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Students Attitudes And Beliefs Towards Recycling On The Campus Of A Midwestern Masters Granting Institution

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Students Attitudes and Beliefs towards Recycling on the Campus of a Midwestern Masters Granting Institution

by

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B.S., Eastern Illinois University, Charleston, IL, 2006

THESIS

Submitted in Partial Fulfillment of the Requirements for the Master of Science in College Student Affairs Degree

Department of Counseling and Student Development

Eastern Illinois University

Charleston, IL

Fall, 2009

Thesis Committee:

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ACKNOWLEDGEMENTS

I would like to thank several individuals for their input, support, and encouragement. First, I would like to thank the lady in my life, Carolyn Beck, for her understanding and patience with me during this lengthy process. Additionally, I would like thank my parents, Dr. Robert and Kathleen Bates, for their support (monetary and otherwise). I would like to thank my grandmother Evelyn Bates for her prayers and support. In addition, I want to extend a heartfelt thanks to Cathy Sowa for her time, experience, and knowledge regarding the assistance she provided to me doing this process. Without her time, this project would not be the quality that it is.

In conclusion, I want to thank my committee chaired by Dr. Dan Nadler for his willingness to spend his time helping me develop this project, and for his endless patience with the ever growing scope of this project. Last, I wish to thank Mr. Lou Hencken and Dr. John Stimac for thoroughly reviewing and editing this project.

ABSTRACT

In choosing this topic, research was conducted to determine what students know about recycling, how they participate in recycling on campus and see how the recycling programs on the campus of Eastern Illinois University (EIU) has been beneficial to the institution, and to the campus community as it attests to helping develop students as global citizenship. Recycling on the Eastern Illinois University's campus generally takes place in two distinct areas: residence halls and academic buildings. Each of these areas presents a unique challenge for the recycling coordinator, in terms of materials readily available, the collection method, and the level of active recycling by the buildings inhabitants. This particular study examines the knowledge, attitudes, and beliefs of the students currently residing in university housing units.

CHAPTER I

INTRODUCTION

In 1989, the state enacted the Illinois Solid Waste Management Act 415, which mandated that each state-supported institution develop a plan for recycling of marketable materials. The mandate required each plan to ultimately achieve at least a forty percent reduction in the amount of solid municipal waste. Meeting the goal of forty percent can be a challenging task for some institutions because they lack the financial incentive to increase recycling efforts. This study will delve into whether college students feel that a campus wide recycling program can be effective. The attitudes and level of active participation relate directly to whether it is fiscally possible for a university to maintain an effective program. Furthermore, the attitudes of the students towards recycling can have a direct influence on how the recycling program is marketed and implemented.

PURPOSE OF THE STUDY

The purpose of this study is to quantitatively explore the relationship between the self-reported recycling behaviors of the students and the actual levels of recycling taking place on campus. The attitudes of the students on campus can dramatically affect how much material on campus is actually collected to be recycled. Further, the study will explore college students' attitudes and beliefs about recycling as well as whether a relationship exists between active recycling habits and student involvement and leadership.

RESEARCH QUESTION(S)/ HYPOTHESIS

In the proposed study, members of the on-campus housing community were surveyed with a researcher-developed instrument to examine the students' knowledge

about recycling on campus, their beliefs about self reported recycling behaviors, and their attitude towards recycling. The planned analyses consist of comparing students who have held leadership positions within recognized student organizations to students who have not held leadership positions. Additionally, students' recycling behaviors will be compared in various ways, including which materials are reported to be recycled most on campus and their attitudes regarding the university's housing recycling program.

RQ1: To what extent do college students choose to recycle?

RQ2: What is the relationship between student involvement and recycling?

RQ3: What attitudes and beliefs do students report regarding recycling efforts?

SIGNIFICANCE OF THE STUDY

In looking for ways to become more ecologically-friendly, it is important to evaluate the level of participation and accessibility of one's recycling program. According to Derksen & Gartrell (1993), results show that people with easy access to a structured recycling program have much higher levels of recycling than people lacking such access. Beyond accessibility, it is important to assess why students recycle and whether attitudes towards recycling student recycling behavior. Furthermore, do students intentionally make a conscious effort to actively recycle when the effort has been made to make it readily accessible? These questions need to be further explored and researched.

LIMITATIONS OF THE STUDY

Within this study there are a few limitations. Applying this study towards a general or broad population might be difficult due to the population sample, even though the sample was racially representative of the overall campus composition. The study also surveyed only students residing in university-provided housing units, limiting the sample

size to one group of students enrolled in college courses. Another limitation is that the study was restricted to students that ranged in age from 18-25.

SUMMARY

The importance of program evaluation cannot be overstated. In order to enhance the living-learning environment on campus, program evaluation must be conducted. Evaluation of the recycling program within the university's housing unit was necessary. This evaluation provides the opportunity to examine and dissect the recycling habits of the students on campus and explore why they choose to actively participate in a proactive means of reducing waste and excess.

CHAPTER II

REVIEW OF RESEARCH LITERATURE:

Promoting the Collection of Aluminum Cans, Plastic, and Paper as Recyclable Materials

Many different universities use different methods to collect and promote recycling. One such promotion method is referred to as "Recycle Mania" (http://www.recyclemania.com), which markets itself as a friendly competition among university recycling programs in the United States that provides students with a fun and proactive way to help reduce waste. This particular competition involves over 92 different colleges and universities from all over the nation and lasts 10 weeks. Respective schools compete in different contests to see which institution can collect the largest amount of recyclables materials per capita, the largest amount of total recyclables, the least amount of trash per capita, or have the highest recycling rate. According to the Recycle Mania web site (2006),

> Recycle Mania began in February 2001 when Ed Newman of Ohio University and Stacy Edmonds Wheeler of Miami University decided that something had to be done to increase recycling in the residence and dining halls on their campuses. Recycle Mania was born. During this 10-week competition, Miami University and Ohio University went head-to-head to see which school could recycle the most (para. 9).

Other recycling promotions include strong requirements and language indicating that participation is expected from among community members. The University of Illinois is one such institution: "University employees and students are expected to participate and support all aspects of the Recycling and Materials Reduction Programs

across campus… because we know that recycling only works when people know how to recycle and why it is important" (Recycle Mania, 2006, para. 5).

The manner in which universities collect the recyclable materials varies from institution to institution. Most institutions' recycling programs largely employ or have volunteer student workers to collect and transport the materials. One such operation is The Associated Students, Inc. (ASI recycling, 2005), a recycling center at California State University-Long Beach that has been in operation since 1971. Ecology-minded students founded the recycling center in 1970 as they identified a need for a campus-recycling facility. Students worked as volunteers, and the small center consisted of a couple of 55-gallon drums that separated different glass, newspaper, and aluminum cans. As a result of the students' efforts, the ASI now collects materials from the university as well as materials from the community. Many universities have begun to examine the recycling programs of use by many local municipalities around the country.

The City of Chicago began implementing a recycling program in the 1980s and has been working to make it more effective since its inception (Fitzsimmons & Cohen, 2006). Fitzsimmons & Cohen (2006) reported that Chicago is the only major U.S. city to use the "blue bag" method of collection. While most collar communities of the City of Chicago ask residents to put recyclables in bins or carts provided by the local municipality, the blue bag method of collection asks residents to place recyclables in their own household containers. Residents place recyclable items like paper, tin, and plastic in a simple blue bag, which is then placed in the dumpster provided to a resident by the City of Chicago. To help promote this system, the city's newspapers were delivered in blue bags, with the idea that residents would return the newspaper in the blue bag to the

dumpster once they had finished with the paper, that they would simply return the paper to the bag, and then place the bag in the dumpster. The city then collects the bags together with other garbage. Sanitation workers are charged with pulling the blue bags from waste piles at city sorting centers, which were built at a cost of $60 million. However, this method of recycling was never very effective. A series of Chicago Tribune stories in 2005 showed how city officials greatly exaggerated Chicago's recycling rate using the blue bag recycling method. In truth, the true rate is only about 8%.

