UNIVERSAL ACCESS NY

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MASTER OF SCIENCE
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NEW YORK UNIVERSITY
TANDON SCHOOL OF
ENGINEERING

UNIVERSAL ACCESS NY
THESIS REPORT

**Submitted in Partial Fulfillment of
the Requirements for
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at the

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TANDON SCHOOL OF ENGINEERING

By

Karla Joselly Ruiz

May 2020

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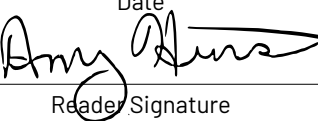
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ABSTRACT

Karla Ruiz was born in Los Angeles, California in 1994. She graduated from the University of La Verne with two bachelor degrees, a B.S. in Communications with a concentration in multimedia design and a B.S. in Computer Science/Engineering with a concentration in internet programming. After Ruiz graduated from her undergraduate program she worked as a print and web designer. Looking for the next steps in her career she wanted to learn more about User Experience design and accessibility, which is why she wanted to apply for the Integrated Digital Media program at NYU. She will be graduating from her masters program May 2020.

For her thesis project, she dedicated one year to collect her research and to develop the solution for the project. Some of the interviews and user testing was conducted at the IDM space on campus and at the Ability Project.

ABSTRACT
Universal Access NY
Thesis

By Karla Joselly Ruiz

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Submitted in Partial Fulfillment of the Requirements for
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Universal Access NY is a research project with the goal of starting a productive discussion about universal design and the importance of access for people in the disability community. Persons with disabilities face widespread lack of accessibility from public buildings and spaces, to services such as health, education, transportation, and emergency response. This project aims to educate individuals on the microaggressions and lack of accessibility of the urban living experience in a wheelchair user's daily life. Through interviews with various wheelchair users who live in New York and articles published on the subject, I learned that there is a lack of knowledge within the general population about these microaggressions. This project uses a social awareness campaign made of an interactive narrative and an educational resource website to help bring awareness to young adults about universal design and accessibility. The narrative is a simulated journey to test the user's knowledge about obstacles that this community faces in their daily lives. The goal of the game is to generate empathy and provide the user with access to important resources and information to deepen their knowledge and perspective.

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INTRODUCTION

The Americans with Disabilities act was passed in 1990, it has now been 30 years since it has been enacted. Progress for making spaces accessible has been lacking especially in urban environments such as New York. Living in these environments while having a disability can be a nightmare when it comes to navigating the city: access to buildings, transportation, and the general population not knowing about the experiences and microaggressions that people with disabilities constantly face. A microaggression is, "an indirect, subtle, possibly unintentional discrimination against members of a marginalized group. Usually these take the form of statements, actions, incidents, or exclusions."[1] Being excluded from an activity because of what a person interprets what an individual can or can't do is almost always a microaggression.

Two years ago, there was an accident that had changed my perspective in regards to accessibility. Living in Los Angeles at the time, I temporarily lost my hearing. Due to my lack of hearing, I was not able to drive my car, thus being housebound during the full duration of my recovery. While I was housebound, I depended on support from family and friends to help me with various tasks and transportation. I am lucky to have been able to recover from my injury and am aware that this is not always the case. Thinking back about my injury and now living in New York, it's hard not to see the microaggressions that come with urban living. Not just for a singular disability but for various disabilities.

"I DO A LOT OF VOLUNTEER WORK HOPING THAT IT TURNS INTO A JOB. BUT, IT NEVER REALLY DOES, AND I'M NOT REALLY SURE WHY. I REALLY THINK IT HAS TO DO WITH MY DISABILITY THAT COMES WITH A WALKER. I'M INDEPENDENT, BUT I'M SURE THEY WOULD RATHER HIRE SOMEONE THAT CAN DO IT 100%…"

PARTICIPANT 5

BACKGROUND & CONTEXT

Early on I knew I wanted to create something that would be impactful and beneficial to the disability community. I have a lot more experience developing websites and working in the digital world of accessibility, and for my thesis I wanted to challenge myself to work on a project that expanded into the physical world. I wanted to study current systems and readjustments for people with disabilities to develop solutions for a better user experience before, during, and after a crisis. Starting off with this topic, it gave me the opportunity to start my research from a broad scope to look at multiple issues with accessibility and narrow down to a specific topic: I decided to study the accessibility of microaggressions in NYC for people who use wheelchairs by starting a social awareness campaign with the goal of starting discussions about universal design and the importance of access to people in NYC. Universal design being the design of buildings, products, technology, or environments so that it may be accessible to all people, regardless of disability.[2] When researching this topic it was important to understand the current policies in place for people with disabilities, such as the Americans with Disabilities Act (ADA).

U.S. DEPARTMENT OF LABOR

The Americans with Disabilities Act (ADA) prohibits discrimination against people with disabilities in several areas, including employment, transportation, public accommodations, communications and access to state and local government' programs and services.

ADA

The Americans with Disabilities Act (ADA) prohibits discrimination against people with disabilities in several areas, including employment, transportation, public accommodations, communications and access to state and local government' programs and services.[3] The disability community has historically been overlooked in our society. Before the ADA act was passed, physical places like restaurants, schools, and museums were not accessible to people within the disability community, that forced them to become socially and physically isolated in our communities, and from one another.[4] Places like schools, stores, restaurants, transportation, and so many other human necessities were not accessible. In an article by UAB Institute for Human Rights they had mentioned that, "Disabled people have suffered in a wide range of circumstances and continue to suffer today from a toxic mixture of economic, social, political, and cultural barriers."[5] After decades of these injustices to this community they were able to get together and advocate for change which led to the ADA.

When this act was passed in 1990, it was a big win for people with disabilities. With this research I learned that there is a trend with the general population not being aware about what really makes a physical/digital space ADA compliant. The guidelines provided by the law tend to be ambiguous and do not provide strict set guidelines. Even though the act has been in law for many decades, the general population still has prejudices regarding this marginalized community which leads to these microaggressions. The act was not really enforced until the past decade when a high influx of lawyers began to profit off of ADA violations, this process is also known as Drive-By lawsuits.[6]

In 2019, ADA became a hot topic in the digital community when companies and organizations were sued for ADA web compliance. In New York many art galleries were being targeted by lawyers because their

UAB INSTITUTE FOR HUMAN RIGHTS

"Disabled people have suffered in a wide range of circumstances and continue to suffer today from a toxic mixture of economic, social, political, and cultural barriers."

websites were not ADA compliant for those with vision impairments.

Since the ADA was passed there has been some progress in making places accessible, but there's this misconception regarding disability. For example, just because your restaurant has ramp access it does not automatically satisfy ADA compliance. You have to think about the bathroom, is that accessible? Is the dining space of your restaurant accessible, or the emergency exit, the tables, are there any steps within the space, and can someone with a wheelchair be able to navigate the space easily? There are so many factors that go into accessibility that the general population needs to be aware about. People have a misconception when it comes to people with a disability which leads to ableist behaviors. Ableism is expressing a discriminatory preference for someone who is able-bodied.[7] Ableism assigns people who have developmental, emotional, physical or psychiatric disabilities as second class citizens by devaluing and limiting their potential. To help curb these behaviors, I learned that providing access to information about accessibility can help young

adults understand the importance of this topic. Having absorbed some of the history behind ADA and learning about its current applications in my classes I was able to get a better understanding of what accessibility is. As well as the benefits of designing products and experiences using universal design methods, which helped me in my ideation process of my project.

EMERGENCY SYSTEMS

In my initial research, I wanted to take in as much information as I could about services and processes during a crisis for people with disabilities. Looking into what it took to prepare, before, during, and after a crisis. I began to read training materials from FEMA starting at a federal level and make my way down to state and local levels for New York.

As I began to lay the foundation of my research I began to read about policy changes on the federal level and state level. I came across a few articles regarding the lack of access in New York. It turns out that New York had been sued before for its inadequate disaster plans that had discriminated against thousands of its New Yorkers that have disabilities. A Federal Court had ruled that New York City discriminated against people with disabilities in its failure to plan for their needs in large scale disasters such as Hurricane Sandy. This major victory for hundreds of thousands of children, women, men, and seniors with disabilities is expected to have national implications.[8] In large scale disasters the largest fatality rate is with people with disabilities because these plans that are in place don't fully account for the need for people in this community.

Time and time again, the infrastructure needed to be revised and would need heavy community involvement from people with disabilities to generate a plan that is

inclusive and anticipates risks to develop a better user experience. Able-bodied people who are designing these services should get more community feedback and testing so that the next large scale disaster could address the needs of refugees with disabilities. Which is recommended as a key insight from a book called *Crises, Conflict, and Disability*, which focuses on different studies about emergency management on a worldwide scale that is relevant today with recent disasters and events.[9] This concept not only applies to emergency systems, but can be applied to services, technology, products, and much more. During my ideation process and prototyping phase it was important for me to include user testing from the disability community to get their feedback on my project as it evolves.

CRISES, CONFLICT, AND DISABILITY

"Persons with disabilities should be mainstreamed in the design and implementation of action plans."

In 2005 Hurricane Katrina was devastating for the disability community especially for those who use wheelchairs. Wheelchair users were left in their homes and had little to no access to transportation. People with disabilities were the largest group that died in this event.[10] Hurricane Sandy happened years after Hurricane Katrina and New York City was still unprepared to help this community. In the book, it brought up a good point that states that haven't experienced large scale disasters may not be prepared to help people with disabilities efficiently and should be prepared ahead of time with practiced simulations.

During the trial many witnesses had testified that there were major deficiencies in the City's planning for various emergencies. Below were some of the oversights that were noted during the trial: [11]

- New York has no system to evacuate large numbers of people with disabilities trapped in high-rise buildings.

- It does not know which emergency shelters are wheelchair accessible and affirmatively tells people with disabilities their needs will not be met at shelters.

- The City also has no protocol to address the needs of most people with disabilities in power outages and lacks reliable and effective communication systems.

