *How can we assess the extent of local innovation in a place and compare this systematically across contexts and time?*

Lean Research

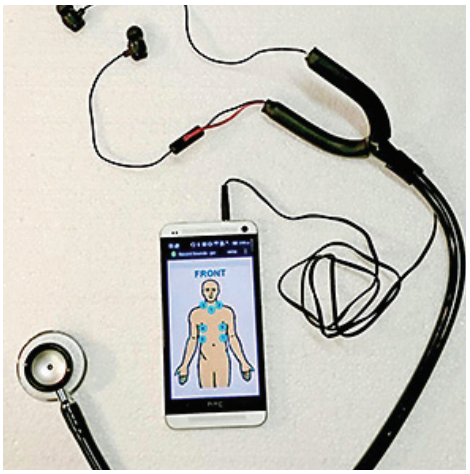
The Lean Research initiative, launched this year, is a framework to guide and improve the practice of field research in the context of international development and humanitarian work.

Lean Research emerges from the work of scholars, practitioners, and donors who recognize research as a form of intervention into the lives of study subjects, particularly those experiencing poverty and vulnerability. By incorporating the principles of rigor, respect, relevance and right-size into the research process, Lean Research seeks to minimize the burden on research subjects while maximizing the value of both the research process and outputs to stakeholders.

The Lean Research community includes over 100 researchers, practitioners, donors, and policymakers. Their core activities include working groups, events and convenings, research, and publications.

Lean Research is jointly organized by researchers at D-Lab, the Tufts University Fletcher School of Law and Diplomacy, and the Feinstein International Center also at Tufts.

Lean Research Convening at MIT, August, 2014.



Mobile Technology

All over the world, mobile phones have become personal, portable computers that have transformed our work as well and lives. These ubiquitous personal computers have enormous potential for improving our lives, assisting our behavior, and in some cases, saving lives.

The Mobile Technology Lab, established in 2014 by Rich Fletcher and based at D-Lab, develops new mobile technologies for a wide range of applications that have social impact, including: mHealth, global health, mobile psychiatry, and intelligent agriculture. Engaging more than two dozen undergraduate and graduate researchers each year, the team's research spans the areas of electronics/sensor design, advanced signal processing algorithms, machine learning, and user interface design.

In June, Fletcher and graduate student Dan Chamberlain, in collaboration with the Chest Research Foundation (CRF) in India, won the $100,000 award from Vodafone for developing a low-cost mobile platform for diagnosing pulmonary disease (pictured above).

D-Lab Scale-Ups

BRINGING POVERTY-ALLEVIATING PRODUCTS TO MARKET AT SCALE

D-Lab Scale-Ups

Scale-Ups was created to identify and support technologies, services, and ventures with potential for wide-scale poverty alleviation in lower- and middle-income countries.

Since its launch in mid-2011, the Scale-Ups program has grown to include an active accelerator for social entrepreneurs, a technical assistance program for agricultural waste charcoal social enterprises, a research and development program with projects in off-grid energy and user research, and a new initiative—the Practical Impact Alliance. Scale-Ups is also the driving force behind the annual MIT Scaling Development Ventures conference.

At the April 2015 Annual Meeting of the Practical Impact Alliance, members got a taste of D-Lab's hands-on Creative Capacity Building methodology in the D-Lab workshop.

Practical Impact Alliance

In the fall of 2014, Scale-Ups launched the the Practical Impact Alliance (PIA), designed to foster shared learning and collaborative action among corporations, non-governmental organizations, and social enterprises committed to scaling solutions to global poverty. Fourteen organizations (eight corporations, three nongovernmental organizations, and three social enterprises) joined PIA for the pilot year.

Engagement commenced in January, when members pitched ideas for PIA's working groups, which represent the core, ongoing engagement mechanism for the initiative.

More than twenty ideas for working groups were proposed by PIA members from which four were selected for the inaugural year:

- BoP Distribution Challenges
- Mobile Phones and Behavior Change
- Food Loss and Waste
- Fostering Local Innovation and Co-Creation

Through the working groups, D-Lab works with members to produce practical working tools—best practices, decision-making frameworks, and other resources—to be broadly disseminated at year's end.

In April, D-Lab brought PIA members to MIT's campus for an Annual Meeting and the MIT Scaling Development Ventures conference. The meeting gave members an opportunity to connect with experts and students at MIT while generating early momentum for the working groups.