The most common items collected on a majority of college campus in the United States consist of many different types of paper products including computer and copy paper, newspapers, magazines, junk mail, catalogs, phone books, and most all types of cardboard. One of the most difficult items to recycle is glass containers due to the lack of facilities accepting used glass and the fact that in most cases it is not cost effective to re-use.

Plastic Recycling

The Society of the Plastics Industry (SPI) developed a voluntary resin identification coding system in 1988 at the urging of recyclers around the country. These codes, permanently affixed to any plastic container, identify the resin from which the container is produced, thereby facilitating the separation and marketing of the materials (SPI, 2007).

The American Chemistry Council (2007) describes seven distinct codes/categories. Each category is coded with an identification number. Identification numbers indicate whether plastic materials can be recycled and provide a marker to the

type of plastic material was used. This aids in quick identification and sorting of materials.

The most common recyclable plastic is Polyethylene Terephthalate (PET) #1, the plastic used to make water bottles. Although this form of plastic is non-renewable, meaning that new bottles cannot be made from old bottles, there are a variety of other uses for this particular type of plastic. Water bottles are made out of this material due to the properties of this plastic. It is clear and has optically smooth surfaces, is an excellent barrier to oxygen, water, and carbon dioxide, has a high impact capability, and has a high shatter resistance. PET plastic bottles are coded with the resin identification code number "1" inside the universal recycling symbol, usually located on the bottom of the container. The recycled PET can be used to make carpet, clothing, and automotive parts. In order for the plastic to be reused it has to be sorted into transparent or uncolored PET, or blue and green colored PET. From there, the material can be crushed or baled; this process makes the further transportation and sale of the material more practical.

The second number in the coding system, #2, stands for High Density Polyethylene (HDPE). HDPE is often used for packaging many household and industrial chemicals such as detergents and bleach because it is has good chemical resistance. HDPE are additionally well suited to packaging products with a short shelf life such as milk, water, juice, cosmetics, shampoo, dish and laundry detergents, and household cleaners. Besides bottles, this form of plastic is also used to make the bags commonly found at supermarkets and other retail centers. Recycled HDPE can be used to make bottles that can hold non-food items, such as shampoo, conditioner, liquid laundry detergent, household cleaners, motor oil and antifreeze. Beyond plastic bottles, HDPE is

used to make plastic lumber for outdoor decking, fencing and picnic tables; plastic pipe; floor tiles; buckets; crates; flower pots; garden edging; and film (American Chemistry Council, 2007).

The third commonly found plastic material is Polyvinyl Chloride (PVC, Vinyl). Over 50% of PVC manufactured is used in construction. As a building material, PVC is cheap, durable, and easy to assemble. PVC is found in many types of pipe, decking, fencing, paneling, gutters, carpet backing, floor tiles and mats, resilient flooring, mud flaps, cassette trays, electrical boxes, cables, traffic cones, garden hose, and mobile home skirting. PVC is popular as a construction material because it has a high amount of chemical resistance, weather ability, flow characteristics and stable electrical properties (PVC Information, 2005). One of the major challenges that PVC presents is how it can be recycled. According to the PVC Information Organization (2005), "PVC waste contributes between 38% and 66% of the chlorine content in waste streams being incinerated. On average, it can be estimated that about 50% of the chlorine input into incinerators is due to the presence of PVC" (para. 3). This is one major reason that the recycling of PVC is very important to the preservation of the water supply.

The fourth type of plastic is Low Density Polyethylene (LDPE). LDPE is used predominately used in film applications due to its toughness, flexibility and relative transparency, making it popular for use in applications where heat sealing is necessary. This type of plastic is used in bags for dry cleaning, newspapers, bread, frozen foods, fresh produce, household garbage, shrink wrap, and stretch film. LDPE is also used as a coating for paper milk cartons and hot and cold beverage cups.

The fifth type of plastic is Polypropylene (PP). PP has good chemical resistance, is strong, and has a high melting point making it good for hot-fill liquids. This resin is found in flexible and rigid packaging, fibers, and large molded parts for automotive products. This plastic is more difficult for universities to recycle based on its limited presence on a college campus. Once recycled, PP can be found in automobile applications such as battery cases, signal lights, battery cables, brooms and brushes, ice scrapers, oil funnels, and bicycle racks. Additionally, PP can be found in household products like garden rakes, storage bins, shipping crates, and pallets.

The sixth type of plastic described by the American Chemistry Council (2007) is Polystyrene (PS). PS is a versatile plastic that can be rigid or foamed. General purpose polystyrene is clear, hard and brittle. It has a relatively low melting point. Typical applications include protective packaging for food items, foodservice packaging, bottles, and food containers. This type of plastic food service items, such as cups, plates, bowls, cutlery, hinged takeout containers (clamshells), meat and poultry trays, and rigid food containers (e.g., yogurt). These items may be made with foamed or non-foamed PS. This type of plastic is often found in the dining centers of many residential and commuter campuses. Currently, the majority of polystyrene products are not recycled because of a lack of suitable recycling facilities and the fact that in many cases it is not cost effective.

The last code in the plastic identification sequence, the #7 code, is a catch-all category for plastic materials that do not fit the previous six identification categories. Use of this code indicates that a package is made with a resin other than the six listed above, or is made of more than one resin and used in a multi-layer combination. This type of

plastic is often hard to recycle based on the nature of the material. The most common use of recycled material in the #7 category is for plastic lumber applications.

Paper Recycling

Paper recycling is quite simply the process of recovering waste paper and remaking it into new paper products. According to Energy Facts (2006), paper is the number one material that we throw away. For every 100 pounds of trash we throw away, 35 pounds of the trash consists of paper. Newspapers take up about 14% of landfill space, and paper in packaging accounts for another 15 to 20 %. Unlike many plastic materials and other aggregate materials, paper is made out of a renewable resource, namely trees. The process for making virgin paper is fairly simple. After the trees are harvested, they are delivered to a paper mill where computer-aided saws are used to cut the trees in such a manner that every part of the tree is used and nothing is wasted. After the usable lumber is extracted, the remainder is turned into pulp. This pulp is then used to make what we know as paper. Recycled paper is made in much the same way, with the exception that the paper has to be de-inked. Different grades of paper are recycled into different types of new products. Old newspapers are usually made into new newsprint, egg cartons, or paperboard. Old corrugated boxes are made into new corrugated boxes or paperboard. High-grade white office paper can be made into almost any new paper product—stationery, newsprint, or paper for magazines and books.

When it comes to paper recycling, the terms pre-consumer waste and post-consumer content or post-consumer waste are often used. The Energy Information Administration (2006) describes pre-consumer waste as material that was discarded before it was ready for consumer use. Post-consumer waste is material discarded after

consumer use, which could include old magazines, old telephone directories, and residential mixed paper. The Energy Information Administration (2006) claims that there is a 40% reduction in energy when paper is recycled compared to paper made with un-recycled pulp; the Bureau of International Recycling claims there is a 64% reduction. Some calculations show that recycling one ton of newspaper saves about 4,000 KWh of electricity (Energy Information Administration, 2006).

