How can a local government implement environmental education for immigrant communities that live in apartment buildings?

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A capstone submitted in partial fulfillment of the requirements for the degree of Masters of Arts in Education: Natural Science and Environmental Education

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St Paul, Minnesota

May 2020

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Thank you to Hennepin County for supporting me during this research process. To the influencers, volunteers and property managers who are working to educate residents how to recycle, you inspire me every day. To my research committee, Patty, Carolyn and Nancy, I appreciate your honest feedback on my paper. Last but not least, to Tyler my husband, you always know how to encourage me and help me be a better version of myself. Thanks for reading my paper a million times.
“The care of the Earth is our most ancient and most worthy, and after all our most pleasing responsibility. To cherish what remains of it and to foster its renewal is our only hope.”

— Wendell Berry
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CHAPTER ONE

Introduction

In a large metropolitan area, we produce a lot of waste. According to the Environmental Protection Agency, each person throws away about 4 pounds of garbage per day (Reynard, 2016). In the course of a year, that adds up to be enough trash to fill up a football stadium about 11 times. That is a lot of trash! Hennepin County is one of Minnesota's largest counties in the state by population (Minnesota State Demographic Center, 2016). They are working hard on finding ways to not only reduce the amount sent to landfill but also recycle and compost as much waste as possible. Hennepin County plans on recycling 75 percent of its waste by 2030. Currently, the County has a 45% recycling rate (Hennepin County, 2016). This is including the amount of food waste that is being composted as organics. 75% by 2030 is quite an aggressive goal for the future, so Hennepin County is working hard to educate its residents as much as possible to meet this percentage and to include everyone in it.

I would like to research “how can a local government implement environmental education for immigrant communities that live in apartment buildings?” Chapter one will be exploring my journal from a small-town girl who hated to recycle, to a woman that passionately educates crowds of people about environmental education as a career. I hope to share this passion with multifamily residents who live in the Twin Cities metro area in order to better serve them. Specifically, I’d love to learn more about what drives people to learn and to become engaged in environmental education, how can we inspire those to
My History

I make people laugh when I tell them how much I’ve changed since I was a teenager. I grew up in an environmentally mindful home, with a mother who taught me everything I know about gardening and a Dad who taught me everything I know about camping. We lived in a small rural town, where we had to drive five miles away to drop off our recycling. We had to sort, peel the labels off each item and make sure everything was impeccably clean. I absolutely hated recycling for many years of my life. I thought it was too much work. My brothers and I would fight over who’s turn it was to take care of the recycling that month. As a young teenager, I found glee from tossing a plastic water bottle into the trash because it was easy. I loved to not think about recycling. My Mother would have been very disappointed in me.

It wasn’t until 2008, my senior year in high school that everything clicked. I was on a camping trip in northern Minnesota during the wintertime. My environmental studies teacher led us on a night hike onto the frozen lake and instructed us to not look at any artificial lights until he told us to. We walked in the dark and smirked at whatever activity he was making us do, but we went along with it. Once I looked up, I was amazed at what I saw. The night sky was breathtakingly clear and I remember how suddenly I realized how lucky I was to be able to be at that place, seeing what I was seeing. I felt like I could see every single star in the night sky. We talked about the different planets, and constellations we were looking at, and how so often in the city, we can’t see the very thing we were looking at now. My teacher reminded us that “this is the only home that
we know of. We don’t get another place to live in and we need to take care of it now or we’re going to lose special places like these.” I felt my soul wake up and I realized on that trip how passionate I was about preserving the Earth in its natural state. I wanted to make sure that places like that frozen lake in northern Minnesota would be around for future generations to enjoy.

It wasn’t until I went to college that I realized that other people had similar passions to mine. I honestly thought that I was the only person who cared as much as I did about the environment but didn’t know how to express my passions. I learned there was an entire group on our campus who met and did things for the environment. I joined the on-campus environmental group, and before long, I became the President. I would find myself organizing campaigns to raise students’ awareness of food waste and energy efficiency issues. I began to consider myself an avid recycler being the roommate who would sort through our garbage that came from our dorm in college. I also was the person who would lecture my roommates about why recycling was important. I found my passion and realized how much I loved sharing it with others.

One of the issues with waste is that there is no “away.” I studied abroad in Belize during my junior year of college. Belize is a wonderfully diverse developing country where poverty exists as I’ve never seen it before. Before leaving the States, we were instructed that any garbage that we purchased while abroad, we would be bringing home with us. It wasn’t until I got to my temporary home that I began to understand why. As a part of our school program, I had the opportunity to stay with a few different families during my time abroad, one in particular stands out in my memory. I stayed with a family
that did not have very much money and yet they treated us like royalty, wanting us to have a great time staying with their family. They had us stay in their master bedroom, cooked us fancy meals every night and even brought us to a fun dance night. One night, my roommate and I talked about the culture of the little village they lived in. We found out that cancer was one of the leading causes of death in their community. Upon further inquiry, we found that the entire village did not have an option to recycle any of their garbage, and instead burned it all. That meant that all of the plastic water bottles, plastic wrap and anything burnable were set on fire to get rid of it. This village my host family lived in was directly downwind from one of these burn sites. Unfortunately, there is no “away” when it comes to waste as someone will always live downwind of you. In recent years, Belize has begun to work on implementing recycling programs, however, the direct result of waste mismanagement opened my eyes to the issue of waste and the effects on lower-income communities.

Once I graduated from college, I started to work for Hennepin County first as an AmeriCorps member, and then as a recycling specialist in the Department of Environment and Energy. Hennepin County is the largest County by population in the State of Minnesota and includes cities such as Minneapolis and Saint Louis Park. Serving residents of Hennepin County really raised my awareness of waste issues. My Supervisor said it best as far as environmental topics go, waste is one of the most relatable ones. Everyone has trash and handles it every day. Not everyone can reduce their energy usage, or necessarily find better options for transit but everyone has garbage. She was right.

Why Recycling?
Recycling is important because it adds up. Our society is focused on convenience items, and having things be single-use for consumption. For example, think of a plastic water bottle. Once the materials are mined, processed, cleaned and packaged, a consumer will purchase this water bottle, drink the contents and throw it away once they are finished. It takes twice as much water than what is contained inside of that water bottle to even make the bottle in the first place (Pacific Institute, 2007). If it isn’t recycled, that plastic water bottle will either be burned, releasing even more toxic waste into the atmosphere, or sit in a landfill for many, many years. It's unfortunate because most plastic water bottles are not recycled today even though they are one of the easiest things for Materials Reprocessing Facilities (MRFs) to recycle (Winter, 2015). In fact, only about 25% of the plastic we use in the United States, actually gets recycled every year (Utah Recycles, 2019). Throwing away one plastic water bottle doesn't seem like a big deal, but if 7 billion people drank and disposed of one plastic water bottle every day, it begins to create some problems. We either need to get better at recycling or encourage people to find other products to use that are reusable, a term called waste reduction. Of course, other countries have implemented systems that allow people to get money back from placing their water bottles in a vending machine. These vending machines were set up as a way to incentivize residents to recycle and not litter. Cities such as Portland have begun to implement take-back programs where residents get 10 cents for every bottle that is returned (City of Portland, 2019). Most of the country is still struggling with what to do with recyclables, especially in the more rural parts of the County. Here in the US, it is incredibly easy to not recycle as economics are not always in place. Someone needs to be
available to buy a product and it needs to not cost a lot of money to collect and transport the material. The economics need to get ironed out before recycling programs can begin.

Why Multifamily Properties?

37% of the U.S. Population lives in multifamily properties (NMHC, 2015). Hennepin County is home to over 160,000 units. Over 80% of the multifamily properties are located in the eastern half, mostly in Minneapolis and St Louis Park. That is a lot of residents living in a small area and the metro area is still growing. In 2017, Hennepin County conducted a study of multifamily waste and found that waste diversion is low and the contamination of recyclables is high. This means that people who live in apartments typically don't recycle very much, and when they do recycle, they often are doing it incorrectly. Service levels tend to be inadequate for the capacity to capture recoverable material generated. This means that there is often more dumpsters and pickup frequency for trash than recycling. It is very likely that a resident who diligently separated their recycling from their waste, and brought it to the recycling area would find containers that are overflowing or else highly contaminated. Feeling like they had no other option, they would have to toss their recycling into the garbage. Hennepin County considers this proof that we need to continue our education efforts and even ramp up the outreach in multifamily properties.

I've lived in many types of living communities. I grew up in a house, went to college in a dorm and lived in an apartment during my senior year of college. I've lived in a condominium, a triplex and now a duplex. I believe that residents who live in apartment buildings get forgotten about. When it comes to educational outreach, mostly
single-family housing is targeted. As someone who has also lived in an apartment building for years, there was minimal communication from our property managers. We had no contact from our city or county on recycling information and definitely had no community around us and absolutely no recycling education.

My supervisor says it well when she says that residents who live in multifamily properties are treated as second class citizens. As a government employee who has worked with multifamily properties for three years now, it's clear that any education has a three year lag for most multifamily properties. In some counties, multifamily residents receive recycling information once per year, but that’s not enough. Not every property is the same, some property managers are excellent at communicating with all of their residents. For the bulk of multifamily properties, it is a struggle to communicate things to residents. I am passionate about finding better ways to communicate effectively with residents.

There are many barriers for property managers to communicate effectively with residents. First, there is a high turnover rate in multifamily dwellings. Second, apartment dwellers are very transient. Many of them are out of their unit and working since a lot of them are working-professionals or families with working parents. One of the biggest barriers is language. In Hennepin County, residents immigrate from Russia, Somalia, France and Asia and all over the world. Residents may speak some English, but some languages are only spoken and only recently are becoming written.

Imagine trying to communicate something with residents who are so diverse and relatively busy. Imagine being a resident who does not understand what is being
communicated to them in the process of moving to a new country and being bombarded with information left and right and is expected to read every slip of paper given to them. Now, imagine being an immigrant trying to understand the country and new language around you. Figuring out environmental knowledge might not be the first thing on your mind, especially when the only information given to you is only presented to you in English. I would like to research how can we implement environmental knowledge for immigrant communities that live in apartment buildings?