The second in-person convening takes place in fall of 2015 in Kumasi, Ghana. Co-Design Summits are week-long immersive experiences which bring members together on project teams with local community representatives and local innovators from the International Development Innovation Network.

PIA also connects members with the student community at MIT. In the coming academic year, members will be able to connect with classes at D-Lab and elsewhere in the Institute, contributing projects relevant to course objectives. In partnership with the IDEAS Global Challenge, PIA will focus student innovation on the Mobile Phones and Behavior Change working group.

Revenues from membership fees support PIA's core activities in addition to providing tangential support to the MIT international development ecosystem by funding the annual Scaling Development Ventures conference and student-focused activities. For 2016, Scale-Ups is expanding the membership pool, with a target of over 20 organizations and upwards of $200K in revenue.

Research in Action

Scale-Ups research focuses on projects with a potential for large-scale implementation. For more information on the D-Lab Scale-Ups Biomass Fuels and Cookstoves group, the Off-Grid Energy Group, and Lean Research, see pages 6 to 7.

MARKET-BASED APPROACHES TO POVERTY ALLEVIATION

The Scale-Ups Fellowship

Impact

Now open to both MIT alumni and members of the International Development Innovation Network (IDIN), twenty-three entrepreneurs have participated in the D-Lab Scale-Ups Fellowship program since its inception in 2012.

During the yearlong fellowship, the entrepreneurs work to retire risk in technical feasibility and market viability in order to position their ventures for investment, partnership, and growth.

During the past year, the fellowship program saw its community of alumni ventures maturing. Scale-Ups Fellows have raised four million dollars on top of Scale-Ups' investment of five-hundred thousand dollars. The fellows have created over 160 direct and 1,240 indirect full-time equivalent jobs; and, through their product and service offerings have directly improved the lives of over 300,000 people living in low-income settings.

Finally, the fellowship is yielding a base of knowledge for future social entrepreneurs and inventors. This is taking the form of targeted case studies and conceptual frameworks.

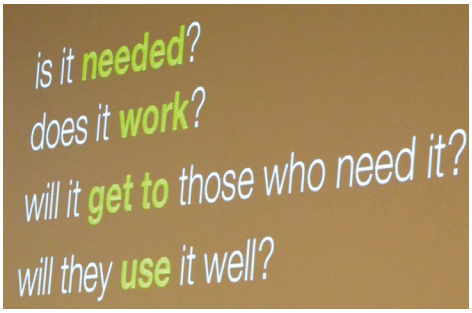
Fellows

Each social entrepreneur receives $20,000, tailored mentoring, skills-building, and networking opportunities. The 2014 fellows included:

- **Zehra Ali, Ghonsla**: Effective insulation panels from recycled materials, *Pakistan*
- **Mitesh Gala, SEED Pump:** A lightweight fuel-efficient irrigation pump, *India*
- **Carl Jensen, Zasaka**: Affordable technologies and services for farmers, *Zambia*
- **Sid Pai, Protoprint:** Converting waste plastic into 3D printer filament, *India*
- **Matthew Orosz, STG International:** Mini-grid power stations for rural electrification, *Lesotho and Tanzania*

Last year, the fellowship program had twice as many qualified applications as the prior year. In June, the 2015 class of D-Lab Scale-Ups fellows was announced. The new fellows include MIT alumni Elliot Avila '14, Kristin Kagetsu '12, and Sidhanth Kamath MBA '15, and two members of IDIN, Betty Ikalany and Julio Lavalle.

In April, current and past Scale-Ups fellows and staff gathered for a four-day retreat. (l-r) Eric Reynolds, Sid Pai, Zehra Ali, Saida Benhayoune, Danielle Zurovcik, Shawn Wen, Kwami Williams, Bilikiss Adebiyi-Abiola.



Scaling Development Ventures

In April, more than 275 students, entrepreneurs, business people, and development practitioners came to MIT for the third annual Scaling Development Ventures (SDV) conference.

This year, the conference broadened its collaboration among development-focused programs at MIT. In addtion to partners at the MIT Media Lab, and the MIT Public Service Center, this year, conference organizers incuded the Comprehensive Initiative for Technology Evaluation, the Legatum Center for Development and Entrepreneurship, and the International Development Innovation Network.

The theme for the year was "Bridging Innovation and Impact." Kevin Starr, director of the Mulago Foundation and the Rainer Arnhold Fellows Program, gave a keynote presentation digging into how simple questions can be used to gauge potential for impact. The keynote panel featured entrepreneurs and innovators from the developing world to explore how organizations can work to foster innovation at the Base of the Pyramid. In breakout sessions, participants were able to discus stopics including product design, financing solutions, distribution strategies, and impact measurement.

