



Crowd-Driven Design

Teaching crowd-driven design methods in the classroom

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Project Brief

Team

Who: Julie Hui

Why: Teaching novice designers how to interact with and collect data from the crowd will introduce a new method of user research to supplement and improve their design process.

Clients:

Dr. Liz Gerber – Professor at Northwestern University.

Dr. Steve Dow – Professor at Carnegie Mellon University

Context

Title: Crowd Driven Innovation

When and Where Offered: Future course at Northwestern University.

Anticipated Enrollment: 15-20 students

Audience Profile:

Undergraduate students – 18-20 years old

Masters Design students – 22-26 years old

Background: Wide range of academic training

Design experience: Semi-experienced, should have taken at least one intro design course

Learning Goals:

Students will understand that interacting with the crowd during the service design process provides design researchers access to more users in order to gather a wider range of opinions more quickly and efficiently. Students will be able to interact and collect data from the crowd during four stages of the design process: Understand, Ideate, Prototype, and Pitch. Students will do this by using social media and crowd work platforms (i.e. Facebook, Amazon Mechanical Turk). Students will apply these methods to design a product idea, which they will post on Quirly.com, a website where design ideas are evaluated and voted on by the crowd.

Importance:

Interacting with the crowd allows students another avenue to understand potential users. The crowd provides design researchers access to more users in order to gather a wider range of opinions more quickly and efficiently.

Resources

Personal Experience:

Project domain experience:

Research on crowdfunding (a type of crowdsourcing)

Interview/Qualitative research

Student experience:

Human Centered Design I/III; Intro to Design for the Learning Sciences;

Communication Design

Teaching Experience:

Teaching assistant for various outreach programs

Faculty Advisors:

Liz Gerber

Taught various undergrad and grad design classes

Research expert in ethnographic and qualitative user studies

Steven Dow:

Taught various undergrad and grad design classes

Research expert in soliciting and analyzing design feedback online

Readings:

"A Pilot Study of Using Crowds in the Classroom" – Dow, Gerber, Wong (2013, in press)

"Opportunities and Trade-Offs for Online Needfinding" – Ma, Dow, Forlizzi (2013, in press)

"The Power of the Ask in Social Media" – Wash and Lampe (2012)

"Learning for Use" – Edelson (2001)

"Understanding by Design" – Wiggins and McTighe (2011)

Existing Teaching Material: None

Standards:

Taken from Drs. Gerber and Dow's Cyberlearning Grant

S1: Understand and observe people to identify real world opportunities.

S2: Ideate a diverse set of novel and useful solutions to a problem.

S3: Test the viability of mock-ups by obtaining and analyzing feedback from consumers, experts, and peers

S4: Test the effectiveness of a pitch that will mobilize consumers to use a product or service

UBD Initial Sketch

Desired Results: Students will understand that interacting with the crowd during the design process provides design researchers access to more users in order to gather a wider range of opinions more quickly and efficiently. Students will be able to interact and collect data from the crowd during four stages of the design process: Understand, Ideate, Prototype, and Pitch. Students will do this by using social media and crowd work platforms (i.e. Facebook, Amazon Mechanical Turk). Students will apply these methods to design a new service.

Evidence: Students will be asked to discuss in class and keep a journal reflecting on their experiences using the crowdsourcing design methods. Students will also apply the learned crowdsourcing design methods in their final project, for which they will explain in a final paper and presentation how and why they used the methods.

Learning Plan:

- Understand users by collecting data on Twitter
- Perform brainstorming activities with Reddit
- Solicit feedback on prototypes from Amazon Mechanical Turk
- Perform A/B Testing on final presentation versions through Facebook

Cognitive Task Analysis Preparation

Framing statement

The project goal is to create an activity that teaches novice design students how to understand potential users and inform design decisions by collecting and synthesizing data on Twitter. The target users are undergraduate and masters students taking a service design class at Northwestern University. Users will perform this activity, under the guidance of an instructor, during the “understand users” period of the curriculum. The key questions: “How do students locate relevant tweets that inform their understanding of potential users? How do students identify useful keywords and hashtags that would facilitate their search for relevant tweets? How do students identify what is and is not a relevant tweet? How do students collect relevant tweets in an organized manner? How do students code the tweet data to identify themes of user needs and opinions?” The CTA needs to address: qualities and traits of useful twitter data; strategies for finding useful tweets; strategies for collecting tweets quickly; strategies for coding twitter data to inform design decisions; benefits and disadvantages of working with partners.

Initial resources

“A Pilot Study of Using Crowds in the Classroom” – Dow, Gerber, Wong (2013, in press)

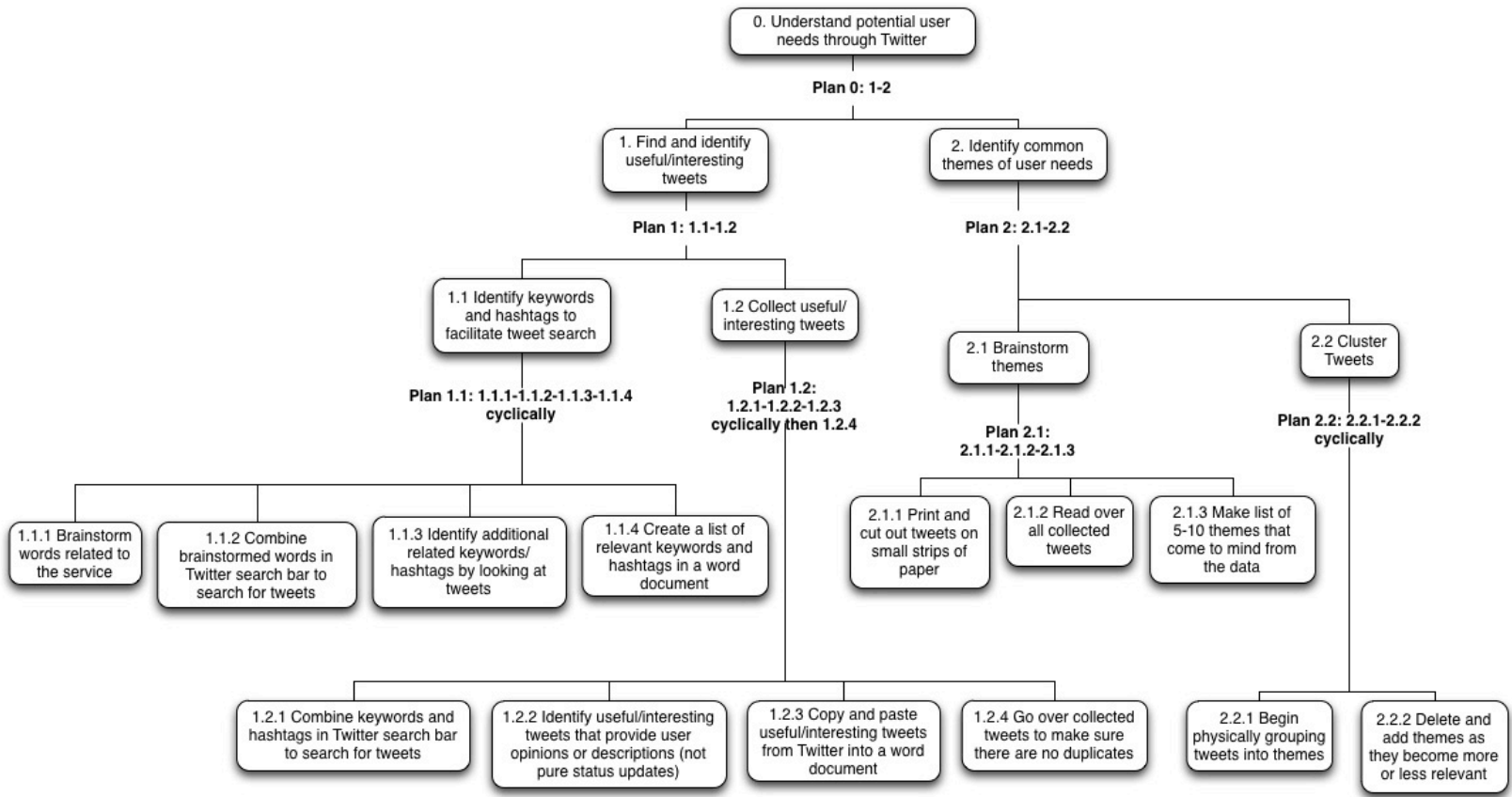
“Opportunities and Trade-Offs for Online Needfinding” – Ma, Dow, Forlizzi (2013, in press)

“The Power of the Ask in Social Media” – Wash and Lampe (2012)

“Learning for Use” – Edelson (2001)

“Understanding by Design” – Wiggins and McTighe (2011)

The Loft



Expert Interview

List of experts

Noah Liebman – Noah is a PhD student in Technology and Social Behavior. He is a prolific tweeter and has 600 followers on Twitter.

Lauren Scissors – Lauren is a PhD candidate in Media Technology and Society. She has more than four years of experience coding textual data. She currently studies multi-modal conversations during couple conflict.

