“Nothing is a mistake. There is no win and no fail. There is only MAKE.”

Stanford d.School

Intro to Human-Centered Design for Social Impact

Matt Nash, I&E, CASE, SEAD
Duke I&E Mission Statement

The Duke Innovation and Entrepreneurship Initiative brings to life and deepens Duke’s enduring theme of *knowledge in the service of society*.

We seek to make Duke an *agent of transformation* through an entrepreneurial spirit, generating innovations from the ideas that grow at the university and translating those innovations to *positively impact individuals, communities, institutions and societies*.

We seek to *inspire and prepare all members of the university* community for *innovative leadership* and to actively support and encourage the translation of knowledge in the service of society.
Themes of I&E Initiative at Duke

**Education**
- Curriculum development
- Summer programs
- Co-curricular activities

**Research**
- Inquiry into inputs and processes behind I&E
- Duke/Region as test-bed

**Translation**
- Support venture creation
- Resourcing
- Mentorship and training

**Social Innovation & Entrepreneurship**
Leveraging our strengths to become a world leader in the design, development, deployment and scaling of social innovations

**Horizontal and Vertical Growth**
Regional and National Partnering • Alumni Engagement
A Bold Vision for SI&E at Duke

- Duke will be the global leader in promoting innovative, sustainable solutions to the world’s most pressing problems
  - Create a transformative learning environment to inspire, prepare, and support entrepreneurial leaders and scholars to turn knowledge into action in addressing critical social and environmental challenges
  - Have an impact on ALL Duke students
Preparing Students for a Lifetime of Innovation and Leadership for the Public Good

• Continue to **innovate, collaborate, and lead** in developing field of SI&E education

• **Target prospective students** who aspire to be entrepreneurial leaders in serving the public good

• Create **new courses** aligned with **certificate(s)**; integrate into courses in other disciplines

• Establish **distinguished faculty chair(s)**; support cohort of **professors of the practice and lecturers**

• Appoint distinguished **social entrepreneur in residence**
Provide World-Class Experiential Learning, Co-Curricular Programs

- Create new *practica, fellowships, internships*

- Support *speakers series, workshops, career planning support, mentoring*, linkage to alumni

- Provide *coaching, funding, and incubation* support to aspiring student social entrepreneurs

- Feature *human centered design* for social impact
What is a Social Innovation?

- “A novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals.”
  – Phills et al, 2008
WE CANNOT SOLVE OUR PROBLEMS WITH THE SAME THINKING WE USED WHEN WE CREATED THEM

-Albert Einstein
What if students weren’t defined by their major, but by what problem they were solving?

WHAT PROBLEM ARE YOU SOLVING?
Human Centered Design

An approach to solving design problems by understanding users’ needs and developing insights to solve those needs

Mindset:
• Only through contact, observation & empathy with end-users can you hope to design solutions that fit into their environment
The Design Discussion.
Questions for all of us.

An increasing number of design and business schools (and private sector firms) are working to add meaningful design thinking education, in order to meet the growing demands of companies seeking graduates with new and more creative skills to their workforce. DMI is conducting a benchmark analysis of programs, vocabulary, tools and curricula for training design leaders globally and ultimately defining the future path of design education in both business and design graduate programs. Visit DMI.org/FutureED

The 3 Gears of Business Design

Empathy and Deep Human Understanding

Levels of Design
- **DESIGN STRATEGY**
  Broad Goals with Social/Cultural Corporate implications
- **DESIGN MANAGEMENT**
  Directing designers and interdisciplinary teams
- **DESIGN PLANNING**
  Products Information Services
- **DESIGN EXECUTION**
  Converting strategy and insights into objects images and action

**Design Thinking**
...is a system that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business can convert into consumer value and market opportunity.

**Design Thinking Principles**

- **Empathy**
  360° Understanding, Involving the Problem
- **Invention**
  Creativity, Ideation, Synthesizing Complexes, Visualizing Solutions
- **Iteration**
  Disciplined Process & Tools
- **Efficiency**
  Service Design, Experience Design, Fashion

Big D and Little d

D = Strategy, System, Service

d = Industrial, Interior, UX, Graphic, Planning

http://www.dmi.org/?WhatIsDMI
Human Centered Design Aims for Solutions at the Intersection of 3 Key Considerations