I experienced this very issue when I was given the work assignment of going to give a recycling presentation to a Mother's group. Giving recycling presentations is my favorite part of my job because I love connecting with other like-minded passionate recyclers. During my prep for the presentation, I was told that this specific group was predominantly Somali mothers. I specifically remember being told that I might as well not bring any of our translated recycling literature, because they wouldn't read it anyways. I know that Somali is a spoken language which means that almost all information that is passed around is done verbally. Despite this, I brought our Somali translated materials. What a fun presentation I had. The mothers were actively engaged with what I was saying and talking to each other excitedly while I was speaking about the information in my presentation. I did my best to include examples and pictures of what I was talking about, in order to be clear. At the end of my presentation, I gave the group the translated materials when one of them commented on how helpful it was to have it translated and she thanked me for bringing it along. (Most of the materials produced in the Twin Cities Metro area are image-based for this reason).
While I know that maybe this group of women was a rarity, and I am absolutely no community expert, I do hear plenty of negative myths about immigrant communities especially, relating to environmental topics. I hear myths such as “they don't care about environmental issues,” or “they're just lazy.” Hearing people say things like this really breaks my heart. I don't think that we're getting to the heart of the issue of outreach if we ignore them, assuming they don’t care. From what I understand, a property manager might want to educate their residents about recycling, but the only type of communication they’re using is handing out information that is only listed in English. This method might not be the best option, it probably isn’t enough. The same goes for residents, maybe they really do want to learn about how to recycle, but they simply don’t know how to recycle and so they toss everything into their recycling bin. Some residents might feel more inclined to be excited about learning about recycling at a community event with environmental games and information. Many of the properties that I visit on a weekly basis tell me that they have a diverse community and tell me how their recycling program is going. A lot of children seem to be taking their recycling to the dumpsters for their parents. As a result, well-intended recyclables end up in the garbage, or garbage ends up in the recycling. This may be due to the children not knowing how to recycle, heavy dumpster lids on the recycling, no images on the recycling dumpster, or hard to reach recycling dumpsters. How can we include all members of a family in recycling education? How can we make recycling fun and exciting and applicable to each family that moves into these apartment buildings? I want to figure out how can we implement environmental knowledge for immigrant communities that live in apartment buildings?
believe these residents have a right to be educated just as a single-family home owner would be.

As a county employee, I have established relationships with many property managers in Hennepin County. I have worked on the apartment recycling program doing presentations, outreach, and giving out any technical assistance that I can. I believe that I will have an easy time reaching out to the property managers and asking for their assistance in my research. “People who live in apartment buildings don't care about recycling.” “People don't want to learn about recycling.” “People who live in lower-income housing don't have time to care about their recycling.” These are three of the many myths I have heard being said by professionals I have worked with in my time with Hennepin County. However, I have to disagree with these statements. In fact, I intend to prove these statements false through my research.

Summary

As someone who used to purposely not recycle because they thought it was stupid, I have to believe that it is possible to educate all residents about why recycling is important. It wasn’t until I actually lived in an apartment building in college that I began to understand why both recycling and environmental education are important. I began to understand that everyone has garbage, a lot of it. If Hennepin County doesn’t start to implement better education to include immigrant communities, we are leaving a huge portion of our population behind. The best way to start introducing environmental education is through doing some initial research to find which method would work the best. This capstone will research different methods of doing culturally sensitive outreach
for immigrant communities living in apartment buildings. Chapter two will detail the research about recycling and environmental education geared towards immigrant communities. It will also include information comparing and contrasting residents that live in multifamily properties, to single-family residents. Chapter three will detail who exactly I plan to work with, where they are and include any necessary information about them.
CHAPTER TWO

Literature Review

Chapter one summarized my personal and professional experiences thinking through my research question of “how can a local government implement environmental education for immigrants living in apartment buildings?” However, before I continue to describe my methods and research, some background context is important. Chapter two will define both environmental and recycling education. It will describe Hennepin County, Minnesota’s most populous county, which all of my research will be based on. It will also look at the history of solid waste in the United States, current methods of waste disposal and how it relates to Minnesota’s immigrant populations. It will also investigate what other leaders are doing around the country to improve both environmental and recycling education for immigrants who live in apartment buildings.

Definition of Environmental Education

Joy Palmer uses the definition of Environmental Education from the International Union for Conservation of Nature, (1970), stating that environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture, and his biophysical surroundings (2002). She later settled on another definition that environmental education is a lifelong process, interdisciplinary and holistic in nature and application and concerns the inter-relationship and interconnectedness between
human and natural systems. The best way she describes environmental education is that environmental education is concerned with building an environmental ethic while encouraging the development of sensitivity, awareness, critical thinking and problem-solving skills (Palmer, 2002).

**Definition of Recycling Education**

Recycling is the process of taking waste and turning it into new products (Terracycle, 2018). Examples of recyclable waste include but are not limited to aluminum cans, cardboard, paper, glass, and plastic. The rules and markets, or buyers of recyclables, for these materials are constantly changing. The rules of recycling that applied ten years ago, are widely different today. Also, what may be true in one state, is not necessarily true in another state because those who buy and sell recyclables cannot reach every state. What they buy also changes. As a result, educators are needed to help residents, schools and businesses understand what can and cannot be recycled.

**Why Recycling?**

While the global average of garbage produced is about 2 pounds per person per day, the average American produces about 4 pounds of garbage per day (Loki, 2016). According to the Environmental Protection Agency (EPA), recycling has many benefits. First of all it helps reduce the amount of trash sent to a landfill each year (2017). While landfills are not harmful in themselves, if they are unregulated they can contribute to air and water quality issues over time (Lisk, 1991). Recycling also helps conserve energy and natural resources such as timber, water and minerals (EPA, 2017). Finally, recycling helps provide jobs. According to the EPA, in 2007, recycling and reuse activities in the
United States accounted for 757,000 jobs, $36.6 billion in wages, added $6.7 billion in tax revenues and keeps jobs local (2016).

**Why Environmental Education?**

While the focus of my research will be on recycling, I wanted to have information related to environmental education since it is such a broad topic. Recycling education is considered only a small portion of environmental education. The EPA says the components of environmental education are first awareness and sensitivity to the environment and its challenges. Secondly, it’s knowledge and understanding of its challenges. Thirdly, it is attitudes of concern for the environment. Fourth, it is the skills to identify and help resolve environmental challenges and lastly, it is participation in environmental activities to benefit the environment (EPA, 2018). Environmental education is very broad, so I will be focusing on a small part of it with recycling education.

**History of Environmental Education**

Sir Patrick Geddes (1854 - 1933), was one of the founding fathers of environmental education and was one of the first to encourage learners to have direct contact with their environment. He set the stage for environmental education through his concern of the whole person, and his teaching methods included students using a “field studies center” in order to take observations of the world around them. By the mid-1940s, the term ‘environmental studies’ was being used frequently largely consisting of geography, history and local nature study (Palmer, 2002). Palmer suggests that the establishment of the Nature Conservancy in 1949 was very significant in the development
of environmental education. In 1968, the United Nations Educational, Scientific and Cultural Organization (UNESCO) called for the development of curriculum materials related to the study of the environment (Palmer, 2002). The 1980 IUCN World Conservation Strategy stated that environmental education should be practical or action-oriented. In June 1992, the Rio de Janeiro Earth Summit was held in Brazil with delegates from more than 170 countries. A proposal was made that “Governments should strive to update or prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within the next three years” (Palmer, 2002).

**History of Recycling Education**

According to Louis (2004), dating back to the 1800s, the United States had little to no environmental programs. The belief in anticontagionism, or fear of contagious diseases, led to the construction of water treatment and sewerage works during the 19th century. This was done by sanitary engineers working for regional public health authorities. By the time attention turned to solid waste in the 1880s, funding was not available for regional infrastructure. Thus, solid waste management was established as a local responsibility, centered on nearby municipal dumps (Louis, 2004). Meanwhile, the United States was trying to manage its waste in the 1950s and 1960s using burn barrels as the most common way to get rid of garbage. Remember, there is no “away” in the world of waste. Burn barrels have a history of causing human health problems due to air pollution (EPA 2016). Throughout this time, incinerators were still very common and were often unregulated.
Finally, in 1969 the Solid Waste Act was implemented. Open burning was restricted and landfill requirements were upgraded. In 1973, the State of Minnesota established a policy of encouraging waste reduction, recycling, and resource recovery. Resource recovery is the act of burning waste for energy. In 1980, the State of Minnesota passed the Waste Management Act (Minn. Stat. 115A). The statute’s purpose is to “improve integrated solid waste management to protect the state’s natural resources and public health” (Minnesota Pollution Control Agency, 2016). The statute also established its own waste hierarchy, in order from most to least beneficial to the environment, of solid waste management practices. First, waste prevention and reuse, second is recycling, third is composting either yard or food waste, fourth is resource recovery, the fifth is land disposal with methane retrieval and sixth is land disposal with no methane retrieval. Cities in Minnesota such as St. Louis Park and Minneapolis began implementing their own curbside programs to collect recycling in the mid-80s. Finally, in the late 1980s recyclables were banned from resource recovery facilities. In 1989, SCORE, or the Select Committee on Recycling and the Environment, was created in order to set county goals.

The Evolving Ton

In the past 25 years, there has been a dramatic shift in types of recyclables, and also in the weight of these recyclables. For example, in the early 1990s, 22 aluminum cans weighed one pound whereas today it takes 34. Many recyclable items are getting lighter as many manufacturers are trying to cut costs for shipping. There has been a shift away from glass and metal containers which were used historically towards more plastic-based packaging (Foth, 2016). As materials continue to change, and recycling
markets continue to shift, recycling educators are needed to communicate these changes effectively.

**Urbanization**

As more people are beginning to move to urban areas the global urban population is projected to grow to 4.9 billion. During this time, the total global population is expected to triple. The changes in where humans will be living will have a major effect on the surrounding ecosystems. The United Nation’s Urban Sustainable Development Goals offer some guidance and global consensus on what is important, “Make cities inclusive, safe, resilient and sustainable” (Maddox, Nagendra, Elmqvist & Russ, 2016). Leaders will be needed to communicate the link between the natural world and people’s everyday actions.

**Community Based Social Marketing**

Community Based Social Marketing, or CBSM method is based in psychology and draws from the idea that sustainable behavior change is most effective when it is carried out at the community level. Also, when it involves direct contact with people. It is known to be an effective method used to influence people. CBSM normalizes a behavior that one would want an individual to adopt. It works to not influence others through guilt, but through positive experiences. First, you select a behavior that you want an individual to adopt into their own life. Second, figure out what the barriers are towards this behavior, and any benefits an individual would have by adopting the behavior. Third, design a strategy that utilizes behavior-change tools to address those barriers (Koontz & Mon, 2014). Fourth, pilot the strategy, for example offering neighborhood informational
meetings to give people hands-on opportunities. It helps to make the choice “opt-out,” rather than “opt-in” and subscribe everyone to the behavior. And finally, balance urgency with realistic hope. People are more likely to act if they feel that they need to take action immediately (Manning, 2009). A good example of the CBSM method at work took place in Minnesota at Fond du Lac Tribal Community College. The group wanted to address the barriers and benefits students have towards recycling programs on campus. Students were asked to fill out a questionnaire, and as an incentive, they were put into a drawing for a gift card to a local coffee shop. The questionnaire revealed that students were aware of recycling, but they had many barriers as well. The group found that the students were all relatively aware of the benefits of recycling. Based on the results of the questionnaire, the college was able to implement different pilot strategies. They placed recycling stations next to existing trash cans, installed recycling stations in high traffic areas, and increased signage to draw attention to the new recycling locations. They also worked to improve communication, preparing the signage in both English and Anishinaabe languages. Six months later, another questionnaire was sent to the students asking the same questions. The questionnaire revealed that the changes to the recycling system were noticed and helpful to the students. In the post-pilot waste audit, the team found that the overall recycling rate improved by 41% (EPA, 2016). Many counties, including Hennepin County, cities and groups have adopted the CBSM method in order to gain participation in a variety of programs.