Problems

Problem category	Problem	Problem description
Twitter data collection	Brainstorming related search words	How do students identify useful keywords and hashtags that would facilitate their search for relevant tweets?
	Locating data	How do students locate relevant tweets that inform their understanding of potential users?
	Determining useful data	How do students identify what is and is not a relevant tweet?
	Data management	How do students collect relevant tweets in an organized manner?
Twitter data synthesis	Data sensemaking	How do students code the tweet data to identify themes of user needs and opinions?

Choice of method

Noah Liebman – Twitter data collection – Expert TAPS

Lauren Scissors – Twitter data synthesis – Expert TAPS

Meeting time

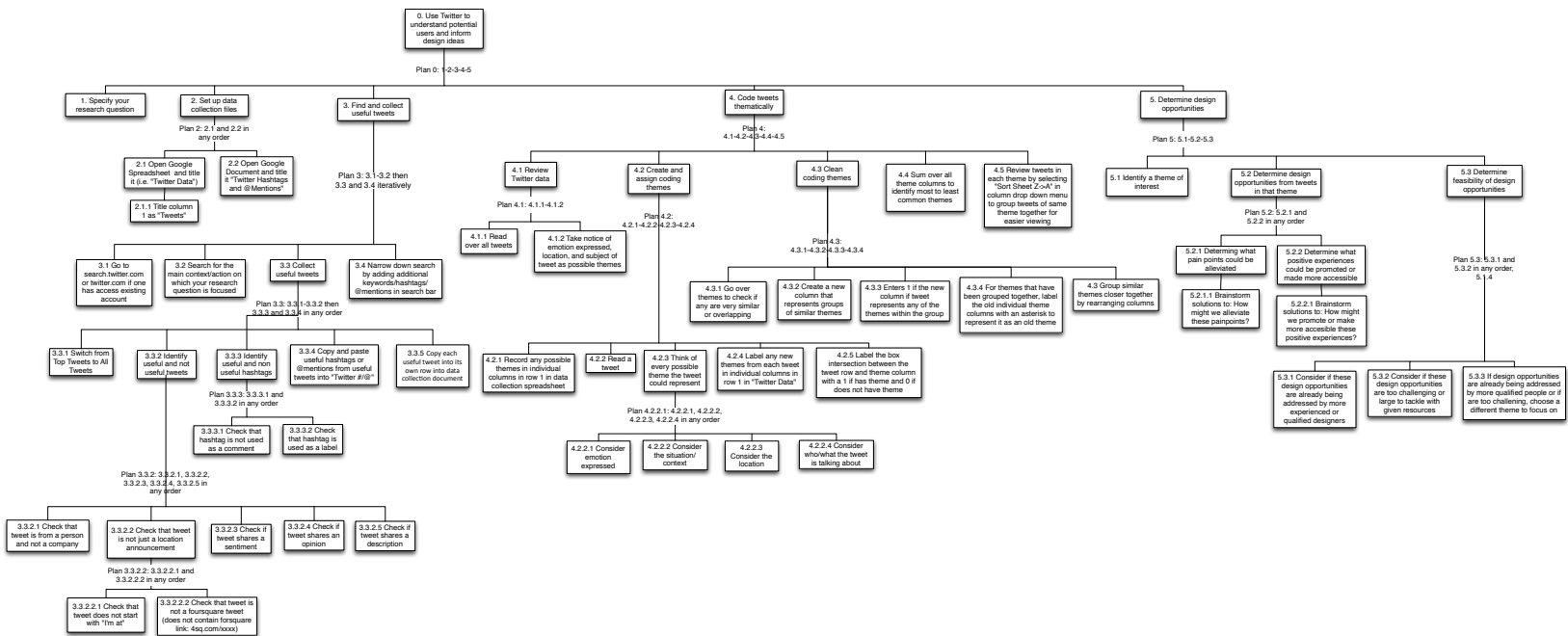
Noah Liebman – April 10, 2013: 1:30-2 pm

Lauren Scissors – April 18, 2013: 11:30 am-12:30 pm

Interview Files

ExpertTAPS_LiebmanNoah_20130410.mov

ExpertTAPS_ScissorsLauren_20130418.mov



Novice interviews

Problem

Understanding users through social media allows designers to collect a wide range and number of people's opinions quickly without minimal disruption to the user. Unlike user interviews and ethnography, which can take hours or days, collecting data about users from what already exists online is quicker and can inform questions for more in-depth inquirers later on.

Imagine you are a design researcher for your city's public transit system, and you have been hired to improve the bus riding experience. How might you use tweets on Twitter to better understand the opinions and concerns of people riding buses? In 1 hour, please collect and thematically code as many tweets as possible in order to build an understanding of bus rider needs and opinions to inform future design decisions.

Choice of method

Novice think aloud

Novice

I interviewed Hannah Hudson, a junior at Northwestern University. Hannah is a member of Design for America, a student group that designs solutions to solve local problems. She does not have one set major, but is creating a combination major of Comparative Literature, Engineering Design, and Marketing Communications. Hannah has taken courses from the Segal Design Institute and is interested in pursuing design as a career. I chose Hannah to be my novice participant because she is in the same cohort as the undergraduate students currently taking Introduction to Service Design, one of the classes in which my activities will be administered. She has not yet taken Introduction to Service Design.

I performed a think aloud for the above design challenge with Hannah. The session was recorded using Silverback, a program that allows you to screen capture record while taking participant video. The session lasted approximately 1 hour, and the data file is saved as NoviceInterview_HudsonHannah_20130424.mov.

Novice Misconceptions

Data Collection:

First, the novice focused too much on non-user tweets, such as news stories or company announcements. News stories and company tweets are not useful in understanding user needs and opinions because they are not being posted by people participating in the service of interest. Second, the novice

did not know to switch from Top Tweets to All Tweets, which significantly limited her possible data sample.

Data Synthesis:

First, the novice collected data and coded at same time. Coding should occur after significant data collection to follow grounded theory analysis methods. Second, the novice did not consider how each tweet could fall into more than one theme. The coding method should allow for determining multiple codes per tweet.

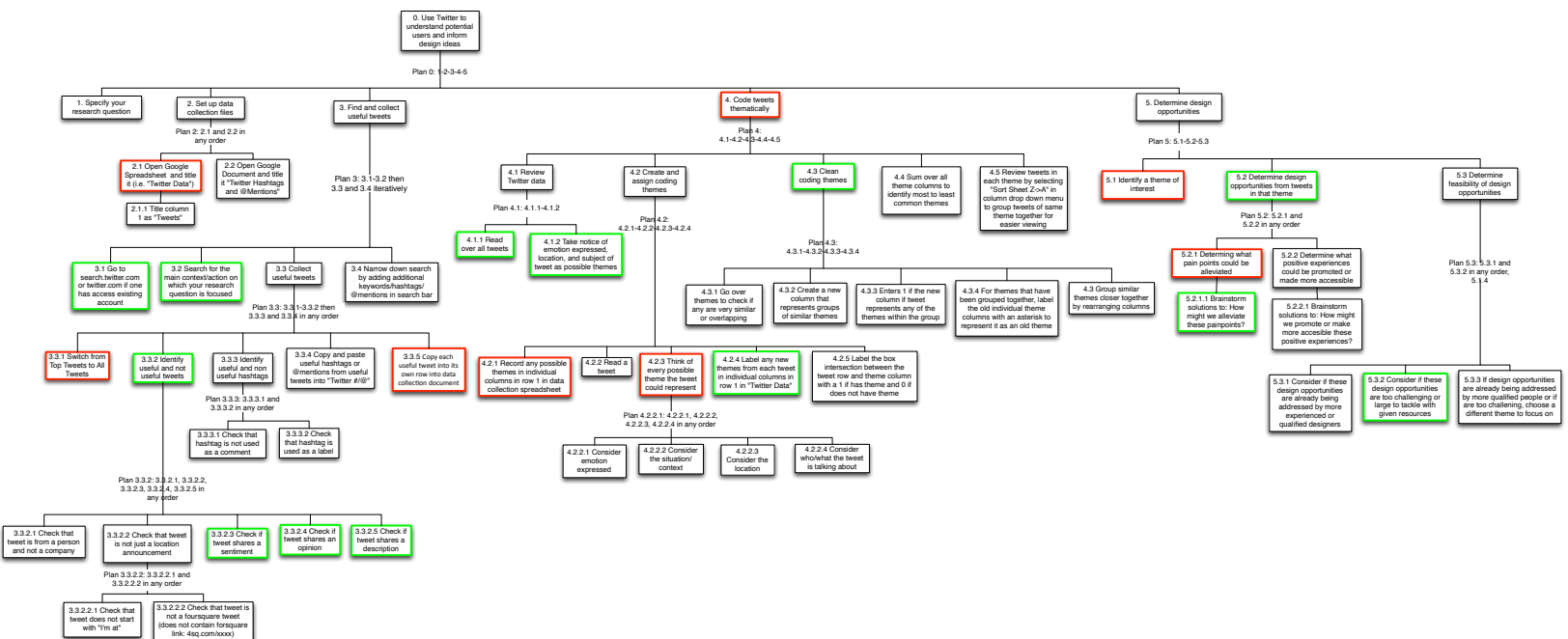
Novice Interview File

NoviceInterview_HudsonHannah_20130424.mov

Novice Model

See file NoviceInterview_Evidence_Hudon_130502.xlsx

Novice HTA Overlaid on Expert HTA



Key:

Green – performed correctly

Red – performed incorrectly

No color – did not perform at all

Casey the College Student

(Primary)

Personal Profile:

Although Casey knows her required Environmental Engineering courses are important, she feels she isn't learning practical skills to actually get people involved in environmental activism. After taking Design Thinking and Communication (DTC) her freshman year, she knew she wanted to learn more about human-centered design and decided to register for Crowd-Driven Design this Spring.