- The City also relies largely on inaccessible public transportation for emergency evacuation and has major deficiencies for this population in its recovery plans.

After gathering and synthesizing this data that I collected for emergency systems, I realized that I needed to reduce my scope. This is because during my interviews, many of the participants have never really been in a crisis and that natural disasters do not happen frequently. Many of the participants that I spoke to also classified emergencies or crises as a personal emergency.

For example, if their wheelchair breaks and they are stranded in a subway station that is not accessible that would be considered an emergency. With this information, I decided to look into these personal emergencies which lead me to look into the microaggressions of the urban living experience.

THE MICROAGGRESSIONS OF TRANSPORTATION

In New York City it is very important to have access to transportation to get around. Having lived here for two years now, my main source of transportation relies on public transit to get to work, school, home, and other places. As someone who frequently uses the MTA system, I would notice how a lot of the stations I would use are not accessible for wheelchair users and those that are accessible are very spaced out.

> *While nearly **85 percent** of the nation's workers drive to their jobs, **four-fifths of all rush-hour commuters** to New York City's central business districts use transit, most operated by the MTA, thus reducing automobile congestion and its associated problems.*[12]

After reading a few reports that focused on transportation services and disability. I learned that the Air Carriers' disability training programs and the Department of Transportation (DOT) has data reports that the DOT receives from air carriers regarding disability complaints.[13] In the report, they focused on some of the well-known air carriers such as Delta, Alaska, etc... In these reports it is laid out a range of disabilities and how many complaints the airline has received. In the US alone a majority of the complaints are for failure to provide assistance for people that are in a wheelchair. Airplane travel can be a nightmare for people who use wheelchairs. From accessing the plane, being carried to their seat, and hoping that their equipment is treated with care.

One of the major complaints that I've been told from my interviews is that sometimes their wheelchair equipment is not handled with care. A wheelchair for someone who uses it is their main source of independence. That equipment costs a fortune as it

is tailor made for the user, if it is damaged it is very expensive to repair and they can be left without their main equipment for some time. When traveling if the wheelchair is damaged, they would have to use alternative equipment that may not fulfill their needs and can cause frustrations and stress of having to deal with the situation.

New York has an accessibility problem that extends to day to day activities not just emergency systems. When people think about accessibility, they automatically think of ramps and elevators, but it goes beyond that. Below is a quote from an attorney in an article by Vice.

> *"However, most people with disabilities do not use wheelchairs. Access is so much more. It is sign language interpreters, Braille signage, lowered tables, for example. Also, it is more than just getting into an establishment; accessibility must include one's ability to actually access what is inside. For example, as a wheelchair user, a store with a ramp is still inaccessible if I cannot get down the aisle."* **- Robyn Powell,** a disability attorney and research associate at the Lurie Institute for Disability Policy at Brandeis University [14]

As an active user of the New York subway trains, there are so many trains that need to be restored/replaced. Riding an older cart can be difficult for someone who may have multiple disabilities, for example someone who may have auditory or visual impairments may have trouble seeing what station they are in or trying to hear the low quality speaker systems to get to a destination. If those services are not available you are left to ask strangers for help and hope that you get to your destination. People in this community face these microaggressions of access in urban living in their daily lives.

It begs the question of what it is like to navigate New York City when you have a disability. If you are a wheelchair user trying to use the subway to get home during rush hour, it may be very difficult for you to get in a packed cart and would have to wait long periods of time for an open cart. Some things that I noticed

while riding the subway is that people sometimes sit in the designated disability seating on public transit and refuse to move if asked, that is a microaggression.

In 2016 an article by the Huffington Post mentioned that less than 20 percent of NYC's 468 subway stations have elevators that enable individuals with mobile disabilities to access trains. [15] According to the Center for Independence of the Disabled, New York (CIDNY), there are 889,219 individuals with physical or cognitive disabilities currently living in the city alone. [16] Under the ADA regulations, the city is mandated to make 100 stations accessible by 2020. Recently there has been some transitions in creating stations to be more accessible, but it's taken 30 years now. Retrofitting older buildings and facilities cost money, but that should not be an excuse because transportation is a civil right for everyone. Some statements that were made from an interviewee in an article by the Brick Underground recalls their experiences while riding the MTA. These are examples of microaggressions while using transportation.

> *"When I get to my stop, it doesn't mean the train will line up with the platform for me to get off. Usually, passengers have to help pull my chair off, because there's that wide gap,...Passengers come to the rescue, but the chair is very heavy to move."* **- Monica Bartley** [17]

After riding the train and making your way out of the station, it may take a while for someone who uses a wheelchair to find a curb cut that allows them to cross the street. For someone who is able-bodied, their journey is different and would have less steps to take once you leave the station because you can easily walk out and go about your day. Someone who has a disability, it will require more additional steps to do the same task.

> *"I face a number of barriers just trying to travel in the city... People are often faced with the choice of going all around to find a curb cut or just going into the street. At best it's incredibly inconvenient and a huge waste of time, at worst it's a major safety concern."* **- Monica Bartley** [18]

In this article I also learned more about the urban experience using public transit. I personally haven't used the bus in New York and reading about the experiences that Bartley has faced has opened my eyes to some of the microaggressions regarding transportation.

> *"The problem you encounter is that some drivers do not want to pick up a wheelchair passenger, or they stop far from the curb and you can't board the bus in the middle of the road. Other times there are two wheelchair passengers already there, which means you can't get on...Sometimes you feel as if you are discriminated against. You don't feel equal with other citizens."* **- Monica Bartley** [19]

For my project, it was important to get an understanding of these microaggressions to help me build a narrative about this issue. With these experiences, it helped me generate some ideas on the direction that I wanted to take for my social awareness campaign. Which leads me to my next question. How do I get someone to care about an issue that doesn't directly affect the individual. I believe you can get someone to care about an issue through empathy. Most successful campaigns use empathy and interactive components to engage their users.

EMPATHY

The purpose of this research is to understand and be aware of these issues to better relay such information to someone who doesn't know. I believe providing this information in a more creative and interactive way would captivate audiences to generate empathy on this topic. It's important to understand empathy and how to get someone to care about an issue that doesn't directly affect them. To get a better sense of these types of campaigns I researched different exhibitions and campaigns that focused on social issues. What they all had in common was that they had an interactive component to generate empathy with their users. Their users were primarily young adults in the Millennial and

Gen Z age groups. Being a Millennial myself I find that interactive experiences provide a rich environment for learning.

A course that I took in Fall of 2019 was called Developing Assistive Technology, as part of the course we were introduced to various assistive technologies such as a wheelchair. In one of our classes we visited NYU Steinhardt where we simulated using a wheelchair in an urban landscape. I had the opportunity to use a manual wheelchair inside and the outside of the building near Washington Square Park. This exercise was for us to simulate what it was like to use a chair in an urban landscape and to take notes about our experience. In the next page you will see the key insights that I learned from that experience.

I also attended a guest speaking event that featured a company called Level the Curve. What really stood out to me about this company is that the founders are wheelchair users. Their story about how they came together and wanting to build innovative products was very eye-opening. They primarily focus on developing assistive technology that uses universal design concepts and that is cost-effective for their users. One particular product that they showcased that really intrigued me was their ramp. The ramp is currently still in the prototyping phase but the ramp would be collapsable both in width and length. The goal of the ramp was for it to be lightweight and that it can be stored on the back of the wheelchair. Once stored it can then be easily taken out to use in buildings that may have a couple of steps in front of them so that it can be accessible. With this product in development, I can see people who use wheelchairs be able to have access to many more locations in the city that are not accessible. What is great about this product is that it's being built by people who understand the user's experience and connect with their audience on an emotional level.

With my social awareness campaign, I want to leave a lasting impression with my audience about

WHEELCHAIR SIMULATION

1

It takes a lot of arm strength to use a manual wheelchair on the sidewalk because it is angled. It is also difficult to reduce your speed on a curbside going down.

2

Bathrooms and Elevators are a bit hard to access in terms of navigation. In instances where someone does not have a custom or a perfectly fitted wheelchair, it may be hard to reach sinks to wash your hands or reach for the door handles.

3

When using a narrow elevator space it was difficult navigating the space so that I can go in and out of the elevator that was joined with a narrow hallway.

4

Not all wheelchairs are the same and some may have some adjustable parts and that they are all very expensive equipment based on the additional features for customization

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accessibility. To generate empathy, it's important to include the audience in the experience so that they can relate to the topic. To get a better understanding of approach, I looked into different campaigns. I came across a campaign called Check Your Blind Spots. The purpose of the campaign was to educate people and explore ways to reduce "unconscious bias" in their daily lives.[20] What made this campaign successful was how they were able to engage their audience. They had multiple interactive activities to educate people on their topic on their mobile tour. Some of the activities include an interactive digital quiz, VR experiences, video stations, signing a pledge, etc... I learned that this campaign embodied the topic and found numerous ways to engage their audience to reaffirm their purpose. Which is why I wanted to include a website component for my project.

Another campaign I learned about was from ESPN and Do Something. The campaign was titled Shred Hate. This was an anti-bullying campaign that launched at the X Games. The purpose of the campaign was to connect to a younger demographic to equip them with tools to combat bullying. [21] This campaign was impactful and successful in engaging the younger demographic by creating an interactive game on a large 120-foot screen. The goal of the game was to "Shred Hate" by using their body to shred life-sized negative words and phrases similar to the popular Fruit Ninja video game. This was another campaign that I really liked in their approach. Having experienced installations that require body movement was very impactful. Their narrative for their game was simple and direct and was something I wanted to embody for my game.

PREPARATION FOR PRIMARY RESEARCH

Once I was able to get a better understanding of all the factors that I did in my secondary research I began to prepare a stakeholder map as part of my preparation process for my interviews. This exercise helped me identify the people and groups that I should interview. This map was useful to visually see what groups of people can help give insightful information about current processes during a crisis, life experiences living in New York, microaggressions they have encountered, and also thoughts and interactions with people in the disability community. My goal was to focus on talking to stakeholders from each primary group in my map. As part of my primary research, you will read about my interviews with lawyers, government employees, wheelchair users, disability organizations, and my community involvement experience.

