



D-Lab

Spring

2010

Development through
Dialogue, Design and Dissemination

D-Lab Offerings

Development

Introduction to
Int'l Development

D-Lab:
Development

D-Lab:
Urban

Design

Prototyping and
Product Development

D-Lab:
Design

D-Lab ICT

D-Lab
Health

Wheelchair
Design

Prosthetics
Design

Cycle
Ventures

D-Lab:
Energy

D-Lab:
Discovery

Dissemination

Implementation and
Business Models

D-Lab III:
Dissemination

Development
Ventures

Spring Class Overview

- Introduction
- Mini-Project
- Design Challenges
- Build-It Modules
- Case studies and guest lectures
- Design Review sessions
- Final Presentations

Course Goals

- To learn about the design process
- To develop technical solutions for underserved communities
- To practice creative design in a real-world context
- To learn hands-on prototyping and manufacturing skills
- To develop problem solving and critical thinking skills
- To recognize the potential impact of engineers in the world

Course Staff

- Instructors
 - Victor Grau Serrat
 - Amy Smith
- Teaching Assistant
 - Mike Kozlowski
- Shop Manager
 - Dennis Nagle
- Design Mentors

Course Logistics

- Main Text:
 - Out of Poverty by Paul Polak
- Other Texts:
 - Cradle to Cradle by William McDonough and Michael Braungart
 - The Fortune at the Bottom of the Pyramid by C. K. Prahalad
 - Small is Beautiful by Ernst Schumacher
 - Gaviotas by Alan Weisman

Course Logistics

- Prerequisite
- Design team meetings
- Meeting Space
- Work Space
 - Safety
 - Collaborative Use
- Attendance

Grading

- Class participation and attendance 15%
- Homework assignments and design notebooks 30%
- Mini project 10%
- Design review sessions 25%
- Final design/prototype 20%