In Crowd-Driven Design, Casey enjoys hearing all the case studies presented in class and has already decided what she wants to do for her final project. She hopes to create a campaign to improve recycling in local parks. Casey has experience promoting recycling among students from being President of the Recycling Club in high school, but she knows little about working with people outside of school. Are there certain people or locations she needs to target? How does she connect with them? Who should she ask to get involved?

From class, she wants to become more familiar with the design process, and learn new design techniques that she can use to follow through with her project. She is particularly interested in understanding more about her users, such as runners, parents visiting parks with children, and dog walkers. As an engineering major, she has little time to perform an in depth ethnographic study of park users, and needs a way to understand their needs and opinions quickly.

User Goals:

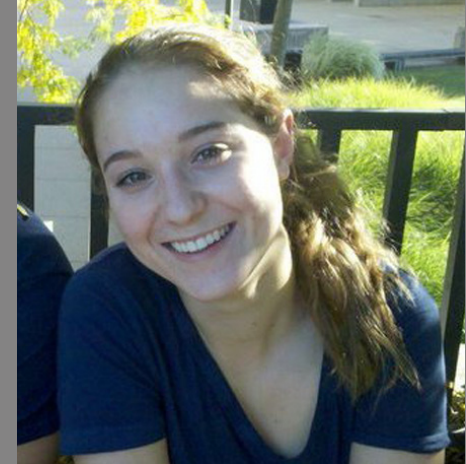
Casey participates in Crowd-Driven Design to...

- Learn new user study methods to support her final project
- Learn user study methods that are less time consuming than traditional methods
- Show the professor that she is eager to learn about design

Lesson Objectives:

We want Casey to...

- Learn how to understand potential users quickly by using the crowd
- Understand that using crowd data provides a quick, broad overview of user opinions
- Understand that using crowd platforms reduces designer-user friction
- Understand that crowd platforms provides a way for designers to see user "thoughts" recorded during time of a service experience.
- Want to learn more crowd-based design practices



"I knew I wanted to learn more about design after taking DTC. But, I'm still trying to figure it all out"

- Occupation: Sophomore at Northwestern University
- Major: Environmental Engineering
- Age: 19
- Personality: Outgoing, friendly, adventurous
- Activities: Design for America, Environmental Club, Alternative Spring Break
- Hobbies: Camping, volleyball, pretty much any outdoor activity

Max the Masters Student

(Secondary)

Personal Profile:

After finishing the Design Certificate as an undergrad at Northwestern, Max decided to pursue a Masters in Design, Engineering, and Innovation. He already has experience from taking basic design courses at Segal and is pretty familiar with the design process. He is looking to expand his portfolio and add to his design toolkit in order to be a competitive applicant for design firms when he graduates.

Although he has some experience in design, he still often caters his efforts towards getting a good grade and just “making something.” After four years of doing projects in design classes, he feels a little jaded about the usefulness of following the design process, and sometimes feels that it gets in the way of getting the project done. He wonders, “Do I really need to take my user opinions and ideas into account if their ideas don't seem feasible? How many people do I really need to talk to before I can start prototyping if I only have 2 months to make this product?”

He knows understanding users is a critical part of design, but he still wants someone to show and convince him of its usefulness. He also wants to stay in the cutting edge of what's going on in design to show that he can market unique skills when he goes on the job market. Most importantly, he wants to learn concrete design techniques that he can demonstrate in his portfolio.

User Goals:

Max participates in Crowd-Driven Design to...

- Learn a new user study method for his thesis
- Learn design skills to improve his CV and LinkedIn profile
- Keep up to date on cutting edge design practices

Lesson Objectives:

We want Max to...

- Learn how to understand potential users quickly by using the crowd
- Understand how performing a user analysis on crowd platforms can supplement traditional design practices (i.e. interviews)
- Believe that crowd-based design techniques provide benefits that current practices lack
- Want to learn more crowd-base design practices in other stages of the design process



“I want to get a job in a design firm after my Masters. So, I’m hoping to build up my portfolio through class projects.”

- Occupation: Masters Student at Northwestern University
- Major: Design, Engineering and Innovation
- Age: 24
- Personality: Artistic, sarcastic sense of humor; prefers working late at night
- Activities: Entrepreneurship Club
- Hobbies: Sketching, playing drums, going out to bars with friends

GOALS		
Standards	Transfer	
<p><i>Learners will use the crowd to...</i> S1: Understand and observe people to identify real world opportunities. S2: Ideate a diverse set of novel and useful solutions to a problem. S3: Test the viability of mock-ups by obtaining and analyzing feedback from consumers, experts, and peers S4: Test the effectiveness of a pitch that will mobilize consumers to use a product or service</p> <p><i>(Taken from Liz Gerber and Steven Dow's Cyberlearning Grant)</i></p>	<p><i>Learners will be able to independently use their learning to ...</i> T1: Collect and analyze data from the online crowd as a way to better understand potential users and inform design decisions. T2: Gather ideas and feedback from the crowd to inform design decisions by asking questions and posing tasks online. T3: Know when to apply which crowd methods during the design process.</p>	
	Meaning	
	<p>UNDERSTANDINGS <i>Learners will understand that ...</i> U1: Using the crowd is often easier and faster than traditional user study methods. U2: The crowd can provide a wider range and quantity of user data than traditional user study methods. U3: Crowds have different affordances and are useful at different stages of the design process.</p>	<p>ESSENTIAL QUESTIONS <i>Learners will keep considering...</i> Q1: Can crowds help us design or are they a waste of time?</p>
	Acquisition	
	<p><i>Students will know...</i> K1: Collecting data from the crowd allows you to bypass obstacles of traditional user study methods. K2: Collecting user data from the crowd is quicker and provides a more diverse view and greater quantity of user data than traditional user study methods. (topical) K2: Crowd data, although more diverse and easier to collect, is often less in depth than traditional user study data. (topical) K3: Online crowd data allows designers to see user thoughts “in-the-moment,” which are not typically accessible through interviews. (topical) K4: It is useful to gather user data from the online crowd before going out into the field as it allows designers to narrow down on themes that can inform future questions and observations. (topical) K5: Collecting online crowd data can have the benefit of not ‘bothering’ research subjects compared with talking to people in person, thus minimizing friction between the subject and the design researcher. (topical) K6: The online crowd can provide access to unique user groups who are difficult to reach in person. (topical) K7: Crowd data is not representative of all users and often difficult to synthesize; crowd data is subject to similar problems as of other types of user research data. (topical) K8: Different stages of the design process require different types of crowds. (topical) K9: Always referring back to the user will lead to better final designs (overarching) K10: Getting feedback from users early and often will reduce “expensive” mistakes later on (overarching)</p>	<p><i>Students will be skilled at...</i> S1: Navigating crowd and social media platforms S2: Using proper search tactics to find relevant crowd data S3: Collecting a wide variety and amount of crowd data quickly S4: Collecting data in an organized format S5: Coding crowd data to uncover themes S6: Asking questions to the crowd that support useful/interesting responses S7: Surveying the crowd to solicit useful feedback S8: Statistically analyzing crowd data to uncover patterns in opinion</p>

ASSESSMENTS		
Code	Evaluative Criteria	
K, S	<ul style="list-style-type: none"> - Data collected are descriptions, opinions, and/or ideas, as opposed to obvious statements of fact. - Learners identify user themes that uncover real world design opportunities supported by crowd user data - Learners are able to solicit useful feedback from the crowd in an organized manner to inform design decisions 	<p>PERFORMANCE TASK (in GRASPS form): <i>Students will show that they really understand by evidence of...</i></p> <ol style="list-style-type: none"> 1) Crowd needfinding 2) Crowd feedback 3) Using the crowd (pre/post- assessment)
U	<ul style="list-style-type: none"> - Learners demonstrate they understand the benefits and disadvantages of using the crowd 	<p>OTHER EVIDENCE <i>Students will show they have achieved Stage 1 goals by...</i></p> <ul style="list-style-type: none"> - Discussing in class the benefits and disadvantages of using the crowd - Giving class presentations on how they used the crowd in their design process - Writing blog entries outlining their process of using the crowd in detail

Performance Task 1

What understandings or goals will be assessed through this task?

Goal:

T1: Learners will be able to collect and analyze data from the online crowd as a way to better understand potential users and inform design decisions.

Understandings:

Primary:

U1: Using the crowd is often easier and faster than traditional user study methods.

U2: The crowd can provide a wider range and quantity of user data than traditional user study methods.

Secondary:

U3: Crowds have different affordances and are useful at different stages of the design process.

What criteria are implied in the standards and understandings regardless of the task specifics? What qualities must student work demonstrate to signify that standards were met?