Aluminum Recycling

The recycling of aluminum is not a new idea or concept. Schlesinger (2006) notes that the practice has been around since the early 1900s and has extensively capitalized and expanded during World War II. However, it was a low-profile activity until the late 1960s when the exploding popularity of aluminum beverage cans finally placed recycling into the public consciousness. In order to understand how aluminum can be recycled one has to know where it comes from. Waste Online (2005) describes the process of creating aluminum. Aluminum is produced from bauxite, a clay-like ore that is rich in aluminum compounds. The aluminum is only found as a compound called alumina, which is a hard material consisting of aluminum combined with oxygen. This alumina has to be stripped of its oxygen in order to free the aluminum. Then, the alumina is dissolved in a molten salt at a reduction plant and a powerful electric current is run though the liquid to separate the aluminum from the oxygen. This process uses quite large quantities of energy. Recycling aluminum requires only 5% of the total energy required when compared to making new aluminum from scratch. Additionally, it produces only 5% of the CO2 emissions as compared with primary production and drastically reduces the waste going to landfill. One of the traits of aluminum is that it can be recycled indefinitely since

reprocessing does not damage its structure. This makes aluminum the most cost-effective material for consumers to recycle in the United States. As a result, the rising cost of other precious metals has caused the theft of aluminum materials to drastically increase and recycling theft has become a lucrative business. In response to this trend, many states are considering legislation aimed at reducing the theft. In fact, the California State Senate has approved legislation that would crack down on theft of recyclables such as newspapers and California redemption value (CRV) containers, which include aluminum cans, plastic and glass bottles (Waste Age, 2008). The bill, AB 1778, would require junk dealers and recyclers to pay by check and obtain identifying information from people who turn in more than $100 worth of CRV containers or $50 worth of newspapers (Waste Age, 2008).

Recycling aluminum cans is one of the best ways to reduce energy consumption on the planet. In fact, during the year 2007, 54 billion cans were recycled, saving the energy equivalent of 15 million barrels of crude oil—America's entire gas consumption for one day (Earth 911, 2008). Each year, the aluminum industry pays out over $800 million dollars for empty aluminum cans. For organizations who collect aluminum cans for recycling, including Habitat for Humanity, the Boy or Girl Scouts of America or even a local school (Earth 911, 2008), the money earned can fund many projects to help people and communities. The money savings can also help build new homes, pay for a group trip, support a project or buy a lunch. Recycling also reduces material waste on the planet. According to Earth Day 911 (2008), Americans today recycle roughly 65% to 70% of the aluminum they use in their household. However, this mostly includes cans and not commonly used aluminum foil. Instead, thousands of tons of this make it into

landfills every year. This amount of aluminum could otherwise be used to create an entire fleet of commercial airliners.

Steel Recycling

Like aluminum, steel is mined from an ore. Iron ore is plentiful, but it is usually combined with oxygen or sometimes carbon or sulfur (Steel Recycling Institute, 2008). The Steel Recycling Institute (2008) describes the process of creating aluminum. Iron ore has to be stripped in a blast furnace to reduce it to pig iron that can then be used in steel production. The average person probably uses at least one steel can every day. The familiar "tin" can has been part of society for more than a century to package a variety of products, including fruits, vegetables, soups, sauces, meats, condiments, juice, pet food, cleaning products, paint, shoe polish, adhesive bandages, coffee and cookies.

Similar to aluminum, steel has the potential to be continuously recycled into new steel products. The Steel Recycling Institute (2008) reported that about 70% of scrap steel is recovered. Of the remainder, two-thirds of the scrap is dumped into landfills. Each year, more steel is recycled than aluminum, paper, glass and plastic combined. The recycling of steel prevents the need to mine additional iron and coal, the primary ingredients to make new virgin steel. Producing new steel from virgin materials requires the use of more non-renewable energy than steel made from recycled steel. As a result of the magnetic property of steel, it can be easily separated from other recyclables (e.g. paper, glass) using magnets. Steel recycling saves landfill space as well as provides a scrap resource to the steel industry. Steel containers are usually comprised entirely of steel, meaning that the entire container can be recycled, including the caps and lids.

Recycling Cardboard

The standard cardboard box is actually made out of corrugated cardboard, which can be identified by its multi-layer construction and is often brown in color. The Recycle Guy website (Recycling, 2007) states that the wavy middle layer gives the cardboard its strength, while at the same time making it light in weight. Cardboard is inexpensive to produce and to date is the most efficient shipping container used to package and move materials securely.

The Recycle Guy website (Recycling, 2007) describes several types of cardboard. One type of cardboard currently used in the food industry is referred to as boxboard or chipboard. What makes boxboard different from corrugated cardboard is that it does not have the wavy middle layer. Boxboard is usually grayish in color and is recyclable, although it is considered a lesser quality paper, it is recyclable. The most common use of boxboard is to produce cereal boxes. Since used corrugated cardboard is often bulky and has the tendency to take up a lot of space in dumpsters, especially if un-flattened, many businesses find it cost effective to bale or compact the material.

Recycling one ton of cardboard eliminates the need to cut down seventeen trees, saves seven thousand gallons of water, and reduces air pollution by 95%. Additionally, recycling boxboard saves eleven barrels of oil or about four hundred-sixty two gallons of oil, saves more than three cubic yards of landfill space. Corrugated cardboard can be recycled an average of seven times before the fibers become to short and they are filtered out as sludge during the pulping process. The pulp slurry is what is then used to make new paper and fiber products.

Staffing of Recycling Programs

When it comes to staffing recycling programs, Lounsbury (2001) found that some universities' recycling programs were staffed by ecological activists who filled newly created full-time recycling coordinator positions. Between the late 1980s and mid 1990s, the vast majority of colleges and universities had been reported to have created "authorized" recycling programs (Smith, 1993). Unlike student volunteer recycling programs of the late 1960s and 1970s that often disappeared soon after they were created, Lounsbury (2001) described authorized recycling programs as those that are sponsored by university administrators and are typically set up and maintained by university staff within physical plant departments. At other schools, authorized recycling programs were mainly staffed by ecologically ambivalent custodial directors who assumed responsibilities for recycling as an additional, part-time duty. Furthermore, Lounsbury (2001) found through his research that virtually all recycling supervisors were in newly created full-time recycling coordinator positions, and were undergraduates at the school where they now held positions.

When the idea of campus wide recycling began to catch on, often times it was a result of community activists or volunteers. Volunteerism has always been a major component of making a recycling program effective. A recent article from the Chronicle of Higher Education (2007) highlighted the students from Colorado State University who sifted through mounds of trash, separating compost from recyclables and plastic from paper from the Democratic Convention held in Denver, Colorado. Over the course of the four-day convention, more than 460 student, staff, and faculty volunteers from Colorado State filled 600 "sorting" shifts at the Pepsi Center and Colorado Convention Center. In

an effort to provide a resource for recycling programs, National Recycling Coalition (NRC) was established. The NRC is a national non-profit advocacy group with members that span all aspects of waste reduction, reuse and recycling in North America (NRC, 2008).

Composting as a Recycling Option

A new option for many university recycling programs is composting, which consists of taking earthy matter, generally food waste and combining it with water, air, and heat to allow the natural process of decomposition to take place. Waste materials that are organic in nature, such as plant material, food scraps, and paper products, can be recycled using biological composting and digestion processes to decompose the organic matter. The resulting organic material is then recycled as mulch or compost for agricultural or landscaping purposes. In addition, waste gas from the process (such as methane) can be captured and used for generating electricity. The intention of biological processing in waste management is to control and accelerate the natural process of decomposition of organic matter.

Developing a composting system on a university campus has some challenges associated with it. Purman (1999) describes how the University of Wisconsin-River Falls set up their composting program. Since the food service provider on campus is responsible for the cost of waste disposal from its kitchens, the idea of composting was appealing to the food service managers. The kitchen facilities were evaluated to identify key locations for placing receptacles. They chose bright red, 32-gallon containers on wheeled carts to allow for flexibility in location and ease of transport to the loading dock. Any organic matter such as meat, cheese, plant materials and soiled paper products are

collected six days a week during the school year and on an on-call basis in the summer months. Once the organic material is collected it is taken to a composting site, which could be located on campus.