**Desirability**
- What do people desire?

**Feasibility**
- What is technically and organizationally feasible?

**Viability**
- What can be financially viable?
There Are Various Design Methodologies

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Design Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooper Hewitt</td>
<td>Identify</td>
</tr>
<tr>
<td>iDesign Thinking</td>
<td>Intending</td>
</tr>
<tr>
<td>D School</td>
<td>Empathise</td>
</tr>
<tr>
<td>IDEO</td>
<td>Discovery</td>
</tr>
<tr>
<td>Design Minds</td>
<td>Inquire</td>
</tr>
</tbody>
</table>
Design for America

IDEO Design Process

1. DISCOVERY
   I have a challenge. How do I approach it?

2. INTERPRETATION
   I learned something. How do I interpret it?

3. IDEATION
   I see an opportunity. What do I create?

4. EXPERIMENTATION
   I have an idea. How do I build it?

5. EVOLUTION
   I tried something. How do I evolve it?
The Design Thinking process oscillates between divergent and convergent thinking modes. It can be helpful to be aware of the needs that correspond to the design phase you are working through.
Stanford d.School

Learn about the audience for whom you are designing, by observation and interview. *Who is my user? What matters to this person?*

Create a point of view that is based on user needs and insights. *What are their needs?*

Brainstorm and come up with as many creative solutions as possible. *Wild ideas encouraged!*

Build a representation of one or more of your ideas to show to others. *How can I show my idea? Remember: A prototype is just a rough draft!*

Share your prototyped idea with your original user for feedback. *What worked? What didn’t?*

https://www.blendspace.com/lessons/JUzWC56LG7jVRQ/design-thinking
An Approach to Human Centered Design (IDEO HCD Toolkit)

HEAR
During the Hear phase, your Design Team will collect stories and inspiration from people. You will prepare for and conduct field research.

CREATE
In the Create phase, you will work together in a workshop format to translate what you heard from people into frameworks, opportunities, solutions, and prototypes. During this phase you will move together from concrete to more abstract thinking in identifying themes and opportunities, and then back to the concrete with solutions and prototypes.

DELIVER
The Deliver phase will begin to realize your solutions through rapid revenue and cost modeling, capability assessment, and implementation planning. This will help you launch new solutions into the world.
The Design Process In Theory...

- UNDERSTAND
- OBSERVE
- SYNTHESIZE
- IDEATE
- PROTOTYPE
- ITERATE
In Practice...

UNDERSTAND

OBSERVE

SYNTHESIZE

IDEATE

PROTOTYPE

ITERATE
Design principles can both encourage and constrain technologists, scientists, and designers who are considering solutions to wide-reaching problems. In this handbook, we refer to UNICEF’s “Principles for Innovation and Technology in Development.” These principles are not intended as hard and fast rules, but are shared as best practices that inform the design of technology-enabled development programs.

- Design with the User
- Build for Sustainability
- Reuse and Improve
- Understand the Existing Ecosystem
- Be Data Driven
- Do No Harm
- Design for Scale
- Use Open Standards, Open Data, Open Source, and Open Innovation
- Be Collaborative
Identify a Design Challenge

A good Design Challenge should be:

» Framed in human terms (rather than technology, product, or service functionality)

» Broad enough to allow you to discover the areas of unexpected value

» Narrow enough to make the topic manageable
Let’s Take an Example...

Urbanization is continuing to drive people all over the world into crowded spaces.
Crowded Urban Spaces

Almost **1.5 billion people** living in crowded spaces worldwide are struggling. People **don’t make enough money**, they can’t reach where they need to be, and they are **living in unsafe spaces** that lack infrastructure and connection to basic services.
Understanding the Problem: 5 W’s

- Who is affected?
- What is happening?
- Where is the problem localized?
- When did it start or get worse?
- Why is the problem happening?
- How have others tried to address the problem before?

Almost 1.5 billion people living in crowded spaces are struggling

People don’t make enough money to afford what they need
People can’t reach where they need to be
Crowded spaces lack infrastructure and basic services
Structures are informal, dense, and sometimes unsafe

Urbanization is continuing to drive people all over the world into crowded spaces

Limited income damages individual prosperity and broader economic productivity

Low-productivity and insufficient employment create a cycle of poverty that takes generations to break
Inefficient markets stunt growth and well-being in communities as well as national development

Governments and NGOs are unable to increase income for the urban poor

Governments focus on supply-side solutions providing services and distributive equality
NGOs and traditional non-profits bypass market forces with supply-side solutions

Social enterprises may be the best option to address this issue

However, building successful social enterprises in crowded spaces will be difficult

Living in poverty is stressful
Earned equality and market forces can be exclusionary
Social enterprise operations are difficult to manage
Partners across the value chain are difficult to work with dependably
TOOL: The Mind Map

http://www.rillmzks.tk/mind-map/
TOOL: The Problem Tree

- Visual problem analysis tool to specify and investigate the causes and effects of a problem and to highlight the relationships between them.