- Data collected are descriptions, opinions, and/or ideas, as opposed to obvious statements of fact.
- Learners identify user themes that uncover real world design opportunities supported by real user data
- Learners demonstrate they understand the benefits and disadvantages of crowd user data

Through what authentic performance task will students demonstrate understanding?

Task Overview:

Because you have learned methods on how to use the crowd to quickly identify design opportunities, you want to be able to apply these methods affectively for the course challenge of getting your design idea accepted to Quirky. However, you only have 6 weeks left to come up with a well-formed design solution, and you don't know anything about the design space. In order to stay on track to submitting your final solution to Quirky, you must identify a design opportunity by the end of the class. Your group should collect artifacts (these can be tweets, excerpts from blog posts, comments on blog posts, etc.) that reflect sentiments and needs of real target users. Your group should then distill these artifacts into a few design opportunities, from which you will choose one. Your collected artifacts should be useful and informative. You should also be able to explain in a 2 minute presentation how each category of artifacts could inform possible design opportunities, why you chose the design opportunity you chose to pursue, and the pro's/con's of crowd needfinding for this particular design challenge.

**What student products and performances will provide evidence of desired understandings?
By what criteria or indicators will task-derived student products and performances be evaluated? (Consider criteria that refer to desired task content, process, and results.)**

- Greater than 25 artifacts collected per person (content)
- Artifacts are from individual users, not companies (content)
- Artifacts are descriptions/opinions/sentiments, not article links (content)
- A range of 3-5 themes linked to real user needs are identified (content)
- Can use themes to identify possible design opportunities (impact)
- Artifacts are collected in a spreadsheet (process)
- Used a coding method in which categories are not mutually exclusive (process)
- Coded artifacts in a way that allows for easy understanding of process (quality/process)

Rubric

Criteria	Volume	Valid	Well-synthesized	Action-oriented
Weight	25%	25%	10%	40%
3	Students collected an ample amount of data (>25 tweets).	All data represented real user descriptions/opinions/sentiments.	Students identified 3-5 themes in an organized manner.	Students were able to describe how each theme could inform a design opportunity, and were able to choose one opportunity to move forward with.
2	Students collected almost enough data (>15, <25 tweets).	Most data represented real user descriptions/opinions/sentiments, although some were posted by companies or were just news articles.	Students identified some themes in a somewhat manner.	Students were able to identify design opportunities, but were unsure how to move forward.
1	Students did not collect enough user data (<15 tweets).	Most data were posted by companies and non-real users and/or were only links to news articles.	Students were not able to identify any themes or themes were identified in a very unorganized manner.	Students were not able to identify any design opportunities.

Performance Task 2

What understandings or goals will be assessed through this task?

Goal:

T2: Learners will be able to gather ideas and feedback from the crowd to inform design decisions by asking questions and posing tasks online.

Understandings:

Primary:

U2: The crowd can provide a wider range and quantity of user data than traditional user study methods.

U3: Crowds have different affordances and are useful at different stages of the design process.

Secondary:

U1: Using the crowd is often easier and faster than traditional user study methods.

What criteria are implied in the standards and understandings regardless of the task specifics? What qualities must student work demonstrate to signify that standards were met?

- Learners are able to solicit feedback from the crowd in an organized manner to inform design decisions
- Learners demonstrate they understand the benefits and disadvantages of using the crowd

Through what authentic performance task will students demonstrate understanding?

Task Overview:

Because you have learned methods on how to get a wide range of feedback from the crowd, you want to be able to apply these methods affectively to test your final idea application that you will post on Quirky. However, you only have 1 week left to come up with a well-formed design solution. In order to have a higher chance of having your idea voted on, you must get feedback on your idea pitch and storyboard from the crowd prior to posting your idea. Your group should be able to identify two useful crowds and employ survey and online discussion methods to solicit useful feedback. You should be able improve your Quirky pitch using the feedback. Finally, you should be able to explain in a 5 minute presentation how they interacted with the crowd, solicited feedback, and used the responses to inform their final Quirky application.

What student products and performances will provide evidence of desired understandings? By what criteria or indicators will task-derived student products and performances be evaluated? (Consider criteria that refer to desired task content, process, and results.)

- Questions asked in discussion and survey solicited useful feedback from many people.
- Learners are able to take the crowd feedback responses and identify next steps to improve their design
- Learners are able to present the crowd feedback in an organized manner.

Rubric

Criteria	Volume	Useful	Well-synthesized	Action-oriented
Weight	25%	25%	10%	40%
3	Students gathered feedback from at least 50 people from 2 different crowds.	Most crowd feedback was useful and on topic.	Feedback was presented in an easily understandable format.	Students were able to make intelligent design decisions based on feedback.
2	Students collected almost enough feedback (>30, <50 tweets) from 1 crowd.	Some crowd feedback was useful and on topic.	Students attempted to present the collected feedback in an understandable format.	Students attempted to make intelligent design decisions based on feedback.
1	Students did not collect enough feedback (<30 tweets).	Crowd feedback was not useful at all.	Collected feedback was not formatted at all.	Students did not use the feedback in any way.

Performance Task 3 (pre/post assessment)

What understandings or goals will be assessed through this task?

Goal:

T3: Learners will be able to know when to apply which crowd methods during the design process.

Understandings:

U3: Crowds have different affordances and are useful at different stages of the design process.

**What criteria are implied in the standards and understandings regardless of the task specifics?
What qualities must student work demonstrate to signify that standards were met?**

- Learners show that the crowd can be used in all stages of the design process.
- Learners show that certain crowd platforms are better for certain types of user studies than others.

Through what authentic performance task will students demonstrate understanding?

Task Overview:

Other design teams outside the class see the how you are using new crowd-driven design methods to supplement the design process, and they want in. Because you now have experience applying the methods, these students have asked you to create a 1-page handout of how to use which crowds during the design process. You should be able to annotate a timeline of the design process with crowd-driven design methods that you learned from class that shows examples of crowds to be used and how to use them.

**What student products and performances will provide evidence of desired understandings?
By what criteria or indicators will task-derived student products and performances be evaluated? (Consider criteria that refer to desired task content, process, and results.)**

- Annotated timeline shows crowds being used at all stages of the design process.
- Students explains the usefulness of each type of crowd at different stages of the design process.

Rubric

Criteria	Breadth	Explanation
Weight	50%	50%
3	Annotated timeline shows crowds being used in all stages of the design process.	Student explains why all of the crowds were listed.
2	Annotated timeline shows crowds being used in most stages of the design process.	Student explains why some of the crowds were listed.
1	Annotated timeline shows crowds being used in few stages of the design process.	Student does not explain why any of the crowds were listed.

Design Argument

Design Question:

What are the characteristics of learning activities for teaching design students how to use the crowd throughout to inform design decisions in the context of the classroom to get students to successfully use crowd-based design methods in future design projects.

Design Argument:

If you want to design crowd-driven design activities to teach students in a class setting how to understand and interact with the crowd to inform design decisions, then you are best advised to:

- Scaffold the learning of crowd-driven design methods through step-by-step instruction
- Provide opportunities to apply crowd-driven design methods in various settings
- Give examples of designers successfully using crowd-driven design methods in the real world

Via these procedures:

- Use a project-based environment
- Provide students real-world design challenges
- Align the crowd-driven design methods with the type of design challenges students choose to pursue

Because:

- Scaffolding supports learning (Wood, Bruner, & Ross, 1976)
- Practice builds mastery skills (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010)
- Project-based learning creates a more authentic learning environment (Dym, Agogino, Eris, Frey, & Leifer, 2005; Fixson, 2009; McKenna, Colgate, Carr, & Olson, 2006)
- Students are motivated to learn in an authentic learning environment (Westerberg & Wickersham, 2011)
- Authentic work tasks help students develop skills to become more innovative (Fixson, 2009)
- Aligning the design method with the design challenge sets students up for small wins, and small wins motivate participation and creativity (Amabile & Kramer, 2011; Teresa & Steven, 2011)

Unit Plan

General Approach

The unit will be taught over the course of 10 3-hour lessons during a quarter at Northwestern University. Each lesson will start with either a warm-up activity or presentation of the homework assignment. In the lessons that start with warm-up activities, we employ the Japanese Flipped Lesson Plan to provide students the need to face gaps in their understanding of a topic before listening to the lecture. In the lessons that start with presentations, students are given time to reflect on their and others work. The feedback following the presentations will point out gaps in certain design abilities, which will motivate the next learning activity.

The lessons are divided into three main groups. The first group consists of just lesson 1 where the students are introduced to the concept of the crowd and how designers are currently using the crowd in modern design practice. In this lesson, students will take a pre-assessment to identify gaps in understanding of when and how to employ crowds during the design process. The second group of lessons involves Weeks 2-4, and involves passively collecting and analyzing data from the crowd. During this part of the unit, students will be walked through strategies of crowd data collection and analysis in order to identify emergent themes that can inform design opportunities. After instructors walk students through the strategies during a practice activity, students are then asked to apply the strategies to their course project of a real world challenge. The third group of lessons involves Weeks 4-9, and involves interacting with the crowd to solicit useful feedback and discussion to inform ideation, prototyping, and pitch iteration. During this unit, students will be walked through strategies of asking questions, promoting discussion, and posting surveys to different types of crowds, such as anonymous (MTurk) and non-anonymous (Facebook). After instructors walk students through these strategies during a practice activity, students will then apply these methods to their course project as a performance task. Having students practice crowd-driven design methods in different design settings supports development of mastery.