STAKEHOLDER MAP

PRIMARY

Wheelchair Users

SECONDARY

Transportation

Police & Firefighters
Paramedics
MTA Employee
Accessible Personal Vehicle
Taxi
Subway
Access-A-Ride

Healthcare Providers

Occupational Therapists
Physical Therapists
Aides
Doctors
Pharmacists
Nurses

School Administration

Higher Ed. Employees
Teacher Aides
Counselors
Teachers
Security Management

People

Friends
Family
Coworkers
Neighbors

Policy

ADA
Lawyers
Urban Planning Architects
Disability Service Facilitator

Organizations

Adaptive Design Association
New York Cares
NYU Ability Project
NYU Disability Student Union

PRIMARY RESEARCH

For my primary research I focused on following a community intervention driven process. My goals was to interview multiple stakeholders and wheelchair users. At the end of the paper there is an appendix of the full list of questions that I used as a starting point to ask my stakeholders. For each stakeholder, I modified the questions to put into context of the interviewee. When structuring my questions, I believe it was best to start broad and then dig deeper over time with more specific questions. In my interviews the questions were focused on emergency systems and interactions with people in this community. Since then my thesis has evolved but the information that was provided in these interviews still tie into the themes and trends of daily microaggressions.

For the more complex questions, I brought sticky notes and pens to the interview to give to the participant. I thought it may be useful to give them a couple of minutes to write out their thoughts and for us to review what was written down to spark dialogue for these questions. The first 3 participants are people who are able-bodied professionals. Participants 4-6 are wheelchair users who were able to tell me their experiences with microaggressions and living in New York. Participants 7 and 8 were also wheelchair users who helped me frame my narrative for my game while touching on some of their microaggressions.

PARTICIPANT 1

This interview was very insightful about the gaps that we have in our current health system in regards to the disability community. Communication seemed to be a common obstacle in a hospital environment when having patients who have disabilities. Being a part of the Crisis Management committee at the hospital, this participant was given the opportunity to attend an Emergency Operations Plan Conference in 2019. The conference was five days long and the first three days were Hospital Emergency Response Team (HERT) training. The purpose of this training is to prepare medical staff for disasters that happen outside the hospital. During this conference they simulated a nuclear crisis with actors to practice the triaging protocols. After the first few rounds, the participant mentioned that there were many issues with communication amongst the staff during each phase. The types of people that were simulated in the situations were able-bodied individuals. They did not represent anyone with a disability in these scenarios, in fact it was only a talking point.

"WHAT THEY DIDN'T DO, WHICH I WISH THEY DID, THEY DIDN'T SEND ANY PATIENTS WITH DISABILITIES THROUGH. THEY DIDN'T SEND ANYBODY WHO WAS DEAF. THEY SENT US OTHER THINGS. THEY SENT A PREGNANT WOMAN THROUGH, THINGS LIKE THAT, BUT THEY DIDN'T SEND US PATIENTS WITH DISABILITIES. WE TALKED ABOUT IT SLIGHTLY ON-SCENE"

PARTICIPANT 1

The health care system has its flaws, but in terms of emergency management it should include the principles of universal design. In the conference, it was disappointing to hear that the patients that were simulated were not inclusive of different abilities. People with disabilities during a crisis are hugely impacted and medical professionals should be aware and experience the needs of those in a marginalized group.

PARTICIPANT 2

In my second interview I was able to connect with a family nurse at a clinic who has children with disabilities. The nurse was insightful in regards to their practice but mostly the microaggressions they faced as a parent with two children with disabilities. They both have autism, and one of them also has cerebral palsy. We discussed some of the challenges and the participant brought up advocacy. This is something I noticed consistently throughout my interviews with different people that there needs to be more advocacy. Being a parent with children with disabilities, they constantly need to advocate for their children, in and outside of school and in their daily lives. The participant talked about the approach to parenting their children with Autism to teach them to be independent. To get a better understanding of the experience, I had asked the participant about the things they found enjoyable about having children with special needs. The response was:

> *"Seeing them improve over time and conquer things that they used to not be able to do, while helping them get to their fullest potential. Like for instance, our son, when he was diagnosed with autism, they told us they didn't know if he'd ever be independent. I have a lot of friends that have children with autism and they just stay home. They don't take them out because it's just too much to handle, which I refuse to do because they have to learn how to deal with the real world and keeping them at home just makes them become a hermit. Like for our son, I decided early on that that was not what we were going to do and he is 16 and just got his driver's license and he's working part-time at*

> *Chick-fil-A. They didn't think he'd ever be independent. He's proved them wrong. It's just helping them to conquer what they want to conquer."* – **Participant 2**

This response resonated with me because of the proactive way this participant handles these microaggressions. There is a stigma that if someone was to have a disability that they would be labeled as incapable of doing certain tasks. That thought process would fall under things that Ableists would say. Anyone is capable of doing a task, there are numerous ways to adapt technologies or tools to help someone achieve their goals. This was further affirmed after an exercise I did in my Developing Assistive Technology where we had a task sheet where we wrote out activities and find ways to adapt based on a type of disability.

PARTICIPANT 3

I spoke to an instructional aide for students with disabilities between the ages of 3-12 years old, I found that the most difficult thing that these professionals encounter when caring for people with disabilities is communication. Especially in situations where a child/adult is non-verbal and/or has autism. People who have Autism rely heavily on their routines at home or in a classroom setting. When an event occurs, this breaks the routine and can cause stress and difficulty in communicating with one another.

In a school setting there are instances where younger students who are able-bodied don't understand the topic of disability. The aide had mentioned instances where their students would act out in front of other students. The participant said:

> *"Because there wasn't the routine being followed, a student started to have a tantrum, and in his tantrum he started to act out towards the other general education students, and I had to step in to kind of be that barrier between him and the general education students."* – **Participant 3**

In the presence of these outbursts there is a chance to educate others about these common obstacles. The

participant had mentioned that it is common for young students to make associations with students with special needs as a separate group. Usually these groups of students have their own schedule, activities, learning material that separates them from other students. As schools begin to teach more about inclusivity, there is an opportunity for students to learn and work together.

VOLUNTEER EXPERIENCE

While volunteering at the Adaptive Design Association in New York, there are groups of students from elementary to high school grades that come in for a working session. In these sessions, these students as a group create assistive equipment out of cardboard for students at their school who require assistive technology.

It's amazing to watch these students from various ages come together to help others. The association is a non-profit organization that specializes in building custom adaptations for people with disabilities. I started volunteering at this organization in September 2019. My role at the organization was to help and advise on their website's ADA compliance. I went to the workshop space once a week until the Stay At Home orders were issued due to COVID-19. Volunteering at the organization gave me the opportunity to connect with people within the disability community.

As part of one of my classes we were able to visit Verizon Media's Accessibility Lab. Verizon Media has an amazing process regarding digital accessibility for all it's products. Although they are making waves for this initiative, it was mentioned that testing for accessibility is done after the product is designed and they were trying to implement a streamlined process to include accessibility during the design phase rather than after.

Having experienced some of this in my current job as a web designer, there were many instances where an older website that was designed many years ago was not ADA compliant and now we would have to go back and redesign an older website that would meet ADA

compliance. Now as part of our design process we check to make sure the initial designs that are presented are ADA compliant.

PARTICIPANT 4

This participant uses a motorized wheelchair. Their wheelchair was custom made for them and it is their most essential assistive technology. The participant spoke about some issues they had regarding transportation in the city. If they were not able to use the subway they would call a cab using apps that are similar to uber/lyft but for people that use a wheelchair. This participant mentioned their experience with people's insensitivity towards other people with disabilities.

A particular experience that was mentioned was how a cab driver picked them up but didn't even know how to properly strap the wheelchair to the car. He heavily insisted that the brakes would be enough and didn't even know there were straps in the cab itself until this participant had pointed them out. They had to advocate why he needed to strap their wheelchair in. This is a microaggression that is all too familiar with people in this community.

People sometimes express ableist behaviors unconsciously by language and actions. There have been so many instances where this participant has been treated as a second class citizen because of their disability. The participant said that one of their friends who occasionally would use either a cane or a wheelchair to get around would see a significant difference in how people saw them versus being in a wheelchair.

To have a night out in the city for someone who uses a wheelchair is very different compared to someone who is able-bodied. If they wanted to attend social events, there is a process to this. The participant needs to call ahead of time to make sure the location is accessible for their wheelchair, ask about the bathroom, the overall space, etc... As this participant was describing the

process to me, I was surprised about the additional steps needed to take to make sure that they can go to an event.

PARTICIPANT 5

This participant has Cerebral Palsy and is verbal, who also uses a walker to move around. They also occasionally use a wheelchair for longer distances. This interview was eye-opening, listening to their story. This participant lives independently and is currently looking for a job. They mention that because of their disability it makes it hard to find a job to support themself. This participant faces discrimination and describes how difficult it is sometimes to use public transportation. More importantly, we talked about advocacy and how people with disabilities have been overlooked. Time and time again, people that are not aware or simply assume things about a specific group of people may not have experienced talking to someone from that group. They mentioned that:

> *"I have a physical disability, so I feel like people judge you on your walker before they even get to know you, or they might not get to know you because you have a walker, because you're different from them. But, if you really give them a chance to get to know them, you would actually find that you have things in common."*
> **– Participant 5**

This is another example of a microaggression, where people express discriminatory behavior. Hearing this participant's story and their experiences, transportation and services for this community still has a way to go.

