SIGHT

Student Innovation for Global Health Technology

► SIGHT is an undergraduate education platform to transform passion and innovation of students into tangible solutions to healthcare problems around the world.

14 UG students
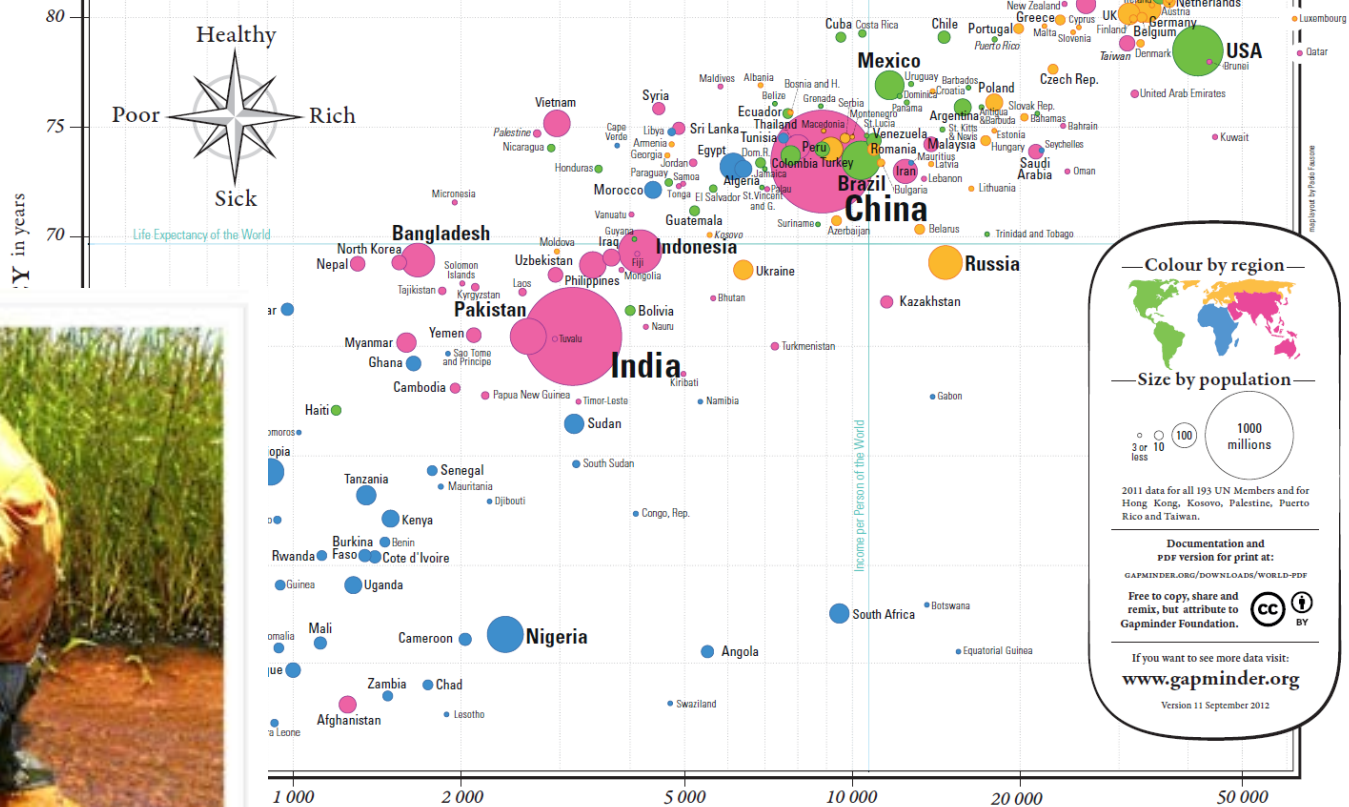(SENG/SCI/SBS/SHSS/IPO)

2 student mentors

1 NGO partner

2 ongoing projects

Launched in Oct 2014

GAPMINDER WORLD 2012
Mapping the Wealth and Health of Nations

Healthy

Poor — Rich

Sick

Life Expectancy of the World

Colour by region

Size by population

3 or less   10   100   1000 millions

2011 data for all 193 UN Members and for Hong Kong, Kosovo, Palestine, Puerto Rico and Taiwan.