Furthermore, the course project will be to develop a design project to be launched on a crowdfunding platform. Having an authentic end goal, where the project's success is evaluated by the crowd, will motivate students to use the crowd-driven design methods in creating and evaluating their design. Overall, our lesson and unit sequence, opportunities for practice, and authentic tasks, will create a prosperous learning environment for teaching crowd-driven design methods.

Alignment of Goals

T1: Learners will be able to collect and analyze data from the online crowd as a way to better understand potential users and inform design decisions.

Weeks 2-4 teach students the goal of transfer goal 1 by walking students through strategies of collecting and analyzing crowd data. We do this by having students first identify the gaps in their understanding of how to collect and analyze crowd data through the Data categorization warm-up. Students will then be provided strategies on how to collect and analyze data from the Data lecture and have an opportunity to practice the strategies in the Tweet Dispositions activity, where the instructor highly scaffolds the process. The students will demonstrate the ability to perform the transfer goal in the crowd needfinding assessment task by applying the crowd data collection and analysis methods to their course-long project to identify a design opportunity. In this assessment task, students will also write a blog post, in which they will describe their process and how crowd needfinding was useful/not useful for their design challenge (Understanding 1).

T2: Learners will be able to gather ideas and feedback from the crowd to inform design decisions by asking questions and posing tasks online.

Weeks 4-9 teach students the goals of transfer goal 2 by walking students through strategies of asking questions to and soliciting survey feedback from the crowd. We do this by walking students through strategies with different types of online crowds in order to solicit ideas and feedback that can inform their design decisions. Students will learn effective crowd communication strategies during the storyboard lecture, storyboard activity, making surveys lecture, storyboard feedback activity, pitch lecture, and pitch activity. Specifically, the storyboard feedback activity will allow students to practice asking questions to different types of crowds in order to narrow down their idea choices towards a final solution. Students will demonstrate the ability to perform the transfer goal by applying the crowd communication strategies to get feedback and iterate on their final design and pitch during the crowd needfinding assessment. They will also create a blog post describing how crowd feedback supported/did not support their design process (Understanding 2,3).

T3: Know when to apply which crowd methods during the design process.

Weeks 1-9 teach students the goals of transfer goal 3 by teaching students how and when to apply each crowd-driven design method. Students will demonstrate that they have successfully synthesized their knowledge through the using the crowd post-assessment. While ideally we would like to see if students use these methods in future design projects, we do not have the facilities to track each of our students in the future. Therefore, in order to gauge whether they know when and how to apply the methods, we ask them to annotate a timeline of the design process with crowd-driven design methods with the goal of sharing their knowledge with designers outside the course (Understanding 3).

Justification of Learning Principles

Learning environment builds in prior knowledge – Our unit allows for students to apply and build on their knowledge of social media to better understand the online crowd.

Learning environment supports knowledge organization – Various activities in our learning environment provide opportunities for the students to map out what they learned and use their maps to identify gaps in understanding. Our pre/post- assessment allow students to map out all the main methods they learned onto a visual representation of the design process to see how all the crowd-driven design methods fits together.

Learning environment provides opportunities for feedback and reflection – Our unit employs opportunities for feedback and reflection after every presentation. Students receive feedback on their designs from the crowd, and on their process from the class. Students are given the opportunity to reflect through blog posts.

Learning environment is sensitive to course climate – We create an environment where feedback and mistakes are safe. By promoting open feedback and project iteration throughout the unit, we hope that students become more open to giving and receiving feedback as well as making mistakes.

Learning environment motivates learning – Our course-long project of creating a design to post on a crowdfunding platform motivates an authentic design challenge that will be implemented in the real world. This scenario motivates the need to repeatedly use crowd-driven design methods because the crowd evaluates the final product on crowdfunding platforms.

Learning environment promotes self-directed learning. Students are provided opportunities to apply the crowd-driven design methods to their course project, in which they must decide which method and which crowd is best for their specific challenge.

UNIT CALENDAR

Week 1 1. Who is the crowd? 2. Online crowd lecture 3. Using the crowd pre-assessment 4. Crowd identification homework	Week 2 5. Data categorization warm-up. 6. Data lecture. 7. Tweet Dispositions activity. 8. Crowd needfinding pro's/con's	Week 3 9. Class project introduction 10. Crowd theme identification 11. Crowd needfinding assessment (finish for homework)	Week 4 11c. *Crowd needfinding assessment presentations/blog due 12. Crowd interactions lecture 13. Crowdstorming activity (finish for homework)	Week 5 13g. Crowdstorming activity presentations 14. Communication lecture 15. Storyboard lecture 16. Storyboard activity (finish for homework)
Week 6 17. Being the crowd activity 18. Making surveys lecture 19. Storyboard feedback activity (finish for homework)	Week 7 20. How to give feedback 21. Class feedback 22. Storyboard feedback reflection (finish for homework)	Week 8 23. Pitch lecture 24. Pitch activity 25. Crowd feedback assessment (finish for homework)	Week 9 25d. *Crowd feedback presentations/blog post due. 26. Class reflections. 27. Using the crowd post-assessment	Week 10 (Buffer week)

LEARNING ACTIVITY	WHERE TO	HLW
1. Who is the crowd? Students will create a concept map of “online crowds” to understand the breadth and complexity of the topic.		
1a. The instructor will explain what a concept map is, how to make one, and give examples of other concept maps.	E1	
1b. Students will work in groups of 2 to create a concept map of “online crowds” in a mapping tool, such as Omnigraffle.	E2, H	Prior knowledge, Knowledge organization, Practice
1c. Students will discuss their concept map with the class.	R	Feedback, Course climate
2. Online crowd lecture. The instructor will give an overview of the class and motivate the use of crowds in design.		
2a. Define the term “crowd,” give examples of crowds, and how designers are using the crowd in modern human-centered design practice. Discuss what are the boundaries of the crowd.	E1	Motivation
2b. The instructor will explain how crowds are currently being used in different environments. Show Dan Siroker video, “How we used data to win the presidential election” (political). Read articles on how analyzing Twitter spreads news about natural disasters faster than traditional news (public safety). Describe the discoveries made using Galaxy Zoo and FoldIt (science). Ask the students if they know anywhere else the crowd is being used.	E1, H	Motivation
2c. Review the goals of the course and syllabus	W	Course climate
3. Using the crowd pre-assessment. Students will brainstorm how to use different types of crowds throughout the design process. Students will record ideas on a visual timeline of the design process in order to compare their progress from pre- to post-course. Students will discuss afterwards what they came up with.	H, E2	Prior knowledge, Mastery, Practice, Self-directed learning, Feedback
4. Crowd identification homework. Students will create a table of at least 20 crowd platforms showing who participates on the platform, how people interact on the platform, motivations for using the platform, and potential uses for design. Students	H	Knowledge organization

will refer back and build on this table throughout the course.		
5. Data categorization warm-up. Students will do a warm-up activity to face the need for systematic data collection and analysis of online crowd data.		
5a. Students will categorize Yelp data about their local Starbucks into useful/not useful categories, and try to come up with ideas for design opportunities (i.e. how to improve Starbucks).	H, E2	Motivation, Practice
5b. Students will discuss afterwards their process and what they found difficult.	R	Feedback, Course climate
6. Data lecture. The instructor will describe methods for crowd data collection and analysis and give examples of how previous students have done so.	W, E1	
6a. The instructor will explain the attributes of useful and not useful data, and go over a few examples with the class.		Mastery
6b. The instructor will explain methods on how to code data thematically.		Mastery
6c. The instructor will motivate the need to identify useful crowd data and code for themes in order to inform future design decisions or in-person interviews/observations. Give examples.		Motivation
7. Tweet Dispositions activity. (Groups of 2) Students will be given the design prompt of acting as design consultants for their city public transit system to improve the bus riding experience. Students will be walked through the steps of data collection analysis. At the end, they will give a mock 2-minute presentation to their clients.		Self-directed learning, Mastery
7a. The instructor will give an overview of what Twitter is, and have Twitter users in class act as mentors to non-Twitter users.	E1, T	Course climate
7b. The instructor will explain good Twitter search strategies, and have each team collect at least 30 tweets.	E1	Practice
7c. Once students have collected enough tweets, they will cluster the data that into themes as they learned from the Data Lecture.	E1	Practice, Knowledge organization
7d. Students will then give a mock 2-minute presentation to the Public Transit Authority on design opportunities to improve bus riding as informed by real user needs. The class will give feedback.	H, R	Practice, Feedback, Course climate
8. Crowd needfinding pro's/con's. The instructor will lead a discussion of pro's and con's of crowd needfinding. The instructor will list out a few other example design challenges, and lead a class discussion on which crowds could be used to perform needfinding. Students will build on their crowd table during this discussion.	R	Mastery
9. Class project introduction. The instructor will introduce the class project of creating a crowdfunding campaign to raise funds and awareness for a socially motivated project. The instructor will choose a class-wide design theme, such as Service Design, to give the students an initial direction. Students will work in groups of 4 for the class project	W, H	Motivation
10. Crowd theme identification. (Project groups) The students will identify as many online crowds (social media, blogs, etc.) that are related to the main design theme.	E1	Practice
11. *Crowd needfinding assessment. (Project groups) Students will explore the design theme space using the crowd needfinding methods learned in class.		Self-directed learning
11a. Students will collect and analyze data from multiple crowd platforms (identified in Crowd Theme Identification activity) to find design opportunities. Students will choose one design opportunity to pursue.	E1	Practice
11b. Students will write a blog entry and give a presentation on their process, how they chose which design opportunity to pursue, the pros and cons of using their chosen platform for the design challenge, and how they could improve. The class will give feedback.	R, E2	Mastery, Course climate
12. Crowd interactions lecture. The instructor will motivate the need to understand how to converse with the crowd. Interacting with the crowd and getting them to participate in the design process is much harder than passively collecting data (what they learned last week). Give examples of how researchers and companies are	W, H, E1	Motivation