**Background on Hennepin County**
Hennepin County is the state of Minnesota’s most populous county. It has a growing population of 1.23 million people. In 2016, it’s median household income was $71,200, an increase from 2015. The largest universities are the University of Minnesota located in Minneapolis, with 13,996 graduates. The second is Walden University in Minneapolis with 11,390 graduates. The third is Capella University also in Minneapolis with 7,094 graduates (DataUsa, 2018).

**History of Hennepin County programs**

On October 30th 1986, the Hennepin County Board of Commissioners adopted Ordinance 13 requiring all businesses to recycle in order to reduce the volume of solid waste generated in Hennepin County (Hennepin County, 2018). This required cities in the county to ensure recycling was happening at businesses. Cities in Hennepin County began implementing their own curbside recycling programs in the 1980s and 1990s but started with only metal cans, cardboard, glass bottles, jars, used motor oil and batteries (City of Minneapolis, 2018). Plastic bottles, mixed paper, and mixed plastics were added in the next few years. In 1997, SCORE implemented a fee on solid waste disposal. Some of the money collected helps fund city recycling programs. Non-residential waste is now taxed at 17%, which gave businesses an incentive to recycle more than they threw away (Minnesota Research Department, 2002). In 2012, all plastic containers and cartons were added to the list of acceptable recyclables. Today, the United States uses a variety of methods for waste disposal including landfill, incineration, recycling, and composting. Hennepin County is trying to do its part to reduce the amount of solid waste by reducing and recycling as much of it as possible.
Hennepin County Goals

Nationwide, the recycling industry received some negative media attention claiming that we should be burying our waste rather than recycling it (Tierny, 1999). Tierny suggests that recycling is a waste of time and money. In Minnesota, recycling is anything but a waste of time for residents. It is supporting local businesses, provides 37,000 local jobs, and helps contribute to $1.96 billion in wages (Minnesota Pollution Control Agency, 2018). In 2018, Hennepin County released its updated Solid Waste Master Plan. Metro Counties in Minnesota are required to update their master plans every six years. The plan was developed to be consistent with the Hennepin County Board of Commissioner’s Mission “to enhance the health, safety, and quality of life of our residents and communities in a respectful, efficient and fiscally responsible way” (Hennepin County 2017). It also is consistent with the county’s Environment and Energy Department’s mission of “protecting the environment and conserving resources for future generations” (Hennepin County, 2017). As of 2016, Hennepin diverted 82% of its waste from the landfill. Of that number, recycling accounted for 41%, resource recovery 31%, recycled yard waste 7% and organics recycling 3% (Hennepin County, 2016). Resource recovery indicates burning waste for energy recovery purposes. Organics recycling focuses on food waste, food-soiled paper, and certified compostable foodware.

The Pollution Control Agency previously required that the Twin Cities Metro Area achieve a 50% recycling rate by 2030 which was achieved in 2015 (PCA, 2016). Hennepin County is intent on sending as little waste to the landfill as possible. By 2030, the Twin Cities Metro Area is required to send zero trash to the landfill and recycle 75%
of its waste. In 2016, the County was sending 18% of its waste to landfill and recycling 42%. Hennepin County currently has recycling programs focused on residential, business, school and multifamily. In order to help the county achieve the 75% goal, single-stream recycling was implemented in 2014, which means that residents no longer had to sort their recyclables. This increased recycling rates countywide from 38% to 42% in 2016 (Hennepin County, 2016). Hennepin County’s rate is higher than the average national recycling rate which is 34.3% (EPA, 2016). Hennepin County has also implemented various waste-reduction programs such as Fix-It Clinics. This is a once a month event where residents can learn how to repair their broken items for free. Another county program is called Choose to Reuse, where residents are given coupon books to local reuse stores and are encouraged to reuse rather than always buying new. These programs are not only helpful in providing residents tools to reduce their waste in their own homes, but they also provide a general increase in awareness for environmental education by providing an opportunity for collaboration. Hennepin County is comparable in its recycling education programs to programs around the country like Austin Texas and Portland Oregon.

**Multifamily Recycling**

Multifamily recycling is a sector that can help divert significant amounts of material from the waste stream. If recycling was made available to every resident living in an apartment building in the United States, 847,000 additional tons of material could be diverted from the solid waste stream (EPA, 1999). Multifamily properties are required by the State of Minnesota to offer recycling to their residents. Despite the requirement,
multifamily properties have many barriers to overcome. Haulers consider multifamily properties commercial properties, so waste pickups are normally lumped with other businesses along trash routes. This means that recycling rates in multifamily properties are elusive.

**Multifamily in Hennepin County**

63% of the units in Hennepin County are single-unit dwellings, otherwise known as single family homes. 7% of housing units are 2, 3 and 4 units otherwise known as duplexes and triplexes. 30% of the units in Hennepin County are multifamily properties. Overall, Hennepin County has 160,000 multifamily units. More than 80% of the units are located in the eastern half of the county, concentrated in Minneapolis and St. Louis Park (U.S Census Bureau, 2010).

In Hennepin County, multifamily is considered anything that is 5 units or more. Waste haulers consider multifamily properties as commercial rather than residential, so property managers and management companies are required to find their own haulers. Anything less than 5 units are typically covered by a city curbside recycling program. Multifamily is considered to be anything that is assisted living, rentals, condominiums and townhomes depending on their hauling contract. While not typically covered in the city curbside recycling program, property managers are required to provide recycling to their residents that live in multifamily properties (PCA, 2017). Recycling rates continue to be elusive at multifamily properties as opposed to single-family dwellings. One study done in 1999 claimed that the average recycling program in a multifamily property diverted 15 percent of residents’ waste from disposal through recycling. Only one in four
communities achieved a 20 percent recycling rate (U.S. Conference of Mayors, 1999). Clearly, there is a lot of material that is continually being thrown away that could otherwise be recycled. While recycling rates may be elusive for multifamily properties, Hennepin County conducted its own research in 2017. The study was done over a two-week period at a random sampling of multifamily properties throughout the county. The study indicated a few things: that contamination is high in recycling, meaning there is a high concentration of trash in the recycling dumpsters. Examples of trash found in the recycling dumpsters would include things like plastic shopping bags, disposable coffee cups, and broken furniture or bulky items. Secondly, there was plenty of organics and recyclable materials in the trash that could have been recycled. Examples of organics material include things like food waste and food-soiled paper like paper towels and napkins. The study shows that 30.2 percent of what is being thrown away at multifamily properties is organics, and 23% is actual recyclables. That means that 60-70% of what is currently being thrown away could be recycled, composted, or reused at multifamily properties. Lastly, it showed that many properties need to update their service capacity because often the pick-up frequency was inadequate. Service capacity refers to how often a trash or recycling dumpster gets picked up by a waste hauler (Hennepin County, 2017). The service capacity at multifamily properties was double the amount of trash available than recycling. What this means for Hennepin County is that education is still needed for multifamily properties.

**Barriers to Multifamily Programs**
Apartment dwellers live and work in the same spaces as single-family dwellers. However, many of them do not receive the same recycling education that single-family dwellers do. Since multifamily properties are considered commercial, the property managers are technically the customers of the service. Because of this, typically not a lot of recycling information trickles down to the resident level (Morrigan, 2016). Many managers may have other priorities, and some may live and work out of State so they have even less vested in Hennepin County recycling information.

There are many barriers to working with multifamily properties. Many buildings were not built with recycling in mind and there is currently no infrastructure to support it. Inside the units, residents are given a small unit, with limited storage for any extra trash or recycling containers. Outside of the units, most buildings in Hennepin County were built in the 1970s and 1980s and were built with a single trash chute in a common space. Residents are often expected to use the trash chute, which is incredibly convenient as opposed to recycling. Residents who wish to recycle, are expected to carry their recyclables to the ground floor to deposit them. This creates a huge barrier for someone who lives on the top floor and has mobility issues in a 9-story building. If someone is strained for time and energy, they will most likely not recycle, or recycle correctly. Recycling should always be as convenient as trash.

Another barrier for multifamily education programs is a high turnover rate for both residents and property managers. When a resident moves from one place to another, there will always be more trash and recycling that accumulates as a result. Many residents consider apartment buildings their temporary home. The median number of
years for residents living in an apartment is 5.2 years (U.S. Census Bureau, 1998). This means that continued education is important as new people are coming and going from apartment buildings. Also, recycling is unique to every area that someone moves to based on what markets are available to that geographic location. Some residents may come to live in Hennepin County not having the opportunity to recycle at their previous home, they may have recycled completely different materials in their last home. Hennepin County staff suggest providing recycling reminders every six months, at move-in and move-out to keep recycling information clear and fresh in people’s minds.

Another barrier facing multifamily recycling programs is turnover. Once a resident eventually moves from one place to another, the residents may see completely different recycling information than they had at their last home. The Twin Cities Metro area in Minnesota has worked together to provide more cohesive recycling education and look to all residents. This means that if a resident moves from one county to the next, they will see similar recycling images and colors that they would associate with recycling. Blue is widely recognized as recycling, grey or black is recognized as trash and green for organics recycling (EPA, 1993). Waste and recycling information should always remain as consistent as possible so property managers do not need to re-educate residents (Environmental Initiative, 2016).

Bulky waste, or furniture, household goods and clothing that inevitably comes with managing apartment buildings during move-in or move-out. The busiest time for property managers is during the summer when there is a lot of resident turn-over. Usually, the furniture and appliances that come with move-outs are unusable. All
residents have bulky waste and not all of them have a way to transport their waste to a facility to properly dispose of it. It is expensive for property managers to have to dispose of bulky items, and these items always appear around move-out times despite giving residents proper information on where to dispose of them properly. The last barrier is language. It’s not uncommon to find two to three languages spoken at a single property. Property managers need the proper tools to communicate recycling information with their residents. Often, the only resources available to property managers are ones written in English. Well-meaning property managers may distribute recycling guides and literature to residents, but this method may not be effective for those residents who not speak or read English. Due to the fees associated with solid waste disposal, it is beneficial for property managers to want their residents to recycle correctly. In Minnesota, trash is heavily taxed while recycling is not (MN Department of Revenue, 2018).

