

Technicity

TECHNOLOGY FOR THE MODERN CITY

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Introduction/ Background

We are part of the 'TechniCity'. The increasing availability of networks, sensors and mobile technologies allows for new approaches to address the challenges that our cities face. The way we understand cities is undergoing sweeping transformation, right along with the analytical tools we use to design our cities and the communication tools we use to engage people. Absorbing, studying and understanding the role of technology from a critical viewpoint allows us to generate creative ideas for improving our cities.

In this iBook we outline the TechniCity Massive Open Online Course (MOOC) that was conducted in the Spring of 2013. The iBook can be used as an introduction and guidebook for the course because it describes the course structure and provides examples of course activities. Because the course will grow and change over time, revised versions of the TechniCity iBook will be made available.

Topics

TechniCity was originally a four week class, focusing on four primary topics. We start with smart infrastructure and then discuss engagement, analysis, and innovation through entrepreneurship. It is first important to explore how and where technology is being deployed in cities to understand the range of uses and benefits. Like physical infrastructure, there is also a social infrastructure composed of preferences, reactions, opinions, behaviors, and interactions that propagate through social networks. This flow of information occurs in raw form, which then needs to be filtered and analyzed to be used by public decision-making processes. Finally, cadres of technologists are finding solutions to both physical and social questions in creative ways that transform urban spaces.

Week 1: Infrastructure for the Real Time City: You'll learn how sensors and networks are transforming our cities.

Week 2: Engaging the Real Time City: Through social networking and crowdsourcing platforms you'll learn how to engage in city building.

Week 3: Analyzing the Real Time City: From sentiment analysis to mashups, you'll experiment with analyzing data.

Week 4: Entrepreneurial Urbanism: You'll explore how open data initiatives, hack-a-thons, and urban prototyping festivals are creatively innovating our cities.

Objectives

Along with lectures on the four primary course topics (see page 2) the course includes online forums that are opportunities for reflection and discussion. Sharing information is an important element of TechniCity.

During this course, students will:

- Gain familiarity with fundamental urban technology concepts.
- Increase understanding of how city planners can communicate with the public to enhance cities.
- Gain hands-on experience with public engagement and analysis tools.
- Generate/collect useful data to support informed public policy decisions.
- Describe how key infrastructure technologies shape cities.
- Accelerate the transfer of ideas between entrepreneurs and urban change agents.

- Develop a solid understanding of how technology is shaping your own city.
- Practice using various methods/tools for professional communication (e.g., Twitter, MindMixer, etc.)
- Access social networking opportunities such as LinkedIn.

This course offers two levels of accomplishment. To receive a “statement of accomplishment” students are expected to fully participate in all aspects of the course. Statements of accomplishment “with distinction” involve participating in and completing all “challenge” activities. The challenge activities include a mix of additional lectures, engagement activities, and assignments. Challenge activities are noted within the course schedule of activities that is part of the accomplishment with distinction track. Any student can participate in challenge activities regardless of whether they wish to receive a certificate of accomplishment with distinction or not. Students taking this course for credit at Ohio State University or Virginia Tech must complete the challenge activities in order to receive academic

FIGURE 1 Example Statements of Accomplishment and Accomplishment with Distinction

Statement of Accomplishment

JOHN DOE

HAS SUCCESSFULLY COMPLETED THE OHIO STATE UNIVERSITY'S ONLINE OFFERING OF



TechniCity

This advanced undergraduate/early graduate course covers how sensors, networks and engagement work together to create real-time, technologically enhanced cities.



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CITY AND REGIONAL PLANNING PROGRAM
THE OHIO STATE UNIVERSITY



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URBAN AFFAIRS AND PLANNING PROGRAM
VIRGINIA TECH

Statement of Accomplishment

WITH DISTINCTION

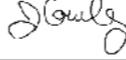
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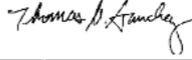


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credit for this course. For those taking this course for AICP Certification Maintenance credit, they must complete a minimum of 15 hours of coursework to fulfill your obligation in order to claim AICP credit.

Instructional Team

The TechniCity instructional team includes two urban planning professors, two doctoral students studying urban/spatial planning, and an instructional designer/technologist. Each team member contributes different expertise to the course either related to course content or course management. The overall course design is a significant undertaking that involves a wide range of content types and preparation. The following are brief bios for the TechniCity team members.

Dr. Jennifer Evans-Cowley is the Associate Dean for Academic Affairs and Administration in the College of Engineering and Professor of City and Regional Planning in the Knowlton



School of Architecture at The Ohio State University. She has passionate interests in technology that can help the public engage in participatory planning for the future of cities. She was named by Planetizen as one of the top 25 leading thinkers in urban planning and technology. She has won numerous awards for her teaching, advising, and research. Cowley publishes and

speaks widely on technology and the future of the city. You can follow her on Twitter [@EvansCowley](#).

Tom Sanchez earned his PhD in City Planning from Georgia Tech



in 1996 and has since taught at Iowa State University, Portland State University, the University of Utah, and is currently professor of Urban Affairs and Planning at Virginia Tech. Dr. Sanchez

conducts research in the areas of environmental justice, technology, and the social aspects of planning and policy. He also serves as editor of Housing Policy Debate and is a nonresident senior fellow of the Brookings Institution. You can follow him on Twitter [@tomwsanchez](#).

Abel Silva Lizcano is a PhD Student in Spatial Planning and



Urban Development at Politecnico di Milano in Milan, Italy. He received his MS in Architecture (Construction) from Politecnico di Torino in Turin, Italy in 2010. As he is interested in the impact of

information and communication technology on urban and regional planning, Silva Lizcano did a research internship at the TILab Group Research Center of Telecom Italia in 2011. His current research is focused on the role that social media can play while being used as a tool for public engagement in the participatory planning processes. You can follow him on Twitter [@A_SilvaLizcano](#).

Nader Afzalan is currently a PhD candidate in urban planning and design (Sustainable and Healthy Environment tract) at the University of Colorado. As an urban planner, his research intersects with policy, science and technology focusing on the use of web-based platforms in decision and plan making processes. Nader is specifically interested in ways in which citizen-generated information influences land-use and environmental decision making. His interdisciplinary research integrates various areas of study; including urban planning and design, environmental planning, computer science and geography. Nader holds Master's and Bachelor's degrees in Urban Planning from the University of Tehran. Prior to beginning his PhD studies, he was involved in various urban planning projects focused on socio-economic revitalization of downtown areas, redevelopment of historical



towns, and ecological planning. You can follow him on Twitter [@naderafzalan](#).

Tom Evans is Senior Instructional Designer & Open Courses Coordinator in the Office of Distance Education & eLearning at The Ohio State University. In his everyday work, Tom provides support for faculty development and open education initiatives, such as overseeing all Ohio State courses on Coursera. Along with his team, he partners with faculty to transform their classes using technology that engages students, increases efficiency, and supports anytime/anyplace learning. You can follow Tom on Twitter at [@taevans](#). For TechniCity, Tom is providing instructional design support, development and guidance.



Course Logistics

Each week students are provided with two+ hours of core video lectures and additional challenge video content. The videos are divided into three categories. “Context” lectures provide an introduction to the key ideas that will be explored as a class in each week. Within each Context lecture there will be in-video reflection questions. These are used to help reflect on presentation topics so students can consider how it might be relevant in their own city. Students are invited to provide their thoughts and ideas as part of course interaction. Case Study lectures provide examples that build on what students have learned in the Context lectures. We also provide Instruction lectures which provide instructions for example on how to complete an assignment.

Throughout the course students are provided with readings and websites that are associated with lecture topics. Next to each video are icons related to the lecture video sections. They link to external resources such as readings, websites, files, and additional videos for further learning.

1. Course Format

- The course will be delivered fully online and introduces a variety of technologies, combined with hands-on demonstrations.
- Course sessions will be delivered via online lectures with many guest speakers participating. Participants will need access to a computer and an internet connection.
- A major project and peer review will be required. Challenge assignments will also be provided to supplement learning.

2. Engagement

Given the scale of student enrollment, personalized contact with every student will not be possible, but we are designing a number of opportunities for engaging with the instructional team.

- MindMixer will serve as our primary tool for engagement. You will be participating and sharing your ideas, as well as support others in the course.

- Weekly in-person/online salons will be offered at various locations, based on where the instructional team is that week. Students can participate onsite or via Google Hangout.
- We also host weekly live Twitter sessions
- We will do our best to respond to messages sent via Twitter (dependent on volume) [@EvansCowley](#) or [@tomwsanchez](#). We will also be using the hashtag [#technicity](#).
- The online discussion forums will be monitored and you are welcome to post questions there, although this is principally for technical questions or questions about your projects.

3. Planning Accreditation Criteria Met

The Planning Accreditation Board has a series of standards by which accredited planning programs are measured. Both Ohio State University and Virginia Tech have accredited planning programs. Below is a list of accreditation criteria that are covered in this course.

- Purpose and Meaning of Planning: appreciation of why planning is undertaken by communities, cities, regions, and nations, and the impact planning is expected to have.
- The Future: understanding of the relationships between past, present, and future in planning domains, as well as the

potential for methods of design, analysis, and intervention to influence the future.

- Global Dimensions of Planning: appreciation of interactions, flows of people and materials, cultures, and differing approaches to planning across world regions.
- Research: tools for assembling and analyzing ideas and information from prior practice and scholarship, and from primary and secondary sources.
- Written, Oral and Graphic Communication: ability to prepare clear, accurate and compelling text, graphics and maps for use in documents and presentations.
- Quantitative and Qualitative Methods: data collection, analysis and modeling tools for forecasting, policy analysis, and design of projects and plans.

Now you have an idea about the structure of the course and who is involved. In the next chapter we provide much more detail about the topics and activities that are included. The course is both rich and rigorous, with many fascinating lectures, discussion topics, and assignments.