“employing” the crowd in innovation (i.e. Quirky, Dow’s A/B Testing).		
13. Crowdstorming activity. (Project groups) Students will be given the design challenge of using Reddit to come up with ideas for their chosen design opportunity.	E2	Self-directed learning
13a. The instructor will give an overview of Reddit, and have Reddit-users in class act as mentors to non-Reddit users to explain Reddit functionalities. Students will be given time to explore the site.	E1, T	Course climate
13b. Students will be given time to list target users.		Practice
13c. The instructor will explain how to write a good “How might we…” question.	E1	Mastery
13d. Students will come up with “How might we…” questions for their target users on Reddit.	E1	Practice
13e. Students will find sub-Reddits representative of their target users on which they will post their questions.	E1	Practice
13f. The instructor will give tips on how to encourage discussion and brainstorming on their question feed.	E1	Mastery
13g. For homework, the students will continue the discussions on Reddit. Students will use the crowd-generated ideas to supplement their own brainstorming session. Students will present a 2-minute presentation on the ideas the crowd came up with from the Crowdstorming Activity, discussing quantity and quality, how these ideas informed their own ideation, the difficulties they encountered, and what they could have done better. Students will identify three main ideas as possibilities to pursue. The class will give feedback.	E1, R, E2	Mastery, Feedback, Course climate
14. Communication lecture. The instructor will motivate the need for clear communication for the crowd. In order to foster a rich discussion or get good feedback, the designer must be able to communicate their ideas effectively. The instructor will go over different ways designers communicate their ideas (i.e. storyboard, video) and give some good/bad examples.	W, E1	Motivation, Mastery
15. Storyboard lecture. The instructor will give a lecture on how to create a good storyboard.	E1	Mastery
16. Storyboard activity. (Project groups) Students will create storyboards for their three ideas. Students will finish the storyboards for homework.	E1	Practice
17. Being the crowd activity. Students learn what it’s like to be the crowd by participating in FoldIt, Galaxy Zoo, Amazon Mechanical Turk, and MindSwarms.	H,	Motivation
18. Making surveys lecture. The instructor will explain how create good surveys when soliciting feedback, why survey structure is important, and describe different question formats to solicit feedback (open ended, multiple choice, rubric etc.). Walk class through a few examples of writing and critiquing questions.	W, E1	Mastery
19. Storyboard feedback activity. (Project groups) Students will solicit feedback on their storyboard ideas from two different crowds.		Self-directed learning
<u>Amazon Mechanical Turk:</u> 19a. The instructor will explain what Amazon Mechanical Turk is, give examples on the type of “hits” people post on MTurk, and how it is being used in design.	E1	Mastery
19b. Students learn how to post a hit on MTurk (how to create a hit, how to choose what to pay, etc.)	E1	Practice
19c. Groups will be given \$15 each to post a survey soliciting feedback on their storyboards onto Amazon Mechanical Turk. In the survey, the crowd will vote on their favorite idea.	E1	Practice, Feedback
<u>Facebook:</u> 19d. The instructor will explain what Facebook is and how people are using Facebook as a way to collect feedback.	E1	Mastery
19e. Students will post the same survey on Facebook, and have the Facebook crowd vote on their favorite idea.	E1	Practice, Feedback

19f. Students will collect the survey feedback from MTurk and Facebook and create a data visualization showing which groups preferred which idea and how many people responded.	R	Practice, Knowledge organization
20. How to give feedback? Give a lecture on what good feedback is, what is useful/not useful, and how to be sensitive to others feelings while still being helpful.	E1	Course climate, Mastery
21. Class feedback. Students will present their storyboards to the class. The class will vote on the ideas and give feedback. After the class has given feedback, the presenters will share their data visualizations of the survey data to see how the class feedback differed from the MTurk and Facebook feedback. Introduce the idea that in the real world, designers will not always have other design students from whom they can get quick in-depth feedback.	H, R	Course climate, Feedback, Self-directed learning
22. Storyboard feedback reflection. (Project groups) Students will reflect on the various forms of feedback that they received and how to move forward with it.		Self-directed learning, Mastery
22a. Groups will narrow down their 3 ideas into 1 idea based on the crowd and class feedback that they received.	E1,	
22b. Students will write a blog post on how the MTurk vs. Facebook vs. class feedback helped them decide which idea was the best to pursue, and how they weighed each of the different forms of feedback.	R, E2	
22c. Students will discuss benefits/disadvantages of anonymous and non-anonymous feedback. Is anonymous feedback more honest or less in-depth? Visa versa?	R	
23. Pitch lecture. The instructor will explain the aspects of a good pitch (needs a hook, motivate need for idea, how it works, etc.), and show a few examples of good/bad pitches.	E1	Mastery
24. Pitch activity. (Project groups) Groups will draft a 1- minute pitch of their final design.		Motivation
24a. Groups will answer questions about their design solution to get them thinking about their pitch.	E1	Knowledge organization
24b. Groups will draft a 1-minute script.	E1	Practice
24c. Students will create a still-picture video using PowerPoint.	E1	Practice
24e. Groups will get feedback from another group on their pitch and iterate.	R, E2	Feedback
*25. Crowd feedback assessment. (Project groups) Groups will solicit feedback on their crowdfunding pitch from 2 different crowds.		Self-directed learning
25a. Groups will be asked to gather feedback in the form of a survey and online discussion.	E1	Feedback, Practice
25b. Groups will gather survey and discussion responses, and identify major and minor changes they need to make on their pitch.	E1, E2	Mastery, Practice
25c. Groups will iterate on their application and create a final draft.	E1	Practice
25d. Groups will present their 1-minute video pitch, and give an additional give a 5-minute presentation on how they interacted with the crowd, solicited feedback, and used the responses to inform their final pitch and design. Students will give feedback on the presentation.	R, E2	Mastery, Feedback, Course climate
26. Class reflection. Lead a discussion on what parts of the class the students enjoyed most/least, found most/least useful, and what they still find confusing.	R, E2	Mastery, Course climate
27. Using the crowd post-assessment. Students will record on a visual timeline of the design process when and how to use the crowd. This will demonstrate that they know when to apply the methods learned in class.	E2	Mastery, Practice, Self-directed learning

* Performance task for the GRASPS Assessment

Lesson Plan

Lesson Designers: Julie Hui

Instructor: Dr. Liz Gerber or Julie Hui

When: Spring 2014

School/Grade: Northwestern University, Undergrad and Grad

Title of Lesson: The Need for Crowd Needfinding

Goals of Lesson:

Students will be able to leverage the scale and diversity of online crowds by harvesting data from social media to understand authentic user opinions about a certain service. Students will be able to do so by collecting and analyzing user opinions from social media platforms, such as Twitter. In analyzing the crowd data, students will identify real world design opportunities informed by user needs. This lesson will satisfy Drs. Gerber and Dow's Cyberlearning Grant standard to "Understand and observe people to identify real world opportunities."

Lesson Rationale:

Design researchers study users in order to create products and services that solve authentic user needs. This exercise introduces using Twitter as a way to quickly collect a wide range and number of user opinions. Understanding users from tweets is often quicker than typical user understanding practices, such as interviews, and reduces friction between the design researcher and subject, such as surveying random people in public. Similar to typical user understanding practices, students will be faced with challenges of learning how to collect useful/interesting data and synthesizing that data into themes that inform design decisions.

Based on our observations, students have difficulty with knowing what data to collect, collecting enough data, collecting the data in an organized fashion, and thoroughly synthesizing the data to uncover many design opportunities. In collecting data, students often choose to collect non-user data, such as news articles or posts from companies. While articles may still be useful in the design process, they are not accurately representative of real user sentiments and needs. Furthermore, users had trouble understanding the amount of data needed in order to synthesizing for design opportunities. Students would draw conclusions after collecting a few pieces of data rather than waiting until they had a sufficient sample. Also, in collecting and synthesizing data, students did not know proper coding strategies for textual data. Lastly, they did not take the extra step to identify design opportunities from the coding themes, but rather stopped with the activity after they identified some patterns.