Documentation and PDF version for print at:
GAPMINDER.ORG/DOWNLOADS/WORLD-PDF

Free to copy, share and remix, but attribute to Gapminder Foundation.

If you want to see more data visit:
www.gapminder.org

Version 11 September 2012

INCOME PER PERSON in US Dollars (GDP/capita, PPP$ inflation adjusted, log scale)

1 000   2 000   5 000   10 000   20 000   50 000

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DESIGN FOR THE OTHER 90%

Engaging Undergraduates in Global Health Technology Innovation

"Appropriate Design for Global Health," the IBI Prize–winning module, primes students to respond to global health challenges with novel technological solutions.

Rebecca Richards-Kortum,[1,2]† Lauren Vestewig Gray,[2] Maria Oden[1,2]

It takes only 90 minutes to fly from Miami to Port-au-Prince, Haiti, but the cities are a world apart. A baby born in Port-au-Prince is nearly 10 times as likely to die before age 1 as an infant born in Miami. Life expectancy on the island is almost 20 years shorter than in the United States. That such disparities persist despite renewed public and private commitments to improve global health illustrates the need for a new generation of innovators who recognize the challenges and can design and deploy new health-care technologies that are both highly effective and affordable (1). In response, we and others have developed educational programs to engage globally minded health-care innovators (2). Our approach is inspired by a Haitian saying that captures the essence of inquiry-based education: "'You don't learn to swim in the library; you learn to swim in the river."

We created Beyond Traditional Borders (BTB), a program to train undergraduates from all majors to work across disciplinary and geographic borders to design novel technology solutions to real-world global health challenges (3). This curriculum has been institutionalized as a minor in global health technologies at Rice University and has engaged more than 10% of the university's undergraduates in its classes. It has also been adapted for high school students (4).

The introductory inquiry-based module is "Appropriate Design for Global Health." Students learn to use the engineering design process to develop innovative technologies addressing global health challenges. To inform their designs, students learn about important global health issues, the framework to understand factors that limit and facilitate access to health technologies, and the role that new technologies can play in solving global health problems. Students also examine case studies of successful global health interventions (5).

Hit the road. Throughout the design process, students are mentored by health-care providers in the developing world. Exceptional students travel to the developing world to implement their designs in partnership with health-care professionals.

Design challenges are identified by partners who provide health care in low-resource settings. For example, one challenge was, "Develop an accurate method to determine hematocrit that does not require electrical power." Additional challenges can be found in the supplementary materials.

As teams design their solutions, they work to (i) define the problem, (ii) develop a solution, (iii) create and test a working prototype, and (iv) refine and present the solution. Health-care providers and engineers in the developing world and the United States mentor students, and they can revise their work appropriately. Through literature reviews and communication with mentors, students identify constraints that their solutions must satisfy. Guided by their own problem statements, teams design technologies that can be taken into the field and demon-

Get real. Students design technologies to solve real global health challenges. The efficacy of the student-designed bubble CPAP technology is now being evaluated in clinical trials in Malawi.

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*IBI, Science Prize for Inquiry-Based Instruction; www.sciencemag.org/site/feature/data/prizes/inquiry/.
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RICE 360°
Institute for Global Health Technologies