Elements of the Course

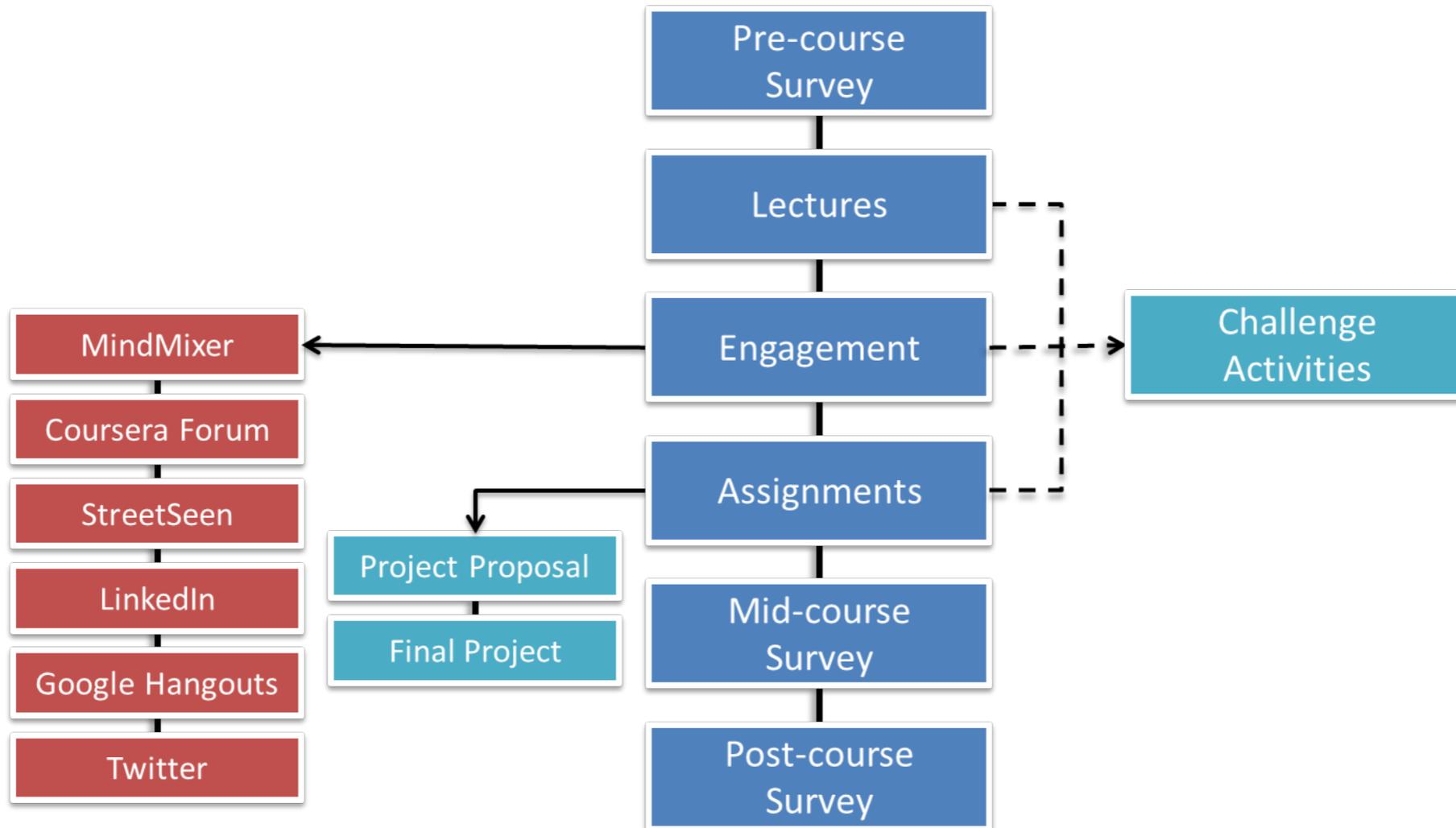
The TechniCity course is made up of several activities to provide a diverse assortment of materials to learn about technology and cities. Experience shows that seeing, hearing, and engaging with learning materials in a variety of ways helps to increase absorption and retention. Each week there are lectures/presentations, suggested readings, case studies, and opportunities for discussion and application of knowledge – all important elements of learning. In addition, because students from around the world are enrolled in the class, there are many lectures and case studies from international sources to broaden the perspective.

General Overview

The following briefly describes course activities which include pre- and post-course surveys, weekly lecture topics and content, engagement activities, assignments, and evaluation. The

objective is to highlight the range of activities included in TechniCity.

FIGURE 2 Course Overview



Pre-Course Survey

With thousands of students enrolled in the course, and being completely online with little face-to-face contact (the exception being video conferencing activities), it is a challenge for the instructors to learn the backgrounds of the students. So we used a pre-course survey to gather information about student demographics including location, age, occupation and their motivations, expectations, and anticipated modes of participation. In particular, the results of the survey helped us better understand the range of topics that students were hoping to learn about. We were able to use this feedback to adjust course contents and activities. The following is a brief summary of the results we obtained from the Spring 2013 TechniCity course.

With so many students enrolled in the course from around the world there is significant diversity not only in geographic locations and city types, but also in backgrounds and motivations. As shown in the series of charts below, students responding to the survey were from over 100 countries and nearly 60 percent of them living in cities with 500,000 or more people. The most popular reasons given for taking TechniCity were that the title of

FIGURE 3 What size of city do you live in?

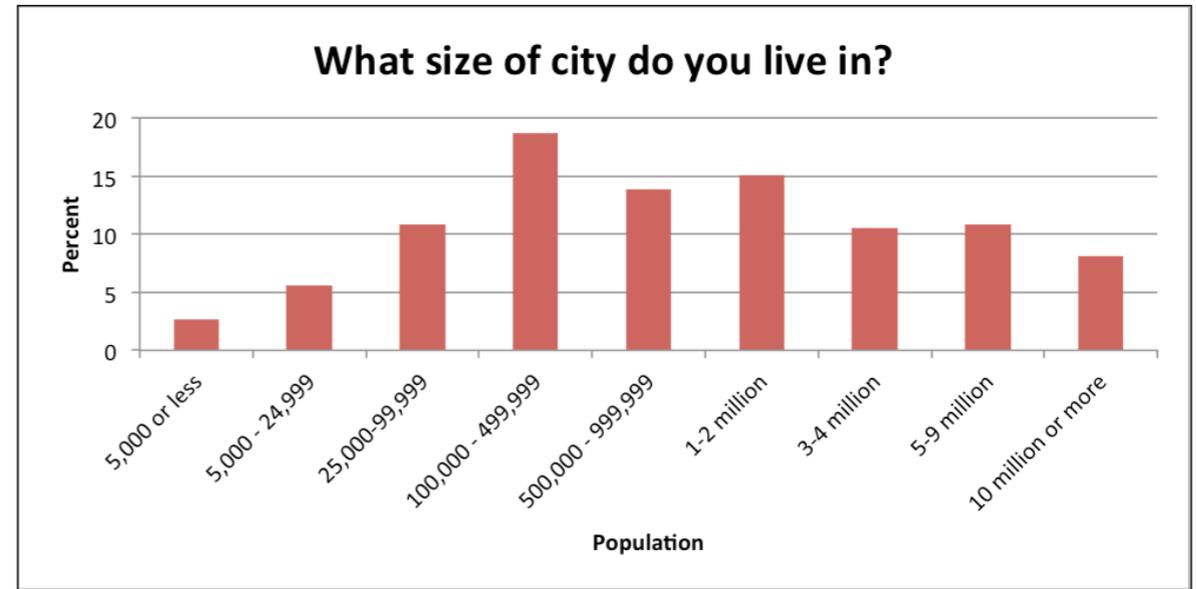


FIGURE 4 Reason for taking TechniCity

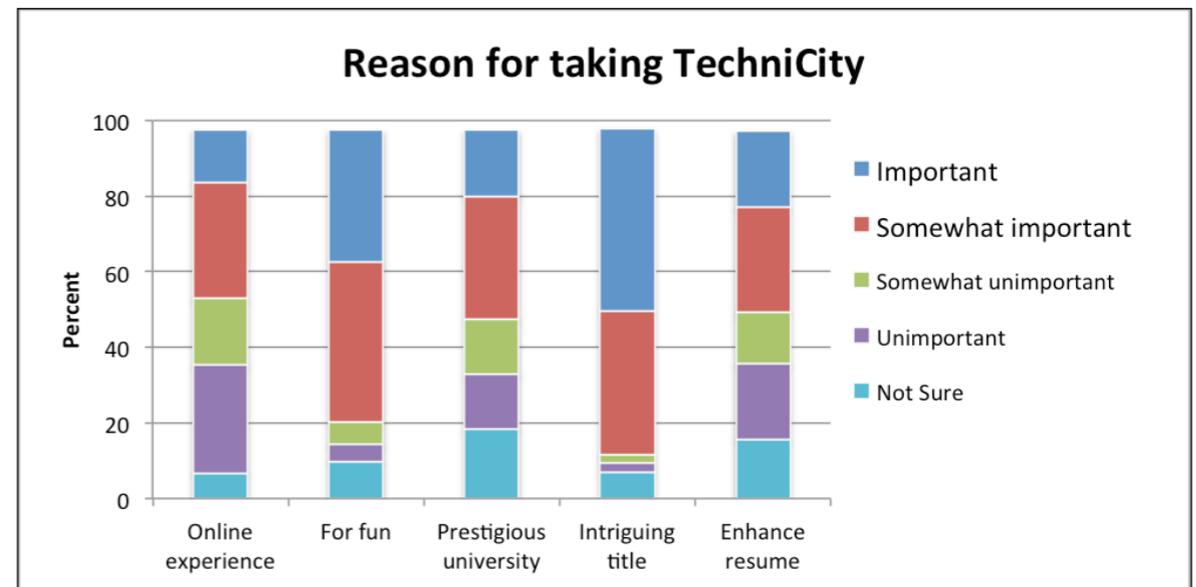
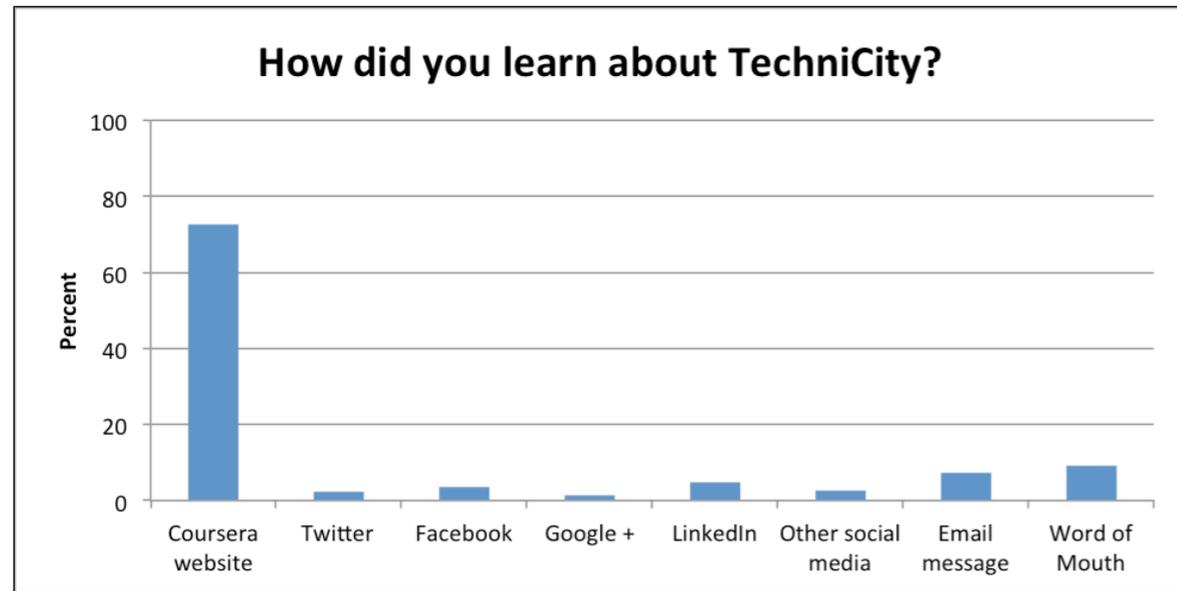


FIGURE 5 How did you learn about TechniCity?



the course sounded intriguing and that students thought it sounded like it would be fun. About one-quarter of the respondents planned to work independently on the class, concentrating specifically on the lectures and assignments. The majority of them planned to access the course using a laptop, with a surprising number planning to use a tablet and/or mobile phone. The vast majority of the students learned of the course directly from the Coursera site, compared to the other social media channels we used to publicize the course. Most already had college degrees and were not new to MOOCs. Their experience with the course subject was evenly spread among already knowing something about it, on through just being curious about the topics. Students reported a very wide range of particular topics they were hoping to learn about from the course.