- The output is a graphical arrangement of problems differentiated according to ‘causes’ and ‘effects,’ joined by a core, or focal, problem. Resembles a tree.

- This technique helps understand the context and interrelationship of problems, and the potential impacts when targeting projects and programs toward specific issues.
Example Problem Tree

Example Problem Tree: Malnutrition Under 5

http://www.fao.org/docrep/008/y5793e/y5793e04.htm
While not all crowded urban spaces are illegal, many, including the slums that house one billion people worldwide, are informal. This means people living in these areas lack support from the government and access to utilities and legal tenure.
Exercise

1. What key problem are you trying to address?
2. What are the root causes and complicating factors?
3. What are the effects?
For more information, see http://www.hultprize.org
To compete in Duke round, register at http://www.hultprizeat.com/duke
President’s Challenge 2016:

Can we build sustainable, scalable, and fast-growing social enterprises that double the income of 10 million people living in crowded spaces by 2022 by better connecting people, goods, services, and capital?
The 2016 Hult Prize is asking you to design a social enterprise that improves connectivity and doubles the income of the urban poor who may live in megacities, slums, or refugee camps.

How you make connections is up to you. The key is providing solutions that meet two criteria:

1) doubling the income of people living in crowded urban spaces, and

2) running a profitable enterprise that meets market needs.

Ways to create connection may include:

**CONNECTING PEOPLE:**
finding new ways to move people from one location to another with transportation or other mobility solutions

**CONNECTING GOODS:**
creating new delivery systems that lower costs and increase efficiency

**CONNECTING SERVICES:**
identifying channels to make services more available and accessible with technology or other network solutions

**CONNECTING CAPITAL:**
making the right capital available for the right people at the right time including the management of remittances and business capital

These types of connections may form solutions that meet any variety of basic human needs. The winning social enterprise will have significant and measurable impact on increasing income for those living in poverty in crowded urban spaces.

A list of questions to help develop a good winning business solution is provided overleaf. The social enterprise should have a sustainable business model. It should increase income opportunities. It should have staged implementation and clear milestones. Overall, the winning solution should scale rapidly to double the income for an ever increasing number of people in a relatively short time, reaching 10 million people by 2022.
Building Successful Social Enterprises

To develop a business, leverage leading practices from other companies, non-profits, and social enterprises. Different industries may have key insights to find growth and opportunity in new areas. In this section, you’ll find general guidance that may help you pressure test your concept and ideas.

**DEVELOP STRONG CHANNELS**
- Tap existing channels that reach consumers quickly
- Leverage technology and new opportunities
- Create connections that add value in the market

**BUILD ENTERPRISES WITH LOCAL PARTS AND KNOWLEDGE**
- Use supplies that are available where your consumers are
- Apply insight and knowledge of the community
- Hire and retain local talent
- Provide attractive options like wages, training, and perks

**UNDERSTAND YOUR CONSUMERS**
- Recognize behavioral motivation and incentives
- Identify targeted segments
- Build trust and reliability
- Consider your employees and micro-franchisees your consumers

**CONNECT PEOPLE, GOODS, SERVICES, AND CAPITAL**
- Offer solutions that are the right-size for your consumers
- Focus on human-centered design meeting basic needs
- Consider the importance of mobility and accessibility

**CREATE VALUE**
- Provide win-win value propositions for partners
- Offer business models with flexibility for volatile incomes
- Generate revenue - this is a business
- Identify network and ecosystem opportunities beyond your own business
Social Enterprises Unite Social and Market Principles

Figure 11. Social enterprises unite social and market principles

- Use existing channels
- Find customers who can pay
- Pursue revenue and sustainability

- Pursue large untapped markets
- Find demonstrable potential
- Provide improved quality and better reliability

- Serve the world’s least fortunate
- Tackle humanities greatest challenges
- Offer better availability and affordability
Hult Prize Guiding Questions

More Income

- Do people have more/better access to earning additional income?
- Is the income secure?
- Does any additional employment reflect standards of quality and decency?