BEYOND TRADITIONAL BORDERS
Creating Leaders
Meeting Global Needs

d.
HASSO PLATTNER
Institute of Design at Stanford

Embrace a life: Make a change
20,000,000

SIGHT

Student Innovation for Global Health Technology

Simple Technology
BIG Difference

Cambodia Projects

Sanitation

Bioengineered foods

Medical devices

Drugs

Biological products

Mobile phones

Internet

Health technologies

Support systems

Organisational systems

Radio

Television

Medical and surgical procedures

Information communication technologies

Agricultural equipment

Technologies for health

Road safety technologies

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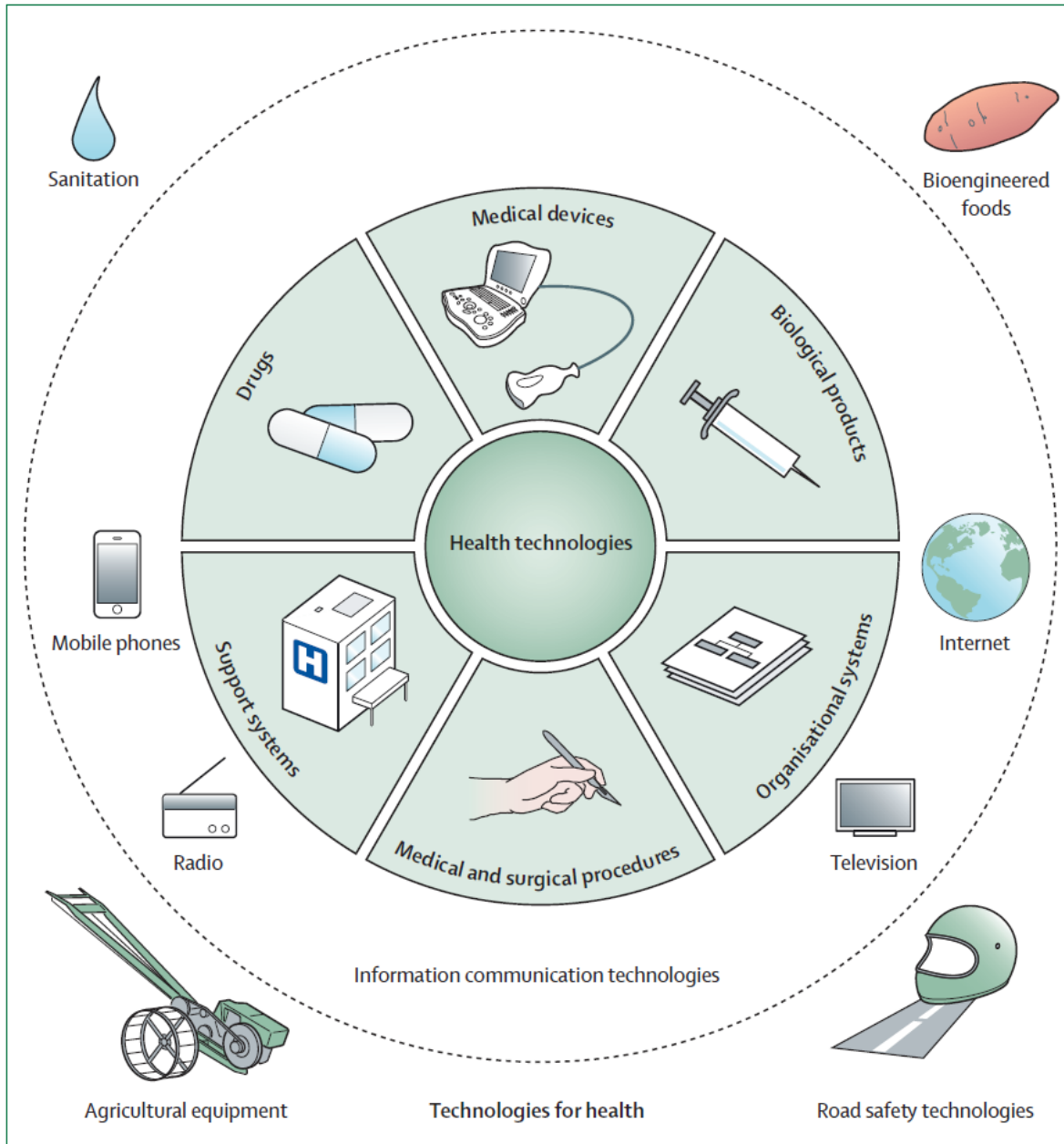
Student-driven projects ...

Design Thinking in practice…

Human-centered ….

Ongoing project:
Electronic Medical Record

#ecofriendly

HEAVY

Get **smudged**

Difficult to share

No data insights

Ongoing project: Electronic Medical Record

▶ A more efficient way to gather individual patient information and a real-time inventory system for its pharmacy.