> *"I tell people about these services I know about now that I wish I knew back then, because they may have helped me a little bit more. But then again, maybe they didn't have those when I was going into school. There are a lot of things that they have now that they didn't have back then. But there's still a lot more to do, to make it easier for us to get through. The system is really not designed for people with disabilities. It's more designed for able-bodied people."*
> **– Participant 5**

Although ADA has been in law for decades, there are resources and services that many people in this community are unaware about. With technology and the web, people are now able to do research to find out about these services available. Think about 15 to 20 years ago when computers were not in every household, how do people access these resources? In the US in 2016, 35.9% of people with disabilities ages 18-64 living in the community were employed. The employment percentage was more than double for people without disabilities, 76.6%. [22] Our products, services, systems, are primarily designed for able-bodied people and do not entirely follow concepts of universal design.

PARTICIPANT 6

This participant uses a manual wheelchair and was 15 years old when an accident had occurred that broke their back in 1973, 17 years before the ADA act was passed. The participant has been using a wheelchair since the accident. I was told about their experience living in New York before ADA and the costs and adjustments that came with having a disability. For example, the family had to get a van that had a lift so that it was accessible for the participant. The participant also expressed some of the microaggressions they faced growing up using a wheelchair. After the accident, the participant had to eventually go back to finish high school and then college.

> *"They didn't have a lot of laws protecting me. I went to a local school and I ended up having to come home so I could take a shower because they didn't have accessible bathrooms."* **–Participant 6**

The participant was also accepted into college. Upon arriving at the college one of the things that they noticed was that it was not very wheelchair accessible and could not live in the dorms. They tried to accommodate the participant and in their opinion it was bad accommodation. Because of this the participant needed to advocate for themselves.

"You're very isolated when you have a disability, especially when things aren't accessible."

Before ADA, there was not much done to make places accessible. The participant stated during their time at college, elevators were not accessible, there were no curb cuts, they had accessible symbols around so it looks like the place is very accessible, but it wasn't.

In a response to this, the participant gathered a group of their friends to make a statement on campus. During their sophomore year, Ghostbusters had just come out and they created signage with the iconic red circle with a slash. They took the wheelchair accessible signs and put the big red circle on it and began to plaster those signs on places that were not accessible to let other people know that "Hey, this place isn't really accessible." Because of this action the campus started to take notice and started to make adjustments so that the participant can access those places. It took initiative on the participant's part and because of that the university appointed them to be a student liaison for accessibility.

> *"I remember they called me up and asked me, they were getting their reader printer for the blind and they asked me where to put it and I said, "I don't know, I'm not blind. You should call who's going to use it, don't ask me. That was a novel concept to them."* **– Participant 6**

Having used the subway system, the participant brought up a good point regarding the design of different spaces. For example, once you've come down from one elevator and then the next elevator you would need to take would happen to be on the completely other side of the structure, which can be frustrating. The way that these structures are designed makes these systems

difficult to use if you couldn't push your wheelchair far or walk very far. Even though it was accessible for some people, it would be difficult for people with severe mobility impairments who didn't have any adaptive aid for them to be able to travel around. Another downside to using the subway is that sometimes the elevators would break and there is no alternative to use that station.

The participant also happens to drive an accessible vehicle to go to work. They mentioned that accessible parking can be difficult if you have a van, you need to have extra space to get out of your van because your ramp comes up. So there's a problem now with these designated parking spaces because the cross out spot that you can use to get out of the van tends to usually be too small. They mentioned how other people don't follow these parking rules which is almost always a microaggression.

> *"The other problem is people are crossing over the lines. They don't really know what those lines are for. So, they can block you in your van or if they go into those areas, you can't get around. It's kind of sad that the state will spend all this money to help me get a van, but they won't spend the time to make sure people don't park in those lines or educate them."* **– Participant 6**

The participant stressed the importance of filing claims on places that are open to the public that are not accessible. Here is a scenario that we spoke about regarding some of the microaggressions going to a place that is not accessible. So if a wheelchair user got to a place and the bathrooms are not accessible, the owners don't care, they don't do anything to accommodate them or they block access to the bathrooms. They're usually blocked with high chairs and or chairs. When a wheelchair user needs to go to use the bathroom it's like a whole world now. The owners make a big production out of it by acting like, "Oh, we have to move all this stuff because you're here and you want to use the bathroom. How dare you." This behavior that

the owners are presenting is hostile, derogatory, and sends a negative message to others. These types of microaggressions are very common in everyday life for people with disabilities. It's discrimination no matter how subtle the action is and can have a negative impact on those groups.

PARTICIPANT 7 & 8

The next participants that I spoke to were both wheelchair users, one uses a motorized wheelchair while the other has a manual chair. We did a combined interview process as a group to talk about their life living in New York. Both participants knew each other and figured it would be a better experience to talk about it as a group. I tailored this round of questions to dig deeper about their life experience. These questions were originally intended for a video interview portion of my project, but due to COVID-19 it was difficult to get access to necessary videotaping equipment. I had this group interview right before the stay at home orders were issued in New York. These were some of the questions that I had asked that gave these participants the opportunity to expand and go into detail for their responses.

This interview was helpful for me to understand the journey of a wheelchair user experience while going out to a location in New York. I needed the perspective to help give me guidance on what I wanted to do for my campaign.

WHAT DOES IT TAKE TO HAVE A NIGHT OUT WITH YOUR FRIENDS?

1. **What do you have to do to prepare in advance to have a night out with your friends in the city?**

   First you need to determine the type of venue, if it is a restaurant, club, or comedy club etc... Once the location is determined, they need to check to see how many floors are a part of that venue. There have been instances where the bottom floor of a venue is accessible but other floors are not. They mentioned that it's best to check Yelp and call the venue to make sure the space is accessible. Yelp has a section of icons that allows business to display features at their venue. If a business has an accessible icon in the feature section, it's usually for front door access. So it is best to call in advance because, **"Everybody's definition of accessibility is different"**. Things they would normally inquire about the entrance, if there are any steps in the venue, bathrooms (a certain width and length), the dining space, tables, emergency exits, the volume of people at the venue.

2. **How many days in advance do you have to make arrangements?**

   Depending on the person, **at least** 24 hours in advance.

3. **What is your commute like to go to work?**

   During rush hour taking the subway would be very difficult to ride due to the volume of people that ride the carts. They look into alternative services like paratransit, accessible taxi, access-a-ride, etc...

4. **If services are not available, for example, an elevator, how do you work around the inconvenience?**

   Worst case scenario is to call the fire department to help you. For example if you get off at an inaccessible station and have to call the fire department they are not required to take your wheelchair. In most cases they leave them behind and it's up to you to figure out how to get your wheelchair out. You can ask the firefighter to bring it with you but you may run the risk of them damaging your wheelchair, or it may be too heavy for them to move.

DATA ANALYSIS

I gathered my data by transcribing my interviews and organizing all of the reading materials that I read for my secondary research. To analyze my data I used the Coding method. The tool that I used to accomplish this was Google Sheets to organize my data in its entirety. I then began my analysis by creating four separate sheets. The first sheet includes my codebook with key terms that are relevant to my topic. The second sheet holds my data and transcripts, meaning who was interviewed, the stakeholder group, and links to the transcripts/citations. The third sheet was where I began coding my data based on my interview questions to identify common themes and trends that appeared in my research and interviews. The fourth sheet is the theme sheet where I could start to identify key terms and associate them with a theme. Using this method gave me the ability to identify trends and key terms that consistently came up within my topic. This process of analyzing my data was very helpful for me to narrow my scope and apply this knowledge to my campaign.

Throughout my interviews and readings communication and advocacy repeatedly came up. Especially when someone who has a disability would have to communicate to someone about why they need certain services or accommodations. For Transportation, it's a hot topic regarding accessibility especially in NY. General Education refers to educating the general public about disability. Many people who I have spoken to and in my secondary research mention discrimination towards this population because some people are not aware about what this community faces in their daily lives. Assistive technology is equipment that helps people with various disabilities. In my interviews and research, I was able to get a better understanding of how life changing this equipment can be for someone and gives them the independence they want.

CODING RESULTS

1

TOP 11 LIST OF KEY TERMS

1. Universal Design
2. Discrimination
3. General Education
4. Access
5. Self-advocacy
6. Social Challenges
7. Transportation Challenges
8. Access to information
9. Independence
10. ADA
11. Assistive Technology

2 DATA COLLECTION

STAKEHOLDER GROUPS INTERVIEWED

Wheelchair Users	Adaptive Designers
Lawyer	Pediatric Nurse
Instructional Aide	MTA Employee
Family Nurse Practioner	Mayor's Office Employee
Occupational Therapist	NYU Disability Organizations

10 TOTAL NUMBER OF INTERVIEWS

5 WHEELCHAIR USERS INTERVIEWED

3

THEMES & TRENDS

Communication/ Advocacy

Throughout my interviews and readings communication and advocacy repeatedly came up. Especially when someone who has a disability would have to communicate to someone about why they need certain services.

Transportation

Transportation was a big theme regarding access to public transit and services. With Transportation there are many challenges that was talked about regarding accessibility.

General Education

General Education refers to educating the general public about disability. Many people who I have spoken to and in my secondary research mention discrimination towards this population because some people are not aware about what this community faces in their daily lives

Assistive Technology

Assistive technology is equipment that help people with various disabilities. In my interviews and research, I was able to get a better understanding of how life changing this equipment can be for someone and gives them the independence they want.

IDEATION AND PROTOTYPING

Once I had synthesized my data that was collected I was able to focus on ideating the output for my thesis. There were two directions I could focus on.

1. Social Awareness Campaign

2. Developing a better user experience for wheelchair users before, during, and after a flood.

I ultimately decided to focus on developing a social awareness campaign because I believed that it has the potential for deeper impact. For this social awareness campaign I wanted to focus on enlightening people to be aware of some of the daily microaggressions that wheelchair users experience. This campaign is a way to interact with young adults to think about accessibility and universal design. In my secondary research, the most successful campaigns had interactive games/quizzes to help promote their cause that were targeted to younger audiences. Having an interactive educational game as part of my campaign would help reinforce the cause.