Therefore, this lesson focuses on teaching students how to identify what is useful/not useful data, setting a data collection goal of 30 tweets, teaching data coding strategies, and offering time to brainstorm design opportunities informed by the emergent themes. We hypothesize that by teaching students correct data collection and analysis strategies and giving them an authentic task to practice on (i.e. improving the bus riding experience), they will be able to apply the methods to other design challenges.

How does students' understanding of this topic develop? How does this lesson fit within a unit, or within students' experiences in prior and subsequent grades?

Students taking this course should have taken previous design courses and should therefore be somewhat familiar with the design process and traditional design methods. This specific lesson will occur early in the unit as it focusing on identifying design opportunities, an initial step in the design process. We argue that students will not see the value of using the crowd unless they have had previous design experience working with users in person (performing interview, ethnography etc.).

Ideally, this course would be taken after Design Thinking and Communication and Human Centered Service Design, the first of which introduces basic design practices while the latter teaches the design process more in-depth. This crowd-driven design course will build on top of these previous design courses to offer students additional methods in involving the user throughout the design process, especially in the real-world situation of not have a large design network from which one can get ideas/feedback.

Relationship to the lesson to standards

Standard 1: "Understand and observe people to identify real world opportunities."

This lesson will satisfy Standard 1 by teaching students how to *identify real world opportunities* from data collected and synthesized from the crowd. Students will *observe people* not in the traditional sense, but through an online medium, where they will collect user sentiments/descriptions/opinions. Students will then code this data to *identify real world opportunities* informed by themes of potential user needs.

Lesson Prototype

Introduction:

Students will be able to leverage the scale and diversity of online crowds by harvesting data from social media to understand authentic user opinions about a certain service. Students will be able to do so by collecting and analyzing user opinions from social media platforms, such as Twitter. In analyzing the crowd data, students will identify real world design opportunities informed by user needs.

Learning Objects:

By the end of the lesson students will know:

- **K1:** Collecting data from the crowd allows you to bypass obstacles of traditional user study methods.
- **K2:** Collecting user data from the crowd is quicker and provides a more diverse view and greater quantity of user data than traditional user study methods. (topical)
- **K2:** Crowd data, although more diverse and easier to collect, is often less in depth than traditional user study data. (topical)
- **K3:** Online crowd data allows designers to see user thoughts “in-the-moment,” which are not typically accessible through interviews. (topical)
- **K4:** It is useful to gather user data from the online crowd before going out into the field as it allows designers to narrow down on themes that can inform future questions and observations. (topical)
- **K5:** Collecting online crowd data can have the benefit of not ‘bothering’ research subjects compared with talking to people in person, thus minimizing friction between the subject and the design researcher. (topical)
- **K7:** Crowd data is not representative of all users and often difficult to synthesize; crowd data is subject to similar problems as of other types of user research data. (topical)

By the end of the lesson students will be skilled at:

- **S1:** Navigating crowd and social media platforms
- **S2:** Using proper search tactics to find relevant crowd data
- **S3:** Collecting a wide variety and amount of crowd data quickly
- **S4:** Collecting data in an organized format
- **S5:** Coding crowd data to uncover themes

Key Messages:

- Useful/interesting data provide insight into the user experience, such as opinions or descriptions, and are not simple statements of fact or posts by non-users (i.e. companies).
- Crowd Needfinding should not take the place of traditional user study methods, but rather supplement or inform it.

Key Terms: Coding – organizing qualitative data in emergent themes

Time Needed: 3 hours

Materials: Computer with Internet access.

Preparation: None

Prototype File: TwitterActivityPresentaiton_130607_TindalTest


Session Procedure:

Steps	Expected student response	Teacher response	Evaluation
Section (Time allotted)	Students will...	Teachers will...	Did they understand/meet the goal?
<i>Useful vs. not useful data activity. (30 min)</i>			
In pairs, students attempt categorize Yelp data about their local Starbucks into useful/not useful categories, and try to come up with ideas for design opportunities (i.e. how to improve Starbucks).	<ul style="list-style-type: none"> - Not be able to collect and analyze crowd data well - Not be able to identify design opportunities informed by a lot use user data 	<ul style="list-style-type: none"> - Pose questions to pairs on why they categorized certain data the way they did, target pairs will low motivation to participate 	<ul style="list-style-type: none"> - Identify students that are trying or not trying
Students will discuss afterwards their process and what they found difficult.	<ul style="list-style-type: none"> - Express that they had difficulty knowing what to collect and how to analyze 	<ul style="list-style-type: none"> - Facilitate discussion why asking students to expand on their difficulties 	<ul style="list-style-type: none"> - Listen for common difficulties expressed and see if they match ones identified in novice observations
<i>Data Lecture. (1 hour)</i> The instructor describes methods for crowd data collection and analysis to identify design opportunities and gives examples of how previous students have done so.	<ul style="list-style-type: none"> - Question the methods of crowd needfinding 	<ul style="list-style-type: none"> - Occasionally ask class questions what they think of the methods being described to encourage listening/participation 	<ul style="list-style-type: none"> - Identify which students ask more/less questions - Identify if questions are
<i>Tweet Dispositions activity. (1 hour)</i>			
In pairs, students introduced to the goal of the activity of learning how to collect		<ul style="list-style-type: none"> - Present the topic 	<ul style="list-style-type: none"> - Monitor for engagement?

and analyze crowd data to identify design opportunities.			
Students presented the challenge of acting as design consultants for their city public transit system to improve the bus riding experience.		- Present the topic	- Monitor for engagement?
Students brainstorm design opportunities to improve the bus riding experience.	- Identify design opportunities, but of a limited scope	- Answer questions posed by students	- Monitor for high brainstorming activity
Students create the data collection environment – Google Spreadsheet. Students go to search.twitter.com.	- create the online environment quickly and share the document with the teammate.	- Help students who have not used Google spreadsheets before - Check to see that everyone has the environment set up	
Instructor gives examples of useful keywords/hashtags to facilitate search.	- May ask clarifying questions	- Answer clarifying questions	- Monitor for level of understanding/confusion
Instructor gives examples of useful/not useful data.	- May ask clarifying questions	- Answer clarifying questions - Maybe go over a few more examples on Twitter	- Monitor for level of understanding/confusion
Students brainstorm useful keywords/hashtags and begin searching. Students are told to collect at least 30 useful tweets.	- Brainstorm some keywords/hashtags before moving on to searching	- Answer clarifying questions	- Monitor for high/low brainstorming/da
Instructor gives examples of how to code data, and walks students through 2 examples.	- Be able to participate in coding examples correctly	- Maybe go over a few more examples of students still seem confused	- Monitor for level of understanding/confusion - Notice whether students can/cannot code examples
Students code tweets into 5-10 themes	- Code data slowly at first, but quicker as time goes on	- Check to see if students are coding correctly - Give hints/tips on how to improve - Give more attention to students who seem less engaged or more confused	- Monitor for level of engagement and coding activity
Students identify design opportunities from each theme.	- Be able to come up with at least one design opportunity for each theme - Share interesting pieces of data from their favorite design opportunity theme	- Lead discussion on design opportunities - Push other students to contribute ideas - Ask teams who have not shared their findings to do so	- Monitor for engagement and sharing activity
Crowd needfinding pro's/con's. (30 min)			
Students brainstorm pro's/con's of crowd needfinding on the board, and discuss with the class.	- Identify that crowd needfinding provides a quick overview of the design space - Identify that crowd	- Pose questions to get students to continue brainstorming	- Monitor whether students mainly give pro's/con's

	needfinding data is not as in depth as traditional user data		
The instructor will list out a few other example design challenges, and lead a class discussion on which crowds could be used to perform needfinding.	- Identify other crowds that would be useful and why	- Bring up crowds that students did not come up with	- Monitor whether students bring up only a certain genre of crowd - Monitor for engagement

Prototype




Tweet Dispositions

1

Challenge

Imagine you are a design researcher for your city's public transit system, and you have been hired to improve the bus riding experience. How might you use tweets on Twitter to better understand the opinions and concerns of people riding buses?



2

Why?

Solve authentic needs
Quickly collect a wide range and number of people's opinions with minimal annoyance to the user.

3

Activity

4

Step 1 (5 minutes)

Without using Twitter, generate as many design opportunities to improve the bus riding experience as you can (i.e. difficulties with paying, environmental benefits).

5

Step 2

1. Create a group Google Spreadsheet
2. Go to search.twitter.com


6

Step 3 (5 minutes)

#publictransportation and bus are two commonly used hashtag/keywords when tweeting about the bus riding experience. Other keywords/hashtags indirectly related to public transportation, such as #agreen, may also help you identify subtopics of interest.
Identify five additional keywords and/or hashtags used on Twitter that can help you identify useful/interesting tweets.


7

What are useful tweets?



8

What are useful tweets?



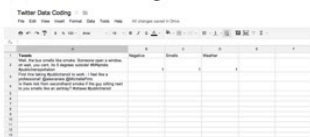
9

Step 4 (10 minutes)

Combine these hashtag and/or keywords in the Twitter search bar to facilitate your search for interesting/useful tweets about the bus riding experience.
In the Google Spreadsheet, collect at least 30 useful/interesting tweets about the bus riding experience.
Be sure to switch from "Top" tweets to "All" tweets

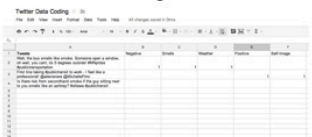
10

Coding Data




11

Coding Data



12

Coding Data



Step 5 (15 minutes)

Code your twitter data into themes, and come up with a few design opportunities for each theme.