BASIC FEATURES

* Fingerprint recognition for patient identification

* Inventory management

* Access from anywhere in the world

* Works on-field without In-ternet facility

* Vaccination, out-of-stock alerts

FIELD SETUP

Triage

Local Server

Consultation   **Pharmacy**

Backup Server

WEB SYNC

Local Server

Update before field visit

Sync after field visit

Web Server
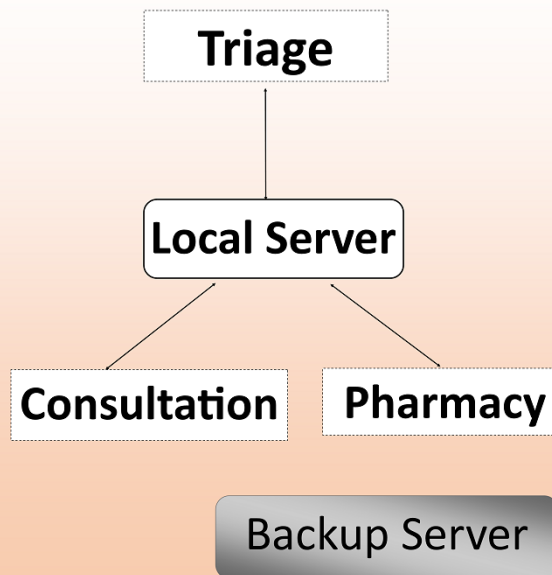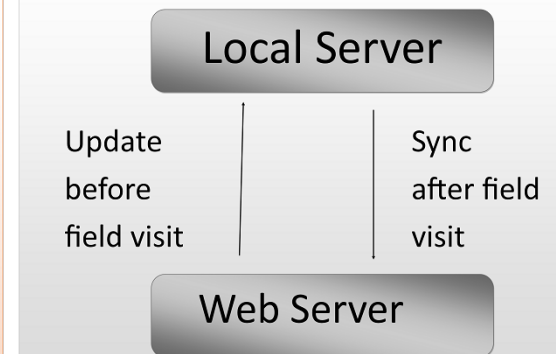
First On-site implementation in Cambodia June, 2015

Ongoing project:
Portable Pharmacy Station

- ▶ Unorganized packing of the medication

- ▶ No control on storage condition of the medication

- ▶ Easily broken roller wheels

- ▶ An extra table required

Ongoing project:
Portable Pharmacy Station

▶ A way to keep the pharmacy organized and reduce the time for pharmacy setup
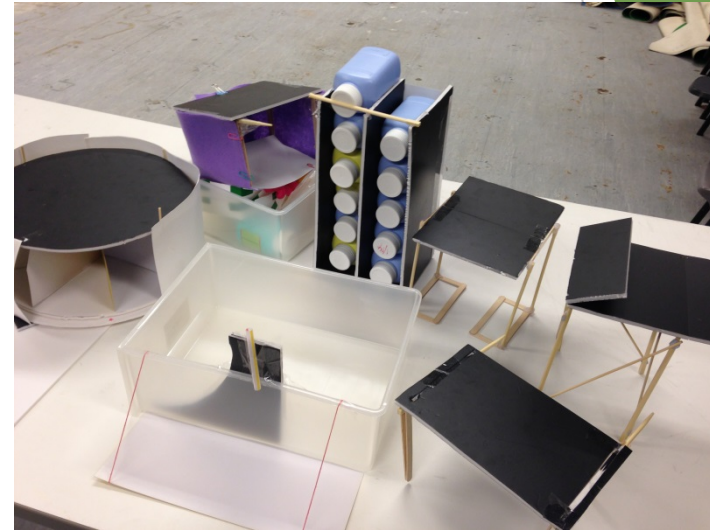
First On-site implementation in Cambodia June, 2015

$\mathbf{S^+IGHT}$
Student Innovation for Global Health Technology

Join us!

Student member recruitment for spring 2015

About SIGHT

Initiated in 2014, SIGHT is an undergraduate education platform to transform passion and innovation of students into tangible solutions to healthcare problems around the world. SIGHT believes in students' creative power, and dedicates to inspire and empower students to develop health technology for sustainable implementation in developing areas.

Join us, if you are

- A UG student from any background passionate about transforming ideas into real impacts;
- A challenge-taker ready to confront and contribute to global health issues;
- A committed group member willing to put SIGHT on top priority;
- A team worker appreciating and growing upon each other's knowledge;
- A humble person who will listen to the underprivileged and see them equal; and
- A global citizen across borders of different disciplines, geographical regions and culture diversity.