D-Lab Projects: Soy Milk Maker















D-Lab Projects: Vac-Cast

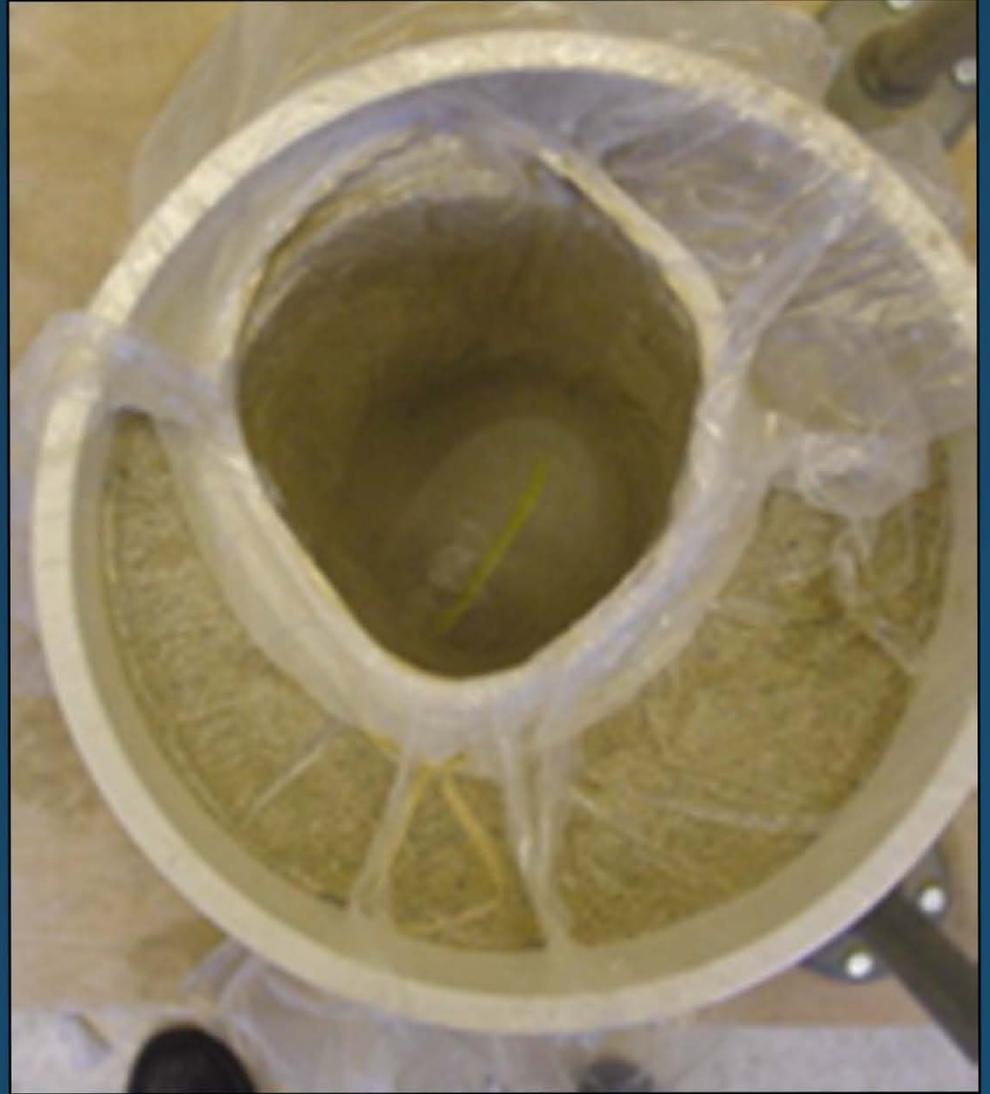
The Jaipur Foot Organization



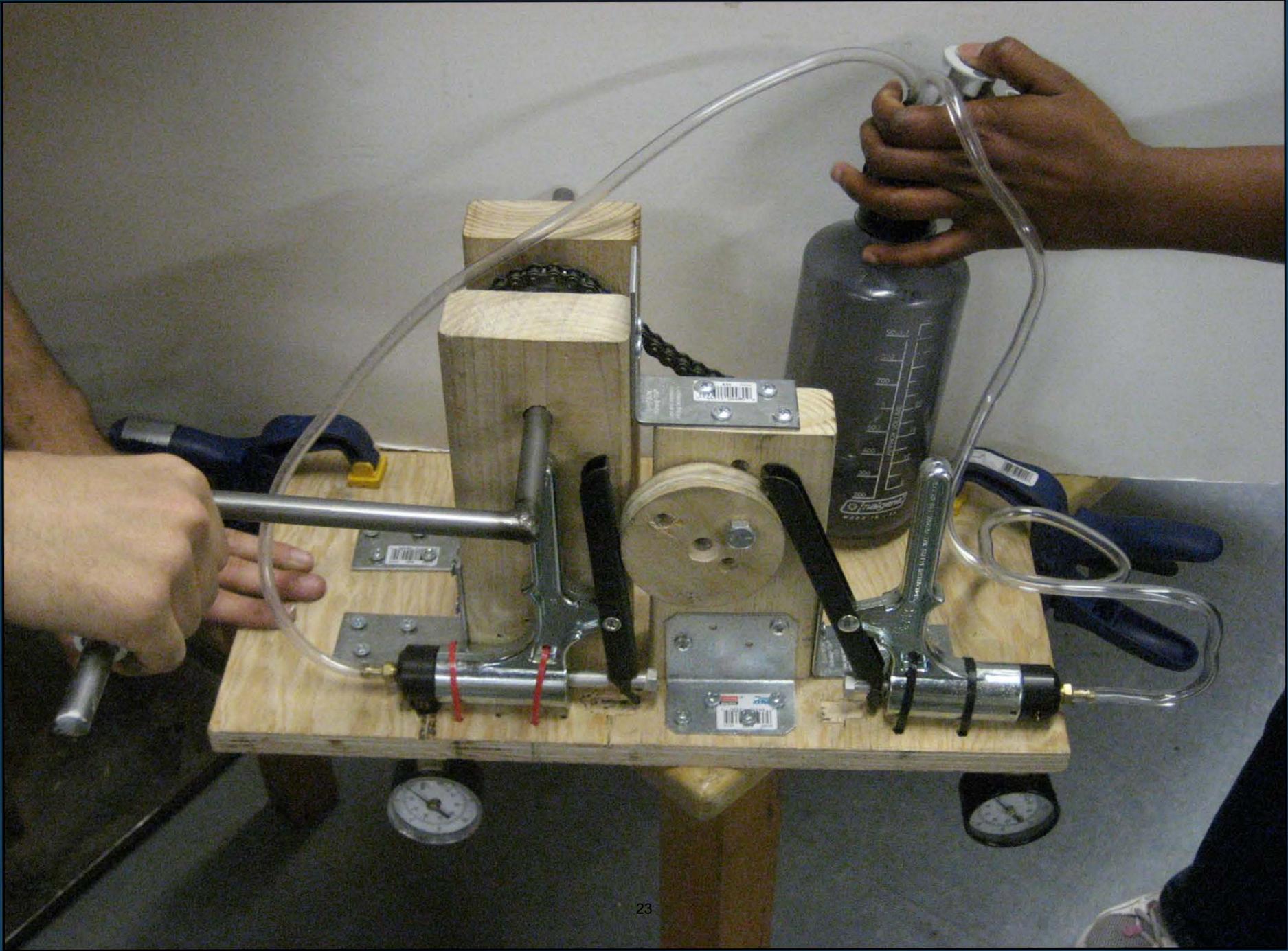
Courtesy of Dr. Pooja Mukul, Bhagwan Mahaveer Viklang Sahayata Samiti - Jaipur Foot Organization, Jaipur, India. Used with permission.