Discussion (15 minutes)

1. Which tweets did you find most useful/interesting? Why?
2. How does the quality of data compare to interview data or ethnographic research?
3. How do you think the experience of collecting Twitter data compares to directly asking people on the bus? Asking just friends?
4. What difficulties did you encounter while deciding what data to capture?
5. How does collecting Twitter data compare to what you were able to come up with on your own?
6. Think about other user research you have worked on in the past or are currently working on where this

Observation

Observer was given:

- Copy of the activity
- Copy of the unit goals

Our team will collect data on:

- Student ideas for lesson improvement
- Student engagement
- Alignment of lesson with unit goals

Observer will collect data on:

- Student engagement
- Points of confusion
- Time taken for each section

Debriefing notes:

- Activities seemed aligned with unit goals
- Activity probably would work better in a group because student did not have anyone to discuss her process with
- Student performed activity 20 min faster than time given of 1 hour
- Student reflection demonstrated main unit understandings
- Student expressed seeing value in activity
- Student would appreciate more motivation to do activity, such as having to give a mock presentation at end of activity

Video of activity saved as:

- Hui_Observation_130607_Tindal.mov

Lesson Observation Log: Tweet Dispositions Activity

Performed by: Colin Fitzpatrick

Date: June 7, 2013

Duration: 40 minutes

Time	Observation	Significance
:00	Intro to Tweet Dispositions j - explain using crowds in design classrooms	set the stage for the lesson
:45	state the design challenge	introduce motivation for the learner
1:00	no questions so far	intro is clear (at least to this learner)

2:00	begin of 5 min brainstorm on paper	mix of tools for learner (ppt and paper and pen, eventually computer)
3:00	brainstorm continuing	learner continues to rapidly write down ideas (monitoring progress, watching for slowing down)
4:00	student looks back up at prompt	leaving stimuli up on the topic may assist learners maintain pace in bstorm
5:00	instructor clarifies if run out of ideas, we can move on	5 mins may be too long
5:00	learner clarifies for good or bad ideas	prompt may need to be more specific about possibilities for the storm
5:40	learner ends the storm	bstorm lasted approx 3.5 mins
6:00	set up spreadsheet and load search.twitter.com	prep materials for the next activity of the lesson
7:00	list words for searching for tweets	prepare to maximize usefulness of tweets returned
8:30	learner chooses to start searching	perhaps wants to see potential of what is out there (then reframe hashtag brainstorm later?)
9:00	slides on usefulness of tweets for design consideration	focus learner to be able to capture effective tweets
10:15	learner begins searching for tweets and loading them into the research spreadsheet	
11:15	looked over when camera was being used	reminded of observation environment
14:00	learner continues to scroll through tweets; laughs at one	twitter users are always surprising
14:30	instructor suggests tip for exploring, with noting down hashtag; learner agrees	intervention when getting stuck/redirecting may help maintain momentum of the research activity
16:00	learner continues to add tweets to the spreadsheet	
17:00	learner searches new hashtag from the list of hashtags	generating a list before you begin benefited the learner
18:20	searchers another hashtag	

20:30	activity ends, collected 14 tweets	
21:30	introduce two ways to code data of tweets; focus on column method	explain next activity, give example and supporting argument for why the column style will be used in the activities
23:00	set parameters (5 main themes, 15 minutes)	timebox activities to ground the learner's expectations/activity's limits
27:00	Learner uses paper and pen again to work through coding exercise	
29:00	learner states she has her three themes	
30:00	goes back to tweets for examples of where the themes were derived	give opportunity for student to back up and explain their work, can be used to validate performance and learning of goals
32:00	instructor continues to ask questions following from activity, connecting the data from the activity to design arguments; focus on difference between individual brainstorm and twitter data	begin determining the pros and cons of the activity
34:00	begin pro and con activity on board	give student opportunity to reflect on experience and engage with other learners on it
36:00	discussion of experience; student and instructor work through ideas	
38:00	instructor has done all the writing on the board	This did not seem intentional, but it happened
39:00	discuss other places to search data	reflect on the tradeoffs between different data collection spaces
40:00	difficulties of the activities	students may provide suggestions for improvement

Previous informal observations:

**Performed before we learned how to do proper observations ☹*

- April 8, 2013, 12-3pm: Tweet Dispositions Activity (masters)
- April 8, 2013, 3-6 pm: Tweet Dispositions Activity (undergrad)
- April 22, 2013, 12-3 pm: Reddit Brainstorms Activity (masters)
- April 22, 2013, 3-6 pm: Reddit Brainstorms Activity (undergrad)
- May 20, 2013: Facebook Pitch Feedback (undergrad)

Sample Student Work:

Twitter Data Collection ☆

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fx Tweet											
	A	B	C	D	E	F	G	H	I	J	
1	Tweet	Other people	Negative	Inconvenience	Self-Image/Confidence	Positive	Economically viable	Idealism	Confusion	Dirty	
2	New rule for public transportation - If the person behind you is 6' or taller you can't recline your seat #MannersPeople	1	1								
3	public transportation!? #countryproblems		1	1							
4	Rode 3 forms of public transportation today and housed an all-kale caesar. What else, DC? Bring it.				1	1					
5	Urrrrf... I need a car. Carrying \$100+lbs of food on public transportation wares me down. :(1	1							
6	Riding public transportation sucks. .but glad I can get to wk #\$\$\$		1			1	1				
7	Whats happenin peoples? Why do the funkiest people always want to sit by me on the public transportation? They should get hit with a blast	1	1								
8	I wish one day we could not use cars. Travel public transportation, walk, ride bicycles.					1		1			
9	Today should be interesting. Hopefully I don't get lost but knowing me and public transportation hahah. #mts #adventurewaitingtohappe		1						1		
10	Dude on my bus is wearing a gas mask & everyone acts like they don't see him. Only in #la. #publictransportation	1	1								
11	Hard to catch your connecting bus when it pulls away as the bus you're on pulls up. #chicago #cta		1	1							
12	You can wipe that seat with your hand all you want, honey. Ain't nothing changing about that situation. #CTA		1							1	
13	#CTA, if your credit card machine at Addison wasn't broken, I would be on THAT purple line to Linden and not waiting like an effing chump		1	1							
14	The first morning commute on the A train from the Rockaways in seven months! I wanted to hug the motorman!				1	1					
15	Always a good sign when even employees of the public transportation										
16											
+ Sheet1											

Discussion and Future Directions

After testing parts of the unit, we identified four areas for improvement. First, while students saw use for crowds to understand the design space, they were less reluctant to use the crowds to gather feedback. They reported that the crowd feedback was less useful than in-class/in-person feedback. This leads us to wonder if crowds are not useful for giving in-depth feedback, if our methods for soliciting crowd feedback are still lacking, or if we must do a better job presenting a real-world scenario when in-person feedback is unavailable. To amend these issues, we hope to build on the work of scholars in HCI who are currently performing research on how to solicit useful feedback from the crowd. For now, we could possibly amend our feedback tasks to be less “in-depth.” For example, instead of soliciting long responses, we could have crowds just vote or rate prototypes/ideas in order to take advantage of the scale of the crowd. Efforts to use the crowd in this method have been successful in other crowd design curriculums (Dow, Gerber, & Wong, 2013). Furthermore, we argue that teaching the use of the crowd during a service design class is not ideal as students always have other students on hand to provide in-depth feedback. However, designers often have trouble finding people to provide feedback in real world design scenarios especially when they are expected to constantly test their solution. In later iterations of this unit, we may have to redesign the type of tasks given to the crowd and motivate the need for crowds better through a different design challenge where soliciting in-person feedback is limited.

The second main observation was the difference in crowd platform capabilities between undergraduate students and graduate students. While we were prepared for differences in design abilities, we were not expecting difference in social media experience. While this aspect of our observation may only be a feature of our observed classes, we found that few Masters students knew how to use Reddit, while most of the undergraduate students were skilled in using Reddit. This suggests that there may be a noticeable difference in crowd-use capabilities between students groups of as small an age gap as 5-years. Because of this difference, we may have to focus on only undergraduates or graduate students in later iterations of the unit.

Third, students expressed reluctance to tap into their own social capital for the purposes of the class. For example, during the Facebook feedback activity, students asked if they could seek feedback from a curated group of friends rather than their entire social network. This suggests that we need to present more options for feedback activities to crowds outside students’ social networks or better motivate the need to receive feedback so that they are willing to tap their social capital. In later iterations of the unit, we will experiment with different design challenges to improve motivation and provide alternative non-personal social network crowds.

Fourth, in testing the activities during the service design classes, we encountered reluctance from the students to learn about crowd-driven design methods because they were not aligned with the goals of the service design course. In response to this feedback, we our current unit plan is dedicated completely to motivating the need for and teaching crowd-driven design methods.

Overall, out testing identified evidence of student learning in line with our unit goals and opportunities for improvement. We plan to iterate based on the feedback received from testing to create a crowd-driven design curriculum for Northwestern design students in a future quarter.

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