FIGURE 6 Which of the following best describes your experience? (Top 5)

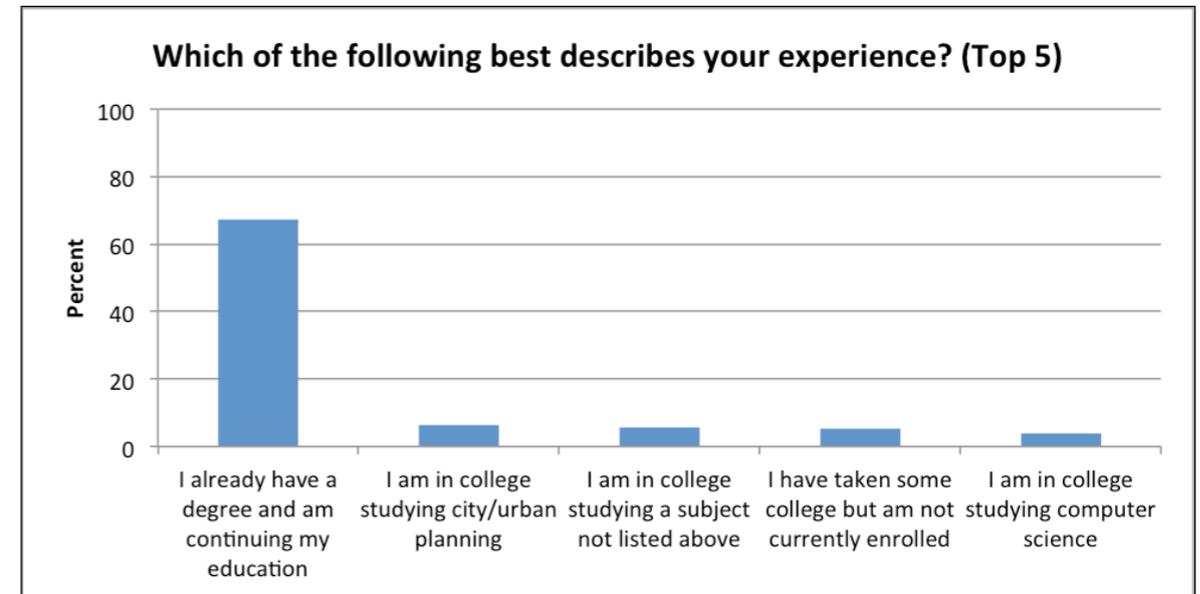
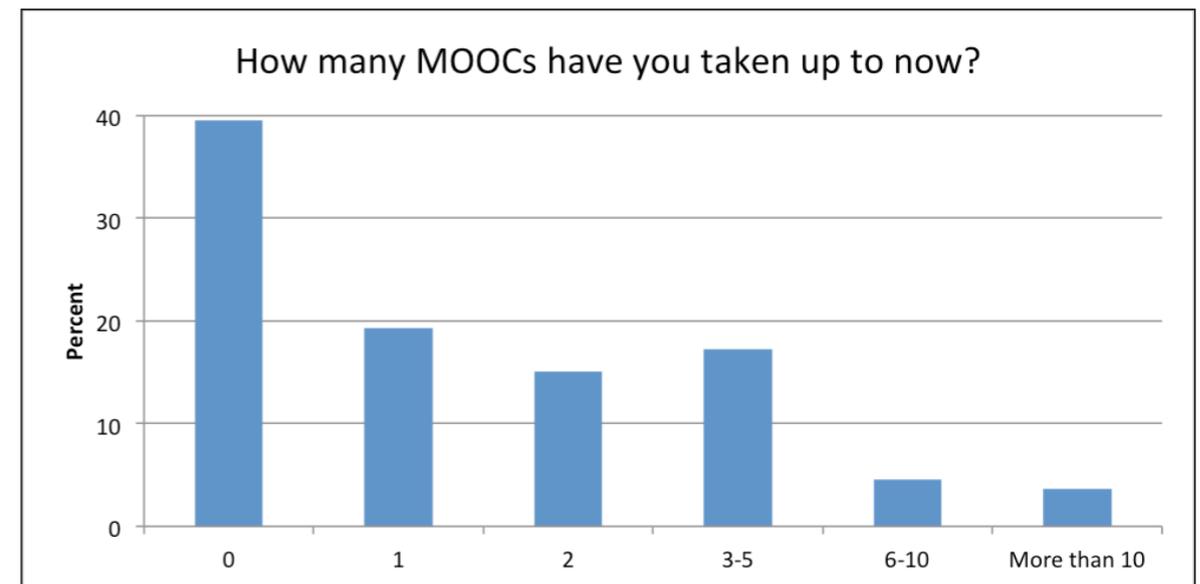


FIGURE 7 How many MOOCs have you taken up to now?



Lecture Content

WEEK 1: INFRASTRUCTURE FOR THE TECHNICALITY

In Week 1 we explored infrastructure that shapes our cities. The context for infrastructure is referred to as smart cities, open cities, and networked cities – each representing a different facet of technology applications in cities. The goal was to gain an introduction to the technological infrastructure that is shaping our cities.

What is a Smart, Thinking, Open TechniCity?

Context: Engaging with TechniCity, Jennifer Evans-Cowley and Tom Sanchez

Context: Welcome to Smart, Thinking, Open Cities, Jennifer Evans-Cowley and Tom Sanchez

Context: Thinking and Networked Cities Ericsson, Ericsson

Context: What is a Smart City? Kevin DeSouza, Arizona State University

Context: Better Stories for Smart Cities, Rick Robinson, IBM

Sensors

Context: Sensors, Ness Shroff, OSU

Case Study: Pollution Monitoring, Ness Shroff, OSU

Networks

Context: Wireless Networks: A Vision for Smarter Cities, Anthony Townsend, Institute for the Future

Case Study: Mesh Networks, Greta Byrum, Open Technology Institute

Radio Frequency Identification

Context: Radio Frequency Identification, John Volakis, OSU

Case Study: RFID in Cities, Jennifer Evans-Cowley, OSU

Imaging

Context: Imaging and Surveillance, Robert Loce, Xerox Research Center

Case Study: Understanding Surveillance, Timo Arnall, BERG

Smart Grid

Context: Smart Grid, Sally Jacquemin, Siemens

Context: Smart Grid Solutions, Sally Jacquemin, Siemens

CHALLENGE ACTIVITIES

Sensor Applications

Case Study: Structural Health Monitoring, Ness Schroff, OSU

Case Study: Transportation, Ness Schroff, OSU

RFID Applications

Case Study: RFIDs in Travel and Beyond, John Volakis, OSU

Case Study: RFIDs in Car Sharing, Relay Rides

Smart Grid

Case Study: Smart Grid Planning, Sally Jacquemin, Siemens

Case Study: Smart Grid in Chicago, Sally Jacquemin, Siemens

Conclusion

Infrastructure, Jennifer Evans-Cowley and Tom Sanchez

WEEK 2: ENGAGING THE TECHNICITY

In Week 2 we explore how to engage with the TechniCity. We start off by focusing on several key concepts. The first is a framework for public participation, a ladder of participation. It is this ladder that we want the students to reflect on throughout the week as they consider the various types of tools and techniques for engagement.. A second key concept is the justification for engagement. Why are we seeking to engage with the public? To what end is engagement valuable? A third key concept is how changes in technology changed the public's perceptions of public

life. How should the availability of technology change the way that engagement happens? Greg Lindsay and Eric Gordon explore this third concept. There are enormous differences in cultural and political expectations of public engagement across the globe. Where one lives has a significant impact on her individual ability to engage with the TechniCity. We introduced this idea in week 2. The goal for this week is to understand key tools, methods, and challenges in engaging with the TechniCity.

Engaging Cities

Context: Engaging with the TechniCity, Jennifer Evans-Cowley and Tom Sanchez

Context: The Importance of Engaging Cities, Mitch Silver, City of Raleigh, North Carolina

Context: Technology as an Enabler for Engagement, Greg Lindsay, Journalist

Context: New Tech, New Civics, Eric Gordon, Emerson College

Nonparticipation is not an avenue that we will be discussing further. We will be focusing our time this week on the Tokenism and Citizen Power portions of Arnstein's Ladder of Participation.

Tokenism: The term tokenism makes it sound like this is not a valuable form of engagement. Within Tokenism there is informing, which is a critical part of the engagement process. It is quite important that the public understand the key issues that are

facing the community, to understand key projects, and to be better prepared to participate in higher levels of public engagement. In the following lectures, we highlight some of the tools and methods that can be used to aid in informing the public. It is also critical that city planners engage in consultation. That is asking people questions that will inform the planning process. City planners often need to understand the community before it can move to a citizen power stage of engagement.

Case Study: Video in Planning, Chris Steins, Urban Insight

Case Study: Infrastructure and Public Engagement, Tom Coleman, Parsons Brinkerhoff

Case Study: Visual Survey Tools, Jennifer Evans-Cowley, OSU

Citizen Power: There are many different platforms for public engagement. The key is how we use these moments of interaction. The key issue is how we respond to this moment of interaction. How will we ensure that we are engaging in true partnerships, that we are giving citizens power and control to make decisions that will benefit our communities? The tools that are highlighted require skilled users that allow for well developed engagement that allows for the community to participate in highly productive ways. Of course these tools can be used ineffectively that may result in these tools being used for merely Tokenism, rather than Citizen Power.

Context: Community Engagement, Eric Gordon, Emerson College

Case Study: Gamification, Eric Gordon, Emerson College

Case Study: Wikipanning, Mark Elliott, CollabForge

Case Study: Metroquest, Dave Biggs, Metroquest

Case Study: Shareabouts, Frank Hebbert, OpenPlans

Case Study: SeeClickFix, Ben Berkowitz, SeeClickFix

CHALLENGE ACTIVITIES

How to Use Tools

How to Use StreetSeen, Jennifer Evans-Cowley, OSU

How to Scrape Twitter, Tom Sanchez, Virginia Tech

How to Scrape Facebook, Jennifer Evans-Cowley, OSU

How to Use SurveyMapper, Jennifer Evans-Cowley, OSU

WEEK 3: ANALYZING THE TECHNICALITY

In the second week we focused on how to engage with the public to support decision making. The public voice alone is not enough to make valuable decisions for the future of the city. It is critical that planners engage in significant data analysis to understand the city and the impact of potential changes on the future of the city. This week we focus on the different types of data collection and analysis that are needed to support the city. We start by understanding data analysis and the importance of care in understanding data in the greater context. For example Benjamin

De La Pena points out the difficulties of making decisions for one group and the unintended impacts on another. The goal is to understand key tools, methods, and challenges in analyzing the TechniCity.

Introduction to Data Analysis

Context: Introduction to Data Analysis in the TechniCity, Jennifer Evans-Cowley and Tom Sanchez

Context: What is a City, and How Does it Get Smarter? Shane Mitchell, Cisco

Context: Data Driven Delusions, Benjamin De La Pena, Rockefeller Foundation

Urban Data

Context: Urban/Big Data, Michael Batty, University College London

Context: Urban Infomatics, Marcus Foth, Queensland University of Technology

Context: The Challenges of Everyware, Adam Greenfield, Urbanscale

Mapping Data

Case Study: Nokia Mapping Network, Milton Ospina, Nokia

Case Study: Creating Traffic Data, Pete Costello, Inrix

Analyzing Social Media

Context: The Emotional City, Sarah Williams, MIT

Case Study: FourSquare Checkins around the Globe, Sarah Williams, MIT

Case Study: Sentiment Analysis, Georgia Bullen, Open Technology Institute

Case Study: Microparticipation in Transportation, Jennifer Evans-Cowley, Ohio State University

CHALLENGE ACTIVITIES

Further Analyzing the TechniCity

Case Study: The Geoweb, Emily Badger, The Atlantic Cities

Case Study: Crowdsourcing, Nader Aflazan, University of Colorado

Case Study: How to Access Foursquare and Jiepan Checkins, Sarah Williams, MIT

Case Study: Open Trip Planner Analyst, Frank Hebbert, OpenPlans

Case Study: Sensed Data for Traffic Analysis, Pete Costello, Inrix

Case Study: Mobile Technologies, Jennifer Evans-Cowley, The Ohio State University

Case Study: Applied Apps, Jennifer Evans-Cowley, Ohio State University

How to Use Tools

How to Analyze StreetSeen, Jennifer Evans-Cowley, OSU

How to Analyze Facebook Data, Nader Aflazan, University of Colorado

How to Create a Web Map, Nader Aflazan, University of Colorado

WEEK 4: ENTREPRENEURIAL URBANISM

In this week we explore how individuals can work towards Entrepreneurial Urbanism. In the second week we focused on how to engage with the public to support decision making. This week we flip things around and examine the ways in which innovators and entrepreneurs are working to bring change to their city. Many of these approaches involve solutions that meet a public need by adapting technology in novel ways. Some of the examples include interesting ideas for public spaces, public art, and traffic counting. In addition, entrepreneurs use fascinating processes to design and implement their ideas. It is also exciting to see how youth are learning to use these technologies. The goal for the week is to understand the methods and experiments that individuals and cities are using to support entrepreneurial urbanism in the TechniCity.