Briefing Session

6:00-6:30 pm, Nov 11 (Tue), Rm 2504 (Lift 25/26)

How to apply

Please send your CV together with a short statement on why you are interested to join the program to sight@ust.hk by Nov 18 (Tue).
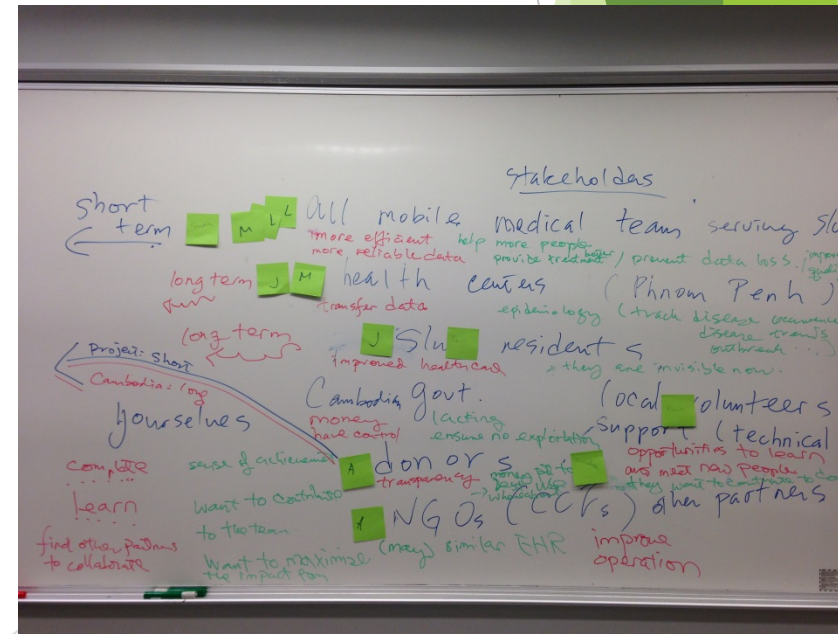
For details of student projects and recruitment arrangement, please come to the briefing session and visit our website http://sight.ust.hk/.

Simple Technology · **BIG** Difference

Student Team Dynamics (or how to sustain the passion)