The compost is then turned every so often to allow air and oxygen to be reintroduced in the material to provide the necessary nutrient that the micro organisms need in order to continue the decomposition process. One of the side effects can be a foul smell in the air, but on the reverse, the university building and grounds crew will have a natural fertilizer to utilize around campus.

Composting is not just an option for university dining facilities, but also an option for intercollegiate sporting events. One such example is The University of California at Davis. The University is trying to encourage environmental awareness among football and lacrosse fans by establishing a zero-waste policy at the new, 10,700-seat Aggie Stadium (Go, Compost, 2007). The policy goes beyond the standard push for recycling empty cans and plastic bottles. The university has also set up composting bins for half-eaten hot dogs, nachos, and other food and paper waste. "Everything that comes out of the concession stands is recyclable or compostable," according to Jennifer Stallkamp, manager of the stadium (Go, Compost!, 2007, p. 34). Not only is food composting starting to catch on, many universities are looking at Compostable or bio-degradable plates, cups, forks, spoons and knives as an alternative to plastic utensils.

Ways to Reduce Waste

Many universities are looking at ways to not only recycle waste materials, but to also reduce the amount of material that could be sent to a landfill. Like many universities, The University of Maryland has established a Reusable Mug program. According to the

University of Maryland's Green Dining web site (http://dining.umd.edu/about/news), the university partnered with their Resident Life department and distributed reusable hot/cold mugs to students and staff for use with coffee, tea and fountain sodas at a reduced price in resident dining rooms. This program dramatically reduced the amount of paper and Styrofoam cups that entered the waste stream.

One of the most beneficial components of reducing waste for a university is the reduction in money that has to be spent on hauling the waste away from campus. Vaillancourt (2008) stated that many universities have to pay for waste removal by the ton; if the university can reduce the tonnage of material needing to be removed they can in turn reduce cost. As a result, many campuses are looking to outside vendors to become Eco-friendly. Aramark, one of the nation's largest provider of food related service to colleges and universities, is working with its campus partners to incorporate a Zero Waste policy. Zero Waste is the process of safely recycling all materials back into nature or the marketplace in a manner that protects human health and the environment. Another new idea on many campuses involves the removal of trays in dining facilities. Currently, at least 23 of the 625 schools belonging to the National Association of College & University Food Services have adopted the idea so far, and 50 to 60% of the 500 campus partners served by Philadelphia-based Aramark and 230 of the 600 universities served by Gaithersburg, Maryland-based Sodexo are expected to dump their trays, company officials said (Vaillancourt, 2008).

Reduce, Reuse, Recycle

The process of recycling is more than just the process of taking a material and renewing it; it is about reducing the amount of the material in the first place. Let's Go

Green (2007) reported that Reduce, Reuse, Recycle is the slogan used by many environmental and ecologically minded individuals. The 3 Rs (reduce, reuse and recycle) refer to what is known as the waste hierarchy. This hierarchy is used to classify waste management strategies according to their desirability. The 3 Rs are meant to be a hierarchy, in order of importance.

The idea behind reducing waste relates to the concept of waste minimization. Waste minimization is the process and the policy of reducing the amount of waste produced by a person or a collective society (Environment Resource Management, 2000). It is part of the wider aim of waste reduction which is often described as a component of the waste hierarchy. In the waste hierarchy, the most effective policies and processes are at the top. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste (Environment Resource Management, 2000). At the bottom of the hierarchy is disposal, or placing materials in a landfill or other reservoir before extracting the full potential of the material or product.

To avoid disposal, there are several methods to reduce, reuse, and recycle materials to reduce disposal of useful materials and prevent the use of additional unnecessary resources. The most effective use of a product or material is to minimize or prevent the use or the production of waste from the spent product. Carrying a mug for coffee and tea rather than using disposable cups is one example of prevention. The basic principle is that one should be conscious about their use of materials and use the least amount of material as practically possible. For example, magazine printers may choose to over-run production by three percent instead of the normal over-run of ten percent; this eliminates waste from seven percent of the customary total product run.

Reusing materials is an important aspect of reducing waste. The reuse of a product is an important way of getting the most out of a product or material before its useful life has expired. For example, using the backs of one-sided office paper for scratch pads and note pads is one way to re-use the paper before the material goes to the next level of being recycled.

Recycling is the minimum one can do to reduce the environmental impact of a product on the surrounding environment. More communities and businesses are providing receptacles for plastic bottle recycling after use. Energy recovery is one aspect of recycling. Every item that is produced has a potential amount of energy stored in it, some products have more than others. One of the most common examples of this is incineration. Incineration is a disposal method that involves combustion of waste material in ovens or a furnace.

There are various ways to reduce consumption by the American consumer, many of these ideas are brand new while some methods have been used for decades to reduce energy cost and also make living easier. The Environmental Resource Management organization (2000) describes several specific projects that many universities are looking at and exploring: replacing incandescent light bulbs with compact fluorescents, upgrading in-ceiling fluorescent lights, installing devices to cut power consumption on refrigerated soda drink machines, a campus greenhouse gas inventory, organic waste diversion, waste reduction, conversion of campus police vehicles to liquid propane, energy efficient building retrofits, procurement and purchasing initiatives including increased use of recycled paper product and purchasing of local food.

One of the leading recycling programs in the nation is located on the campus of Harvard University in Cambridge, Massachusetts. Powell (2007) noted that Harvard University has diverted 6,676 tons of refuse for recycling in the year 2005. Additionally, Harvard University donated over $2,000,000 worth of reused furniture, clothing and books to non-profit organizations and needy individuals, thus preventing the furniture from being destroyed or incinerated. Harvard's recycling efforts have netted an award from the American Forest and Paper Association.

CHAPTER III

PURPOSE OF THE STUDY

The purpose of the proposed study is to examine students' knowledge of the recycling program at Eastern Illinois University and assess their attitudes and behaviors regarding recycling. This research will extend the knowledge base of college students' recycling beliefs and behaviors on college campuses and provide an instrument for assessing campus recycling program efforts. This research specifically focused on current undergraduate student involvement and interest in actively participating in green campus programs.

RESEARCH QUESTIONS

The data for this research addressed the following research questions.

RQ1: To what extent do college students choose to recycle?

RQ2: What is the relationship between student involvement and recycling?

RQ3: What attitudes and beliefs do students report regarding recycling efforts?

These questions allowed the researcher to examine students' intrinsic interests in recycling and the relationship between their interests and actual practices.

METHODOLOGY

Participants

Subjects for this survey consisted of only full time undergraduate students currently residing on campus in one of the fifteen residential housing units. Undergraduate students were chosen as the target population for this study because this group constituted the majority of the students on campus and were more likely to live in university housing facilities. Students were recruited from all majors on campus. The

emails were sent to the campus email address assigned to students at their enrollment into Eastern Illinois University. The survey was emailed to 600 selected students residing on campus from a list prepared by the campus Information Technology Services (ITS), the area responsible for maintaining the university email lists. A stratified random sample technique was employed. Of the 600 students contacted, 300 were freshman, 100 sophomores, 100 juniors, and 100 were seniors. More freshmen were recruited for the survey due to the higher number of freshman students residing in university housing units on campus.