So I began to ideate on the purpose of the game. The game is supposed to start discussions about universal design and the importance of access for people in

the disability community. The game would portray an interactive journey that simulates the amount of steps it takes to do a task. The goal of the game is to generate empathy and provide the user with access to important resources and information to deepen their knowledge and perspective.

When brainstorming on the narrative for the game I used sticky notes to lay out some initial directions of what this game could be about. Looking back at my trends, I looked into scenarios based on transportation, money, and advocacy as a good starting place to ideate.

At first I had some challenges coming up with a narrative that would be relatable. I knew I didn't want the game to have the user imagine what it would be like to be in a wheelchair. It would be very difficult for someone to relate to an experience without actually experiencing those obstacles.

For my first iteration of the story, I wanted to simulate the stresses of not being to perform a task as you would normally. This iteration focused on a scenario where you didn't have a cell phone for 24 hours and how would you go about doing certain tasks. After user testing this
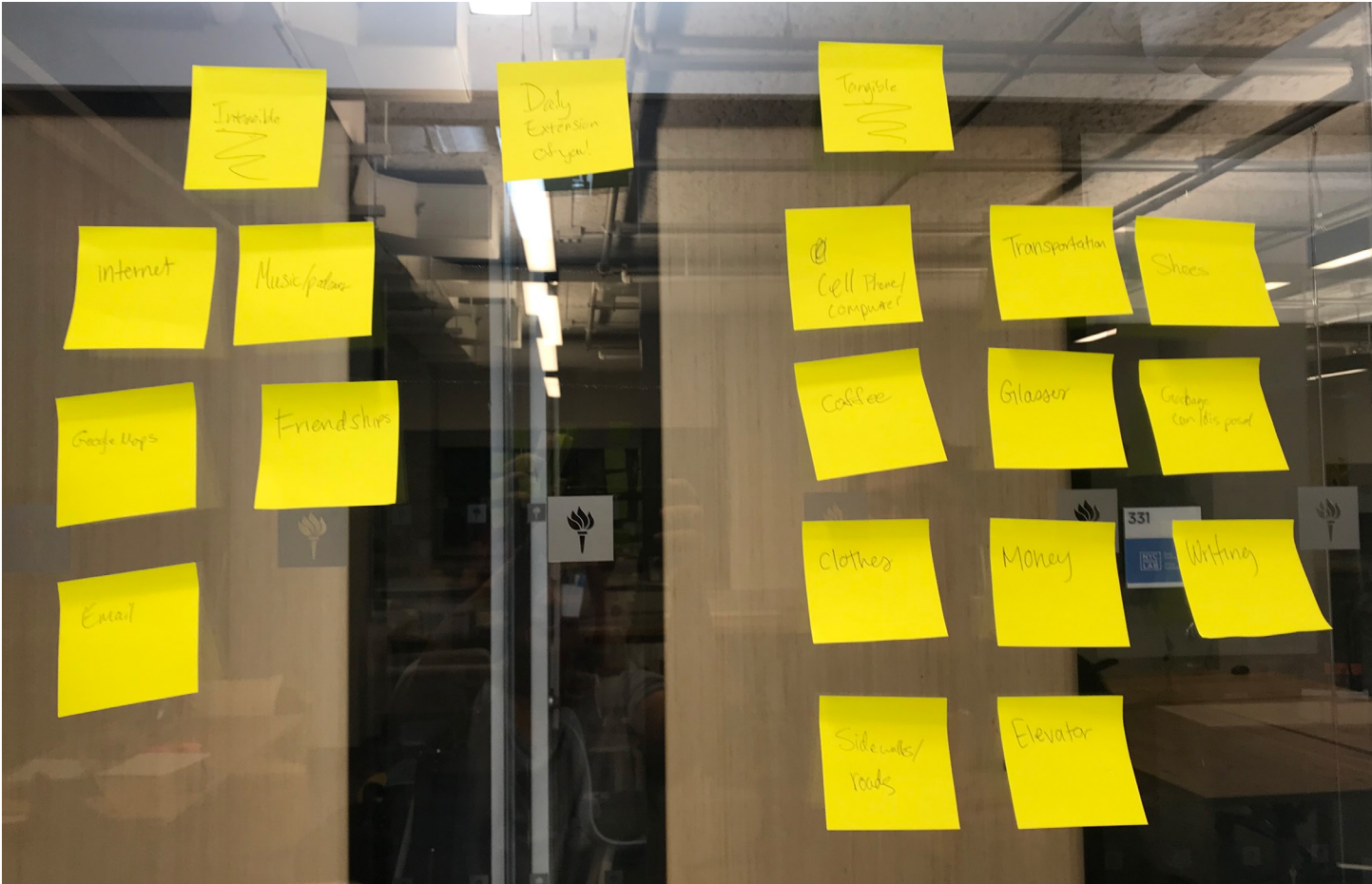
initial story, I received feedback that the narrative did simulate the frustrations but was hard to relate back to a wheelchair user's experience. There was a disconnect with the story.

I decided to go back to my sticky note exercise to review other topics and started to pull ideas from experiences that were mentioned in my interviews. I thought of a narrative that sets up the user to be in the story and would help it relate back to a wheelchair user's experience. I really liked the idea of simulating a night out with your friends. I felt that this topic is very relational to many people and can help generate empathy from someone who may not fully understand these obstacles.

From there I created a user journey map of what it takes to have a nice night out with friends and address some of

the microaggressions of having a night out. The journey map includes a list of my steps from before, during, and after the night to help identify key moments to develop the questions for the game. Listing out the number of steps it would take for someone to have a night out is pretty straightforward. When listing these steps, I couldn't but think about the experiences from those that I have interviewed and what their journey would look like. Someone who uses a wheelchair would have many more steps than someone who is able-bodied.

Once I picked out the key pieces of information that I wanted to highlight for the narrative of my game, I felt I was ready to write my narrative for my first iteration. Secondly I was also ready to start building the foundation for the resource website.

JOURNEY MAP

1
BEFORE

- Make plans with friends
- Agree w/ day and time
- Get ready
- Confirm address on maps
- Plan route
- Get to train
- Get on train
- Get off train
- Walk to bar
- Text friend letting them know you arrived

2
DURING

- Arrive at bar
- Find friends
- Sit down
- Ask for menu
- Order drinks
- Talk
- Drink
- Order more
- Close tab
- Pay tab
- Check route home
- Decide on route
- Say goodbye
- Leave bar

3
AFTER

- Walk to train
- Get on train
- Get off train
- Walk home
- Let friends know that I got home safely
- Drink water
- Get in pjs
- Sleep

FIRST ITERATION OF THE GAME

So I began to prototype my game with low-fidelity mockups. I wanted to focus on the story when I user test my game and not have my users focus on the design so I can get more concise feedback. The game needs to be short experience, so that users could easily play the game and not worry about it taking a long time.

So I limited it to have 5 questions with an opening statement. After discussing with an external advisor on the direction of the game, they made recommendations to add more narrative to the game. I had originally proposed that it was simple questions but once I added more to the narrative so that it tells a story it enhances the purpose and experience for the user. You can view the first iteration of the quiz and its contents on the next page.

In addition to the game I wanted to develop an accessible website that has resources and information about the campaign. The website would feature statistics and information about universal design activism. Persons with disabilities face widespread lack of accessibility to current built environments such as roads, housing, public buildings and spaces, services such as health, education, transportation, and emergency response.

The website originally would have the main home page with resources and statistics and then a page for video interviews named stories. Due to COVID-19, I was not able to move forward with the stories section of my website and in place of that, I decided to include a glossary page. In the glossary page it includes a list of terms that are often used within the community with examples for some of the terms.

Pulling from key terms that came up in my research I was able to put together a preliminary glossary to be featured on the page. After receiving some feedback on this list, it was suggested that I add some examples or reference a youtube video that can go into depth about a specific term. Below is a list of the current glossary. All definitions were based on the dictionary definition.

RESOURCE WEBSITE

The website would have the main home page with resources and statistics and then a page for video interviews named stories. Due to COVID-19, I was not able to move forward with the stories section of my website and in place of that, I got feedback that I should include a glossary page. In the glossary page it would include a list of terms that are often used within the community with examples for some of the terms.

GLOSSARY

Pulling from key terms that came up in my research I was able to put together a preliminary glossary to be featured on the page. After receiving some feedback on this list, it was suggested that I add some examples or reference a youtube video that can go into depth about a specific term. Below is a list of the current glossary. All definitions were based on the dictionary definition.

MICROAGGRESSION

A microaggression is an indirect, subtle, possibly unintentional discrimination against members of a marginalized group. Usually these take the form of statements, actions, incidents, or exclusions. Being excluded from an event because of what the host perceives you can or can't do is almost always a microaggression

DISABILITY

Disability includes impairments of physical, sensory or mental functions that may affect undertaking activities or participating in community life. It may be caused by accident, trauma, genetics or disease. A disability may be temporary or permanent, total or partial, lifelong or acquired, visible or invisible.

ABLEISM

Ableism is the expression of a discriminatory preference for someone without a disability.

ITERATION #1: GAME & WEBSITE

QUIZ

It's your best friend's birthday! You planned a special night out for her with all your closest friends at a new restaurant you haven't been to. The restaurant has great reviews, and everyone is excited to try it. The birthday girl uses a wheelchair, and as the party planner, it's your job to make sure she has a great night!

→

**It's the night of your friend's birthday dinner!
You finished getting ready and are about to head out.
What do you do to prepare?**

Walk to your bus/subway stop

Call ahead to confirm the restaurant is accessible.