- Team building
    - Especially important for interdisciplinary teams
- Design Thinking Approach
    - Empathy – Fast Prototyping – Collaboration
- Carefully planned goals and checkpoints
    - Challenging yet achievable
- Team member role linked to academic training
    - Everyone on the team must contribute
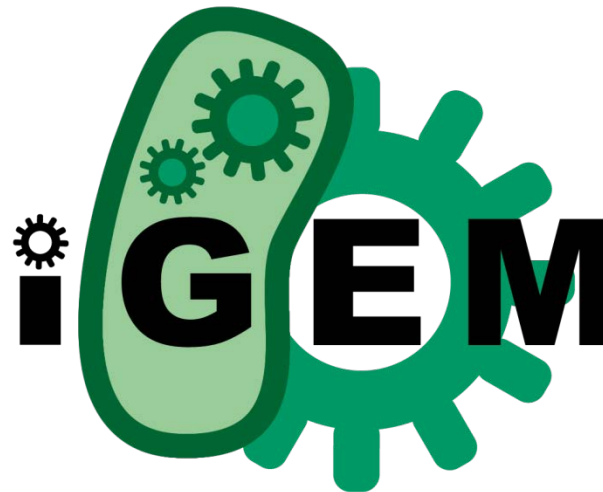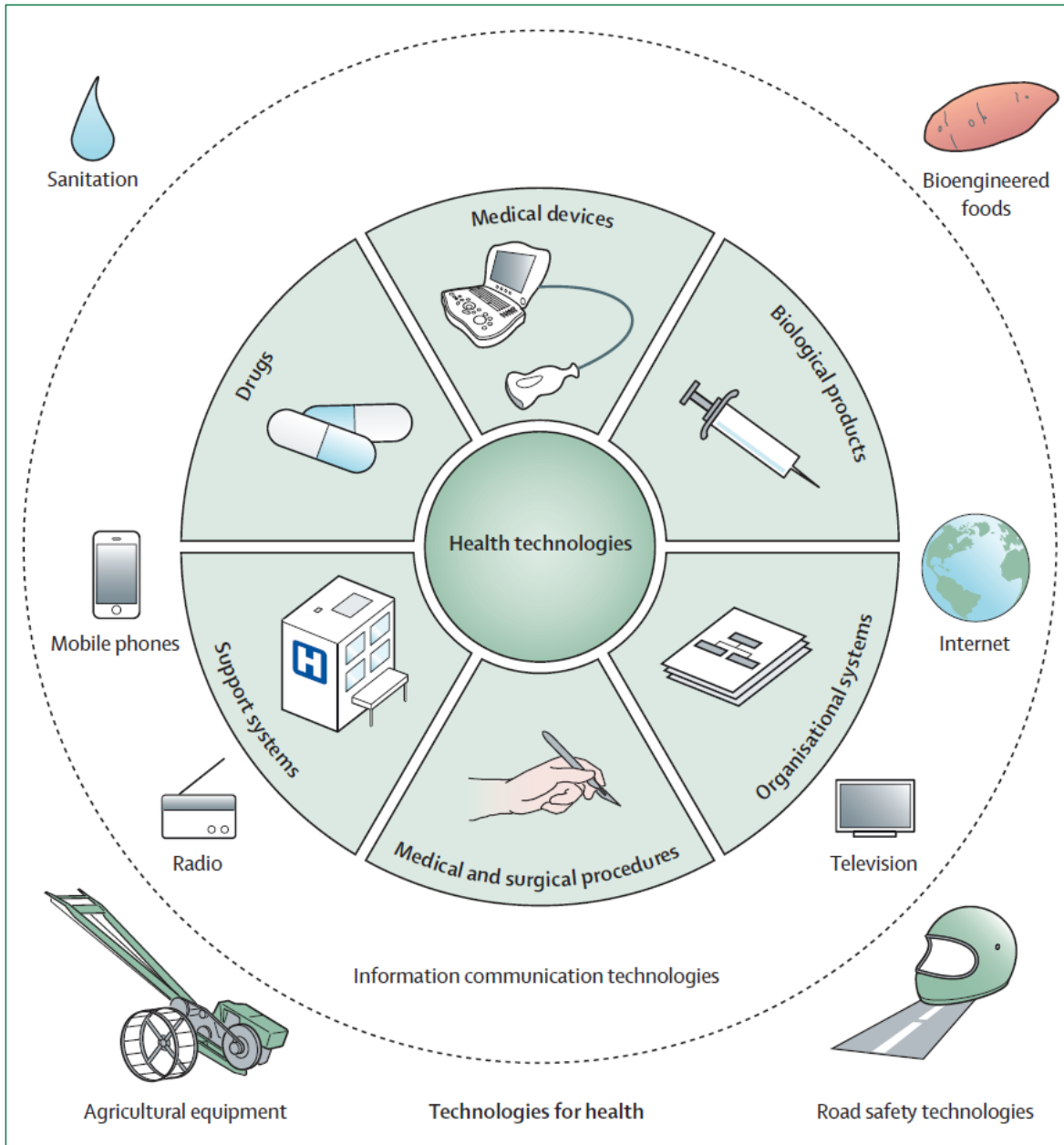- Channels for communication and reflection
- Project expansion and transition

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SPECIAL
JOURNEYS
ONLY

Trimodal

CSE One

Sanitation

Bioengineered foods

Medical devices

Drugs

Biological products

Health technologies

Mobile phones

Support systems

Organisational systems

Internet

Radio

Medical and surgical procedures

Television

Information communication technologies

Agricultural equipment
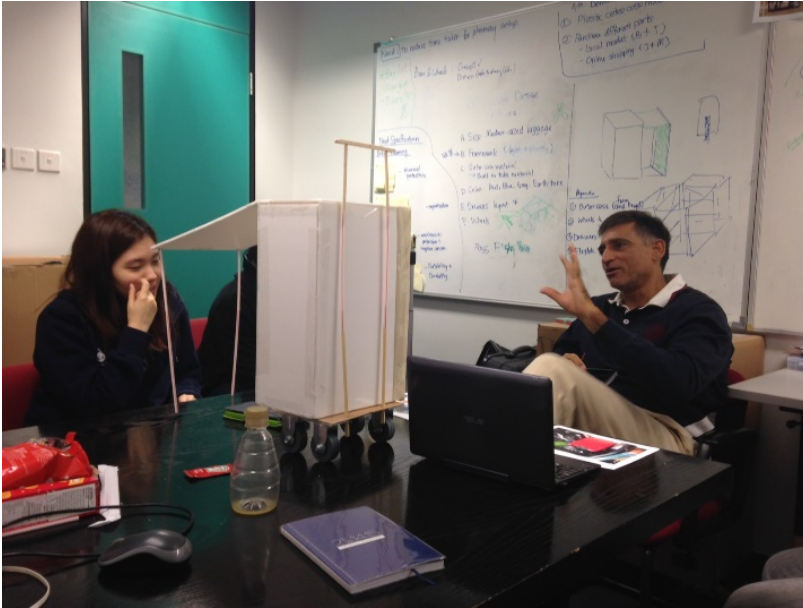
Technologies for health