Introduction to Entrepreneurial Urbanism

Context: Introduction to Entrepreneurial Urbanism, Jennifer Evans-Cowley and Tom Sanchez

Do It Yourself Urbanism/Urban Prototyping

Context: Tactical Urbanism, Michael Lydon, Street Plans

Case Study: Urban Prototyping, Dave Rauchwerk, Bohemian Innovation

Case Study: Be Your Own Souvenir, BlaBlaLabs

Case Study: Electronic Countermeasures, Liam Young, Tomorrow's Thoughts Today

Case Study: Traffic Counting Sensors, Aurash Khawarзад, Change Administration

Case Study: Water Wall, Antonin Fourneau, Digital Arti

Hackathons

Context: Civic Hacking, Sunlight Foundation

Case Study: Hack-a-Thons, Jason Lally, PlaceMatters

Youth in the TechniCity

Case Study: Spyhop Youth, Technology and Apps, Kassandra VerBruggen, Spy Hop Productions

Case Study: Youth, Digital Technology and Community, Matt Dunleavey, Radford University

City Sponsored Engaging Experiences

Case Study: Virtual/Immersive Planning, Justin Hollander, Tufts University

Case Study: Reinventing the Pay Telephone, Frog Design

Case Study: Rundle Lantern, Damien Mair, Fusion

Case Study: Sensor Valley, Daan Roosegarde, Studio Roosegarde

Engagement Activities

During the course we designed a number of opportunities for the students to engage with the instructional team, which included the following:

- MindMixer served as our primary tool for engagement. The students participated and shared their ideas, as well as support others in the course.
- Weekly in-person/online salons were offered at various locations, based on where the instructional team was that week. Students could participate onsite or via Google Hangout.
- We hosted weekly live “tweet-up” sessions.
- We did our best to respond to messages sent via Twitter @EvansCowley or @tomwsanchez. We also used the hashtag #technicity during the course to interact with twitter users.
- The online discussion forums were monitored and the students were welcome to post questions there, although

this was principally for technical questions or questions about their projects.

1. Mindmixer

We are very excited about our partnership with MindMixer who provided our engagement platform. To get the students familiar with MindMixer and to start engaging, we provided a video introduction that walked them through MindMixer and showed them how to participate. In addition, in the “beginner’s corner” section of the course, we posted the instructions for what to do the first time they visit MindMixer.

Furthermore, in order to get the students familiar with MindMixer and to start engaging with their classmates we created several opportunities from the very beginning. For example, we had the following topics during the preview week:

- Tell us who you are and where you are from by placing a pin on a map.

- Participate in an instant poll. Let's see what portion of the class has a smartphone.
- Select our theme song. Contribute an idea or second the songs that you think would make a great theme song for our course.
- If you want an extra challenge, we would welcome your contribution of a photo of how technology is being used in cities across the globe. If you don't have a photo that is okay, feel free to share what how the photos make you feel or add a comment.
- Share your thoughts on the use of surveillance cameras using the recent example of the bombing in Boston, Massachusetts in the United States.

We knew that the students were eager to discuss many topics related to technology and cities. We selected a limited number of topics each week to allow for deep discussion around focused topics. If the students had an idea for a topic they would like to discuss, we encouraged them to feel free to offer a suggestion in our Coursera discussion forum. We picked the most popular topics that were related to each week's topics.

During week 1, we asked the students to participate in an instant poll on MindMixer: How are you using RFIDs? And to share their ideas about How would you use RFID's to improve

your city? Furthermore, we had a number of interesting questions we wanted the students to reflect on and share their thoughts with others in the course. Here is example of some of these questions:

- What aspect of your city appears to be using technology most?
- Show images of sensors in your city and how they can improve quality of life
- Who plays the biggest role in shaping urban technology and innovation in your city?
- Should technological infrastructure be managed by local government, private business or a mixture of both?
- What is your big idea for a smarter city?
- How do you think we should define urban technology for the purposes of this course? Can we come up with a common definition?

In week 2, we were exploring how to engage with the TechniCity. Based on the context videos we invited the students to reflect on what is happening in their own community and share with the class the experiences in their own city through questions like:

- Where is your city at on the ladder of public participation?
- Have you answered a survey or poll from your local government?
- How are people in your city using technology to organize for positive change?
- What are some of the ways that you think crowdsourcing can be used to address issues in the city where you live?
- How can we engage effectively?
- How would you spend 100 TechniCoins on Public Engagement?

Just for fun, during week 2 we launched a T-Shirt Design Contest too. We encouraged the students to use their creativity and post their idea for a class T-shirt on MindMixer. The winners had their winning t-shirt featured as a reward in the rewards store in the last week of class.

How can we analyze the TechniCity was the main topic of week 3. During this week, we had a number of interesting questions we wanted the students to reflect on and share their thoughts with others in the course using MindMixer. Some of the questions for this week were:

- Where do you get most of your information about new urban technologies?
- How can new urban technologies have unfair social impacts?
- What are some sources of open data in cities?
- What are your thoughts on privacy of data?
- What does technology look like in YOUR city? We encouraged the students to share a picture of technology in action in their city. For example, they could take a picture of themselves standing next to technology.
- What are ways that you use mobile mapping technologies?
- Share your ideas about new or potential urban indicators that can help us better understand cities.
- Name some types of data that you suspect are not collected where you live, but that may be very useful for planning purposes.

In week 4, the main goal during this week was to learn how individuals can work towards Entrepreneurial Urbanism. Having in mind this topic, we used MindMixer to ask students questions such as:

- Name some challenges to Tactical Urbanism? Have you participated in crowdfunding an idea?
- What are some examples of how you have seen art and technology used in public spaces?
- Share ideas about technology and children.
- Do you think most new technologies are good for children?
- Do you think 3D Virtual Environments are effective for engaging the public?
- What do you think the role of government should be in developing and promoting urban technology?
- If you could build any citizen app, what would it be and how could it help the community?

We also decided to put together an e-book (this book) to highlight some of the best projects presented during the course. We asked the students, if they wanted to have their project considered for inclusion, to share their project at Technicity: The Book Competition on MindMixer. And for those in the class who were particularly ambitious and believe their project can be realized we hosted a competition with one project that could be selected by the class for

crowdfunding. The students were able to post their project and an explanation of how crowdfunding will help them complete their project. Students did not have to submit, but everyone was asked to help pick the projects that we should include in the book or crowdfund.

2. Coursera Discussion Forum

The online discussion forums were monitored and the students were welcome to post questions there, although this was principally for technical questions or questions about their projects. The discussion was organized following the Coursera conduct standards. Like most communities, the Coursera community has some basic ground rules. The students were encouraged to help us create a healthy learning environment by respecting the following standards:

- Be polite. Please respect your fellow students. Insulting, condescending or abusive words will not be tolerated. Use the same tone and behavioral judgment you would use when speaking face-to-face. Polite debate is welcome as long as you are discussing the ideas, not attacking the person.
- Be sensitive. This is a global forum with participants from many different cultures and backgrounds. Be very careful when discussing race, religion, gender, sexual orientation,

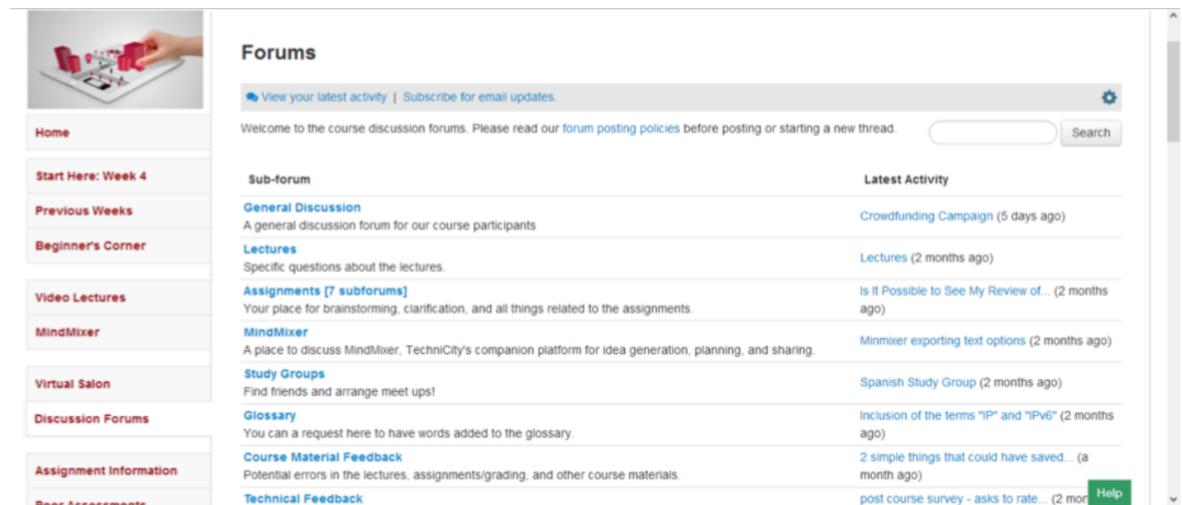
or controversial topics since others may be more sensitive about them than you are.

- Post appropriate content. Content that violates the Honor Code or Terms of Service is not permitted. You may not post inappropriate (eg. pornographic) or copyrighted content, advertise or promote outside products or organizations, or spam the forums with repeat content.

In addition, Coursera asks to consider the following guidelines when posting in the course forums.

- Vote wisely. Upvote helpful posts and only downvote posts if they violate the Code, not just because you disagree with their content.
- Use informative titles. Keep your post titles short and on-topic so the forums are easier to navigate. If you're asking a question, it should go in the title.
- Read before posting. It is likely that a thread on your topic or an answer to your question already exists. Use the search function to avoid creating duplicate threads and find the most appropriate subforum to post in.
- Make it easy to read. Don't capitalize or bold entire sentences since this makes the forums harder to read. Check your posts for spelling or grammatical errors.

FIGURE 8 The discussion forums section of the course



- Stay on topic. Don't change the topic of a thread or split a thread into multiple discussions. If you are discussing something that is not directly related to the course materials, pick one thread instead of discussing over multiple threads.

The discussion forums of the TechniCity course were organized in eight sub-forums in order to keep an order of the different topics. The sub-forums were:

- General Discussion. A general discussion forum for our course participants.
- Lectures. Specific questions about the lectures
- Assignments. The place for brainstorming, clarification, and all things related to the assignments. This Forum had 7 sub-forums.