→

**What spaces in the restaurant do you confirm are accessible when you call the restaurant?
(select all that apply)**

Bathroom

Back door/Emergency exit

Entrance/Front Door

The dining space

→

Once you arrive at the restaurant and walk through it, you realize space is not actually wheelchair accessible. This isn't the first time a restaurant owner hasn't realized their space isn't fully ADA compliant... what do you do now? (select all that apply)

Look for a different bar that may be accessible

Leave a yelp review

Report the restaurant

Everyone was excited to try this restaurant, so you try to make it work

→

After a quick Yelp search, and a phone call to the bar, you found a different restaurant that is accessible for your friend nearby. This restaurant bar has a back patio where you all want to eat, hang out in but the entrance has a 3-step staircase to get inside. What do you do?

Ask your friend if they want to go to the patio and if they are comfortable with you helping them down the stairs

Make an executive decision and only hang out in the dining space

→

**You are ready to leave the restaurant, and your friend asks for help to find accessible transportation.
What do you do? (Select all that apply)**

Call a regular Uber/Lyft

Check the MTA Info website for elevator service information

Use the Accessible Dispatch service (wheelchair accessible yellow and green taxi service)

Check different MTA train station routes to see what stations are accessible

→

If your average night out was always like this would this change how you plan the night?

Yes

No

→

You Made Did It!

People with disabilities often face these obstacles in their daily lives that prevent them from.

Enter:quick statistics about percentages of places that are accessible and the population

---

UNIVERSAL ACCESS NY
A STUDY

● ● ● ● ●

(Introduction) Nunc interdum lacus sit amet orci. Suspendisse potenti. Aenean imperdiet. Phasellus volutpat, metus eget egestas mollis, lacus lacus blandit dui, id egestas quam mauris ut lacus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos.

Integer ante arcu, accumsan a, consectetuer eget, posuere ut, mauris. Phasellus a est. Etiam imperdiet imperdiet orci. Quisque rutrum. Praesent congue erat at massa.

Nunc interdum lacus sit amet orci. Suspendisse potenti. Aenean imperdiet. Phasellus volutpat, metus eget egestas mollis, lacus lacus blandit dui, id egestas quam mauris ut lacus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos.

Integer ante arcu, accumsan a, consectetuer eget, posuere ut, mauris. Phasellus a est. Etiam imperdiet imperdiet orci. Quisque rutrum. Praesent congue erat at massa.

FACTS/ STATISTICS OF PEOPLE WITH DISABILITIES LIVING IN NY

**–ACCESSIBLE PUBLIC TRANSIT
–LOCATIONS THAT ARE ACCESSIBLE**

UNIVERSAL DESIGN ACTIVISM

Nunc interdum lacus sit amet orci. Suspendisse potenti. Aenean imperdiet. Phasellus volutpat, metus eget egestas mollis, lacus lacus blandit dui, id egestas quam mauris ut lacus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos.

Integer ante arcu, accumsan a, consectetuer eget, posuere ut, mauris. Phasellus a est. Etiam imperdiet imperdiet orci. Quisque rutrum. Praesent congue erat at massa.

PROCESS PHOTOS

RELEVANCY

Nunc interdum lacus sit amet orci. Suspendisse potenti. Aenean imperdiet. Phasellus volutpat, metus eget egestas mollis, lacus lacus blandit dui, id egestas quam mauris ut lacus. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos hymenaeos.

Integer ante arcu, accumsan a, consectetuer eget, posuere ut, mauris. Phasellus a est. Etiam imperdiet imperdiet orci. Quisque rutrum. Praesent congue erat at massa.

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RESOURCES

TITLE
LINK

TITLE
LINK

TITLE
LINK

TITLE
LINK

TITLE
LINK

TITLE
LINK

TITLE
LINK

TITLE
LINK

Ableism assigns inferior worth to people who have developmental, emotional, physical or psychiatric disabilities by devaluing and limiting their potential.

ACCESSIBILITY
Accessibility refers to the design of products, devices, services, or environments so it is usable by people with disabilities.

ADA
The Americans with Disabilities Act (ADA) became law in 1990. The ADA is a civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public. The purpose of the law is to make sure that people with disabilities have the same rights and opportunities as everyone else.

UNIVERSAL DESIGN
Universal design is the design of buildings, products, technology, or environments to make them accessible to all people, regardless of age, disability or other factors.

DIGITAL ACCESSIBILITY
Digital Accessibility is the ability of a website, mobile application or electronic document to be easily navigated and understood by a wide range of users, including those users who have visual, auditory, motor or cognitive disabilities. This enables users to navigate the website or mobile application using assistive technologies/screen readers to interact with the content.

DISABILITY ADVOCATE
Disability advocates may advocate for themselves, another person, or a group of people with disability. They work through issues that have an adverse effect on rights for an individual or group, or on a society-wide level.

USER TESTING
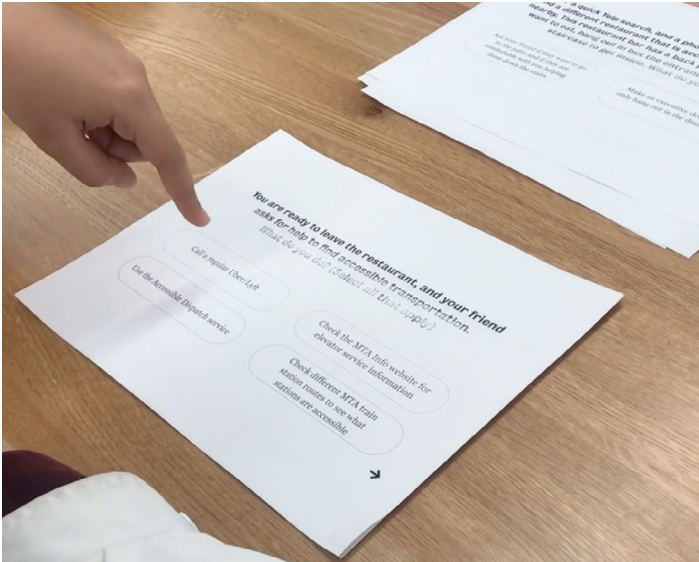
DESIGN ACTIVISM

Design activism is about using your talents as a designer to create a positive impact in the world. Activist design creates a series of questions or proposals using media for unresolved ends: to provoke, or question, or experiment in search of new political/social conditions.

ASSISTIVE TECHNOLOGY

Assistive Technology is any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities. This can be low-tech and/or high-tech equipment, computer software, mobile applications, etc..

ACCESS-A-RIDE

Access-A-Ride (AAR) Paratransit Service provides public transportation for eligible customers with disabilities or health conditions that prevent them from using the public buses and subways for some or all of their trips. AAR operates 24/7/365.

CIDNY

Center for Independence of the Disabled, New York (CIDNY) is a nonprofit organization founded in 1978. We are part of the Independent Living Centers movement: a national network of grassroots and community-based organizations that enhance opportunities for all people with disabilities to direct their own lives.
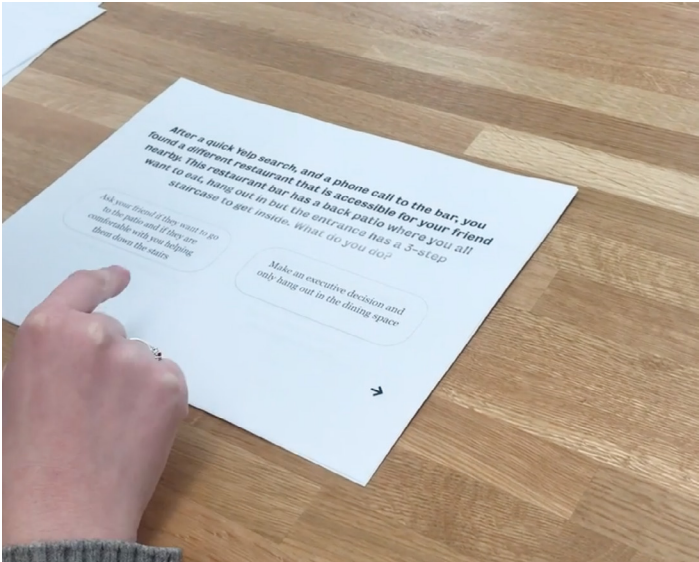
ITERATION #1: FEEDBACK

Once I received feedback on my first prototype, I got very positive reviews about the narrative and suggestions for functionality that would help me begin the design for my second iteration.

The images above showcases the first prototype being tested and some of the insights that I got from this user testing helped me determine what functions I should include in my game. One of the users was indecisive in selecting their choices and instead of having selected an option and automatically loose/proceed to the next question. I thought that a next button would help with that issue. The other user also recommended to give reasons as to why you would loose on certain questions.

I also got feedback from wheelchair users on this narrative, and as they were going through my quiz they had mentioned that I should include more "Select all that apply" questions. This is because they are multiple answers for some questions. Not only that but also provided me some of the resources that some wheelchair users use to get one location from another depending on the transportation option. For example if using the MTA, they suggest looking at the MTA webiste for live elevator feeds to make sure the stations are accessible to them before leaving to that station.

COVID-19

Because of the stay at home orders that were enacted in New York I was not able to get in-person user testing for the game and website. I relied on sending links via email to multiple people in the NYU community to test my game and website. During this time, I found some challenges in connecting with people outside of the NYU community to get further testing and reactions from users. Moving forward I would like to take an opportunity with the NYU IDM Showcase to collect more feedback and user testing on my game and website from a wider audience. For my website I created a contact form in my 3rd iteration to collect comments from my users. I would also like to get more user feedback from wheelchair users about the narrative.

ITERATION #2: WEBSITE

For the second iteration of my website, I also wanted to incorporate the same aesthetic of the game. So that the design of my campaign is cohesive in its branding. The color palette includes shades of blue that are commonly associated with the accessible icon. In my user testing section you will read more about the feedback that I received for this iteration and future iterations.

Universal Access NY

Universal Access NY
A Study

The purpose of this study is to start discussions about universal design and the importance of access for people in the disability community. Persons with disabilities face widespread lack of accessibility to current built environments such as roads, housing, public buildings and spaces, services such as health, education, transportation, and emergency response. With this study, I hope to educate people on the microaggressions of the urban experience for someone who uses a wheelchair to highlight how tidy lack of accessibility affects the day-to-day life.