Road safety technologies

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Advisors

> 26 advisors from SCI, SENG, SBS and SSHS with expertise spanning biosensors and biomaterials, environment, ICT, innovation management, product design and prototyping, and nutrition and human health
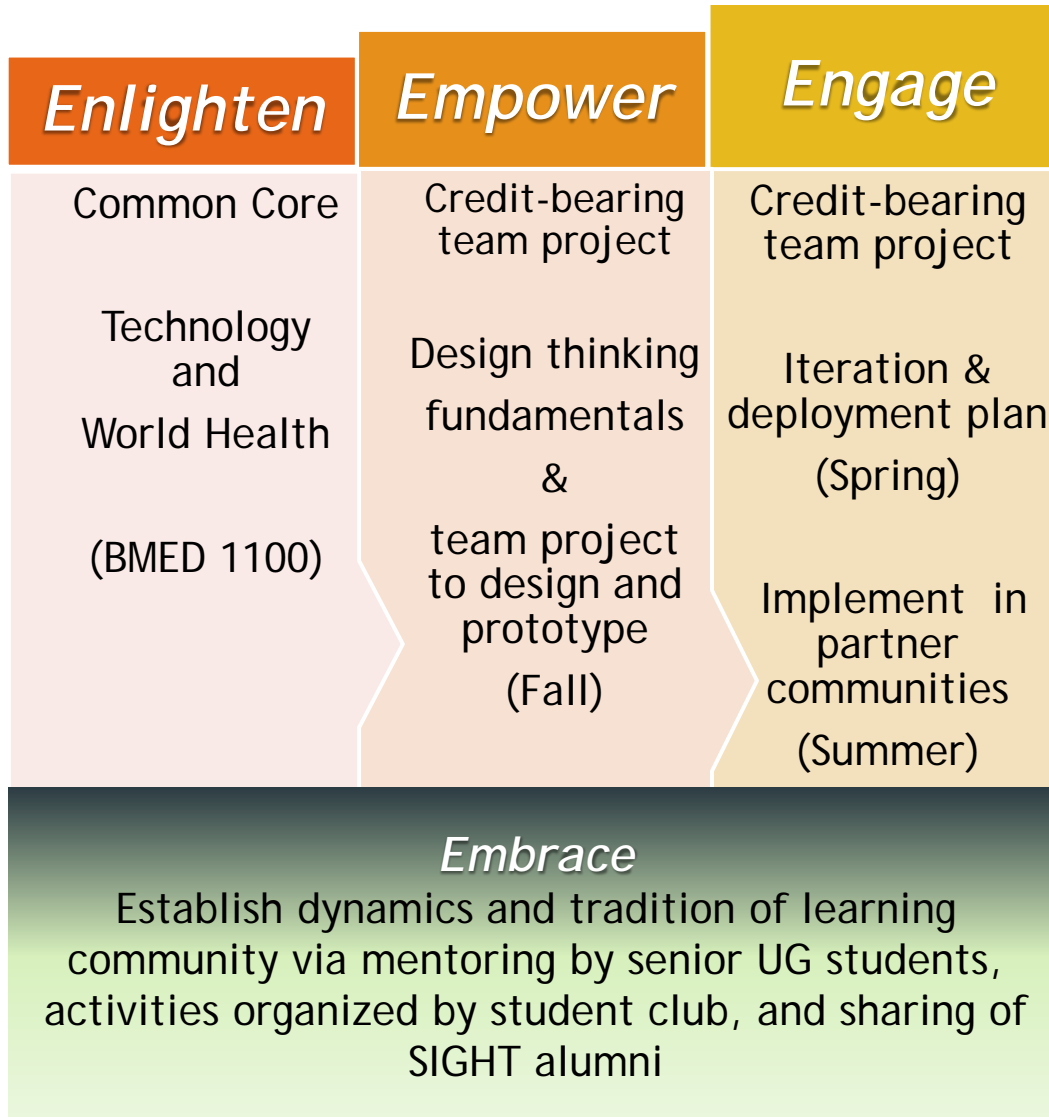
Mission of SIGHT