Survey Procedures

In December of 2008, the survey instrument was sent out electronically to students' email addresses. Again in January 2009, a follow-up email was sent to students requesting their participation. The survey was available for students to participate from December 3, 2008 to February 14, 2009. The email request for participation directed students to link to the survey posted through the university Center for Academic Technology Services (CATS). Before completing the survey, students had to consent to participate through the online consent form which served as the portal to the survey. The online consent form instructed students that they could leave the survey at any time to end participation. They could also contact the researcher to exclude their data from the research at any time after completing the survey. The consent form is presented in Appendix A. Of the 600 surveys sent, data were collected form 195 undergraduate students.

Demographic Data.

Students responded to a set of fourteen questions regarding their gender, class standing, racial identification, and political affiliation and leaning. They identified their area of permanent residence and whether their hometowns had curbside recycling. Students also responded to questions regarding their on-campus residence site and their involvement on campus, including membership in Recognized Student Organizations (RSOs) and service in leadership positions and volunteer hours.

Measure.

Student Recycling Beliefs, Attitudes, and Behaviors. The survey instrument was developed to measure student's beliefs, attitudes, and behaviors as they relate to their recycling habits at Eastern Illinois University through a set of twenty-four researcher-developed questions. Twelve questions asked the students to describe their attitudes and beliefs about recycling on the campus of Eastern Illinois University while twelve questions asked the student to describe their current recycling habits by asking respondents how often they recycle. The questions were modeled based on similar surveys regarding recycling behaviors (Jennings, 2004; Schultz, & Oskamp, 1996). To respond to the questions, students read a statement and chose the response that best fit from the categories of "Never," "Sometimes," "Usually," and "Always." Higher means to the survey questions regarding attitudes and behaviors indicated more positive attitudes regarding recycling programs and greater recycling behaviors.

The questions were chosen to specifically target student knowledge and motivations towards recycling. Examples of questions include, "I recycle because it is the right thing to do," "Additional recycling information would be useful to me," and "I recycle paper products and newspapers." The Student Recycling Beliefs, Attitudes, and

Behaviors survey had an internal reliability estimate (α) for this study of .892 and a mean score of 2.703 (*sd* = 10.839). The items comprising the Student Recycling Beliefs, Attitudes and Behaviors survey is presented in Appendix B.

Data Analysis

Once the survey was completed by the student and the responses submitted, the results were collected, tallied, and coded by CATS survey software. This provided the data in a convenient format that was easily converted into SPSS (SPSS Graduate Pack 17.0) for analysis. The following statistical procedures were used in the analysis. Pearson's r was used to determine correlations between recycling behaviors items. Correlation results were considered significant if $p \leq .05$. t tests and one-way analyses of variance were used to compare differences between nominal and ordinal data. For t tests, results were considered significant if $p \leq .01$ and one-way ANOVA results were considered significant if $p \leq .001$.

CHAPTER IV

RESULTS

The Importance of Campus Recycling

Students reported that recycling was an important issue at Eastern Illinois University. Ninety-seven percent of the respondents (n=188) agreed or strongly agreed that it is important to recycle at Eastern Illinois University. Additionally, students reported that recycling is a worthy cause (96%, n=186) and recycling is good for the environment (98%, n=188).

Recycling Habits of College Students

Students indicated that they most often recycle plastic bottles (77.5%, n = 152), whereas students under-recycled glass bottles. Sixty-six percent (n = 131) of students sometimes or never recycled glass bottles. One of the easiest items to recycle on campus is the campus newspaper, but only fifty-six percent of students (n = 109) always or sometimes recycle their used campus newspapers. Six percent (n = 11) of students never recycle the newspaper. In an analysis of student behavior, it appears that many students are trying to recycle their used materials on campus.

A one-way ANOVA compared self-reported recycling behaviors among students of different class status for paper products, aluminum cans, plastic bottles, and glass bottles. No significant difference was found for any of the recyclable items. Data comparisons are presented in Table 1.

Table 1

Variance Among Students With Different Class Status

Measure and source	Df	SS	MS	F
Paper products/newspapers				
Between groups	3	9.144	3.048	3.837
Within groups	191	151.728	.794	
Aluminum cans				
Between groups	3	3.980	1.327	1.351
Within groups	191	187.507	.982	
Plastic bottles				
Between groups	3	4.827	1.609	1.942
Within groups	191	158.219	.828	
Glass bottles				
Between groups	3	4.508	1.503	1.384
Within groups	191	207.338	1.086	

* $p < .001$.

There were no differences among the groups means for paper products ($F(3,191) = 3.837$, $p > .001$) among freshmen ($m = 2.36$, $sd = .931$); sophomores ($m = 2.75$, $sd = .954$); juniors ($m = 2.57$, $sd = 1.016$); and seniors ($m = 2.91$, $sd = .674$). There were no differences among the group means for aluminum cans ($F(3,191) = 1.351$, $p > .001$) among freshmen ($m = 2.84$, $sd = 1.005$); sophomores ($m = 2.95$, $sd = 1.131$); juniors (m

= 2.81, *sd* = 1.153*);* and seniors (*m* = 3.16, *sd* = .688). There were no differences among the group means for plastic bottles (F(3,191) = 1.942, p > .001) among freshmen (*m*=3.07, *sd* = 1.006); sophomores (*m*=3.40, *sd* = .810); juniors (*m* = 2.93, *sd* =1.113); seniors (*m* = 3.13, *sd* = .668*)*. There were no differences among the group means for glass bottles (F(3,191) = 1.384, p >.001) among freshmen (*m*=2.29, *sd* = 1.043); sophomores (*m* = 2.08, *sd* = 1.248); juniors (*m* = 2.00, *sd* = 1.148); seniors (*m* = 1.91, *sd* =.752).

Students from different class years showed no significant difference in recycling behaviors. An independent t-test was used to compare male and female recycling behaviors for paper products, aluminum cans, plastic bottles, and glass bottles. No significant difference was found for recycling paper products (*t*(193) = .406, p >.05) between males (*m* = 2.68, *sd* = .732) and females (*m* = 2.62, *sd* =1.001).

A Pearson correlation coefficient was calculated for the relationships among paper products, aluminum cans, plastic bottles, and glass bottles. There was a significant relationship among recycling materials. Students who recycled one type of material were more likely to recycle other material. Correlations between recycling habits for the various materials are presented in Table 2.

Table 2

Correlations Among Survey Questions on Recycling Behaviors

Recycling material	M	SD	2.	3.	4.
1. Paper products/newspapers	2.64	.911	.606**	.522**	.230**
2. Aluminum cans	2.95	.994		.782**	.426**
3. Plastic bottles	3.12	.917			.383**
4. Glass bottles	2.08	1.045			

** $p < .01$

Impact of Involvement on Recycling Behaviors

While it was interesting to see that less than 50% of the students surveyed were not currently a member of a RSO, the data indicated that involvement in student organizations did not impact whether students chose to recycle or not. Students who were members of recognized student organizations (RSOs) showed no significant difference for recycling materials compared to students who were not members of RSOs. An independent-samples *t*-test was used to compare recycling behaviors based on membership in student organizations. No significant difference was found between means groups of students who were members of RSO and non-RSO members for recycling paper products ($t(189) = 1.656$, $p > .05$); aluminum products ($t(189) = .106$, $p > .05$); plastic products ($t(189) = -.700$, $p > .05$); and glass bottles ($t(189) = -1.124$, $p > .05$). Mean scores are presented in Table 3.