Data from the U.S. Census Bureau, there were **930,100 people with disabilities living in New York City in 2017,** representing 11 percent of the total population.

As of July 2019, **120 (or 25%)** out of 472 total stations in the New York City Subway system are accessible to some extent.

16% of people in the US (39 million people) have difficulties with their physical functioning. 17.1 million people would find it very difficult or impossible to walk unassisted for a quarter mile.

In New York City, **52.4 percent of people with disabilities** spend more than one-third of their income on rent compared with 42.1 percent of their non-disabled peers.

The general employment rate is 70%, and **only 29% of people with disabilities** are employed full or part-time. The employment gap is greater in New York City than it is at the State or national level.

People with disabilities, **have higher rates of health insurance coverage** nationally and in New York State, compared to people without disabilities.

What is Universal Design Activism?

Universal Design activism uses the concepts of universal design to create political and/or social awareness. Instead of solving problems in the manner of industrial design, or organizing forms as in graphic design, activist design creates a series of questions or proposals using media for unresolved ends: to provoke, or question, or experiment in search of new political/social conditions. The point of this is to bring to light certain issues most people are not aware about and is not a tidy fix. A way to highlight these issues, I wanted to develop an interactive game to educate people on the experience of someone who uses a wheelchair. With this concept, it can easily be applied to create different journeys for various disabilities.

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Disability Awareness Game

The videos above highlight the initial stages of user testing the game. The purpose of the game is to portray an interactive journey that simulates the stresses of someone not being able to perform a standard activity. The goal of the game is to generate empathy and provide the user a basic perspective of the obstacles that wheelchair users constantly encounter. The game also has an educational component where if the user loses the game, there is an explanation as to why.

PLAY GAME

Read More

The Accessible Icon Project
This project is an ongoing work of design activism for the accessibility graphic icon.

New York City Is a Nightmare for Disabled People
Article by Vice regarding accommodations for people with disabilities in subways, ride shares, and taxis

What it's like to navigate NYC when you have a disability
Article by Brick Underground focusing on the issues on relying on public transportation in NY

NY MTA Live Elevator & Escalator Status
This website contains live status updates for stations that may have impacted service for elevators and escalators.

Court Says New York Neglected Disabled in Emergencies
Landmark win for people with disabilities living in New York City. During hurricane sandy NY had violated the rights of its residents with disabilities by failing to accommodate for their needs during emergencies.

New York City Is Still a Disaster for the Disabled
Article by New York Intelligencer that is insightful about the experience of living in NY having a disability

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How I Overcame the Stigma of My Wheelchair
A as-told-to account of a women who is quadriplegic overcoming an unimaginable obstacle.

CIDNY
CIDNY (Center for Independence of the Disabled, New York) is a nonprofit organization that is the voice of people with disabilities in New York City. They offer many resources and reports regarding the community.

The Disability Collection
Verizon Media created a library of stock images with people with various disabilities to repicture disability stereotypes.

In this iteration, I included the title of the website and a header graphic that is used for the statement page of the game. Beneath that section I included a colorful grid of disability statistics to highlight. These statistics are highlighted to bring awareness to users about transportation, employment, health services, etc..

After that section I wrote a paragraph about universal design activism and why it is important. Universal Design activism uses the concepts of universal design to create political and/or social awareness of issues that a group encounters. Activist design creates a series of questions or proposals using media to provoke, or question, or experiment political/social conditions.

The point of this campaign is to bring awareness and access to information about the microaggressions of urban living for people who use wheelchairs. There are certain issues that this community faces that most people are not aware about and is usually not a tidy fix. After that section the user is given a description about the narrative game following a list of resources where the user can learn more about the topic.

I created the website using Webflow because it easily allows designers to create websites that are accessible for all audiences.

ITERATION #2: WEBSITE USER TESTING

In my second iteration of the website you need to scroll down the page to get to the information about the project and game.

USER 1:

"From a quick glance, it's not super clear this is about accessibility. I might consider adding the ADA logo or a wheelchair icon, or something to make it clearer to the eye what your site is about."

In the header image it only includes the title and for my next iteration I will be including the wheelchair

accessible icon along with the title. After speaking with my advisor, the game is a vital component to the website and recommended that I readjust the hierarchy of my content. I agree with their comments and for my next iteration I will place the play button and a description of the game to be in the header. With adjustment I think it would also be helpful to have an arrow link in the header to notify the user that there is more content that they can scroll through.

USER 1:

"The stats in the tiles are GREAT, wonder if you can offer a printable and/or a shareable version of these?"

This is something I would like to implement in a further iteration of the site. I could picture this being an infographic pdf that is accessible for anyone to download and share.

ITERATION #2: NARRATIVE GAME

So for the second iteration, I worked on the design and functionality of the game. For the aesthetic of the game, I really liked the concept of flat design and creating my own graphics to set the scene and narrative. I designed all the graphics for each background of each question so that it is tailored to the contents of the questions and/or answers. So that when the user progresses through each question they instantly know that it is a new question. I created each graphic using Adobe Illustrator and to build my game I used HTML, CSS, and JavaScript.

AESTHETIC FEEDBACK

Overall I had positive feedback on the design of the game. Many users really enjoyed the look and feel. The users liked that each questions had its own background design.

FUNCTIONALITY FEEDBACK

Some users had some trouble with the navigation of the game. On the bottom right there is a "Next" button where after the user would select their choices they can continue on. Some of the initial feedback I received was

that if a user selected an answer it should then trigger the next question. This was not something I could implement for the game because there are questions that call for multiple answers. I believe that having the button is essential to allow the user to select multiple answers or deselect their answers before moving on to the next question.

USER 1:

"Move the next button underneath the choices."

This is something that multiple users have mentioned, this change will be implemented in the next iteration of the design. The next button will now appear closer to the choices rather than being in the corner of the browser.

USER 2:

"I got stuck on the question of what to do now that the restaurant isn't accessible, I tried 3 more times but couldn't get past that level - do you think you could make it so if you get it wrong you either have 3 tries on the same question (strikes maybe?) or if you get it wrong you don't have to start from the beginning you could just start at that question again?"

This user has a good point. The purpose of the game is to help educate people. This learning experience is valuable and it is important to have everyone be able to go through the learning experience. Instances like what this user encountered can deter someone from the experience and would lose the educational value. To help resolve this issue I in my third iteration is to include hints and chances that would encourage the user to keep playing. This is to allow the user to try 3 times to go through the experience.

USER 3:

"I think a transition video or a quick summary of what the correct answer would be really useful! I wasn't sure if I was getting them right since I had already completed the quiz before, but it would've been good to confirm."
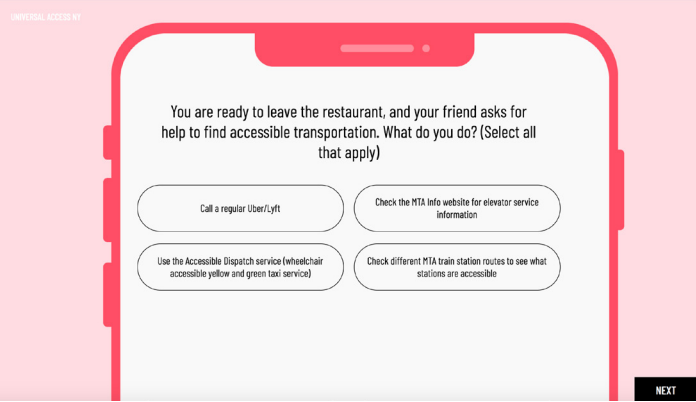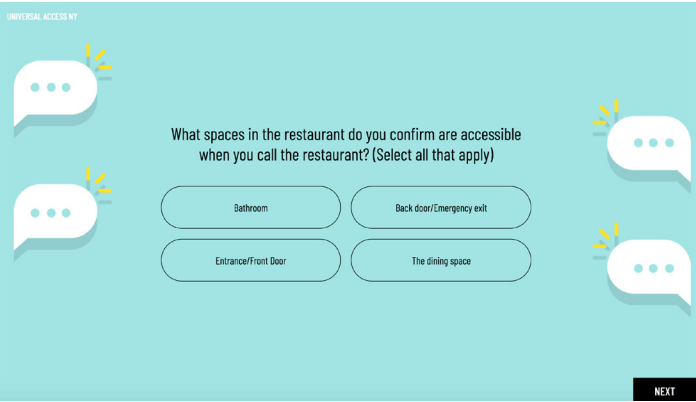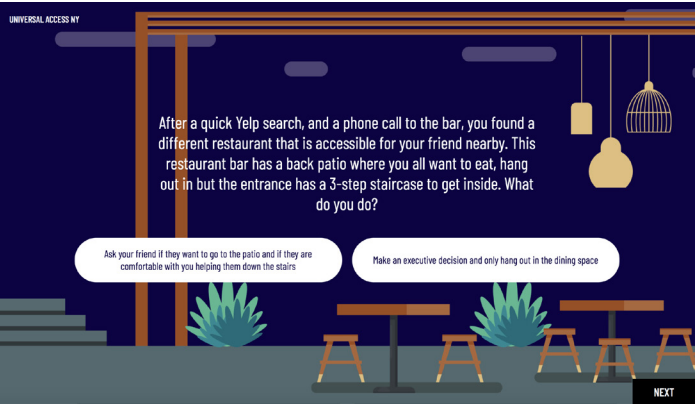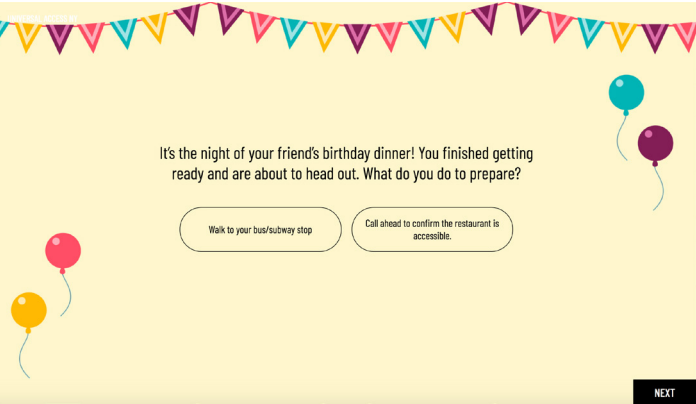
For my next iteration of the game, I included animated transitions that confirm why the user answered correctly on a question to further the educating experience. The goal of the transition screen is provide encouraging phrases and reasons of why the answers selected were correct.