**Other Recycling Leaders**

Hennepin County’s multifamily recycling education program is similar to a few others around the country. One of them is Portland, Oregon. According to the City of Portland (2018), the city solid waste staff began to work extensively with the commercial sector in 1993. Commercial is considered anything that is a business, including multifamily properties with five or more units. In 2004, the City started to implement recycling at multifamily properties, achieving a 75% recycling rate. A 75% recycling rate is extremely high for multifamily properties, meaning that only 25% of Portland’s waste is being disposed of as trash. In 2017, a report was compiled that included information for the greater Portland area, calling themselves “metro.” The report listed the barriers to
multifamily-property residents recycling. They listed concerns of having no room in the dumpsters to put their recyclables, lack of consistency for recycling signage and having a messy trash area, so residents don’t feel like they can place their recyclables in the proper containers for fear of making even more issues for property managers (Metro, 2017). The City of Portland has had great success with its multifamily properties diverting its waste (City of Portland, 2018). Since 2004, The City has been working to streamline communication methods with residents to make access to their resources as easy as possible.

King County, Washington is another leader in the recycling world with a diversion rate that exceeds the national average. Their diversion rate for multifamily was 35% in 2006. In 2006, King County partnered with Waste Management and conducted a study focused on increasing recycling at five large complexes in the county. The target audience was multifamily properties that had a high concentration of Spanish-speaking residents. The focus of their research was to improve recycling, improve access to recycling containers, provide clear signage in languages other than English, provide newsletters to tenants and assistance to property managers. They found an improvement in their diversion rates, a decrease in the contamination rates and found the program to be effective. However, staff suggests that any future research should focus on the specific recyclable items such as paper, cardboard, and cans since they are the easiest to teach (King County, 2006).

Davis, California is another recycling leader. Each apartment unit receives a special bin called “iBIN,” which makes it easier for residents to recycle in their
apartment. While many units are small and have limited space for another recycling bin, the “iBIN” provides residents with an easy option to store and transport their recyclables (City of Davis, 2018). Many counties and cities have adopted a resource similar to this one in order to give residents more ease in recycling.

Austin, Texas has a robust multifamily recycling program. Fifty-two percent of Austin residents live in multifamily properties. As of October 1, 2017, all property managers are required to offer recycling to their residents for at least three materials. They included the types of materials properties should be collecting, yearly educational reminders, capacity requirements, signage and also a recycling plan. A recycling plan describes a property’s compliance with the recycling laws. By enacting a law like this, Austin is providing all of its residents the opportunity to recycle, and have the proper education to do so correctly.

My last example is the City of Toronto. The city itself is very ethnically diverse with 2.6 million residents, with over half of them immigrants and over a quarter speak a language other than English at home. Nearly half of all residents live in multi-family buildings. Since 2008, Toronto’s Solid Waste Management Services has invested in a multi-pronged strategy to increase the multifamily diversion rate. The city does this by enlisting a select few apartment residents to act as recycling champions to spark recycling enthusiasm with their own neighbors across cultural and linguistic boundaries. In seven years, Toronto has doubled its multifamily diversion rate from 13 percent to 26 percent. Toronto accomplished this because they effectively engaged diverse populations, making
time to understand residents’ backgrounds, views and behaviors and undertaking multilingual outreach (Morrigan, 2016).

**History of Immigration**

According to Keehan, as of 1900, 88% of the U.S. population was composed of white caucasian English speakers. Minorities, including African Americans and Hispanics, lived in certain parts of the country but were barely found in other parts of the country. We had, in other words, a fairly homogeneous nation. Between 1990 and 2000, the City of Minneapolis went through an immigration boom. In 1980, the Refugee Act was passed and made it easier for people fleeing war-torn countries and today there are thousands of immigrants coming from Somalia and Congo (Simmons, 2018). The 2000 Census Bureau stated that 14.3% of residents were foreign-born, the highest the number has been since 1930 (Hennepin County Library, 2010). Keehan also states that as of 2016, the percentage of white people decreased to 61.3% (2013). The rise of other minority (immigration) populations has increased, including people from, but not limited to, African American, Hispanic, Asian and American Indian (United States Census Bureau, 2016). The influx of immigrants into the United States has made the United States rich in multiple cultures and very diverse in many communities. As of 2016, Hennepin County’s population was 13% Black or African American, 6.9% Hispanic or Latino, 7.4% Asian and 1.3% two or more races including Hawaiian or Native American.

**Recycling Barriers for Immigrant Populations**

Immigrant populations face more barriers than non-immigrants toward recycling. The City of St Paul did a study focused on immigrant communities and found that some
have misconceptions about what actually happens to their recyclables. Many believed
that the material was actually sorted from their trash (Rogers, 2013). Many of the
residents are unaware that the city posts translated recycling information on their website.
The city developed some recommendations for property managers with large immigrant
communities. They suggest having image-based outreach materials, offering larger bins
to capture a family’s worth of recyclables and targeting culturally competent outreach.

Another barrier to immigrant-population education is that not all languages are
written. For example, Somali is spoken in two different dialects and only became a
written language in 1972. Minnesota has the largest Somali immigrant population in the
United States (NYU, 2012). Overall, more than 30,000 Somalis live in Minnesota with
the majority living in Minneapolis. Why immigrant populations? Minority and immigrant
populations often bear the brunt of environmental contamination. For decades, power
plants, and toxic waste sites including landfills have disproportionately been placed in
communities with high populations of immigrants and minorities, an issue called
environmental racism (Baugh, 2015). These communities have just as much right to gain
free resources and education if they want it. One study done in Montreal looked at the
effectiveness of having immigrant children be the ambassadors of environmental
education (Blanchet-Cohen & Reilly, 2016). They believe that using children may be the
way to create change.

**Immigrant Environmental Education**

There isn’t a lot of environmental education focused on immigrant populations -
yet. Immigrants count as a significant portion of our country’s population 10.4% and are
expected to double within the next century (Drill, Surls, Aliaga & DiGiovianni, 2009). The research was done to connect immigrant children to environmental education. The research showed that if supported by committed adult educators these children remained motivated and that their own education process had the power to lead others into action and change. Children valued the socio-physical and aesthetic aspects of the environment, and their engagement provided them with a sense of belonging (Blanchet-Cohen & Mambro, 2014). Another study done in Southern California looked at the effects of environmental education in an English as a second language or ESL program. They found that an ESL classroom was an excellent connector for immigrant communities. The students adopted actions focused on recycling, reducing fertilizer usage and watersheds. This study found that an ESL classroom was an excellent place to integrate environmental education and the students learned how to benefit from it (Drill et. al, 2009).

**Gaps in Recycling Education**

Of all the other environmental actions someone can take, waste reduction efforts are seen as the most beneficial to the environment and cost-effective because individuals can save money in some cases. These efforts require consumers to purchase durable, recyclable and compostable products. They also rely on reducing waste so the materials would never need to enter the waste-stream, or finding ways to reuse the materials they do purchase. Despite this fact, many communities have not been able to fully integrate these efforts into their own waste programs. The implementation process has been especially difficult in urban areas with high-density areas, diverse demographic groups,
and the lack of resources to promote such resources. In these areas recycling participation usually ranges from 4% - 20% (Margai, 1997). One example is in East Harlem in Manhattan where recovery rates for their recyclables tend to be historically low. Only 5% of the recyclables was able to be recovered from the waste stream sometimes with high levels of contamination (1997).

In spite of continuous immigration to the United States, the country has yet to produce more culturally competent outreach. Many of the county websites that I looked at while doing my research had many types of literature directed at native English speakers but left out non-English speakers. In my own professional experience, I know of many instances where property managers try and educate their residents on a range of issues and only hand out literature in English with little to no images on them. Property managers become frustrated because they feel like their residents are not listening to them. Hennepin County has some translated materials in stock with all of the materials image-based. Even translated materials may not be the catch-all. A well-intentioned property manager may try giving the translated recycling materials to their residents, only to find out that the resident has a language that is traditionally spoken and not read. I believe that we need to go deeper to fill in the gaps for non-English speakers living in apartment buildings. We should be working to include more images that are relevant to the cultures we are working with, translating the materials in both writing and in person and finding better ways to connect with residents. I want to find a better way to serve our residents who traditionally have been forgotten about.
Doing this research does not indicate that these immigrants are uneducated. One article from the Washington Post detailed the highly educated backgrounds that many people receive while living in their home countries. Many of these immigrants are coming from highly skilled professional jobs. They all have very significant skills that they can contribute to any country (Simmons, 2018). Immigrants should be able to have access to the same information in their new home that others receive.

Lastly, research suggests that all recycling setups should meet best management practices. Best management practices require that all recycling containers be conveniently located to serve employees and customers, paired with all trash containers with appropriate lids, labeled, color-coded with an ongoing employee and resident education on how to recycle (Dakota County, 2018). These are the efforts that will ensure that residents have the easiest ability to recycle and to do it correctly. Unfortunately, many apartment buildings do not have a recycling setup that meets best management practices, which may contribute to the confusion around recycling and increase contamination. Space and time are generally the biggest concerns against implementing best management practices in multifamily properties. Space is limited in small apartment buildings, so usually, there is only space for a trash can. Managers are hesitant to add extra work to cleaning the staff’s daily duties. And the biggest factor of all is education. Having good communication between the property managers and residents on how to recycle is key to having a good recycling program. Only with these best management practices can a recycling program excel in a multifamily property.

Summary
One theme has remained clear throughout chapter 2: education is key. Educators are needed to communicate the changes in recycling and waste in local government as materials and markets change. Studies show that posting 2 to 3 recycling reminders can increase participation by as much as 20% (Montello & Sutton, 2012). Our recycling outreach and education have come a long way but I believe it needs to be strengthened with more culturally competent outreach. The heavily populated and diverse counties in the metro area of Minnesota have a goal of reaching a 75% recycling goal by 2030 and in order to reach that goal, everyone needs to be included including residents living in multifamily properties. Multifamily recycling capture rates in Hennepin County, the most populous county in Minnesota, remain consistently low, at 33%. This means that 66% of recyclables were placed in the garbage rather than a recycling container (Hennepin County, 2017). As stated before, language is one of the biggest barriers for property managers to address when educating their residents about recycling. Many property managers who are actively trying to educate their residents about how to recycle, only have access to documents in English, sometimes Spanish. We need to improve our outreach for multifamily residents, and also residents who do not have English as their first language. Based on the recommendations from King County, Washington, and the City of St Paul, we know focusing on culturally competent outreach would be beneficial to Hennepin County communities. However, it is important for Hennepin County to do its own research to figure out what actually works the best for increasing diversion rates at multifamily properties with its own population. Up until now, recycling research focused on immigrants living in apartment buildings is very sparse and more is needed on
this subject. The next chapter will detail my plan for how local government can implement culturally competent recycling and environmental education for residents that live in apartment buildings.
CHAPTER THREE

Methods

As established in chapter two, immigrant populations that live in apartment buildings deserve environmental education. There is a great need for more research focused on culturally sensitive environmental education, specifically recycling education. This led to the development of my research question: “how can a local government implement environmental education for immigrant communities living in apartment buildings?” Chapter three will describe the how action research methodology will answer this research question. Also included, is an overview of the methods used to gather data, the setting, the participants involved, the way the data was analyzed and any conclusions.