Table 3

Variance among means for recycling materials based on student involvement

Involvement	Recycling material							
	Paper products/ newspapers		Aluminum cans		Plastic bottles		Glass bottles	
	M	SD	M	SD	M	SD	M	SD
Student leadership								
Held leadership role	2.84_a	.745	3.07	.816	3.18	.752	1.75_b	1.114
No leadership role	2.55_a	.957	2.90	1.055	3.12	.968	2.27_b	.780
RSO involvement								
Member of RSO	2.79	.828	2.96	.911	3.08	.824	1.99	.930
Non-RSO member	2.58	.875	2.94	1.028	3.17	.949	2.16	1.129

* Mean groups sharing the same subscript are significantly different. $p > .01$

Students who responded that they had held leadership positions in campus organization did show a significant difference in recycling behaviors compared to those who had not held leadership positions. An independent samples *t*-test comparing the mean scores of students who had held leadership positions and those who had not been leaders found a significant difference between the groups for recycling paper products/newspapers ($t(190) = 2.162$, $p < .05$). Students who had held leadership positions had higher mean responses for actively recycling paper products/newspapers ($m = 2.84$, $sd = .745$) than students who had not held leadership positions ($m = 2.55$, $sd = .957$). An independent samples t test comparing the mean scores of students who had held

leadership positions and those who had not found a significant difference between the groups for recycling glass bottles $t(190) = -3.443$, $p < .05$). Students who had held leadership positions had lower mean responses for actively recycling glass bottles ($m = 1.75$, $sd = 1.114$) than students who had not held leadership positions ($m = 2.27$, $sd = .780$). For plastic bottles and aluminum, an independent-samples t-test indicated that there was no significant difference between the mean groups for students who had held leadership positions and those who had not been leaders. No significant difference was found between the groups for recycling aluminum ($t(190) = 1.155$, $p > .05$) or plastic bottles ($t(190) = .410$, $p > .05$). Mean scores of the groups are presented in Table 3.

When it comes to volunteerism at EIU, a majority of the students reported that they volunteered for 6 or more hours each academic year (44.9% n=88) and only 17% of students (n = 35) indicated that they did not volunteer in the last academic year.

A one-way ANOVA compared students volunteering habits with their amount of recycling. Only one item showed a significant difference between the group means for students who had different hours of volunteerism in the past academic year. A significant difference was found for the item, "I recycle glass bottles," ($F(3,191) = 3.837$, $p > .01$). The results are presented in Table 4.

Table 4

Variance among means for recycling behaviors based on hours of volunteerism (n =195)

Recyclable Material	Levels of volunteerism							
	0 hrs.		1-5 hrs.		6-9 hrs.		10+ hrs.	
	M	SD	M	SD	M	SD	M	SD
Paper / Newspapers	2.38_a	.853	2.54_a	.928	3.12_a	1.013	2.73	.766
Aluminum Cans	2.82	1.086	2.81	1.011	3.36	.995	3.02	.813
Plastic Bottles	2.88	1.122	3.07	.937	3.48	.823	3.21	.676
Glass Bottles	1.88_b	1.149	2.23	.981	2.68_b	1.215	1.79_b	.845

Note. Mean groups sharing the same subscript are significantly different. $p < .001$

Follow up tests were conducted to evaluate pair-wise differences among the means using Tukey's *HSD*. The results of these tests, included means and standard deviations are presented in Table 4. Students who volunteered for 6-9 hours had a significantly higher mean ($m = 2.68$, $sd = 1.215$) than those students who had volunteered for 10 hours ($m = 1.79$, $sd = .845$). The means of students who volunteered at other levels of service hours or did not volunteer were not significantly different from any of the other groups.

Attitudes and Beliefs about Recycling

An independent-samples *t* test comparing the mean scores of females and males on found a significant difference on two of the three survey items asking about students' recycling attitudes. For the item, "I feel recycling is good for the environment," there was a significant difference between the groups ($t(193) = -2.960$, $p < .05$). The mean of female students was significantly higher ($m = 3.75$, $sd = .658$) than the mean of the male students ($m = 3.46$, $sd = .629$). Females indicated greater agreement that they felt recycling was good for the environment.

For the item "I recycle because it is the right thing to do," there was a significant difference between the means of males and females as well ($t(193) = -2.617$, $p < .05$). The mean of female students was significantly higher ($m = 3.45$, $sd = .736$) than male students ($m = 3.15$, $sd = .804$). Females indicated greater agreement that recycling is the right thing to do.

An independent samples *t* test compared the means between males and females on the third survey item on recycling attitudes, "I actively seek ways to recycle new items." There was no significant difference between the group means ($t(193) = -.043$, $p > .05$). The mean of the female students ($m = 2.27$, $sd = 1.077$) was not significantly different than the mean scores of the male students ($m = 2.27$, $sd = .925$).

A one-way ANOVA compared attitudes about recycling to students' self-reported political party affiliation. No significant difference was found on the item, "I feel that recycling is good for the environment" ($F(6,188) = 3.069$, $p > .001$). There was no difference among the means for students who identified as Democrat ($m = 3.74$, $sd = .657$), Republican ($m = 3.70$, $sd = .542$), Independent ($m = 3.67$, $sd = .492$), Green ($m =$

4.00, *sd* = .000), Libertarian, (*m* = 3.33, *sd* = 1.155), and Undecided, (*m* = 3.56, *sd* = .581). No significant difference was found on the item, "I recycle because it is the right thing to do" ($F(6,188) = 3.470$, $p > .001$), among students who identified as Democrat (*m* = 3.51, *sd* =.737), Republican (*m* = 3.33, *sd* = .620), Independent (*m* = 3.33, *sd* = .492), Green (*m* = 3.75, *sd* = .500), Libertarian (*m* = 3.67, *sd* =.577), Undecided, (*m* = 3.19, *sd* = .804). No significant difference was found on the item, "I actively seek ways to recycle new items" ($F(6,188) = 1.441$, $p > .001$), among students who identified as Democrat (*m* = 2.32, *sd* =.924), Republican (*m* = 2.07, *sd* = 1.238), Independent (*m* = 2.33, *sd* = .985), Green (*m* = 3.25, *sd* = 1.500), Libertarian (*m* = 2.67, *sd* = 1.155), and Undecided (*m* = 2.24, *sd* = .984). No significant difference was found on the item, "I find that I want to recycle more then I currently do," ($F(6,188) = 3.694$, $p > .001$), among students who identified as Democrat (*m* = 2.88, *sd* = .843), Republican (*m* = 2.93, *sd* = .874), Independent (*m* = 3.42, *sd* = .669), Green (*m* = 4.00, *sd* = 0.00), Libertarian (*m* = 3.00, *sd* = .000), and Undecided (*m* = 3.13, *sd* = .612). No significant difference was found on the item, "Additional recycling information would be useful to me," ($F(6,188) = 1.691$, $p > .001$) among students who identified as Democrat (*m* = 2.68, *sd* = .818), Republican (*m* = 2.74, *sd* = .813), Independent (*m* = 3.00, *sd* = .739), Green (*m* = 3.00, *sd* = .000), Libertarian (*m* =3.00, *sd* =.000), and Undecided (*m* = 2.54, *sd* = .695).

An independent-samples *t* test comparing the mean scores of University Honors students and students who were not in the university Honors College on survey items asking students about their recycling attitudes. There was a significant difference on three of the five survey items asking about students' recycling attitudes. For the item, "Recycling is a worthy cause," there was a significant difference between the groups

($t(192) = 2.237$, $p < .05$). The mean of university Honors students was significantly higher ($m = 3.83$, $sd = .381$) than the mean of the non-Honors students ($m = 3.46$, $sd = .793$). For the item, "Recycling at EIU is good for the environment," there was a significant difference between the groups ($t(192) = 2.290$, $p < .05$). The mean of university Honors students was significantly higher ($m = 3.83$, $sd = .381$) than the mean of the non-Honors students ($m = 3.45$, $sd = .800$). For the item, "I actively seek ways to recycle new items," there was a significant difference between the groups ($t(192) = 1.998$, $p < .05$). The mean of university Honors students was significantly higher ($m = 2.67$, $sd = .963$) than the mean of the non-Honors students ($m = 2.23$, $sd = 1.009$). There was no significant difference between the group means for the item "I feel recycling is good for the environment" ($t(192) = 1.820$, $p > .05$), between students who were honor students ($m = 3.88$, $sd = .338$) and non-Honors students ($m = 3.64$, $sd = .631$). There was no significant difference between the group means for the item "I recycle because it the right thing to do," ($t(192) = 1.889$, $p > .05$) between students who were honor students ($m = 3.663$, $sd = .495$) and non-Honors students ($m = 3.32$, $sd = .963$).