Better Outcomes

- Do products/services improve the lives of those living in crowded urban spaces?
- Do solutions create network effects (agglomeration economies)?
- Are resources used responsibly?
- Does the outcome break the cycle of poverty?

More Empowering

- Is the social enterprise not predatory or exploitative?
- Does the mission serve consumers and employee needs?
- Are people in a better position to participate in the broader market economy?

Better Connectivity

- Has the social enterprise improved efficiency of the local value chain?
- Are resources more accessible - by quantity or proximity?
- Is life better for those that have been connected?
- Do people have more freedom and mobility?
Frame Your Design Challenge

What is the problem you’re trying to solve?
Improving the lives of children.

1) Take a stab at framing it as a design question.
How might we improve the lives of children?

2) Now, state the ultimate impact you’re trying to have.
We want very young children in low-income communities to thrive.

3) What are some possible solutions to your problem?
Think broadly. It’s fine to start a project with a hunch or two, but make sure you allow for surprising outcomes.

   Better nutrition, parents engaging with young kids to spur brain development, better education around parenting, early childhood education centers, better access to neonatal care and vaccines.

4) Finally, write down some of the context and constraints that you’re facing.
They could be geographic, technological, time-based, or have to do with the population you’re trying to reach.

   Because children aren’t in control of their circumstances, we wanted to address our solution to their parents.
   We want a solution that could work across different regions.

5) Does your original question need a tweak? Try it again.
How might parents in low-income communities ensure children thrive in their first five years.

FROM:
The Field Guide to Human-Centered Design. IDEO, 2015

http://www.ideo.com/work/human-centered-design-toolkit/
Craft a Challenge Statement

How can we...

Framing the right question is halfway to finding the right solution!
Challenge Statements Should Include

- User
- Location
- Behavior
EXAMPLE:

How can we make it easier for **doctors and nurses** to sanitize their hands in a patient’s room?
Challenge Statements + Insights:

Tidbits of information that are surprising or powerful, and that are directly applicable to your team’s future direction or solution.
Example Insight:

When trying to reduce the amount of hospital-acquired infections....

Observations:
1) Dr.’s and nurses touch a lot of things in a patient’s room
2) Hand sanitization happens when entering and leaving room
3) Washing hands at the in-room sink takes too long

Insight:
Doctors and nurses don’t have access to quick hand sanitization sources in patient rooms!
Hand hygiene. Redefined.

Consistent hand hygiene is the first and most important action caregivers make in the battle against hospital-acquired infections.

However, despite diligent efforts, the annual statistics on affected patients and the costs for infection control are staggering. That changes now.
The complete hand hygiene solution

The SwipeSense System combines point-of-care hand hygiene with real-time usage data to eliminate dependency on manual observations and increase compliance with infection control procedures.
Create Insight Statements


http://www.ideo.com/work/human-centered-design-toolkit/

Write Your Design Challenge

Our design challenge is to make the eToilet experience more intuitive, user-friendly, and safe.

Theme: Women’s needs

Insights:
1. Women want a private space in which to enter and exit the toilet.
2. Women greatly prefer single-sex toilets, but may still use unisex if they are clearly labeled.
3. Most women are forced to dispose of sanitary products by flushing them down the toilet.

Theme: Cleanliness

Insights:
1. Cleanliness is the defining quality of any toilet experience.
2. Without proper maintenance, toilets will become dirty very quickly.
3. Most people feel that free toilets are dirtier than paid ones, but many are still more likely to use a free toilet.

Theme: Reliability

Insights:
1. Reliability drives routine and gets people to return and use facilities frequently.
2. The people who live and work near a public toilet play a crucial role in directing users toward or away from it.
3. Most people care more about basic functionality than extra technology.
Create How Might We Questions


Turn Your Insights Into How Might We Questions

Insight:

Women want a private space in which to enter and exit the toilet.

**How might we create a private zone for women before they fully exit the toilet?**

Insight:

Without proper maintenance, toilets will become dirty very quickly.

**How might we design toilets to be easily serviced and maintained?**

Insight:

The people who live and work near a public toilet play a crucial role in directing users toward or away from it.

**How might we create an experience that will drive the surrounding community to encourage more use?**
How Can We Gather Information & Insights?

• Secondary Research

• Interviews
  – “Expert” Interviews (users, subject matter experts, stakeholders, key informants)
  – Group Interviews

• Observation

• Immersion
Outputs of the Hear Phase

- Peoples’ stories
- Observations of constituents’ reality
- Deeper understanding of needs, barriers, & constraints
Value Proposition Design

Clearly communicates the benefits of an innovation for a specific customer/beneficiary group.