ITERATION #3: WEBSITE

Based on the feedback I recieved from my second iteration, I decided to redesign the website to be more modern and simplistic. I arranged the game to be on the top of the website, as you can see on the right. This is so that the game is highlighted as the main component of the project.

From there I created a glossary page that includes the list of terms that was relevant to this project. This is designed with a masonry grid format which enables the user to click on the word and then it expands to reveal the definition. Some of the words has view more links that link to a youtube video that explains the term further.

Lastly, there is a contact page with a form that I hope to get additional user feedback during the IDM Showcase at NYU.

You can visit the website at:
https://www.universalaccessny.com/

ITERATION #3: NARRATIVE GAME

On my last iteration of the game, I added the transition screens with the reasons why a user answered the question correctly. Not only that I was able to implement the 3 chances and hint feature for each question which gives the user the opportunity to answer a question correctly before restarting the game. I also adjusted the hierarchy for my win screen and lost screen so that the content appears large and readable.

The next button was also adjusted to appear below the choices for each question. I also decided to change the

statement to be a blue cityscape graphic rather than a purple cityscape so that it is cohesive with its branding. As well as changing the last question background image. The reason I changed the phone background, was because I wanted to end with a graphic that is similar in detail compared to the other backgrounds. In place of that graphic, I did a subway station background. You can review a snapshot of the changes on pages 42-43.

The game can be accessed on the website or directly via this link: https://karlajoselly.github.io/ThesisQuiz/

UNIVERSAL ACCESS NY

This research project focuses on the experiences of wheelchair users and aims to bring awareness to the **MICROAGGRESSIONS** and **LACK OF ACCESSIBILITY** of the urban living experience.

To help bring awareness an interactive narrative was developed to help educate young adults in urban areas to think about universal design and accessibility.

PLAY GAME

Universal Access NY

Universal Access NY is a research project to start discussions about universal design and the importance of access for people in the disability community. Persons with disabilities face widespread lack of accessibility from public buildings and spaces, to services such as health, education, transportation, and emergency response. This project aims to educate individuals on the microaggressions and lack of accessibility of the urban living experience in a wheelchair user's daily life. Having gathered data through first hand experiences from wheelchair users who live in New York, I was able to develop an interactive narrative game.

About **1 in 4 people** with a disability will face at least one incident of discrimination every day.

–Brandon Gaille, Small Business & Marketing Advice

As of July 2019, **120 (or 25%) out of 472 total stations** in the New York City Subway system are accessible to some extent.

–New York Times

Many articles has shown that there is a lack of general knowledge within the general population about microaggressions. This study uses a social awareness campaign that utilizes an interactive narrative and an educational resource website to help educate young adults that live in urban areas to think about universal design. The narrative is a simulated journey to test the user's knowledge about obstacles that this community faces in their daily lives. The goal of the game is to generate empathy and provide the user a basic perspective of these obstacles.

UNIVERSAL ACCESS NY

It's your best friend's birthday! You planned a special night out for her with all your closest friends at a new restaurant you haven't been to. The restaurant has great reviews, and everyone is excited to try it. The birthday girl uses a wheelchair, and as the party planner, it's your job to make sure she has a great night!

START THE NIGHT

UNIVERSAL ACCESS NY

It's the night of your friend's birthday dinner! You've finished getting ready and are about to head out. What do you do to prepare?

Walk to your bus/subway stop

Call ahead to confirm the restaurant is accessible.

NEXT

UNIVERSAL ACCESS NY

That's Right!

Before you arrive to the venue you should to call ahead to confirm if certain spaces are accessible for your friend. This is important because everyone's definition of accessibility is different.

CONTINUE

UNIVERSAL ACCESS NY

You are ready to leave the restaurant, and your friend asks for help to find accessible transportation. What do you do? (Select all that apply)

Call a standard Uber/Lyft

Check the MTA Info website for elevator service information

Use the Accessible Dispatch service (wheelchair accessible yellow and green taxi service)

Check different MTA train station routes to see what stations are accessible

NEXT

UNIVERSAL ACCESS NY

You Made It!

When Congress passed The Americans with Disabilities Act (ADA) in 1990 it didn't just help the 58 million plus disabled Americans it helped us all and continues to help us all. All of this has led to a better general understanding of how disability affects someone's experience, and what still needs to be done to create an inclusive environment for everyone.

The purpose of the quiz is to start discussions about universal design and the importance of access for people in the disability community. This quiz portrays an interactive journey that simulates the stresses of someone not being able to perform a standard activity. As a community we should design with accessibility in mind to create equal opportunities and inclusive environments where everyone can benefit.

UNIVERSAL ACCESS NY

You Almost Made It!

It is always best to call ahead to confirm if a place is accessible before arriving to the location to find out that it is not accessible.

RESTART GAME

REFLECTION & FUTURE DIRECTIONS

Throughout my research process I was able to learn a lot about the community first hand by involving myself with organizations such as the Adaptive Design Association, New York Cares, Disability events at NYU, Level the Curve, and the Ability Project. Being able to connect with people and talk about their experiences and stories was an amazing opportunity for me to better understand the importance of accessibility in many forms.

As I was creating this narrative for my game many questions arose. Such as are there really any wrong or right answers? I based my game narrative off of a few interviews I had with wheelchair users. I wonder if other wheelchair users would have other ideas or thoughts regarding what is considered right or wrong. This is something I would have liked to get more feedback on with more wheelchair users with the completed game.

Because of COVID-19 I had limited resources to user test my project and website. I would've liked to interview and user test the project with more people to see their reactions. What I had originally thought of doing to launch this campaign was to do this outside of campus where there is a lot foot traffic. I would design large posters and graphics to be posted outside and inbetween the posters would be a podium with an iPad

where users can came up to play the game. Once the user is done with game, I would take the opportunity to ask a few questions about their experience and give them a sticker representing the campaign. Another idea with the sticker would also be having someone place the sticker on a graphic regarding microaggressions to visually see what people consider as a microaggression living in a urban environment. This would be used as a physical data visualization of what experiences people encounter as microaggressions. This idea was inspired by the pledge that people would sign on the Check Your Blind Spot Tours In My Secondary Research.

Not only students in the NYU community could do this but it would be open to the general population. For future directions, I can envision the narrative model that I built for my game to be templated to create different narratives with different disabilities as the focus to spread awareness on different topics and issues.

APPENDIX QUESTIONS

1. Have you worked with people with disabilities before?

2. If so in what capacity were some of their disabilities?

3. What makes caring for people with disabilities easier or more difficult than able-bodied/minded people?

4. Can you tell me any of the more difficult or intensive stories of your experience caring for a person with a disability?

5. Is there a difference between a disabled adult, adolescent, child, and baby? If so what are they?

6. What are the less noticed expenses (be it time or money) with taking care of disabled people? The things people forget about or do on autopilot.

7. What is the most consistent task when caring for people who have a disability?

8. Is there a system in place to ensure the protection and safety of patients during situations of armed conflict, emergencies, and natural disasters?

9. Are there laws, policies, or regulations providing guidance, methods, and strategies to integrate and coordinate emergency management inclusive of persons with disabilities?

10. What should persons with disabilities know to be prepared for emergency situations? What lessons have we learned from past experiences?

11. What are the current shortfalls (physical and cultural) that put persons with disabilities at risk during emergencies and what can be done to improve the situation (e.g. through new technologies, disaster planning, general education)?

12. How does disability affect people's experiences during a crisis?

13. What programs and best practices are in place to protect and promote the rights of persons with disabilities during an emergency in a hospital?

14. How are people transported to hospitals, from hospitals, and between hospitals?

15. How are people with disabilities transported to hospitals, from hospitals, and between hospitals?

16. How must persons with disabilities be factored into the resettlement and rebuilding process; does an opportunity for ensuring universal access exist in the rebuilding process?

17. What would be your top 5 considerations if you were tasked with relocating or transporting a person with disabilities if you had zero support or access to necessary equipment? (Such as during a catastrophic natural disaster).

18. From real-life experiences of persons with disabilities before and after a disaster, how does one return to work and home? Are there any things you notice that people within this community struggle mentally and emotionally?

19. Do people with disabilities suffer from PTSD, anxiety, or any other conditions after a traumatic experience?

20. Have you experienced weather-related emergencies? Were there any systems in place that were helpful?

21. What services for transportation do you utilize for emergencies?

22. Do disasters impact people such as women with disabilities, children with disabilities, and those with intellectual disabilities?

23. What is your preferred method of transportation? Why?

24. How do we create better access to information during a crisis or emergency? Especially in situations where electricity is knocked out.

25. During city planning and building construction processes, how can we ensure that buildings and services be designed with principles of universal design to ensure access?

26. During an emergency would you use a medical alert system as a wearable? If you already have one what do you like/dislike about it?

27. How do we provide access to transportation and first aid to help this population during a disaster?

28. What mobile applications do you use in your daily life to do activities? This is probably for someone who has an impairment/disability

29. During Crisis are there assistive technologies that are provided to help evacuate transport necessary items?

30. What trends do you see within the community during displacement and resources after a crisis?

31. In a world where there are limited resources, how would you address the needs of those that require the equipment? Are there low-tech solutions?

32. How many days supplies does a hospital usually keep on hand?

33. What products expire quickly?

34. What products are used most frequently?

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