INTERNATIONAL DEVELOPMENT INNOVATION NETWORK

FOSTERING COMMUNITY-LED, LOCAL INNOVATION WORLDWIDE

What is IDIN?

The IDIN program empowers a diverse, global network of innovators to design, develop, and disseminate low-cost, practical solutions to improve the lives of people living in poverty. IDIN is headquartered at D-Lab, and implemented by D-Lab in coordination with its 11 consortium partners located in Brazil, Ghana, Singapore, Tanzania, the US, Uganda, and Zambia.

IDIN accomplishes this goal by introducing people around the world to a collaborative design approach and then connecting them to a network of other innovators and an ecosystem of support. Some of these individuals then generate solutions to development challenges and spread the approach of collaborative design.

IDIN is funded by the Global Development Lab at USAID.

IDIN By the Numbers 2014-2015

94	innovations supported
125	new network members
524	total members
24%	growth in network
6	new maker spaces
7	IDIN local chapters
53	countries represented
158	students engaged
32	microgrants awarded

Helping Innovation Thrive

Over the past year, IDIN partners have worked to build an ecosystem of support for innovators. IDIN's three innovation centers in Brazil, Tanzania, Uganda, and six community maker spaces in India, Kenya, Nepal, Sierra Leone, and Zambia, serve as venues for innovators to gather and access tools and advice.

Some maker spaces expose younger users to hands-on learning and non-traditional career paths, and provide adult makers and inventors with encouragement and the necessary tools to help move their projects forward.

IDIN partners also support innovators by administering a range of grant opportunities connecting innovators to mentors, facilitating exchanges between consortium partners and innovators who are working on similar technologies or challenges, a student-project matching initiative, and technical support.

IDIN actively involves university students in Ghana, Kenya, Singapore, Tanzania, and Zambia by sponsoring student capstone projects, student technology competitions, scholarships and fieldwork on innovation research and technology development.

100 Innovations: Two Examples

IDIN supported approximately 100 innovations in 2014-2015. Two of them, Sensen and PoupaCerto are described below:

Sensen

Designed by a team of students from MIT and the University of California, Berkeley student and IDIN Network members, Sensen provides an affordable solution for remote data collection that can be used to collect and analyze data in developing countries. The team won awards from VentureWell and MIT IDEAS Global Challenge this year, enabling them to iterate their prototype in preparation for a longer-term trial in Uganda run in coordination with D-Lab and IDIN Network member Betty Ikalany.

PoupaCerto

Originally conceived at IDDS 2012 in Brazil, PoupaCerto is a mobile application that helps low-income households track and accomplish their financial goals. Team member Julio Lavalle was awarded a D-Lab Scale-Ups fellowship and chosen to be part of the Yunus Social Business Incubator to move the project forward in partnership with local banks. The application can be downloaded for free and uses gamification to promote day-to-day savings and achievement of financial goals.

In the aftermath of the earthquakes in Nepal, IDIN Network members put their expertise to work during relief efforts. Pictured left, IDIN Network Member (and former D-Lab Scale-Ups fellow) Suprio Das traveled to remote villages in Nepal to install two Zimba water purification units. Zimba was developed by a team of IDIN network members and MIT D-Lab students based on Suprio's original design.

POVERTY ALLEVIATION THROUGH SIMPLE TECHNOLOGIES

At the four-week-long International Development Design Summit in Tanzania in July of 2014 two participants, Mwanaharusi Goha from Tanzania and Helen Amorin from Ghana, work on building a bicycle-powered coffee bean sheller to be used by local farmers.

Expanding Access to Design Education

International Development Design Summits (IDDS) are intensive multiweek design experiences open to aspiring as well as practicing innovators worldwide. After attending an IDDS, many alumni go on to teach collaborative design in their own communities and universities.

During 2014-2015, three summits took place, IDDS Tanzania in July, Rethink Relief in Pader, Uganda in November, and IDDS Zero Waste in Cali, Colombia in June.

This year, IDIN has explored several routes to better support design education initiatives in their different forms, whether by providing training and mentorship or developing resources. One way in which IDIN has supported these initiatives is by launching a design workshop pilot program to fund two IDIN Network members to lead one-day design workshops and document their curriculum and lessons. In the next year, IDIN hopes to learn from this experience to better advise and support design education initiatives across the Network.