Student Innovation for Global Health Technology

▶ To inspire and empower UG students to brainstorm and create health technology innovation for sustainable implementation in developing regions around the world

▶ To engage interdisciplinary strengths of university for UG education

▶ To channel student innovations to global communities

▶ To develop tomorrow's leaders who are visionary, creative, socially responsible and collaborative
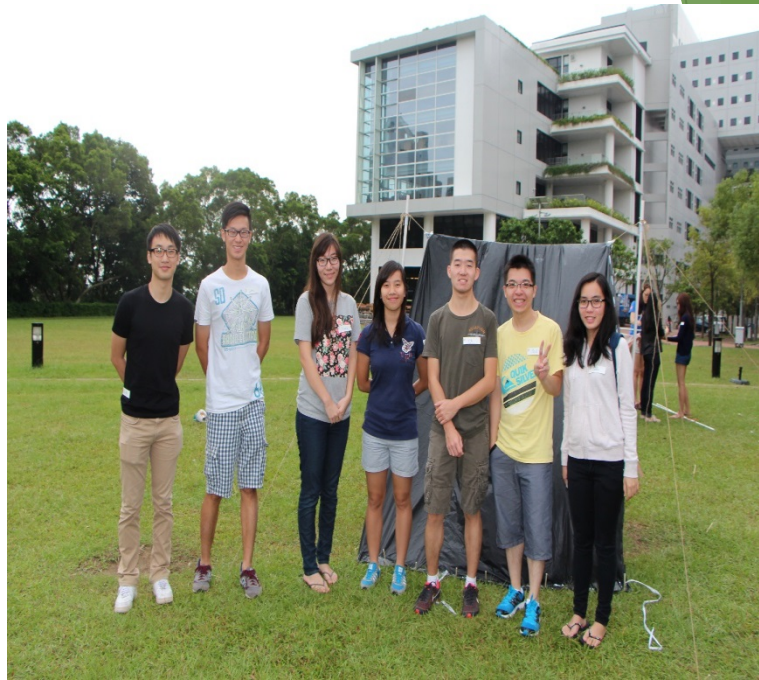
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"4E" Approach

Enlighten	Empower	Engage
Common Core Technology and World Health (BMED 1100)	Credit-bearing team project Design thinking fundamentals & team project to design and prototype (Fall)	Credit-bearing team project Iteration & deployment plan (Spring) Implement in partner communities (Summer)

Embrace
Establish dynamics and tradition of learning community via mentoring by senior UG students, activities organized by student club, and sharing of SIGHT alumni

BMED 1100 Class activity Canopy Challenge

	Easy-to-Use Canopy Providing Temporary Shelter (<1 day) for Mobile Medical Service		Team 1	2	3	4	5	6	7	8
	Important Characteristics	Measurable	Points (the best team gets 8 points, the last team gets 1 point)							
Performance in transportation & set up	Students will carry all materials from Atrium to lawn area outside LG7		n/a							
	Light	Weight (balance)								
	Compact	Volume (L*W*H) in folded state (ruler)								
	Easy to set up	Time taken to set up canopy (timer)								
Performance in use	UV block	UV strength I/O ratio (UV meter)								
	Ventilation	Smoke dissipation time I/O ratio (smoke generator, timer)								
	Heat block	Temperature difference= O-I (thermometer)								
	Waterproof	All team members stand inside. 30s water spray. Leaky 0; slightly leaky 4; not leaky 8.								
	Windproof	Maximal tolerable lateral pulling force (spring balance)								
Cost	Low cost	Cost proved by receipt								
Total										

Team A

Team B

Team C

Team D

Team E

Team F

Team E

Dr. Annie's Comment on the Winning Team

Simple Technology BIG Difference

WEBSITE: SIGHT.UST.HK

"SIGHT AT HKUST"