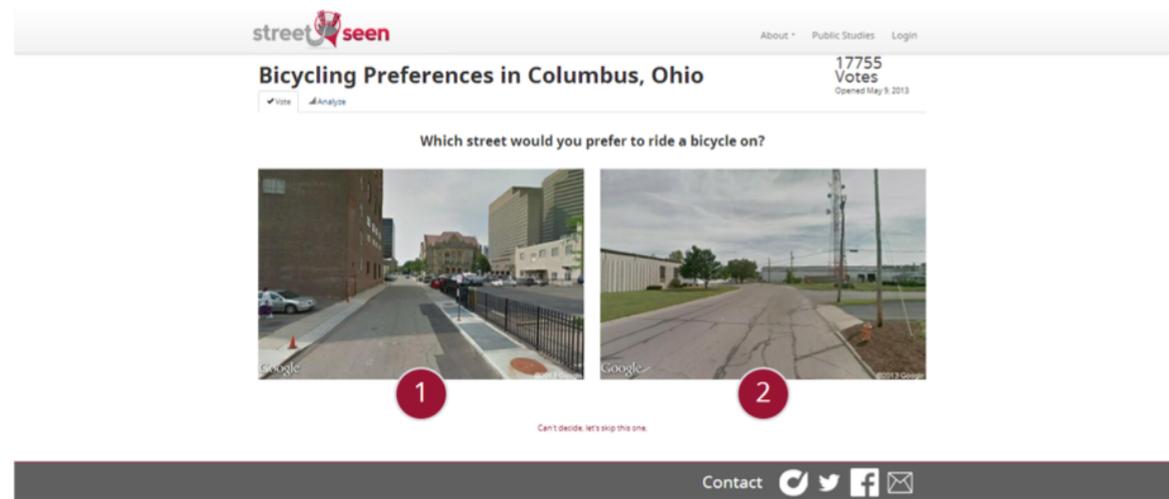
- Project Proposals. If students needed help thinking through their project proposal.
- How to Video. If students needed help thinking through their How to Video assignment.
- StreetSeen. If students needed help thinking through their StreetSeen assignment. See page To learn about the StreetSeen assignment.
- Social Media Scraping. If students needed help thinking through their Social Media Scraping assignment.
- Social Media Analysis. If students needed help thinking through their Social Media Analysis assignment.
- Google Streetview Stitching. If students needed help thinking through their Google Streetview Stitching assignment.
- Final Project. If students needed help thinking through their Final Project.
- MindMixer. A place to discuss MindMixer, TechniCity's companion platform for idea generation, planning, and sharing
- Study Groups. Find friends and arrange meet ups!

- Glossary. Students can request here to have words added to the glossary (see Appendices).
- Course Material Feedback. Potential errors in the lectures, assignments/grading, and other course materials.
- Technical Feedback. Video playback issues, 404 errors, and other technical issues and bugs with the platform.

3. **StreetSeen**

- During week 2, the students learned about how visual surveys can be used to help city planners understand the preferences of those who live in their city so we invited them to participate in a visual survey using StreetSeen. The students were asked to answer the following question:
- Which street would you prefer to ride a bicycle on? (They were given two images at a time. We suggested that they voted on 10-20 image sets, but they could continue to vote for as many as they like. It was an endless cycle of randomly paired image sets carefully selected)
- This survey should take less than 10 minutes to complete. The responses to this survey were used to understand the preferences of different people from different parts of the world. The participation of the students was completely

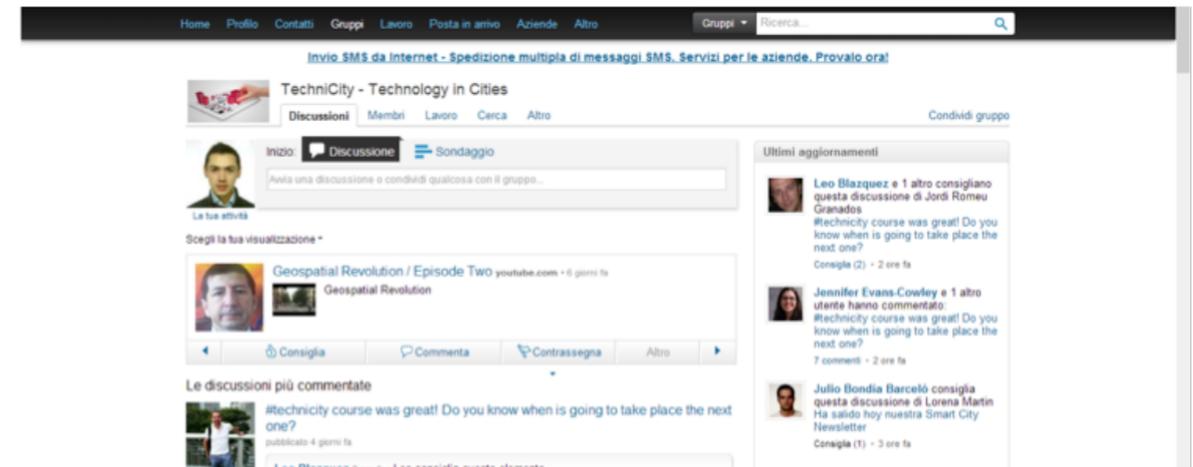
FIGURE 9 Screenshot of the StreetSeen web app while performing the Bicycling Preferences survey for Columbus, Ohio



voluntary and was limited to persons over the age of 18. The instructors could not know who participated. The students could skip questions or withdraw participation at any time.

Once the students tried StreetSeen, we proposed a challenge activity featuring this web app in order to learn how to use and analyze results from a visual survey tool. Each student was responsible for visiting StreetSeen and creating their own visual survey. Where possible it was ideal to create a visual preference survey that could be used as part of their course project. This project should take them approximately two to three hours to complete.

FIGURE 10 The TechniCity LinkedIn group

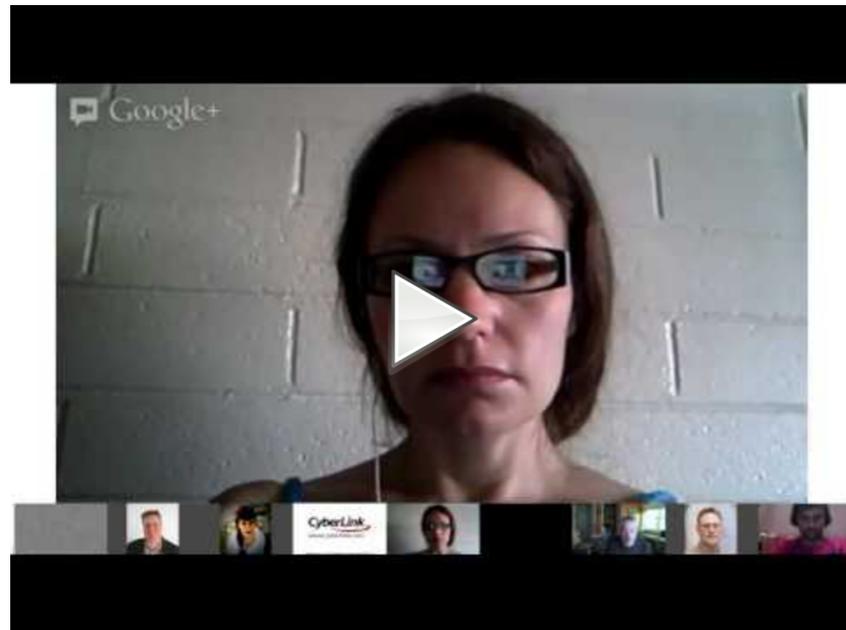


4. LinkedIn

We knew that the students in the course may want to continue the conversation beyond what we provided in the course site and MindMixer. Having this in mind, we thought that social media was a great way of enhancing the course experience by sharing resources, tips, and planning meet-ups for those who were close by. So we encouraged the students to join the conversation on LinkedIn where hundreds of members of the course were networking and engaging around topics that are related to technology and cities.

The LinkedIn group continues to where the conversation will continue for as long as people wish to engage. More than 1,500 people are members of the group.

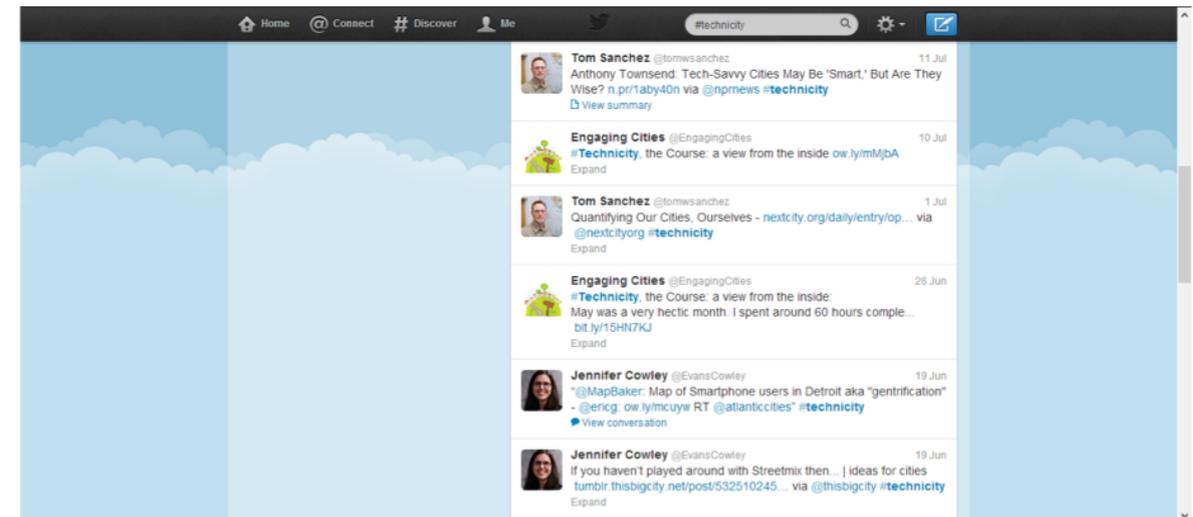
FIGURE 11 Video of the Google Hangout hosted at the Virginia Tech



5. Google Hangouts/In-person Meetups

Each week we hosted a live meetup that was also broadcasted via Google Hangout. This was the student's salon, a gathering of people under the roof of inspiring hosts (the instructors), held partly to amuse each other and partly to refine our collective taste and increase the knowledge of the course participants through discussion. Everyone was welcome to join in person or online. We were hosting these in a variety of locations in the hopes that some of the students could be able to join us in person. At each live meetup, a member of our instructional team was onsite to facilitate the discussion.

FIGURE 12 Screenshot of the Twitter website with some of the latest tweets related to the hashtag



As an example you can watch the Google hangout held on May 14th at the Virginia Tech [here](#).

6. Tweetups/Weibo Events

Each week we hosted live tweet-up events. A live tweet-up allows people to engage on Twitter for a continuous period of time - with a sequence of focused Tweets. This was a fun way for us to engage in sharing about the exciting things we were learning in class. We organized these to encourage broad participation. The live tweet met on: Twitter or Weibo (where specifically noted). We encouraged the students to use the hashtag **#technicity** to engage with people in the class. For example, if the students wanted to post something during the Live Tweet they type in their message followed by **#technicity**.

Assignments

Even though the TechniCity course was only 4 weeks in length, we felt it was important for students to have some hands-on experience with some of the topics and tools that were discussed in the lectures. The primary assignment was broken into two parts, 1) the project proposal and 2) actual project execution. Each of these is described below. In addition, there were several “Challenge” assignments for students pursuing a certificate of distinction and/or for those interested in particular extra topics. Another important element of the class projects is the peer evaluation. Do to the scale of the class, it would be impossible for the instructors to view and comment on each and every project. Using a peer evaluation system within Coursera, each student completing an assignment was expected to evaluate a small number student assignments (randomly assigned). The instructors provided rubrics to guide students in the evaluation process. We feel it is especially valuable for students to see each other’s work and have the chance to engage with each other in the process. This helps to promote sharing of ideas and resources. The following briefly describes the assignment.

PROJECT PROPOSAL (UP TO 40 POINTS)

Each student should select a topic with which they plan to research. They should identify a problem in their own city. This should be a one page assignment. Where possible students should include pictures with captions that describe the problem they want to study. This could be anything from traffic congestion, to pedestrian safety, to water quality to really anything. Students were welcome to work alone or you can team up with one more other people in the class. The students were also allowed to work together on a project. This would need to be self organized if they wish to pursue this. See this project proposal page for all of the details about how to complete this assignment.

PEER ASSESSMENT

Peer assessment is the process students providing feedback to other students according to a rubric that has been developed by the instructors. Once the deadline for the project proposal has passed, the students will receive five proposals from other students in the class. They will then self-grade their own

assignment based on the rubric, along with the projects others have submitted. The grade for the project proposal will be viewable, based on the rubric, once the students have completed the peer evaluations.