Knowledge on Recycling

Colleges and knowledge on recycling. Comparisons of mean score on items asking about students' recycling knowledge among groups of students with different majors are presented in Table 5.

Table 5

Variance among Mean Groups among Students Enrolled in Different Academic Colleges (n = 195)

Recycling knowledge item	df	SS	MS	F
I know what to put in each recycling bin.				
Between groups	5	29.421	5.884	9.601*
Within groups	189	115.840	.613	
Recycling bins on campus are clearly marked.				
Between groups	5	24.729	4.946	7.586*
Within groups	189	123.220	.652	
I have received enough information about recycling at EIU.				
Between groups	5	9.702	1.940	3.015
Within groups	189	121.631	.644	
I find it easy to decide what to recycle at EIU.				
Between groups	5	134.455	.305	.429
Within groups	189	135.979	.711	
Recycling bins are easily located on campus.				
Between groups	5	10.993	2.199	3.566
Within groups	189	116.525	.617	

* $p < .001$.

There was a significant relationship between scores on two of the five recycling knowledge questions among students in different university colleges. The questions

included: "I know what to put in each recycling bin;" "Recycling bins on campus are clearly marked;" "I have received enough information about recycling at EIU;" "Recycling bins are easily located on the campus;" and "I find it easy to decide what to recycle at EIU." Follow-up tests were conducted to evaluate pair-wise differences among the means using Tukey's *HSD*. The results of the follow-up tests, including means and standard deviations are presented in Table 6. In general, students who were enrolled in majors in the College of Arts and Humanities had less recycling knowledge, especially knowledge of where to recycle certain materials on campus, than students majoring in other colleges.

Table 6

Variance among means for recycling knowledge based on college major (n =194)

Recycling knowledge item	College major							
	College of Arts and Humanities		College of Education		College of Sciences		College of Business and Applied Sciences	
	M	SD	M	SD	M	SD	M	SD
I know what to put in each recycling bin.	2.48_a	.720	3.32_a	.711	3.51_a	.768	3.07_a	.884
Recycling bins on campus are clearly marked.	2.39_b	.811	3.28_b	.750	3.11_b	.737	2.76	.951

Note. Mean groups sharing the same subscript are significantly different. $p < .001$

A one-way ANOVA comparing recycling knowledge scores with college major found a significant relationship for the survey item, "I know what to put in each recycling bin," ($F(5, 189) = 9.601$, $p < .001$). Students in the College of Arts and Humanities had the lowest scores on knowledge of which materials to recycle ($m = 2.48$, $sd = .720$) compared to students in the Lumpkin College of Business and Applied Sciences ($m = 3.07$, $sd = .804$), the College of Education and Professional Studies ($m = 3.32$, $sd = .711$), and the College of Sciences ($m = 3.51$, $sd = .768$). There was no significant difference between students in the College of Continuing Education ($m = 3.00$, $sd = .000$) and undecided majors ($m = 3.06$, $sd = 1.063$).

A one-way ANOVA also showed a significant difference on the item, "Recycling bins on campus are clearly marked," ($F(5, 189) = 7.586$, $p < .001$). Students in the College of Arts and Humanities had the lowest scores on knowledge of where recycling bins were located ($m = 2.39$, $sd = .811$) compared to students in the College of Education and Professional Studies ($m = 3.28$, $sd = .750$), and the College of Sciences ($m = 3.11$, $sd = .737$). There was no significant difference between students in the Lumpkin College of Business and Applied Sciences ($m = 2.76$, $sd = .951$), the College of Continuing Education ($m = 3.00$, $sd = .000$) and undecided majors ($m = 3.00$, $sd = .894$).

A one-way ANOVA was conducted to compare recycling knowledge scores with college major found no significant relationship between academic major and recycling knowledge for the survey items, "I have received enough information about recycling at EIU" ($F(5, 189) = 3.015$, $p > .001$); "Recycling bins are easily located on the campus ($F(5, 189) = 3.566$, $p > .001$);" and "I find it easy to decide what to recycle at EIU" ($F(5, 189) = .429$, $p > .001$).

CHAPTER V

DISCUSSION

The purpose of this research was to examine the difference between the self-reported recycling behaviors of the students and the actual levels of recycling taking place on campus. The specific attitudes of the students on campus can dramatically affect how successful a recycling program is on campus. In order for the program to become successful, it needs consistent and active student participation. One of the underlying reasons for student participation relates to their belief that recycling is good for the environment. Therefore, students demonstrate their interest in environmentalism by actively recycling material such as newspaper.

RQ1: To what extent do college students choose to recycle?

In order to determine how successful a recycling program has become, it is important to determine what materials students report that they recycle. As soda companies move away from using aluminum cans to dispense there product they have increasingly move toward the use of #1 PETE bottles and the increase in the popularity of bottled water has resulted in an shift in the amount of plastic bottle recycling compared to aluminum, especially since aluminum cans are no longer available for purchase on the campus.

There was a significant correlation between recycling materials as it relates to overall recycling participation. Generally, if the students recycled one material, they recycled the other materials at or near the same rate. It is possible that students would be interested in recycling more materials, such as glass bottles or AA batteries, if there were pick-up locations available on the campus based on their interest in recycling materials

that are currently collected. The results indicate that getting buy-in from the students on recycling increases recycling behaviors universally. In addition, the university can save money on solid waste removal and purchase of new materials when old materials can be renewed for other uses. The university can also earn monetary rewards from returning recyclable materials, such as ink and toner cartridges.

RQ2: What is the relationship between student involvement and recycling?

Another of the purposes of this study was to examine whether a relationship exists between active recycling habits and student involvement and leadership. No significant difference was found for the (49.7%, n = 90) students in a RSO as it relates to recycling habits, but there was a significant difference in recycling behaviors for student leaders (34.7%, n = 35). When it comes to recycling and volunteering habits the only significant difference in recycling behaviors was for the recycling of glass bottles.

The number of students who indicated that they did not volunteer over the course of the last academic year (17%) was surprising to the researcher, especially since student development research indicates that involvement on campus in extracurricular activities is an indicator for undergraduate persistence towards finishing a degree (Astin, 1999). It appears that membership and involvement on campus does not affect recycling habits, but taking an administrative role in an organization impacts recycling behaviors. Because students are indicating some interest in volunteerism, one of the ways that student could become more involved physically and psychologically on campus is to involve them in designated campus service or volunteer programs related to recycling, such as collecting ink and toner cartridges from residence halls on campus. In addition, student leaders could encourage their organizations to get actively involved in recycling since they

indicate higher recycling as a group. Their encouragement and leadership may motivate others in their organization to take greater steps in reducing, reusing, and recycling materials.

RQ3: What attitudes and beliefs do students report regarding recycling efforts?

While attitudes towards recycling were not different based on political party affiliation, the data indicated that there was a difference in students' attitudes and beliefs regarding the importance and impact of recycling based on gender. Ninety-five percent of students (n = 187) indicated that recycling was good for the environment. Additionally, there was no difference in recycling rates for paper, plastic, glass, and aluminum when compared to gender or class standing. This may indicate a strong sense of environmentalism among the students, especially among females who indicated greater agreement that recycling is the right thing to do and good for the environment. Given this interest, it was not surprising that half of the students surveyed (58.1%, n = 114) agreed or strongly agreed that additional recycling information would be useful to them. One positive for EIU is that a majority of students (78.1%, n = 173) of students indicated that recycling at EIU was easy to perform. One of the reasons that students may have thought recycling was easy could relate to the fact that a majority of the students come from a town that currently has a curbside recycling program (63.8%, n = 125).