Setting

This study took place in Hennepin County, which is the largest county in Minnesota by population (Minnesota Demographic Center, 2010). The properties that were included in this research were located in New Hope, Saint Louis Park, and Minneapolis, which is the largest city in the state. The six properties were all unique in their physical setups and resident backgrounds. For example, it’s a shorter drive for a resident to bring their bulky items to recycle in Minneapolis, rather than one of the surrounding suburbs. Drop-off facilities in Minnesota are located all over the metro, but the farther a site is from a resident, the less likely they’ll take their items to recycle. Our project staff selected four apartments and two townhomes to participate in the pilot. All properties had reported contamination fees on their monthly invoice. Each of the six properties had their own waste hauler whose drivers provided varying levels of
communication with their customers. It’s the driver’s job to recognize the contamination levels in a recycling dumpster - and decide whether or not they’ll issue a fine for contamination. Another factor mentioned above was the resident backgrounds. One property had five or six different languages spoken among the residents. Another property had only English and Somali. Lastly, all of these properties had varying amounts of residential units from 35-unit complex to a 300-unit skyrise.

**Overview**

This project used the action research methodology, which is a process to gather data to gain information on how an organization or institution operates, examine the interactions and relationships of social systems and processes, and seek improvements (Riel, 2016; Mills 2014). In this methodology, research is conducted by the educator or practitioner to reflect upon and improve their work in collaboration with their colleagues, partners or audience. Recognizing their views are subjective, researchers in action research projects seek multiple perspectives in order to understand and identify improvements (Riel, 2016; Mills, 2014).

This type of research calls for mixed methods including both qualitative and quantitative data. The action research methodology is applicable to this project because it was conducted at Hennepin County and adds to the research and assessments that have been done regarding immigrant environmental education. The goal of this research was to identify how a local government can best implement environmental education for immigrants living in apartment buildings. The main objective of this project was to increase the volume of recyclables captured and decrease the amount of contamination in
recycling containers at pilot test properties. The results and recommendations will be intended to inform the design and implementation of future recycling projects.

**Invitations**

I emailed the multifamily property managers in the summer of 2018 in order to invite them to participate in the culturally sensitive pilot program. I informed them about the pilot through three different methods:

- The first was the in-person meetings. Hennepin County provides recycling materials to property managers and delivers them free of charge. Recycling guides are available in many languages such as Spanish, Somali and Russian. When an email request would come in for translated recycling guides in large quantities, Hennepin County then contacted them to participate in the pilot.

- The second method was through newsletters. Hennepin County publishes a monthly multifamily recycling newsletter that details helpful information on how a manager can dispose of difficult materials and promotes upcoming free events including participation in the pilot.

- The final method is always considered the most successful - word of mouth. City staff wanted to promote the pilot in order to increase recycling awareness and help their properties improve education. One property was referred to the program through word of mouth.

We selected the project participants based on the following criteria:

- A majority of residents are non-native English speakers
• Low recycling rates
• High levels of contamination in the recycling collection containers
• An apartment building, with five units or more, located within Hennepin County

Hennepin County’s recycling unit put out a request for proposals (RFP) for a consultant to conduct the waste audits during the course of the pilot. Only two consulting companies responded to the RFP, and Foth Inc. was selected based on their project plan. Once the pilot properties were selected, I emailed the property managers to let them know they were approved to participate in our pilot. My email outlined the process of participating in the recycling pilot project, and requested that each property manager identify the influencers, or interpreters at their property. A preliminary waste audit was conducted to find the properties’ current recycling and contamination rates. I met with all of the property managers to determine property-specific recommendations regarding on-site waste and recycling infrastructure. Next, we walked around each property in order to talk about implementing best management practices. Best management practices include co-collecting (ensuring that wherever there is a trash can, there is also a recycling can), color-coding (blue for recycling, grey or red for trash), and ensuring there was adequate recycling capacity. Recycling capacity indicates the service levels and dumpster sizes. Too little recycling capacity can contribute to materials being placed in the trash.

The next step was hanging recycling posters and information around each property in locations where residents would see them. A variety of materials, including recycling posters, guides, and dumpster trash and recycling labels were used. Staff
attempted to make each of the educational materials (labels and recycling guides) with cultural-specific images of what a resident living in an apartment building might recognize. Once project staff realized that participating residents were incredibly diverse language-wise, we focused our efforts on a new method for signage. Icon-based images were chosen to breach any perceived barrier of brand confusion. See appendix A for the recycling guide and dumpster labels used during the cultural pilot.

**Participants**

As mentioned above, residents at the participating properties spoke a variety of different languages including: Amharic, Somali, Oromo, Spanish and Lao. The main languages identified were Somali and Amharic. The pilot consisted of 535 residential units. Property managers selected one or two translators, or influencers, per property to assist with project outreach and implementation. The influencers were irreplaceable as they acted as organizers and liaisons for the pilot. Often, they were the ones whom residents recognized. Hennepin County offered the influencers gift cards to local grocery stores as an incentive to participate in the pilot program. Residents who participated in the program had various background knowledge surrounding recycling education.

**Data Collection, Quantitative Data**

This type of research calls for quantitative data, similar to the King County study done in Washington state (King County, 2014). In King County, consultants collected waste samples from 8 properties in order to do a waste audit before and after they implemented any education strategies.
For the Hennepin project, pilot evaluation activities included waste audits at all test and control properties throughout the duration of the pilot program, January - June 2019. The objective of this research was to increase recycling volumes and decrease contamination at the participating test properties. The first waste audit was performed in January before any changes were implemented. The project team also did a second waste audit in September after all of the strategies were fully implemented. A quiz was used to evaluate resident recycling knowledge, and was conducted in January. See appendix A for the sample quiz.

**Qualitative Data**

The King County pilot also included a before-and-after survey about resident knowledge. The Hennepin County pilot was a bit more informal. Property managers were asked about their experience participating in the pilot. The answers on the property management survey are included in chapter four.

**Approval**

Approval for this research was granted by each property manager working at each apartment building. Information about the pilot research was given to residents at each property either by newsletter or flyer. Approval for the pilot project was given by Hamline University School of Education and the Human Subject Committee, and the Hennepin County Board of Directors. Anonymity and confidentiality were assured through the process.

**Summary**
The action research for this project consisted of collecting multiple sources of data, both qualitative and quantitative, in order to answer the question, “how can a local government implement environmental education into apartment buildings?” Each property was given a recycling tote bag, had access to a culturally competent recycling event, and the opportunity to answer a quiz. From these techniques, the research team’s goal was to conclude which methods were the most helpful to communicate environmental education to non-native English speakers. The following chapter will include the results that were found in this research.
A variety of methods outlined in chapter three were used to gather information to answer the research question “how can a local government give environmental education to immigrants living in apartment buildings?” Research methods included implementing best management practices including; color-coding trash and recycling containers and adding labels with images to all trash and recycling dumpsters. We also attempted to coordinate in-person education events including going door-to-door and a recycling informational presentation.

We launched the pilot in January 2019 and needed baseline data before implementing any strategies. This pilot was based on a report done in King County (2014). The King County study stated that consultants were able to sort the properties’ waste and recycling right on-site in a parking lot or garage. For the Hennepin pilot, it was the easiest to sort a property’s waste at the Hazardous Waste Drop-Off and Transfer station located in Brooklyn Park. This was due to the fact that all of the participating properties did not have a parking garage. Also, the initial sort was happening in the month of January. Winter months in Minnesota are cold and snowy, and consultants agreed it was easier to spread out rather than have to be packed in a property’s parking garage.

Multiple trash and recycling samples were collected and transported to the transfer station. Samples were sorted into twelve (12) categories and weighed. The
consultants who sampled the waste data did not provide any education services or coordination to the residents in order to remain objective throughout the pilot.

We implemented pilot strategies from February through June 2019. In addition to providing property managers with technical assistance to optimize on-site recycling infrastructure, outreach staff also attempted to complete three rounds of door-to-door resident education at each test site. See Appendix C for the recycling quiz used during door-to-door education. Each staff or volunteer was accompanied by an influencer to assist with interpretation and recognizability. If a resident did not answer the first or second time their door was knocked on, volunteers were supposed to come around again to see if they could be reached at a different time. A total of 56 percent of all of the 535 occupied residential units were provided with a tote bag and accompanying educational resources. Of 900 door knocks, outreach staff engaged in a total of 197 resident interactions, 60% of those interactions were conducted in a non-English language. The primary two languages spoken by residents during the pilot were Somali and Amharic. A county-organized cultural event was offered to each property which included cultural food, games and recycling education. Unfortunately, the event was declined by each property except one, who wished to implement the event right at the start of the cultural pilot. 21 residents attended the event and received verbal recycling education through a sorting activity and question-answer time.

During the door-to-door education, we administered a recycling questionnaire and quiz. The intent of the questionnaire was to assess barriers residents faced to recycling and how they could be addressed. The first question was, “Do you know where your
recycling dumpsters are?” The questionnaire indicated that most residents who opened their doors knew where the recycling bins were located. We asked this question because often, recycling educators hear residents say that they don’t know where their recycling is and therefore do not recycle because of it. Properties they live at may or may not have recycling at their building, and the resident may have not been told where the containers are. Residents who didn’t know where their recycling was located tended to do worse on the recycling quiz. After speaking to project staff, residents indicated they would be more likely to recycle after receiving education. The second question was, “Do you currently recycle?” Residents who knew where their recycling containers were located and did not recycle, were asked by project staff to ask why not. Many residents listed the distance to the recycling container compared to the trash dumpsters as their main barrier. The second most common theme was while they knew where the recycling dumpsters were, and they didn’t recycle at home, they did not know what was recyclable. After speaking to project staff, residents indicated they would be more likely to recycle now that they felt more confident in what was recyclable. All residents who knew where the recycling bin was, currently recycled. Many residents struggle with wish-cycling. Wish-cycling is the result of people wanting to recycle everything. The issue with wish-cycling is it causes more problems for the recycling sorting facilities that need to sort through resident’s trash and recycling in order to get items properly recycled. Residents who indicated they were confident knowing what materials are recyclable, pointed to just about everything on the quiz saying it was recyclable.
Once all outreach methods were completed, a final waste audit was completed at
the Hennepin Hazardous Waste Drop-Off Station. The same methods to capture waste
samples in January, were implemented in June and September. After analyzing results
from the June sample it was determined that the results were inconclusive. This was
because the samples that Foth was able to collect were too small to get an accurate
depiction of the trash and recycling habits of residents. Additionally, we couldn’t trust
the results due to the fact that many of the sampling methods were considered
insufficient. Results from the September waste audit showed that there was a 20%
decrease in recycling, and a 34% increase in contamination. The data results are listed
below in Table 1.