Scaling IDIN's Approach

This year, IDIN also focused on scaling its approach—both by holding more summits and design trainings than ever before as well as by providing in-person and webinar-based trainings, expanding our capacity to disseminate IDIN's approach to teaching collaborative design and co-creation.

Research

IDIN research focuses on the role of local innovation and grassroots problem solving in improving community wellbeing and addressing development challenges associated with poverty. IDIN research is organized into three areas including:

- Local Innovation Processes and Ecosystems
- Development Impacts of Local Innovation
- Enabling and Scaling Local Innovation

See page 7 of this report for further details.

Looking Forward

In the next year, IDIN looks forward to holding International Development Design Summits in Para, Brazil (focused on livelihoods in the Amazon region); D'Kar, Botswana (focused on livelihoods of the San people); Bogota, Colombia (education-focused); Chennai, India (health-focused); Lahore, Pakistan (ICT-focused); and Kampala, Uganda (cookstove-focused).

IDIN Consortium partners in Zambia, Tanzania, Ghana, and Singapore also plan to use new training and resources to organize more Creative Capacity Building trainings throughout the year.

idin.org

Comprehensive Initiative on Technology Evaluation

In 2012, CITE was created as the first program dedicated to developing methods for product evaluation in global development.

Led by MIT's Department of Urban Studies and Planning, D-Lab continues to be an instrumental partner in ongoing product evaluation work, providing technical expertise, monitoring and evaluation, and communications support.

This year, longtime D-Lab instructor and water and sanitation expert Susan Murcott led CITE's evaluation on household water filters in Ahmedabad, India. As CITE's second evaluation, the water filter project assessed over 100 different water filter models in a complex, urban market. Under Susan's leadership, CITE researchers conducted nearly 400 interviews and surveys throughout Ahmedabad and conducted water quality tests of source water and filtered water in 698 households to understand how products compared to one another, and where the water filter market could be improved and optimized. The results of CITE's water filter evaluation will be published in Fall 2015.

D-Lab Evaluation Manager Kendra Leith continued to provide invaluable support to the CITE team this year. In her role as CITE monitoring and evaluation manager, Kendra continued to develop CITE's results-based monitoring and evaluation approach to assess the impact of the program's work. In addition, Kendra shaped CITE's evolving strategy for engaging core partners, which culminated in an annual partner convening in May 2015, driving decision-making for evaluations conducted in the upcoming academic year.

Led by Susan Murcott (right), the CITE household water filter evaluation team found that water filter products in the gravity non-electric and reverse osmosis categories are far more effective at filtering water. However, most are financially out of reach for Ahmedabad's poor. This leaves a gap in the market where CITE's research has identified opportunities to introduce existing solutions or to create entirely new ones.

cite.mit.edu

The D-Lab Youth Program includes D-Lab tours, hands-on hands-on activities, and design reviews for middle and secondary school students in the Boston-area and abroad. The program seeks to build the confidence and skills needed by the next generation of innovators from around the world.

d-lab.mit.edu/youth-outreach

D-Lab Youth

Hands-on learning D-Lab-style for middle & high-schoolers

Over the course of the year, the D-Lab Youth program worked with a team of five educators and reached over three-hundred youth from more than fifty classrooms. The program ran fifteen tours for youth and an additional five tours for educators and other professionals working with young people.

During the fall, the program offered six youth workshops and eleven more during the spring semester. Seven of these workshops were for international youth groups. In keeping with D-Lab's hands-on approach, every single young person that visited D-Lab in the spring semester made something!

Forty-three high school student designers came to D-Lab for design reviews. These reviews were in direct response to a growing demand of educators whose students were already working on design topics, associated with sustainability areas primarily, who were interested in having their students exposed to a design review-like experience with expert scientists and engineers.

Reviewers for the youth program included invited guests from D-Lab, the MIT Energy Initiative, MIT Media Lab, the International Design Center, the Edgerton Center, and the International Development Innovation Network (IDIN).

Finally, D-Lab Youth ran a Creative Capacity Building program in El Salvador and contributed to a curriculum development and training of trainers in Kenya focused on the design and current implementation of alternative energy.

Creative Capacity Building

Fostering creative potential, a sense of agency, self-efficacy, and empowerment.

D-Lab uses its Creative Capacity Building (CCB) methodology in classes at MIT, at International Development Innovation Network (IDIN) summits, with community partners, and in youth programs as well.