The D-Lab Philosophy

Traditional Approaches to Technology in Development

- 1950's & 60's: Industrial Development
- Urban focus
- Large scale manufacturing
- Competitive advantage of cheap labor
- 1960's: The Green Revolution
- Rural focus
- Large scale farming with hi-tech inputs

Movements that Shape D-Lab's Approach to Development

- 1970's & 80's: Appropriate Technology
- 1980's & 90's: Participatory Development
- 2000's: Creative Capacity Building (?)

Appropriate Technology

- Low cost
- Locally available materials
- Small scale
- Improves livelihood
- Can be understood, maintained and repaired locally
- Environmentally sustainable
- Open source

Appropriate Technology

Photos removed due to copyright restrictions:

- “Pot in Pot” for temperature controlled food storage
- treadle water pump
- weaving cloth on a home loom

Participatory Development



- Working with communities to identify needs and resources
- Decentralization of decision-making
- Building local capacity

Creative Capacity Building

- Promotes co-creation in the development context
- Enables people to be involved in the entire design process
- Builds upon Appropriate Technology and Participatory Development





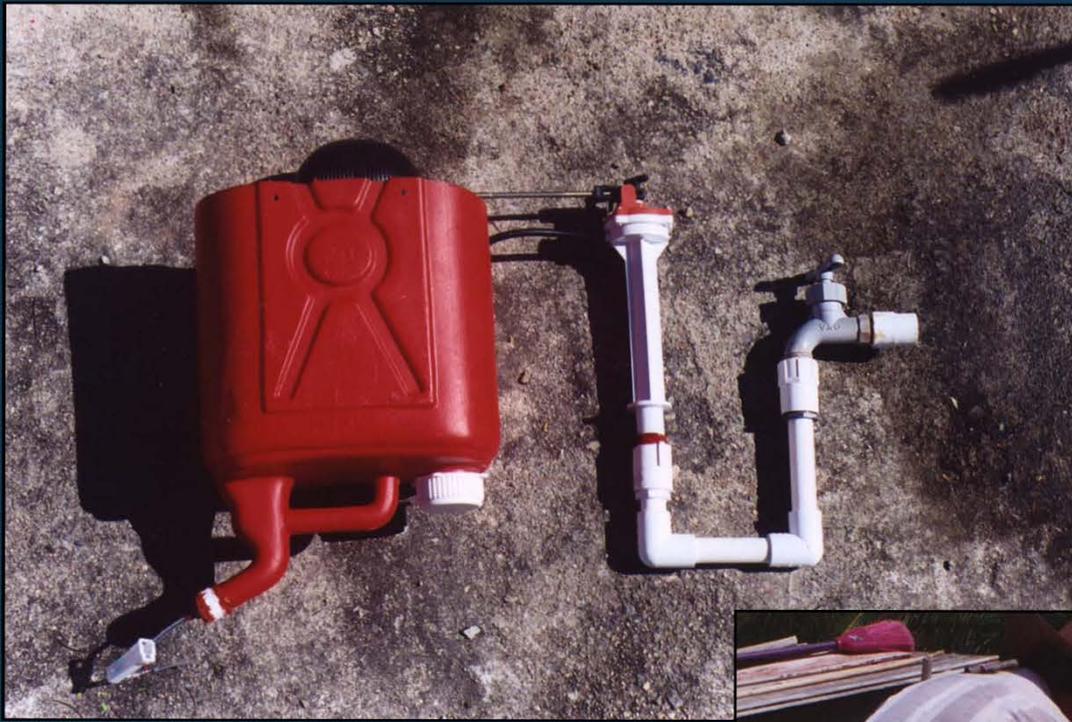




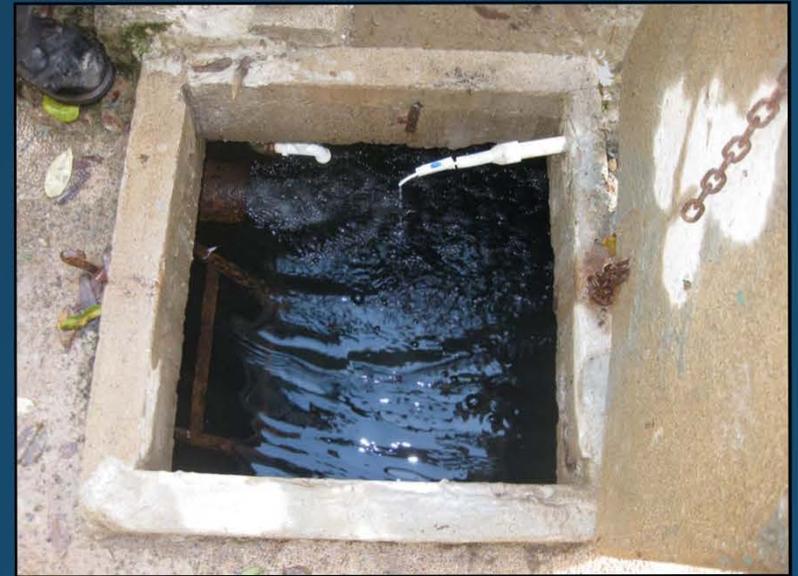


Chlorination System in Honduras









Community Involvement in Technology Development

Community Involvement

Problem



Community Involvement

Solution



Guiding Principles

- Identify functional requirements
- Encourage participatory development
- Value indigenous knowledge
- Promote local innovation
- Strive for sustainability

Design...

There's no solutions, there
are only trade-offs.

-- *T Sowell*

Design Boxes

- Which is your favorite example and why?
- What drove the design of each example?
- What trade-offs were made?

Coming up...

- Class Lottery-- results by e.mail on Friday
- Project Selection (Feb 24)
 - Design challenge descriptions due for review by Wednesday, Feb 17
 - Slides due by noon on Friday, Feb 19
- Readings on course website
- Homework 1 (due Feb 10)

MIT OpenCourseWare
<http://ocw.mit.edu>

EC.720J / 2.722J D-Lab II: Design
Spring 2010

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