Table 1 shows the percent change in volume of recycling and trash from January
to September 2019.

**Aggregate January and September Sort Data***

(Trash and Recycling)

<table>
<thead>
<tr>
<th>LOCATION, SAMPLE TYPE</th>
<th>Trash %</th>
<th>Trash %</th>
<th>Organic %</th>
<th>Organic %</th>
<th>Recycling %</th>
<th>Recycling Contamination Rate</th>
<th>Recycling Diversion Rate</th>
<th>Recycling Capture Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverbluff, Trash</td>
<td>45 %</td>
<td>32 %</td>
<td>35 %</td>
<td>50 %</td>
<td>20 %</td>
<td>17 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riverbluff, Recycling</td>
<td>12 %</td>
<td>42 %</td>
<td>0%</td>
<td>8%</td>
<td>88 %</td>
<td>50 %</td>
<td>12 %</td>
<td>39 %</td>
</tr>
<tr>
<td>Parker Skyview, Trash</td>
<td>31 %</td>
<td>48 %</td>
<td>22 %</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The waste audit results indicate the pilot strategies did not have an effect. The average recycling contamination rate was 16.1% pre-pilot, and 34% post-pilot. The recycling capture rate (the rate that all recyclables were placed in the recycling dumpsters) went from an average of 64.5% pre-pilot, to 52% post-pilot. The test pilot groups had an average of a 35.83 trash rate pre-pilot and a 29.6 trash rate post-pilot which is a six percent trash reduction. It is important to note that none of the participating properties have organics hauling collection available. It was assumed that organics are placed in the trash dumpsters during this pilot.

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1 Missing data from 1815 Central, consultant attempted recycling sample collection but dumpster was already emptied a day early from hauler
2 Trash reduction may not be that significant as 1815 Central did not have a trash dumpster, consultants were unable to access the trash compactor to get a solid sample for the research.
A total of 22 residents from all test properties attended a recycling education event that included culturally appropriate food as recommended by property management. During this event, Hennepin County staff discussed what was and wasn’t recyclable while answering any questions the residents may have. Out of the property managers, only one took Hennepin County’s offer of a free recycling event.

Residents at all six properties had their recycling knowledge assessed through a quiz administered by outreach staff to residents at their doorstep. The quiz featured pictures of common recyclable and trash items. Outreach staff asked residents whether the pictured items belonged in the garbage or recycling container. Plastic bags were the most confusing item. A follow-up recycling audit may or may now show that these pilot
strategies raised awareness, encouraged residents to recycle, and decreased “wish-cycling”.

Lastly, managers and residents were asked about their experience during the pilot. Many of the managers commented that they felt the pilot strategies were making an impact. Master Recycler and Composters, or MRCs, acting as volunteers who participated in the pilot program commented that they thought the pilot was a great idea. According to the report the MRCs filled out and sent back to the County - they had some excellent connections in teaching residents how to recycle. Many of them enjoyed in whatever capacity they assisted with. Most of them acted as the educator during the door knocking.

**Individual Property Results**

Riverbluff Apartments - Each of the trash dumpsters were sampled in September, June, and September of 2019. The trash consisted of 32 percent trash, 50 percent organics (food or food-soiled paper), and 17 percent potentially recyclable material, see full report in Appendix. This property had the lowest percentage of recyclables in the trash of the six sampled. The recycling sample consisted of 42 percent trash, 8 percent organic materials, and 50 percent recyclables.

Parker Skyview - This property has an automatic building-wide trash compactor where all residential solid waste in which all resident trash is placed. A trash sample was not able to be taken from this property. The recycling dumpsters were located in an area that is accessible by residents and the public. Residents are paid a stipend to collect recycling door-to-door and bring them to the recycling dumpster on the first floor of the
skyrise. Due to this collection method, recyclables were often contained in plastic bags. Illegal dumping was an issue at this property and may have contributed to the contamination issues in the recycling samples. The recycling sample consisted of nine percent trash, six percent organics material and 86 percent recyclable materials. Additionally, this property has an established program for bulky items (furniture), and electronics.

Oak Park Village- Trash samples were collected from all dumpsters on site. In total, 159.8 pounds of material was collected. The trash sample consisted of 46 percent trash, 32 percent organics, and 21 percent recyclable material. The recycling sample totaled 100.7 pounds of recyclable material. The sample consisted of 56 percent trash, 6 percent organics and 38 percent recyclable material.

New Hope Estates - The consultant noted that there is only one enclosed area for trash and recycling dumpsters at this property. In total, the consultant collected 81 pounds of material for the trash sample. The trash sample at this property consisted of 43 percent trash, 36 percent organics, and 21 percent recyclable material. 71.8 pounds of material was collected for the recycling sample. The recycling sample at this property consisted of 40 percent trash, two percent organics, and 58 percent recyclable material. The OCC, or cardboard found at this location was particularly wet, which added to the weight of the recycling sample.

Glendale Townhomes - Trash and recycling are collected in carts at this property (see setup 4 in appendix B). 130.1 pounds of trash was collected for the sample. The sample consisted of 40 percent trash, 31 percent organics, and 29 percent recyclable
material. For recycling, the consultant collected 66.3 pounds of material. The sample consisted of 11 percent trash, two percent organic materials, and 87 percent recyclable materials.

**Summary**

Chapter four discussed the results in trying to answer the question, “How can a local government implement environmental education into apartment buildings?” This approach aligns well with action research methodology. The goal was to increase diversion and reduce recycling contamination rates. We implemented waste audits both pre and post implementation. The results from the waste audits were considered to be inconclusive due to the fact that recycling decreased and trash increased at all pilot properties. Chapter five will discuss more of the variables and explain theories as to why the results ended up the way they did. It will also go over lessons learned, review the literature review highlights and talk about future recommended research.
CHAPTER FIVE

Conclusion

Chapter four discussed the results of the research conducted to answer the question: “how can a local government implement environmental education for immigrant communities that live in apartment buildings?” Chapter five will reflect on the final project and the research process. Lessons learned, project limitations, and major themes that emerged from the outreach and behaviors of apartment dwellers are included. My future research recommendations are included as well.

In trying to answer this question, it could have been easy to assume that any educator could follow what has been done in the past - handing someone translated literature and hoping to see an improved recycling and decreased contamination. Many have tried to design their outreach materials with more images on their guides and information, to be clearer in providing education. This could still be an effective strategy for some educators, but all of the property managers who participated in the Hennepin pilot agreed that those methods had been used in the past, and did not yield any positive results. They all had previously participated in Hennepin County’s Multifamily recycling program in which they had access to free labels, signage, handouts, and multifamily tote bags all with clear and readable recycling images on them.

When asked about why I was doing this research, and why recycling education is important I had to take a step back and think about my answer. Over my time of working for Hennepin County, I had given many presentations and each time, the topic of
non-English speakers trying to recycle came up. One theory was that residents don’t want to read too much text on a label. Many Minnesota metro Counties had changed their recycling labels to include images rather than text - to address those barriers, rather than include translated text. If managers want to go above and beyond, many of the cultures we worked with in the pilot tended to connect better through verbal communication, rather than text or images. In order to encourage recycling, finding someone who can be a cultural leader or someone who is looked up to and respected in the community. Having leaders represent the importance of recycling could make a huge impact on how many people would recycle. If managers can use their residents to motivate others to change, and continually support and encourage questions, they could see major improvements in their recycling contamination.

This project has helped the County become a leader in implementing culturally sensitive environmental education to residents who live in apartment buildings. It worked to help breach many barriers that research has stated has been an issue for recycling in the past. It hopefully raised awareness around recycling. In addition, this pilot has given me ideas for engaging residents in future environmental education attempts.

**Lessons Learned**

The literature review provided some helpful insight on what other county and city governments have done to implement recycling and environmental education into apartment buildings, specifically focused on buildings with non-native English speakers. I learned a lot about myself as a government employee during this process. I learned that in order to do research correctly, you need to be very specific in how you ask questions to
gather data. I learned that once the first set of waste audits were completed by our consultants, one of the properties only had a trash compactor and therefore, we would not have access to it. During my interviews with property managers the focus was on recycling and what their setup looked like and how I could help them improve their program. I didn’t dig deep enough to actually go and see one specific property’s trash area, because if I had, they would not have qualified because we needed to get good data samples from all properties. Now, I realize the importance of seeing both the recycling dumpsters in addition to the trash dumpsters, because there may be some helpful information missing.

I wish we could have implemented more of the educational events. As an environmental educator, my favorite part of my job is interacting with residents in a group setting and helping them learn about recycling through fun activities and allocating time for questions and answers. I love interacting with all residents and helping them learn in a positive environment. Since the timeline for the pilot was limited, we needed to focus on the door knocking in order to best use the interpreters’ time. The buildings set-up themselves came into play during this portion of the pilot as well because many of the properties did not have a central location to have the education event.

Lastly, as my job with Hennepin County was temporary - I found a new job working for a new County in the metro. Leaving the pilot in the hands of other Hennepin County staff was a difficult decision. However, I do think the change in staffing did create some educational gaps in this pilot. Passing along new contact information to property managers and influencers was fine, and the new Hennepin staff member hit the
ground running, but I fear by the time she took over, property management staff had lost steam in the program. Needless to say, my recommendation is to keep the same staff working on the pilot throughout the entire process.

**Knowledge is Not Always the Answer**

I was reminded during the course of this project that knowledge is not the key to behavior change. People can become frustrated because of the amount of information surrounding recycling. For example, a resident may not respond to reminders given online or in person, that may not be enough to connect with them. To support this idea, one study suggests considering individuals who smoke or try to lose weight. People may have all of the knowledge in the world about why they should quit smoking or lose weight, and yet they still fail. “Change is difficult and requires sustained motivation and support (Kelly & Barker, 2017).” People will do what is logical or easiest, unless they have the systems in place to change their habits. The same goes for recycling information - it is never a one-and-done scenario. Educators need to push to implement best management practices to ensure an individual has the option to recycle wherever they go (Dakota County, 2018). In addition to providing education, it is important to make recycling opportunities accessible and convenient. The nudge can come in the form of reminders whether it be from the property manager, or maybe it’s the recycling educator to reinforce that recycling is important and that it really does make a difference.