Students will conduct a similar peer assessment for the final project and for any challenge assignments they decide to undertake.

FINAL PROJECT (UP TO 60 POINTS)

For the final project students followed through on their initial proposal. (See the assignments information tab on the Coursera site for more detail.

This project will take a variable amount of time depending on the individual project. Students are expected to spend substantial time creating something that could have value in improving their city. It is very important that students provide constructive feedback so that they can improve on their project. We asked students to be polite, detailed, and fair in their evaluation of others' work. The students should expect to take approximately 20-30 minutes to complete each peer assessment.

CHALLENGE ASSIGNMENTS

The Challenge assignments are designed to be fun and encourage students to experiment with different methods for collecting and

analyzing information. Students can choose to do all of these if they would like, or pick those that are of most interest. Students should note that each assignment has its own limitations. For example, the tool may not work on every browser or computer. Or due to restrictions in the students' home country, they may not be able to access a website.

CHALLENGE: StreetSeen (up to 10 points)

Each student will be responsible for visiting StreetSeen and creating their own visual survey. Where possible it would be ideal to create a visual preference survey that can be used as part of their course project.

This project required approximately two hours to complete. To receive credit for this assignment, students needed to submit a link to their survey and prepare an analysis.

CHALLENGE: Google Streetview Sticking/Hyperlapse Photography (up to 10 points)

This assignment focused on taking Google Streetview images and Sticking it together to create a video that navigates through the students' city. This project should approximately took them one hour to complete, possibly longer depending on how they construct the route. To receive credit for this assignment the students were required to submit their analysis.

CHALLENGE: Scraping Social Media Data (up to 10 points)

Web and social media data scraping refers to the process of extracting the content and metadata of user submitted activities. This includes information about the author, time, date, location, and content of Twitter tweets, Facebook posts, FourSquare checkins and other social media sources. In this assignment students were asked to identify a data source and then scrape a minimum of 100 observations or individual pieces of information that will be suitable for analysis.

This project should take the students approximately one hour to complete, longer if they do not have the skills to undertake a foursquare or jiebang analysis. To receive credit for this assignment, the students were required to submit the social media that they have scraped.

CHALLENGE: Social Media Analysis (up to 10 points)

This assignment was focused on taking the raw data scraped from scraping social media data assignment and performing one of several types of analysis. Descriptive analyses can be performed to explore the range of tweet topics and survey responses. Maps could be created for spatial or geographic analyses. Network analyses could be used to describe the connections between Twitter users or Facebook friends. Sentiment analysis could be used to interpret the nature of Twitter, Facebook, and survey data

content. Quantitative and/or qualitative analysis methods could be used for this assignment.

This project took the students approximately three hours to complete, possibly longer depending on the analysis. To receive credit for this assignment the students were needed to submit their analysis.

CHALLENGE: How To Video (up to 10 points)

This assignment was focused on sharing skills of the students. Students should select a FREE tool that they think would be helpful to the other students in this course. They should record a step by step how to video showing students exactly how to use the tool. This can be any kind of tool that students might think of that would be helpful to people interested in improving their city.

This project should take variable amount of time depending on the tool the student develops and their knowledge of video creation.

PROJECT EXAMPLES

The following are three examples of class projects that were submitted by students. Each project proposal needed to include the following:

1. Topic: What is the issue you want to explore

2. What: What do you hope to learn by exploring this issue
3. Why: Why are you drawn to exploring this issue
4. Where: What city are you exploring this issue in. You should include pictures, maps, or other graphics if possible showing the issue in your city. Be sure to include the sources of any images that you include. In order to include these images in your assignment, you will need to provide a weblink to the images you want to show.
5. Who: Who are the people that are most impacted by the issue?
 - a. Who do you think you would like to engage as part of this project?
6. How: How does the student hope to explore this topic:
 - a. Data Analysis: What data do you hope to obtain and how do you anticipate using this to support your project?
 - b. Design: Describe the key design elements that you hope to include in your project.
7. Final Product: Describe what format you anticipate that the final product will be in. You could create a poster, video, document, or other proposed final product format.

8. Who you are working with: Indicate whether this is your project or if you are working in a team.

EXAMPLE PROJECT 1

1. Objective: I want to explore how technology can be used to improve the experience for bicyclists in the city.
2. What: I hope to learn about how I can use sensor technology to improve the bicycling experience. This would include understanding how sensor technology works in smartphones and how I can use the sensors in my smartphone as part of a mobile application. I'd like to learn to design a mobile application.
3. Why: I participate in an annual bike ride to raise money for cancer research. I train all summer long. I find that I get bored cycling up and down the bike trail closest to my house. While I have a mobile app that will map my ride, it only tracks where I have gone not where I could go. I get nervous about going into areas of the city I am not familiar with and am afraid that I might get lost.
4. Where: This project is in Columbus, Ohio, United States.
5. Who: There are thousands of recreational bicyclists, like myself, that use the Olentangy Trail and the other bike trails in Columbus, Ohio.



The Olentangy Trail is a multiuse path that is located close to my home. It is very convenient. It includes travel through natural areas.

Source: Rails to Trails Conservancy



- Engage: I would like to hear what people think about the existing bicycle network in Columbus. I would like to find out from bicyclists if they would enjoy a mobile application that would allow them to explore the city while riding their bike.

6. How:

- Data Analysis: I will reach out to bicyclists in Columbus through Facebook groups devoted to bicycling in Columbus, Ohio to ask them to tell me about what they would want to see in a mobile application. I will analyze this data and use this in developing my design.
- Design: I would like to design a mobile application that would allow anyone to put in the distance that they would like to ride and then be provided with a series of options for the type of bicycle ride they would like to take. I would like to engage with bicyclists to find out what type of features they would like to have in the mobile application.

7. Final Product: Based on what people tell me, I will then provide a written description, along with some drawings of what the app would look like and how the app would work. The final product is expected to be a document that includes a mock-up of the app and its features.

8. I will work on this project by myself.

EXAMPLE PROJECT 2

1. Objective: I would like to explore the way in which we can use technology to enhance the tourist experience in my hometown.



The historic center of Pachuca de Soto is a place full of interesting and beautiful buildings and sites. In spite of being an area with a great number of tourists there is a lack of information about its iconic places. The current sources of information (mainly brochures and flyers) do not have a good quality and quantity of data and its consultation might not be attractive for most of the users.

Source: Maquedasahag

2. What: I would like to find innovative ways to use Radio Frequency Technology (RFID) or Near Field Communication

(NFC) in combination with new mobile technology to enhance tourism services. In order to do this, it would be helpful to understand how these technologies work and how they are currently used. I would like to learn how to combine these technologies in order to create a system that allows exploring the city in an interactive way.

3. Why: After some years living abroad, I traveled to my hometown and I decided to visit its historical sites with some friends from other cities. During the trip I realized that the travel book/guide they missed some buildings and places that are not so famous but that worth a visit. I also notice that while walking in the city it was quite difficult to consult the book and that at the end of the day my friends even got bored of it. One of my thoughts from this experience was that a more accessible, friendly and fun way to interact with the city you are visiting might enhance your tourism experiences.

4. Where: This project is in Pachuca de Soto, Hidalgo, México.

5. Who: According to the data of the Government, more than 400 thousand tourists from Mexico and abroad visit Pachuca de Soto each year. This is not considering the current inhabitants that, like myself, would like to know more about their hometown.

- Engage: It would be interesting if people could contribute and share the information they know about the historic places of Pachuca de Soto. This could work like a wiki where not only tourists can participate, but also local people could contribute and share their insights about the important places of the historic center, but not only. This might contribute to promote positive identity among the city inhabitants.

6. How:

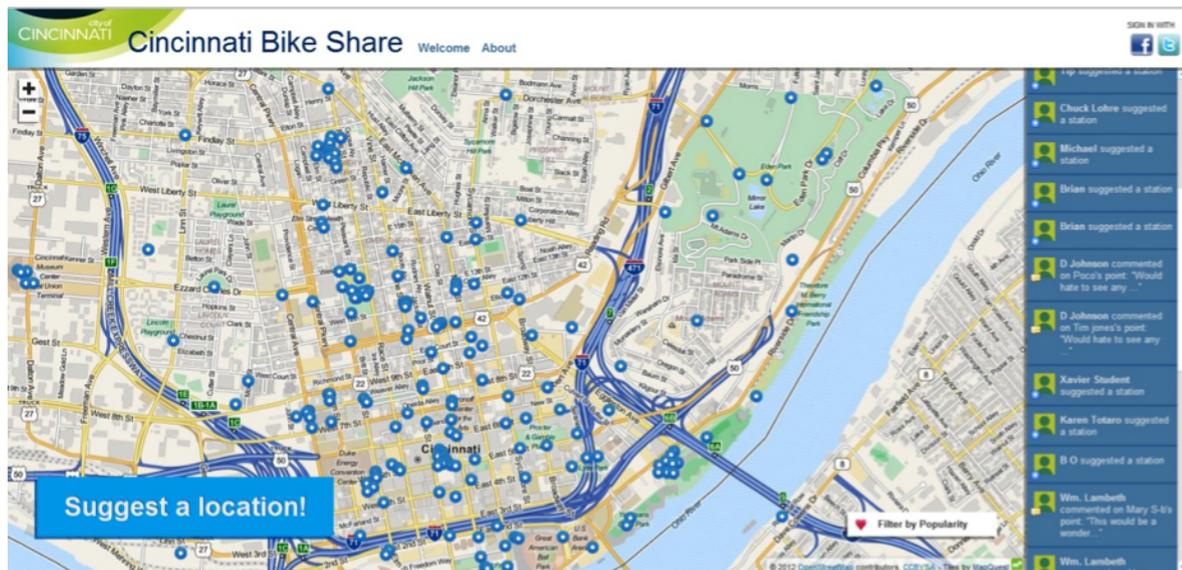
- Data Analysis: I will make in-situ surveys among the tourists and inhabitants of Pachuca de Soto in order to know what they think about a system like the one proposed in this project and what kind of modifications would they do. I would like to analyze Foursquare data too in order to better understand which are the places that the tourists and inhabitants visit to identify the buildings and sites in which the project could or should be first implemented.
- Design: I would like to design a system based on RFID or NFC and mobile phones that allow exploring the city in a fun and interactive way. The system could include NFC tags attached to nearly all the buildings and sites of high historical value. The basic idea would be that when the tourists holds their NFC-enabled phone against the area where the tag is

attached, that triggers the NFC tag to transmit a code back to the phone. The code could be then used by the mobile phone to stream an audio or video guide over the cell phone network. Furthermore, the tourists and city inhabitants would be able to read and add comments about the site, allowing common people to be part of the project and to share their knowledge about their city. Although it might be possible for tourists to simply wander around and interact with the NFC tags as they come across them, maybe it would be useful to create something that allow the users to generate a personalized route. This may help to create a better city by making people aware of the historical value that the city in which they live has.

7. Final Product: I will try to make a video that shows the important sites in Pachuco de Soto and demonstrates how a system could be implemented to improve tourism.
8. I will work on this project with AbelR22 and RobertoL.

EXAMPLE PROJECT 3

1. Objective: I want to structure and analyze online user-generated data.
2. What: I would like to learn how I can structure and analyze crowd-sourced data, in order to explore citizens' desires and



The interface for Cincinnati Bike Share website.

Source: Cincinnati Bike Share

behaviors in cities. At the end, I would like to (a) introduce couple of methods for analyzing such data, and (b) examine pros and cons of each method.

3. Why: I am conducting a research on how using citizen-generated data can enhance transportation planning. There are various citizen-generated datasets out there that can help me with my research; however, I do not know how I should analyze and structure these datasets.