• Easy to understand & focuses closely on what the targeted customers *really care about, want, and value*

• Consider:
  – What are your *“pain killers”*?  
    • A pain is a customer problem or need
  – What are your *“gain creators”*?  
    • A gain is a benefit or outcome
  – What *“jobs”* do you fulfill?***  
    • Things the customer is trying to get done
  – Who is *willing to pay* for this value?
Value Proposition Design


See also Business Model Generation website, Strategyzer, www.businessmodelgeneration.com
Value Proposition Canvas

Product

Benefits

Experience

Features

Customer

Gains/Wants

Pains/Fears

Jobs/Needs

Substitutes

Company:

Product:

Ideal customer:

http://www.peterjthomson.com/2013/11/value-proposition-canvas
Resources

• **Design resources** on I&E website (click on “Venture Support” tab)
  – [https://entrepreneurship.duke.edu/social-entrepreneurship/resources/](https://entrepreneurship.duke.edu/social-entrepreneurship/resources/)
• “DukeSocialEntrepreneurship” **listserv** on Sympa
  – Includes speakers, events, news, competitions, conferences, etc.
  – [https://lists.duke.edu/sympa/subscribe/dukesocialentrepreneurship](https://lists.duke.edu/sympa/subscribe/dukesocialentrepreneurship)
• **I&E Academy** workshops, such as…
  – *Intro to Human-Centered Design for Social Impact* (10/19)
  – *Demystifying 3D Printing* (11/2)
  – *Iterative Prototyping: How to Fail Fast* (11/16)
  – …and more! Visit [http://tinyurl.com/ieacademy](http://tinyurl.com/ieacademy)
• **Social Innovation Fridays** brown bag lunch & learn series *(NEW!)*
  – Weekly. Bring your lunch and questions, we’ll bring milk and cookies!
  – 12-1pm, Student Life Conference Room, Bryan Center (near Red Mango)
• **Social innovation courses** at undergrad and grad levels
  – I&E 261 and PubPol 890-05
• **Design to Impact**, social innovation incubator at Duke *(NEW!)*
Competitions & Challenges

• Duke Start-up Challenge ($50K), http://www.dukestartupchallenge.org/
  – Multiple tracks, including social enterprise

• Hult Prize ($1M prize awarded at CGI). http://www.hultprizeat.com/duke
  – Register for Duke internal competition in fall

• Clinton Global Initiative U, http://civic.duke.edu/cgiduke/
  – For more info and to apply (due 12/1): http://www.cgiu.org


• Big Ideas@Berkeley (up to $300K prize), http://bigideas.berkeley.edu/
  – Conflict & Development, Food System Innovations, Global Health, Mobiles for Reading, Open Data for Development
  – Pre-Proposals due November
Other Competitions

• **OpenIDEO Innovation Challenges**, [http://www.openideo.com/open](http://www.openideo.com/open)

• **VentureWell**, 
  - Several competitions and grant programs for engineering students, including **E-Teams** (due 10/7), [http://venturewell.org/student-grants/](http://venturewell.org/student-grants/)

• **Verb U** (formerly Dell Social Innovation Challenge), [http://www.dellchallenge.org](http://www.dellchallenge.org)

• **Ashoka Changemakers**, [https://www.changemakers.com/opportunities](https://www.changemakers.com/opportunities)

• **Global Social Venture Competition** (MBA students), [http://www.gsvc.org](http://www.gsvc.org)

• **Mentor Capital Network Sustainable Business Plan Competition**, [www.mentorcapitalnet.org](http://www.mentorcapitalnet.org)

• **Many other competitions**: 
Resources for Aspiring Duke Entrepreneurs
https://entrepreneurship.duke.edu/resource-guide/
Recommended Books on Design & Startups


- Stickdorn & Schneider (eds), *This is Service Design: Basics, Tools, Cases*. John Wiley & Sons, 2011.

Recommended Books on Social Innovation


For More Information...


Email: mnash@duke.edu
Twitter: @dukesocent, @dukesead, @caseatduke, @nashcase, @eshipatduke

Join the Duke Social Entrepreneurship Listserv (events, news, resources):
https://lists.duke.edu/sympa/subscribe/dukesocialentrepreneurship
Download These Slides