The goal of CCB is to train participants to create or adapt technologies that will improve their lives and strengthen their communities. The CCB curriculum, for people with any level of education or literacy, consists of three to five days of hands-on activities, skills-building sessions, design process lessons, and a team project that provides a framework for applying the design process to a real-life challenge, and culminates with the development of a functional prototype by the end of the training.

IDIN saw the greatest CCB activity in 2014-2015. Eighteen CCB trainings were provided to 410 participants in countries including Ghana, the Philippines, Tanzania, Uganda, the U.S., and Zambia. Of these trainings, two provided additional train-the-trainers sessions (in Ghana and the Philippines).

In January, a four-student team from the D-Lab: Development class traveled to Santa Ana, El Salvador where they engaged at-risk urban teenagers with CCB and co-creation workshops through D-Lab's community partner, ASAPROSAR.

In October, D-Lab laid the groundwork for a program with the Guatemalan social enterprise Soluciones Comunitarias (SolCom) for which D-Lab will offer CCB training to local SolCom staff, who in turn will offer CCB workshops to community members, providing them with the tools and design strategies to generate low-cost technologies that address local needs.

Two participants in a Community Capacity Building workshop in Botswana. This workshop was delivered by D-Lab founder and co-director Amy Smith along with D-Lab: Development students over MIT's Independent Activities Period in January of 2015.

d-lab.mit.edu/creative-capacity-building

D-Lab students, fellows, staff and associates use the D-Lab workshop to learn and hone shop skills using a variety of hand and power tools. Open 24/7 to trained users, the shop is used for both class and field projects. The students above are working together to build a prototype of a clay cookstove.

d-lab.mit.edu/workshop

D-Lab Shop

Make what you couldn't when you walked in.

The D-Lab workshop is one of the places where D-Lab students, staff, fellows, and associates bring technologies for the developing world to life.

Last year, approximately 150 students used the workshop to test ideas, build prototypes, and refine technologies designed to improve the lives of people living in poverty around the world. Dozens of prototypes are developed in the shop each year.

The D-Lab workshop, the heart and soul of D-Lab, is airy, colorful, well-equipped, and well-organized. The workshop includes:

- A large collection of hand and power tools
- Steel fabrication and welding tools
- An open shop with multiple workbenches
- A dedicated wood shop and long-term projects room

D-Lab attracts students who know their way around a shop as well as those who have never wielded a hammer. To support all students interested in learning to build things with their hands, the D-Lab shop features illustrated, poster-sized "Learn-Its" on types of adhesives, fasteners, and material selection, along with well-labeled hand and power tools of all kinds.

Resources like these help make it possible for both beginners and seasoned "makers" to get their prototypes made well, and made safely.

In addition to current D-Lab students, the workshop welcomed D-Lab alumni, D-Lab Scale-Ups fellows past and present, visiting inventors, as well as other D-Lab visitors and associates to use the shop to pursue international development-related projects.

WHERE IN THE WORLD IS D-LAB?

Abbreviation	Country	Capital City
ALB	Albania	Tiranë
ARM	Armenia	Yerevan
AUST	Austria	Vienna
AZER	Azerbaijan	Baku
BEL	Belgium	Brussels
BH	Bosnia-Herzegovina	Sarajevo
CRO	Croatia	Zagreb
CYP	Cyprus	Nicosia
CZ REP	Czech Republic	Prague
EQ GUI	Equatorial Guinea	Malabo
GER	Germany	Berlin
HUN	Hungary	Budapest
LEB	Lebanon	Beirut
LITH	Lithuania	Vilnius
LUX	Luxembourg	Luxembourg
MAC	Macedonia	Skopje
MO	Montenegro	Podgorica
NETH	Netherlands	Amsterdam, The Hague
RUS	Russia	Moscow
SER	Serbia	Belgrade
SLO	Slovakia	Bratislava
SLOV	Slovenia	Ljubljana
SWITZ	Switzerland	Berne
UAE	United Arab Emirates	Abu Dhabi
UK	United Kingdom	London

Through student and staff field work with community partners, our Scale-Ups Fellowship program, research projects, youth programs, and International Development Design Summits, D-Lab was active around the globe during 2014-2015 in countries including Botswana, Brazil, El Salvador, Ethipia, Ghana, Guatemala, Haiti, India, Myanmar, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Rwanda, Tanzania, Uganda, Zambia.

D-Lab Scale-Ups

International Development Innovation Network

CITE

MIT Scaling Development Ventures

U.S. GLOBAL DEVELOPMENT LAB Powered by USAID

MIT

Community Jameel

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