4. Where: City of Cincinnati has designed a website to ask people about their desired locations for bike-share stations. To suggest a location, People can locate a point on a map and describe why they think it is an important location for putting a bike-share station. They can also make comments on the

other members' comments and discuss their ideas. In addition, the website allows the users to support specific locations by clicking on a "support" button.

5. Who: I am going to analyze all the suggested locations and comments on the website, made by diverse peoples and groups. However, I do not have access to the detailed demographics of the participants.

6. How:

- Data analysis: I need to structure and analyze (a) peoples' suggested locations, and (b) comments. I will use ArcGIS software to identify the most desired locations and areas, and NVivo (a content analysis software) to find the common themes in peoples' comments.
- Data collection: I will also collect data manually from the City of Cincinnati's website.

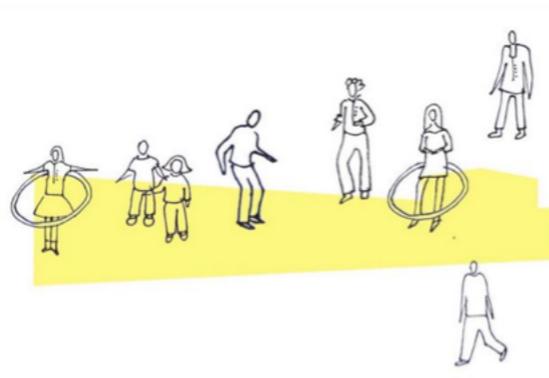
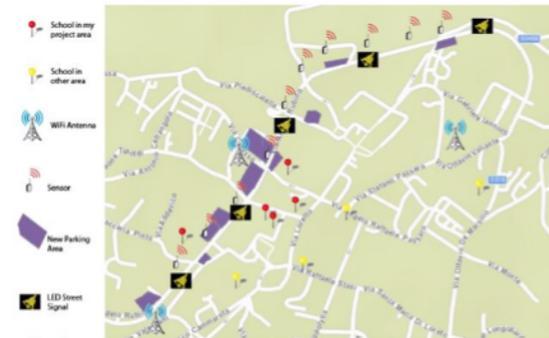
7. Final Product: I expect that my final product will be a poster that shows visuals of my analysis, along with descriptions of my project.

8. I will work on this project by myself.

TOP 25 STUDENT PROJECTS

We hosted a student project competition with students and instructors voting on those with the most potential to be crowdfunded. Students were able to post their project with an explanation of how crowdfunding will help them complete their project. The projects were judged based on three primary criteria: 1) comprehensibility, 2) creativity, and 3) usability in real-planning world. The following were selected as the top 25 (not shown in a particular order). The instructors hoped that the competition would encourage students to consider how to further develop their projects. The following provides a brief description for each of these projects. You can find a more complete project description by clicking the title of each project.

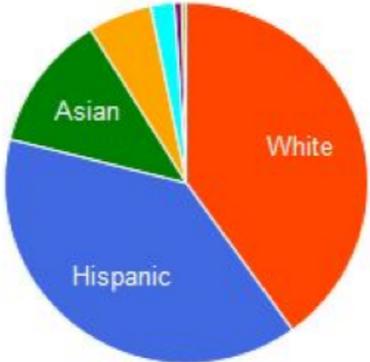
TABLE 1 Top 25 Student Projects

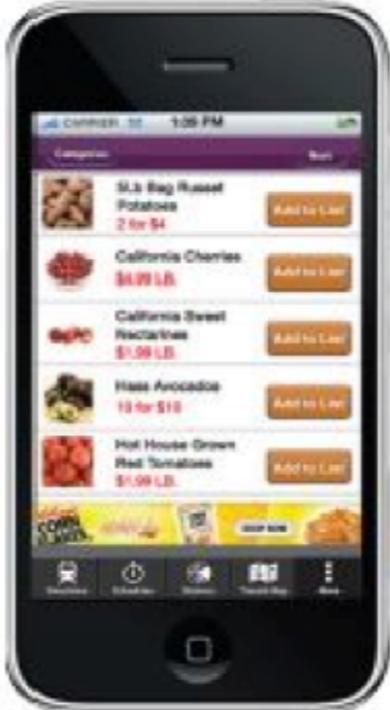
Name	Title	About the Project
Agata Ruchlewicz-Dzianach	<p data-bbox="603 815 823 864">L Spot App</p> 	<p>The L.SPOT app aims to link empty urban public spaces with people who look for spaces for their outdoor alternative activities and facilities social interaction between them. In the long term, the project aims to increase people’s awareness about their surroundings. Additionally, it can serve for decision making in the process of converting temporary facilities into permanent. This way, the permanent structures, that city plans to implement, will respond to real needs of people and base on real-time feedback from users.</p>
Anellina Chirico	<p data-bbox="603 1282 1207 1391">The Ringing Bell: Solution to Traffic Jams</p> 	<p>By exploring this topic I learned how difficult it is to involve residents in issues related to urban planning in my town through the use of technology. In the case of my project the greater involvement has been achieved through face to face interviews. I learned how to exploit the technology already installed in the city (wi-fi network, hot-spots and video surveillance) to monitor traffic by communicating in real time traffic data and then by implementing this system with an application that responds creatively and effectively to the cause of traffic to avoid traffic jams and long lines of cars. In my final project I have decided to focus only on the communication of probable traffic jams.</p>

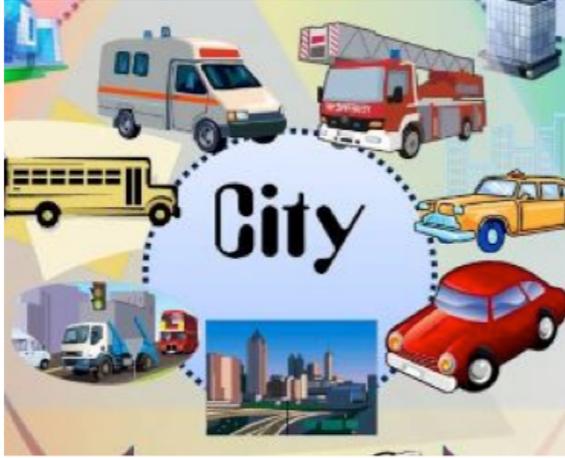
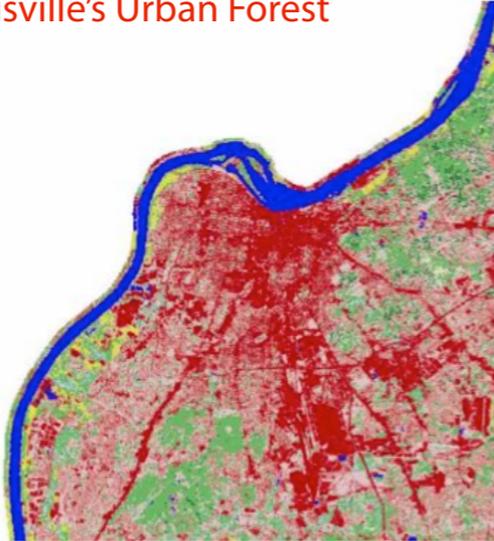
Name	Title	About the Project
Anna Gabriela Hoverter Callejas	PedApp: The App for Pedestrians 	<p>PedApp could be an important tool to help create strategies on how to ‘measure’ sidewalks quality in São Paulo, identifying priorities for upgrading these spaces, and explore techniques of public engagement. This tool could be a bottom-up + top-down built map, since it could be updated by both community and the City. It could work as a surveillance, or supervision, tool where all stakeholders could demand and follow-up on city works. It is important to acknowledge that PedApp should also be something more than just an App for smart phones: it could be possibly placed in public spaces such as bus and subways stations and accessible by home computers, so it could be a true inclusive platform.</p>
Atef Rostom	Massive Open Online Carpooling 	<p>The objective is simply to track commuting cars and passengers and offer incentives for carpooling (two or more passenger using one car) on specific roads and time-frames. To do this, we will rely on technologies in passengers smart phones, as an affordable alternative to infrastructure like automated zero-delay toll-gates. From a high level, we will use Bluetooth to detect the proximity of different passengers to each other (sharing a car), GPS to track distance/time travelled on target roads/times and GPRS (mobile internet) to send collected information to a central database. A gamified system offering game-like incentives will be the foundation for different kinds of incentives. For example, where possible, points earned on the system for carpooling can be exchanged for material benefits like cash, discounts or vouchers.</p>

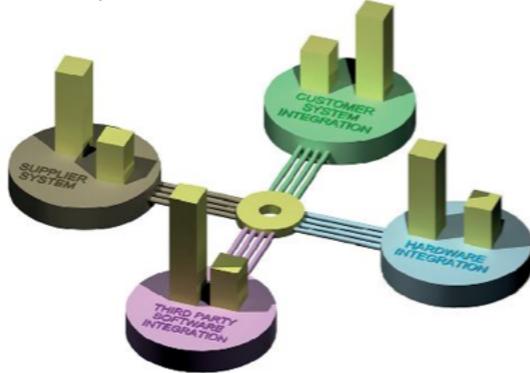
Name	Title	About the Project
Cathy Tao	TechniCities Grand Challenge 100,000 Minds Working Together	<p>Many citizens are only minimally engaged in city affairs and are largely ignorant of the problems that city leaders deal with on a daily basis. Citizens have the most to gain from living in a safe, well-functioning city with rich amenities and well maintained public spaces, so how do we motivate them to be active participants in solving problems faced by their city's leaders? A generous financial reward for coming up with the most innovative solution to a city's problem by crowdsourcing from a diversified citizenry with a multitude of talents may be the answer. A 100,000 heads working to solve a problem are better than one.</p>
Dario Cianciarulo and Liene Some	Emergency Services with Augmented Reality	<p>I wanted to explore how augmented reality technologies can be used to improve efficiency of rescue services in city. Particularly how you can use location data of power lines, water and gas pipes in order to help rescue services in the city in a case of emergency.</p>

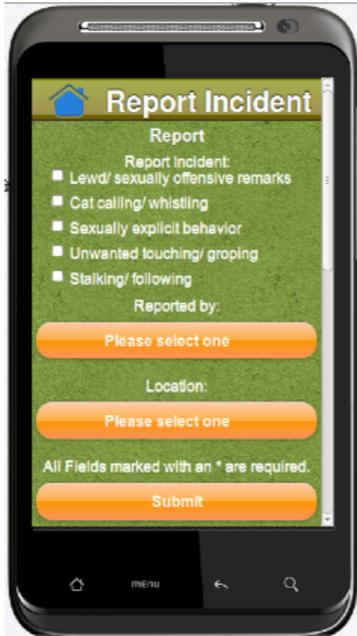


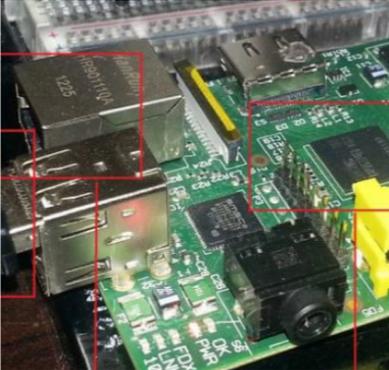
Name	Title	About the Project
Dmytro Krasnoshtan	Happibus, Easy to Use Public Transportation 	<p>For this project I have started to work on the web application. It is not completed and actually I do not believe that any application can be viewed as complete. I think that the application can be finished and marked as complete only when no one is using it anymore and it is basically dead. Otherwise application has to constantly evolve to meet and exceed customers' expectations. I am attaching video, where you can view the current state of the application. First 5:22 seconds is just an explanation about the problems I am going to address, so if you want to view just an app, please feel free to skip this part.</p>
James Yeung	California Race Projector 	<p>This project developed a website with instant race/ethnic population projections by U.S. county. All data and projections on this site are publicly available from the State of California at data.ca.gov. The demographic data is provided by the state's Department of Finance. This site is an exercise in mining open, public, government data. We hope our spin on the way this information is communicated and conveyed proves to be useful (and fun) for you.</p>
Kala Gurung	Use of RFID Technology for Providing Safe and Accessible Bicycling 	<p>For this project, I am exploring how Radio Frequency Identification (RFID) technology can be used at roadway intersections and bike trails to provide safe biking and walking opportunities for Watertown residents and visitors. I am also exploring how RFID technology can be used for improving bike and pedestrian accesses to the community paths and neighborhood areas.</p>