Finally, I learned a lot about myself during this pilot. I learned that thinking about recycling and environmental topics for 16 hours a day is exhausting and I needed to find ways to take a break. I would work out, cook, pet my cats and dive back into my paper. I
know that many environmentalists think constantly about the current state of the environment, and become depressed. This depression is caused by knowing all of the problems our environment faces, and not feeling like anything will change. Working in the environmental field can be difficult, where your passion and career can also be very frustrating and you hardly ever see positive results happening around you. I find that I’ve been lucky in this regard because I know I’ve found ways to cope. Self-care really is so important. Everyone needs a mental break from work, and there’s no shame in that.

**Literature Review Insights**

As stated in chapter two, environmental education is concerned with building an environmental ethic while encouraging the development of sensitivity, awareness, critical thinking and problem-solving skills (Palmer, 2002). My research strived to accomplish achieving an increased awareness around recycling to residents living in apartment buildings. According to Community Based Social Marketing (CBSM), people are more likely to act if they feel that they need to take action immediately (Manning, 2009). I found reading through the CBSM model very helpful while developing my communication strategies.

On October 30th, 1986, the Hennepin County Board of Commissioners adopted Ordinance 13 requiring all businesses to recycle in order to reduce the volume of solid waste generated in Hennepin County (Hennepin County, 2018). The Pollution Control Agency, which governs Minnesota Cities and Counties, required that the Twin Cities Metro Area, or seven metro Counties, achieve a 50% recycling rate by 2030 which was achieved in 2015 (PCA, 2016). Since then, Counties have taken on the role of providing
recycling education to residents living in single-family units and rarely reached those who lived in multifamily units. Over 37% of the U.S. Population lives in multifamily properties (NMHC, 2015). That is a lot of people who are living in a relatively small location. Wherever people are, waste will be generated. In Hennepin County, 30% of the units are multifamily properties. Overall, Hennepin County has 160,000 multifamily units. More than 80% of the units are located in the eastern half of the county, concentrated in Minneapolis and St. Louis Park (U.S Census Bureau, 2010). It was helpful to get an idea of who I’d be working with during this research.

Immigrants count as a significant portion of our country’s population 10.4%, and are expected to double within the next century (Drill, Surls, Aliaga & DiGiovianni, 2009). The implementation process of environmental education has been especially difficult in urban areas with high-density areas, diverse demographic groups, and the lack of resources to promote such resources. In these areas recycling participation usually ranges from 4% - 20% (Margai, 1997). A lot of misinformation is out there, according to a study done by the City of Saint Paul, where many residents who had immigrated to the metro area believed that recyclable material was actually sorted [out] from their trash (Rogers, 2013). In order to have a successful recycling program, research suggests that any setup should meet best management practices or BMPs. BMPs require that all recycling containers be conveniently located to serve employees and customers, paired with all trash containers with appropriate lids, labeled, color-coded with the ongoing employee and resident education on how to recycle (Dakota County, 2018). Lastly, multifamily recycling capture rates in Hennepin County remain consistently low, at 33%.
This means that 66% of recyclables were placed in the garbage rather than a recycling container (Hennepin County, 2017).

The most helpful source I found was a similar study done in King County, Washington. In 2006, King County conducted a study focused on increasing recycling at five large complexes in the county. The target audience was multifamily properties that had a high concentration of Spanish-speaking residents. The focus of their research was to improve recycling, improve access to recycling containers, provide clear signage in languages other than English, provide newsletters to tenants and assistance to property managers. King County found improvements in their recycling rates and a decrease in the contamination found at these properties. Based on research from the City of Saint Paul, and King County Washington, Hennepin decided to implement a similar pilot using BMPs and ensuring residents receive - or have access to face-to-face education, with interpretation provided if needed.

Limitations and Future Research Recommendations

I will conclude my paper by calling out the limitations of my research, and providing future study recommendations. There were quite a few limitations that other staff and I encountered in the timeline of this pilot.

Some of the limitations surrounding this research include question phrasing during the residential survey and door-to-door education. Residents may have felt led to answer the questions a certain way in order to end the interactions quickly. Instead of admitting that they did not know where the recycling dumpsters were located at their property, for example, they told us they knew so we would move onto the next question.
on our survey. This may have skewed some of the data. Another factor could have been
resident turn-over. Summer is one of the most popular times for people to move. The
residents who received education in March and April, may not have been the same
residents who contributed to the waste samples in September.

Doing research that needed to be outdoors during the winter months in Minnesota
proved to be very difficult especially with the winter of 2019. Minnesota received a lot of
snow this season, which hindered implementation of the recycling setup. Many of the
property managers were very eager to begin implementing the outreach methods initially
but knew it would not be effective because there was too much snow on the ground.
Residents would be more hesitant to open their doors, and communicate with people they
didn’t initially recognize. Additionally, temperatures were ranging around -10 degrees
Fahrenheit, which is unsafe for Hennepin County project staff to be outdoors trying to do
the setup. Placing new stickers on dumpsters and carts in temperatures under 30 degrees
was impossible. Many of the stickers would not stick properly because the adhesive
would be frozen. Hennepin County staff would attempt to warm the stickers with body
warmth but it was not enough to make the stickers stay put on the containers. The stickers
peeled off of the dumpsters within minutes. Walking through a lot of snow carrying a cart
with materials would be difficult for volunteers and staff. Since this pilot was on such a
limited time schedule, there wasn’t an option to wait for warmer temperatures, usually
closer to April. If possible, my recommendation is to avoid winter months where cold and
snow are a factor.
As stated above, the timeline for this pilot was very short. Despite the small number of properties participating, the total number of units that needed to be reached was 535; which was a lot for staff to attempt to reach in such a short timeline. Door knocking took the most amount of time and property managers needed a few weeks to secure an influencer, or translator to assist staff and volunteers. Additionally, property managers wanted to notify their residents in order to let them know who was coming and what for. The King County research implemented door-knocking at least three times to try and reach all residents at different times of the day. We ran out of time, and the influencers, or translators, were ready to be done after the second round.

Goals

The goal of this research was to identify how a local government can best implement environmental education for immigrants living in apartment buildings. The main objective of this project was to increase the volume of recyclables captured and decrease the amount of contamination in recycling containers at pilot test properties. This research was based on a study done in King County, Washington. This research confirmed my assumption that recycling has to meet best management practices, or BMPs (Dakota County, 2018). Best management practices say that all containers should be:

- Paired, both trash and recycling together
- Strategically and conveniently located in high traffic areas
- Set up with appropriate and restrictive lids
- Labeled with images
Paired with resident and employee education at least yearly and upon resident move-in

Doing this research has provided more fuel into our suggestions for property managers to implement best management practices, since they are the decision-makers for what type of trash and recycling service their property receives. The County cannot force these methods on them. Identifying the most helpful practice is more realistic than trying to implement all practices at once.

The second goal of this project was to inform and inspire other County and City governments who may be looking at how to best educate immigrant communities on environmental issues. Many times, people feel the disconnect between them and those who do not speak their own language. This research shows the best attempt at trying to bridge the communication gaps.

**Future Research Recommendations**

My recommendation for further research would be to implement these pilot strategies over a longer time period, up to at least eight months or else having more than one staff member implementing strategies. By doing so, the timeline would be more relaxed and residents would have more time to react to the pilot strategies. I believe county governments and cities have an incredible opportunity to educate their residents about the importance of waste reduction, reuse, and recycling. I think that if door-to-door education is done with a translator, it should always be paired with the property manager in order to show how intentional they are about recycling messaging. Whenever implementing a pilot similar to this, BMPs should always be set up before doing
recycling education. In order to accomplish as many BMPs as possible, project staff should have property managers to agree to make recycling as convenient as possible before the pilot would actually begin. With this Hennepin County pilot, recycling was as inconvenient before the project and afterward because property managers did not wish to change their setup despite staff recommendations. Change is always necessary in order to decrease barriers to participation in any recycling program. I hope that the managers that participated in the pilot will not be disheartened by the results of the pilot program.

**Using and Communicating Results**

As stated before, I now work at another metro County in Minnesota, Dakota County. I’d like to do a similar research project in a County a bit further removed from Minneapolis - where recycling isn’t as much of the culture as it was in Hennepin County. Looking back on the research done during the pilot in 2019, I still believe that providing interpretation is one of the best ways to educate and make non-native English speakers feel welcome in their home. I’d like to recruit more properties, who all have a single waste hauler, and who do business all over Dakota County. Since starting with Dakota County, I organized a door-knocking session at a townhome located in Apple Valley, Minnesota. The property was receiving monthly contamination fees of over $2000. The manager knew it was due to food waste, plastic bags, and furniture ending up in the recycling dumpsters. We hired a Somali interpreter and went door knocking. The manager was the recognizable person in the community, I provided the education, and the interpreter was able to bridge the communication gap. One resident asked us “what’s recycling?” Since we did our door-knocking, the property hasn’t received any fees on
their recycling. I was able to use my capstone research to communicate effectively to each of those residents, to give them something easy they can do, present the problem, and give them the tools to do so correctly. I’m looking forward to learning more about how to communicate effectively with individuals who live in apartment buildings and help them work through the barriers they have towards recycling.

Since this thesis was started, Hennepin County has implemented new requirements for multifamily properties in order to improve recycling education. In November of 2018 Hennepin County updated their solid waste ordinance, Ordinance 13. Minnesota State Statute 115A.551 calls for all metro Counties to achieve a 75% recycling rate by the year 2030 and send zero waste to landfills. Ordinance 13 states that multifamily property managers must clearly label both recycling and trash dumpsters. The labels need to clearly identify which container is for trash and which is for recycling. Secondly, Ordinance 13 states that property managers ensure that residents receive recycling information upon move-in and every six months. And lastly, property managers must ensure there is enough dumpster capacity for all recycling at their property. Managers can do this by ensuring they have adequate service for recycling. All cities in Hennepin County are required to provide education to multifamily residents, rather than relying on the property managers. I see this as a win for recycling educators, to make education to residents more accessible. I hope that other county and city governments will follow suit in order to make an impact on recycling diversion rates.

Summary
Chapter five discussed the many barriers I had while trying to implement this pilot in trying to answer the question, “how can a local government implement environmental education for immigrant communities that live in apartment buildings?” It also went more in depth about theories as to why the results came out the way they did. I talked about the lessons learned and future research recommendations.