RECOMMENDATIONS

The researcher would recommend a few changes to the residential recycling program at EIU. These changes will help further students learning outside the classroom by supporting the idea of environmentalism. Updating the university's mission statement regarding environmental awareness and recycling efforts would also demonstrate the

institution's dedication to green efforts on campus.

One recommendation would be to look at removing glass bottles from the university vending machines. Although glass bottles on campus are presently under-recycled, adding glass recycling on campus could be costly and still ineffective. Instead of adding that service, it might be best to remove glass bottle material completely from campus vending, if possible. The energy and time that would be spent promoting glass recycling could be directed to efforts to recycle materials that already have campus recycling drop-off areas. Some ways to further promote recycling in the residence hall would be to look at how to reduce waste in the dining facility. Recycling containers in the lobby and on each floor are good starting efforts for environmentalism, but the addition of containers in the actual dining facility would only provide another opportunity for students to recycle.

Newspaper recycling is one area which should be targeted for enhanced collection due largely to the sheer volume and use of it. A comprehensive program targeted toward the recycling of The Daily Eastern News could yield a drastic increase in actually recycling habits of the students. This program could include stronger and larger labeling of current and additional recycling containers to draw attention to the availability of recycling the news paper at the conclusion of its use and the use of factoids specific to EIU regarding how Recycling is beneficial to all. These various promotional materials could be used to educate the university population on how to change their wasteful habits. Besides the cardboard recycling that takes place at the beginning and end of each semester, a pilot program promoting the recycling of single and corrugated cardboard should be actively explored. Currently, the majority of the commercial packaging and

especially food containers commercially available at stores like Wal-Mart, Target, and other retailers arrive in a cardboard box. So, a program that seeks these materials has the potential to become highly successful if the collection bins are or adequate size and the bins are emptied in a timely manner all the while they have to be kept relatively clean and sanitarily.

Plastic recycling is one major area in which EIU can improve its collection. Currently, EIU only recycles PET #1. If EIU expands its program, they could recycle items like the bags from the University Bookstore, take-out containers from the resident hall, and liquid laundry detergent bottles. Not only will expanded collection help the university recycle more, it will save money in the short and long term. When more recyclable items are collected, the demand for solid waste removal is reduced, resulting in less waste collection fees which are negotiated based on estimated tonnage for the year. With lower tonnage, comes a lower cost for removal from campus. An important first step to take when trying to become a green campus is to develop a Green mission statement on sustainability. This statement, much like a universities mission statement, should be the driving force behind why a university does what it does. Another collection item that is a money maker for the university is the collection of old/empty ink jet carriages. One such company, FreeRecycling.com LLC, pays cash/check for used empty inkjet cartridges; they pay up to $3.60 for each used ink cartridges. Additionally, they recycle old/use CD/DVD free of charge, which are often difficult to recycle.

Another way the university can promote recycling is by setting a standard related to post-consumer content. By doing this, you would look for products made from high percentages of post-consumer waste, which is the waste produced by the end consumer of

a material stream. Post-consumer waste is the garbage that individuals routinely discard, either in a waste receptacle or a dump. What this does is avoid using virgin resources like forests, petroleum products, and other natural resources all the while strengthening the market for recycled materials. We can separate all the metal, paper and plastic we want, but if no business remakes the scrap into something new, the cycle is broken.

Beyond the resident hall, recycling can be promoted to all faculty and staff as a way to reduce cost for the institution and as a way to further protect the natural resources of mother earth. One way to do this is by having a recycling mascot, much like "Billy the Panther" pumps up the crowd at an athletic event, the recycling mascot would travel the campus promoting and providing awareness for environmental causes. Such a program has become quite successful at the Michigan State University. Such a mascot could be used to further promote Recycle Mania and make its presence on campus known to all.

All of the above suggestions are meant to make recycling at EIU; practical, convenient, and effective. Recycling is a major part of the "Go Green" incentive.

APPENDIX A

On Campus Student Recycling Survey

(Please indicate your response by placing a X in the correct box that matches your Response)

(Please mark the correct box as it relates to who you are)

	Freshman	Sophomore	Junior	Senior+	Graduate
What is your class standing as of Fall 2008?					

	Male	Female
What is your Gender?		

In Which Academic College or School are you enrolled?	
College of Arts and Humanities	
Lumpkin College of Business & Applied Science	
College of Educational and Professional Studies	
College of Science	
Graduate School	
School of Continuing Education	
Unsure/Undecided	

	YES	NO
Are you in the University Honors Program?		

Where do you currently live On-Campus?			
Andrews Hall		Ford Hall	
Carmen Hall		Douglas Hall	
Lawson Hall		Lincoln Hall	
McKinney Hall		Pemberton Hall	
Stevenson Hall		Taylor Hall	
Thomas Hall		Weller Hall	
Greek Court		University Apartments	

University Court			

What is your Race?			
White		White, Non-Hispanic	
African American		Hispanic	
Asian-Pacific Islander		Native American	
Other			

What is your Political Leaning?	
Very Conservative	
Conservative	
Moderate	
Liberal	
Very Liberal	

What is your Political Party Affiliation?	
Democrat	
Republican	
Independent	
Green	
Libertarian	
Unsure/Undecided	

As a kid growing up, did your hometown have curbside recycling?					
YES		NO		Unsure	

Does your hometown currently have curbside recycling?					
YES		NO		Unsure	

Have you ever held a Student Leadership Position at EIU?			
YES		NO	

Are you currently a member of a Recognized Student Organization (RSO)?			
YES		NO	

In the past Academic year, how many hours have you spent Volunteering to help others?							
None		1-5 Hours		6-9 Hours		10+ Hours	

Would you consider your hometown to be in a Rural Setting or an Urban setting?	
Rural	Urban

Recycling Location

(For the next several questions please read the question and mark the choice that most closely resembles your belief and attitude?)

	YES	NO
Do you currently know where the Recycling bins are located in your Residence Hall		
Do you currently know where they are located on your Floor?		

Recycling Knowledge

	Strongly Disagree	Disagree	Agree	Strongly Agree
I find it easy to decide what to Recycle at EIU				
I find that I want to Recycle more then I currently do				
Recycling Bins are easily located on Campus				
Additional Recycling				

information would be useful to me				
I know what to put in each different recycling bin				
It is important to recycle at EIU				
Recycling is time Consuming				
It is easy to Recycle at EIU				
Recycling Bins on Campus are Clearly marked				
I have received enough information about Recycling at EIU				
Recycling is a worthy cause				
Recycling at EIU is good for the Environment				

Recycling Behaviors

(For the next several questions please read and fill in the Blank using one of the following terms)

	Never	Sometimes	Usually	Always
I _____ recycle paper products and Newspaper				
My friends _____ Recycle				
I _____ recycle Aluminum Cans				
I _____recycle Plastic Bottles				
I _____ recycle Glass Bottles				
I _____ put recyclables in the trash				
I can _____ find a recycling bin at EIU when I want to Recycle				
My family_____Recycles				

Recycling Attitudes

	Never	Sometimes	Usually	Always

I feel recycling is good for the environment.				
I recycle because it is the right thing to do.				
I actively seek ways to recycle new items.				

To what extent do college students chose to recycle?
What is the relationship between student involvement and recycling?
What attitudes do students report regarding their beliefs on recycling?

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