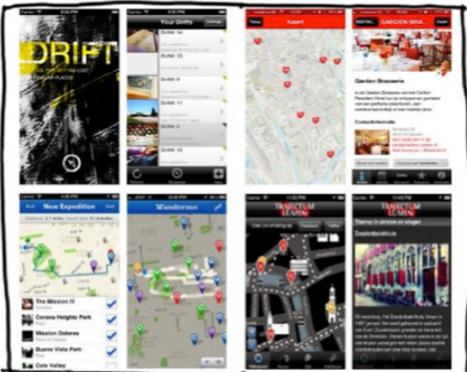
Name	Title	About the Project
Laila Ammar	<p>Technology Enhanced Park and Ride</p> 	<p>Forward Motion is a network of devoted Park & Ride locations with a direct stance against car dependency. Each location would provide their parking to connect professionals from their home to work via Park and Ride facilities. Centrally located in communities across the Greater Cincinnati area (location map to the far right), Forward Motion contains a cafe' and bookstore that supplies riders with choices of necessary business items to use while freeing the rider from the hassle of navigating their commute. They also have a grocery section for people to place pre-orders on their ride home with their Forward Motion App. By connecting all areas of Cincinnati with a convenient mode of transportation, the number of vehicles on the highways will decrease, and will in turn decrease travel time and pollution. Forward Motion presents sustainable transit choices as well as incorporates the latest green technology to alleviate energy waste. With GPS tracking on buses, users can also efficiently plan their trips and spend less time waiting.</p>
Liew Wen Hwee	<p>City that Connects Learns and Loves its Urban Biodiversity</p> 	<p>The idea is to create an app that connects the user to a back end analysis system and database so that people living in the city could learn more about the urban biodiversity and appreciate them.</p>

Name	Title	About the Project
Mariela Saez	<p data-bbox="639 226 1210 326">Solidarity Communities, Solidarity Cities</p> 	<p data-bbox="1243 226 2631 902">I want to explore how communications technology can facilitate the process of a paradigm shift in the behavior of the citizens who live in suburban areas. On one side are the people who can attend and people can be assisted. It argues that in the "Cities of Solidarity" is the citizen himself that, with the technology that is available to them, obtains and manages city services and this meets that demand an intelligent citizen services "wherever you are and when that is "increasing satisfaction and improving their quality of life. Is the person who decides what he wants and when he wants it. And thanks to the participation by the minute, the citizen is truly aware of the city. The 'Cities of Solidarity' public administration involve more proactive, flexible and adaptable, which improves responsiveness to the more complex needs of the citizen.</p>
Patrick C Smith	<p data-bbox="639 948 1141 1047">Improving Data Collection for Louisville's Urban Forest</p> 	<p data-bbox="1243 948 2631 1562">Research from Georgia Tech's Urban Climate Lab has demonstrated that Louisville is getting warmer at higher rate than other cities thanks to the Urban Heat Island (UHI) effect, that is, Louisville has an increasing gap in temperature between its urban area and surrounding countryside. The best thing cities can do to combat the UHI effect is to plant more trees in urban areas. Unfortunately in Louisville, and despite several false starts, we still do not have accurate, precise, and up-to-date data reflecting the current state of our urban tree canopy Specifically, I wanted to use my Technicity project to I learn more about the best methods for volunteer data collection for Louisville's urban tree canopy, including location, species, size, health, and planting environs.</p>

Name	Title	About the Project
Paul Goff	<p data-bbox="633 226 1064 330">Framework for Smart City Deployment</p> 	<p data-bbox="1237 226 2631 459">The objective of this project is to support the practical deployment of technology and infrastructure within the public realm and focus efforts within the city at a macro rather than micro level by summarizing the potential issues to be considered during the SMART planning process.</p>
Robert Giusti	<p data-bbox="633 757 1196 860">Mapping Bicycle Movement via Smartphones Mobile App Design</p> 	<p data-bbox="1237 757 2631 1109">This project develops a mobile application and web based portal that encourages users to track their bicycle movement using their smart phones. Focusing on the City of Toronto these rides will be recorded and sent to a central database that can be used to improve bicycle infrastructure investment and inform city planners where bicycle movement is most prominent within the City of Toronto.</p>

Name	Title	About the Project
Robert Strohmaier	Urban Gardening Toolkit 	<p>The Urban Gardening Toolkit consists of a microcontroller based sensor system and data--visualization as well as alerts based on this data on existing Internet of Things Web platforms. For the sensor system I've used an Arduino UNO microcontroller and several Grove sensors to measure soil moisture, air temperature and air humidity. To enable standalone usage I've used a solar power supply with a backup battery. To transmit the data in this version an Ethernet shield with a WLAN bridge is used. These components will be replaced with a WiFi or GPS shield in the near future. The internet platforms I've used are xively (https://xively.com/ (former cosm)) for communication with the microcontroller sensor system and Open.Sen.se (http://open.sen.se/) for data visualization. The alerts are triggered by Open.Sen.se and sent by Twitter.</p>
Shabana Charaniya	Tease Me Not App to Report Eve Teasing Incidents 	<p>Explore the use of crowd-sourcing to identify and map neighborhoods/areas/ public places, etc in the city prone to eve-teasing (a term used in India to refer to a prevalent phenomenon of public sexual harassment or molestation of women by men and can range from sexually offensive remarks to brushing and/groping) by using appropriate technologies. The December 16 gang rape case (http://en.wikipedia.org/wiki/2012_Delhi_gang_rape_case) brought to surface a critical issue tormenting New Delhi, i.e. crime against women. Consequently, the media and women advocacy groups along with citizen representatives have been trying to highlight the issue of crime against women through reporting, advocacy and awareness events, etc. This is the prime motivation to explore the subject.</p>

Name	Title	About the Project	
Sky King	Ubiquitous Environmental Sensing Using Low Cost Microprocessors	Prototype #1 represents the most rudimentary approach for developing an environmental monitoring station. While it uses barebones components and represents the lowest cost solution/platform, it is technically the most challenging as it requires a substantial amount of low level design and programming.	
	Veridiana Neves Lejeune	Curbita Recycling	In this project I explored an application to smart phone, GPS and RFID to improve the collection and management of solid waste in Curitiba - Brazil. Society needs more conscience and greater participation on the solid waste that are being collected in the city, so they might help the management of solid waste.
	Victoria Darah	Mobile App for Ohio State Student Safety Service	I wanted to create an easier way for Ohio State students to utilize the Student Safety vehicle rides by designing a mobile application for the service. To solve this issue, I designed a mobile application for Student Safety Services escort that will allow students to submit a request for a ride using the app, without having to waste time on the phone while placed on hold.
			

Name	Title	About the Project	
Vivian Doumpa	U-Drift: A Personalized Drifting app for Utrecht	<p>U-Drift was inspired by the successful psychogeographical app Dérive developed by Babak Fakhmzadeh and Eduardo Cachucho. By not suggesting a specific route, like most common city-guide or GPS apps do, U-Drift allows users to discover Utrecht in an experiential manner that is designed according to their personal interest. Thus, it is possible to find out the hidden secrets of the city, that it wouldn't have been found otherwise.</p>	
	Winfred Selwyn Ooh-Azlin	Human Battery Gym	<p>Imagine a gym where you are PAID to lose those extra pounds. Such technology already exists: http://www.econvergence.net/. The key to adoption is motivation; gyms patrons are paid for the energy they generate. The generated energy from battery gyms would be stored in a storage facility and diverted as need to the grid.</p>
	Yvonne Tan Yit Fong	The Trucking Culture	<p>I completed this project with research on Radio Frequency Technology (RFID) and Near Field Communication (NFC). With that, these technologies were integrated into a "library card" that just about anybody could afford instead of relying on a specific model of phone. A lock system for the glass of the shelves that correlates to the Radio Frequency Technology (RFID) was also looked into. Due to the wide range of interests and languages, an app was also proposed to be made in order for citizens to find a certain book available at certain bookshelves in certain areas. The app could also show the most popular books of the moment and feature some events. They could also track where their books went!</p>
			

Grading/Evaluation

Grading for the course was based primarily on the project proposal and the final project, which were peer evaluated. Opportunities for additional points were also available from the “Challenge” assignments and incentives from MindMixer. The following shows the point breakdown for the class assignments.

- Project Proposal and Peer Evaluation of Proposals up to 40 points
- Final Project and Peer Evaluation of Proposals up to 60 points
- CHALLENGE Assignments and Peer Evaluation are worth up to 10 points each

To receive a statement of accomplishment students must achieve a minimum of 85 points. To receive a statement of accomplishment with distinction they must achieve a minimum of 110 points.

Post Course-Survey

Feedback from students is an important element of any course, especially for one with students spread out across the globe. As previously mentioned we asked students to fill out a pre-course survey to get some background on students and better understand their expectations and motivations. During the course we relied on comments and feedback from our discussion forums to respond to questions, requests, and suggestions. After the course was over we then asked students to fill out a post-course survey so we could gauge the overall level of satisfaction with the course. Feedback we received will help us improve the course for subsequent offerings. The following are the questions included in the post-course survey:

- Which of the following descriptions best characterizes you?
- Please rate your experience in this course.
- How many hours per week did you dedicate on average to this course?
- How valuable were the videos in helping you to complete the course?

- How valuable was MindMixer in helping you engage with others in the class?
- How valuable were the Discussion Forums in helping you resolve technical issues?
- How valuable were the challenge assignments in helping you to learn the course material?
- How valuable was the project in helping you to apply the course materials?
- Are there other factors not listed in the last five questions that helped you to complete the course?
- At any point in the course did you make contact with the instructors?
- How often did you make contact with other students?

The analysis of the post-course survey is on-going and will be incorporated into a larger overall analysis of TechniCity. This analysis will be made available through the course social media channels.

Summary

As more cities realize the benefits of using technology to improve infrastructure planning, citizen participation, healthcare, education, crime prevention, and environmental monitoring, we see the evolution of city technology or TechniCity. Advances are occurring daily and the ways that cities are applying technology are multiplying. Understanding the TechniCity means not only knowing about the methods and techniques that are being used, but also understanding the changes in quality of life and implications for individuals, households, government, and business.

As cities grow and change and adopt new technologies, our class change to include the new topics that emerge. This will be exciting because changes will occur at different rates with different impacts depending on where you are in the world. In his blog post “Seven steps to a Smarter City; and the imperative for taking them” ([The Urban Technologist](#), September 8, 2013), Ric Robinson mentions seven particular areas that should be considered as part of a “Smart City” vision. These involve defining the objective, assembling stakeholders, creating a decision-making structure, building resources and expertise, designing a policy framework, financing, engagement, and implementation (not in this specific order). Our course, TechniCity, touched on many of these themes and will likely expand on others in the future.

From a planning perspective, we are starting to see examples of “technology” plans. Recently the City of Chicago released its [Technology Plan](#). The Plan includes 28 initiatives within five strategies focused on “Next-Generation Infrastructure”, “Every Community a Smart Community”, “Efficient, Effective, and Open Government”, “Civic Innovation”, and “Technology Sector Growth”. The TechniCity course included lectures and discussion on all of these topics and we will be monitoring how Chicago, and other cities around the world, plan and implement their technology strategies.



So what this means is that TechniCity will grow and change over time. Each time that you take TechniCity, you will learn about these rapid changes in cities and technology.