Over my time of working as a recycling educator, the need to answer this question kept coming up in conversations with other recycling educators. Many property managers reported having difficulty connecting with their residents and implementing recycling education. They reported receiving contamination fees on their monthly recycling invoices.

The literature review discussed the many types of recycling education programs experts have created, from all over the world. Some of the programs have begun to implement culturally sensitive education efforts - but little to none have focused on those residents living in apartment buildings. I expanded my literature review to include not just recycling education, but environmental education in order to yield more search results. Themes that emerged was using verbal messaging, including kids and making the message interactive to be more clear.

While trying to answer this question, we encountered our own barriers which made research methods difficult. Barriers ranged from a short timeline, difficult weather patterns, staff turn-over and inability to address BMPs. Through this research, I have a better understanding of the barriers residents face while trying to recycle and strategies local governments can implement to address them. More research like this is needed.
because more people are moving to apartment buildings in metro areas. Many recycling professionals struggle with ways to address barriers residents face while trying to recycle in an apartment building. We wanted to address these barriers, especially for those who did not speak English - to see whether or not it would make an impact.

I think that recycling education still has a long way to go. I’m reminded of the fact that knowledge is not always the answer, but sometimes a recycling message has to be repeated over and over in a variety of ways for it to stick and create change. I am hopeful that as our culture becomes more aware of how our daily actions affect the environment, we will see more systems come in place to make caring for our creation easier.
Appendix A: Sample labels and setups

No plastic bags label placed on recycling dumpsters
Recycling guide, given to each resident who requested one during outreach
Trash guide given to each resident during education (recycling and trash guide were one document, recycling on front and trash on back).

Recycling tote bag - reusable bag to carry recyclables to and from recycling dumpster
Recycling poster - a detailed list of what’s recyclable and what is trash - placed in high traffic common areas to reinforce recycling in the building.

Appendix B: Sample recycling and trash setups
Setup 3

Setup 4
SIDEx 1: PRE-SURVEY
Complete this side before the workshop.

Please circle the items that you would recycle in your cart or dumpster:

Please do NOT change your answers after completing the first side. Thank you!
Answer key

Please circle the items that you would **recycle in your cart or dumpster**:
Appendix D: Sample recycling facilitation guide for door-knocking

The goal is to identify what recyclables people know how to dispose of correct, and which items may confuse them. Don’t make them feel stupid, identify with them but correct them. Always be safe, and do door-knocking in pairs, and provide interpretation when needed.

Script:

“Hi, my name is (insert name here) I work for (insert organization here), and I’m helping your property manager (insert name here) teach people how to recycle. Do you have two minutes to chat about recycling?” If they answer no, end on a positive note “No problem, have a great day!” If yes, proceed.

Do you know where your recycling dumpsters are?” Allow for a response. If no, tell them (many residents may not know and may not recycle because of this).

Do you know what is and isn’t recyclable?

“Awesome. I have a quick recycling quiz I’d like you to take. Simply point out which items you believe can be recycled in your property’s recycling dumpsters/carts.” Hold up quiz for them, allow for them to make their own decisions. Once they’re done pointing out which items they choose, go over them.

“Thanks for taking our quiz, I see you pointed out the Styrofoam cup, and I know it’s super confusing because they’re plastic - right? But styrofoam is actually a type of plastic that your waste hauler doesn’t want because if it gets to the recycling sorting facility it’ll break apart into little bits and create a huge mess - so it’s actually trash. Does that make sense?” Allow for response. Pull out recycling tote bag.
“I have this recycling tote bag for you if you’d like it. Simply put your recyclables in here and use the bag to carry your recyclables to your recycling dumpsters, empty the contents and keep reusing the tote bag. We’d like you to use the tote bag instead of a plastic bag which causes issues at the sorting facilities. Would you like to take the bag? No pressure.” *Allow for a response.*

“I also have this recycling guide for you. It shows the general items of what’s recyclable and what’s not. Remember, your recycling is for bottles, cans, cardboard, paper and some plastics shown here. Would this be helpful to use as a reference?” *Allow for a response.*

“Do you have any questions? No? If you think of any questions, talk to your property manager. They have my contact information and can reach me if needed. Have a great rest of your day!”
# Appendix E: Outreach tracking spreadsheet

Building Name: 1815 Central

Notes: each door was only knocked on once because as the project progressed we realized that most residents spoke English and so they didn’t re

<table>
<thead>
<tr>
<th>Unit #</th>
<th>Name</th>
<th>Date</th>
<th>Time</th>
<th>Do you kn?</th>
<th>Do you cu?</th>
<th>Notes</th>
<th>Visit 2</th>
<th>staff/vol/language</th>
<th>Do you cu? Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2508</td>
<td>Kirsten</td>
<td>20-Mar</td>
<td>1:15</td>
<td></td>
<td></td>
<td>no answer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2507</td>
<td>Kirsten</td>
<td>Head of ho/English</td>
<td>20-Mar</td>
<td>1:15</td>
<td>yes</td>
<td>yes</td>
<td>Positive interaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2509</td>
<td>Kirsten</td>
<td>Head of ho/English</td>
<td>20-Mar</td>
<td>1:17</td>
<td></td>
<td>Busy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2510</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2506</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2511</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2512</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2514</td>
<td>Kirsten</td>
<td>Head of ho/Amharic</td>
<td>20-Mar</td>
<td>1:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2513</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2503</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2502</td>
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<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>vacant</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2501</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>1:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2408</td>
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<td>Head of ho/english</td>
<td>20-Mar</td>
<td>1:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2407</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>1:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
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</tr>
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<td>2409</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>1:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
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</tr>
<tr>
<td>2410</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>2:00</td>
<td></td>
<td>not home</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2406</td>
<td>Kirsten</td>
<td>Head of ho/Amharic</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
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<tr>
<td>2411</td>
<td>Kirsten</td>
<td>Head of ho/Amharic</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
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<tr>
<td>2405</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>yes</td>
<td>“already knows how to recycle, doesn’t need help”</td>
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<tr>
<td>2404</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
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</tr>
<tr>
<td>2412</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>2:00</td>
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<td>no answer</td>
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</tr>
<tr>
<td>2403</td>
<td>Kirsten</td>
<td>Head of ho/english</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>no</td>
<td>doesn’t have recycling to dispose of</td>
<td></td>
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<tr>
<td>2402</td>
<td>Kirsten</td>
<td>Head of ho/Somali</td>
<td>20-Mar</td>
<td>2:00</td>
<td>yes</td>
<td>yes</td>
<td>good</td>
<td></td>
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<tr>
<td>2414</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>2:00</td>
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<td>no answer</td>
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<tr>
<td>2401</td>
<td>Kirsten</td>
<td>Head of household</td>
<td>20-Mar</td>
<td>2:00</td>
<td></td>
<td>wanted us to come back</td>
<td></td>
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</table>
REFERENCES

All are welcome here: A brief history of services... (2010). Retrieved from https://hclib.tumblr.com/post/157408738417/all-are-welcome-here-a-brief-his\tory-of-services

All Are Welcome Here: A Brief History of Services to Immigrants at the Minneapolis Public and Hennepin County Libraries


Yes, environmental racism is still a problem, but recent research shows that minority groups care about protecting the environment because of the positive experiences they've had.


Hennepin County's master plan for managing solid waste, and the county's future plans for increasing recycling.

Environmental Initiative. (2016). *Minneapolis zero waste plan stakeholder*
engagement

Environmental Protection Agency. (1999). Multifamily recycling A golden opportunity for solid waste reduction


Marketing and Social Media: A Guide for Libraries, Archives, and Museums is a much-needed guide to marketing for libraries, archives, and museum professionals in the social media age.


How can we facilitate more effective, efficient, equitable and sustainable solutions to the problems that confound our communities and world?


In the past, landfilling involved burying municipal refuse directly or after on-site burning. Design and management into efficiently operated bioreactors to produce purified CH4 for use as a fuel, and leachates, which were treated biologically and chemically to minimize groundwater pollution.


Municipal solid waste management (MSWM) in the United States is a system comprised of regulatory, administrative, market, technology, and social subcomponents, and can only be understood in the context of its historical evolution.


Cities—their design and how we live in them—will be key in our struggle for sustainability and, indeed, our future.


Organizing the way people travel in a more sustainable way is a key challenge. This changes the definition of transportation problems, the influencing factors as well as the types of solutions that need to be considered.

Marcinkowski, T. J. (2009). Contemporary challenges and opportunities in

Over the past four decades, numerous professionals in the field of environmental education (EE) have attempted to take stock of conditions within and outside of EE.

Minnesota Department of Revenue. (2018). Solid waste management tax information

Commercial Recycling Law,

*Minnesota solid waste history*


Montello, D., & Sutton, P. (2012). *An introduction to scientific research methods in geography and environmental studies* SAGE.

A broad and integrative student introduction to the conduct and interpretation of scientific research, covering both geography and environmental studies. It offers a clear balance of quantitative vs. qualitative and physical vs. human.

*Multi*


This story originally appeared in the December 2015 issue of Resource Recycling. Subscribe today for access to all print content.


Data, reports and resources related to SDC-prepared population estimates.


Environmental education is a field characterised by a paradox. Few would doubt the urgency and importance of learning to live in sustainable ways, but environmental education holds nowhere near the priority position in formal schooling around the world that this would suggest.


TerraCycle is an innovative recycling company that has become a global leader in recycling hard-to-recycle materials. They offer a range of free programs, as well as recycling solutions available for purchase for almost every form of waste. Eliminating the Idea of Waste


Environment and Community: Caring for Our Natural Resources is a curriculum developed by UC Cooperative Extension to teach adult immigrants about


President Trump is opposed to accepting immigrants from what he reportedly called "shithole" countries. He cited African nations and Haiti as examples. Research shows that immigrants from Africa make a significant contribution to the U.S. economy.

Sonya Sutton. (2011, July 7,). Landfill air pollution may be as unhealthy as it is unpleasant, study finds - UNC center for health promotion and disease prevention. Retrieved from http://hpdp.unc.edu/2011/07/07/landfill-air-pollution-may-be-as-unhealthy-as-it-is-unpleasant-study-finds/


U.S. census bureau QuickFacts: UNITED STATES. (2016). Retrieved from
Universal recycling ordinance (URO) | austin resource recovery | AustinTexas.gov the official website of the city of austin. (2017).


Provides the the basics steps involved for recycling


EPA developed the non-hazardous materials and waste management hierarchy in recognition that no single waste management approach is suitable for managing all materials and waste streams in all circumstances.


Each year EPA produces a report called Advancing Sustainable Materials Management: Facts and Figures. It includes information on municipal solid waste (MSW) generation, recycling, and disposal.


Basic and background information on what is environmental education and how it relates to environmental literacy.
will help keep me organized and my resources in order.