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Exploring Strategies for Converting Illinois Wesleyan University from Dual-Stream to Single-Stream Recycling

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Exploring Strategies for Converting Illinois Wesleyan University from Dual-Stream to Single-Stream Recycling

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ENST 480: Creating a Sustainable Society
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Executive Summary

Exploring Strategies for Converting Illinois Wesleyan University from Dual-Stream to Single-Stream Recycling

Illinois Wesleyan University (IWU) located in Bloomington, Illinois is converting from a dual-stream to a single-stream recycling program. This transition is scheduled to take place in chunks, with the entire campus converted by August 2013. The purpose of this research is to assess the current waste collection infrastructure and determine key educational strategies to accompany the transition, with the purpose being to increase the rate of recycling on campus. This research is being conducted to supplement research being made by the University, specifically a committee assigned to the task of implementing single-stream on campus.

Why Single-Stream Recycling?

Illinois Wesleyan University had discussed transitioning the campus to a single-stream recycling program for several years as a method of increasing the rate of recycling (seen in other communities in the United States). Single-stream recycling allows participants to place all recyclable material in one receptacle, in contrast to a dual-stream program that requires recyclables to be sorted into paper and containers. The goal in single-stream is that the added convenience of *not* sorting recyclables increases the likelihood that recycling will occur.

While the majority of IWU's campus is located in Bloomington, IWU has historically operated their recycling program with the adjoining Town of Normal's system using community roll-off bins. In July of 2012 the Town of Normal transitioned to a curbside single-stream recycling program and thus eliminated their need for most of the community drop-off sites. IWU currently houses two roll-offs (used for community member and IWU campus recycling drop-offs) in the Shirk Athletic Center parking lot. The Town of Normal granted IWU approximately one year to figure out another system of recycling before they ceased picking up recyclables from the roll-offs.

Research Design and Methodology

With the permission of IWU's Internal Review Board this research was conducted between September and November 2012 in order to answer the question: *how can a transition from dual-stream to single-stream recycling be implemented effectively as a way of increasing the rate of recycling on the Illinois Wesleyan University campus?* First a comprehensive literature review was conducted in order to determine how universities and other communities recycle as well as how to improve the rate of recycling specific to these communities. Following this, thirty-one interviews were conducted with members of the IWU and Bloomington-Normal community. In addition, a visit to Midwest Fiber (a local Materials Recovery Facility (MRF)) was made, where the process of separating recyclables was examined. Lastly, an

assessment of waste and recycling collection infrastructure on the IWU campus was executed using available floor plans and a camera. This was done in order to map out current recycling and waste receptacles.

Summary and Discussion of Research Findings

This research found, based off of a small sampling of IWU community members, that there was a gap between perception of recycling and actual practice of recycling. The research suggested that while IWU community members saw themselves as knowledgeable of recycling, when asked to complete a short recycling quiz, they scored significantly below their perceived level of knowledge. Additionally, in looking at the perceptions on the amount of contamination in recycling, the rate of contamination was reported to be high in some cases—suggesting that people do not know how to recycle properly (or that there are barriers to recycling properly). IWU staff reported that, on average, six out of fifteen bags of recycling had to be deposited in the waste due to contamination. Additionally, staff reported that contamination of recyclables occurred in the residence halls 60% of the time. However, due to limitations of this research there is no way to determine whether this rate of contamination is accurate, or if there is a knowledge gap among IWU staff as to what qualifies as contamination of recyclables.

All interviewees said they would support a single-stream recycling program on campus. In addition most interviewees also supported more recycling receptacles on campus. Interviewees reported difficulty finding recycling receptacles in common areas, and a lack of knowledge on how, where, and what to recycle. They also reported confusion with the existent signs and prompts encouraging recycling.

Recommendations

In order to increase the rate of recycling on campus, several adjustments should be made. First, every waste receptacle should be paired with a recycling receptacle. This will ensure that every person is presented with a choice to recycle or not to recycle that is not based on convenience of location. Second, signage and prompts encouraging recycling behaviors should be present, and consistent.

In order to decrease the amount of recycling contamination, or the amount of perceived contamination it is first important to educate staff members responsible for collecting recycling and waste on what an acceptable amount of contamination is. From here it is possible to assess whether contamination is a significant concern on the IWU campus. Lastly, this research found that training of educators should be improved. There was little to no training of staff members on how to recycle and how to educate peers.

Conclusion

To answer the question: *how can a transition from dual-stream to single-stream recycling be implemented effectively as a way of increasing the rate of recycling on the Illinois Wesleyan University campus*—there are a variety of barriers to be addressed. IWU community members showed a lack of knowledge on how to recycle and frustration with the inconvenience of recycling. In order to rectify this, several tactics can be used both at alleviating confusion with current recycling infrastructure, and at educational promotions designed to decrease contamination of recyclables.

Due to an enormous world population and equally booming rate of consumption the Earth's natural resources¹ are being eaten away at a rapid rate while the supply remains finite. Simultaneously the storage of waste² is an increasing concern. In the United States, waste is primarily stored in sanitary landfill sites. In this day and age landfill filling is a significant charge. Concerns with full or nearly full landfill sites require entities using them, such as municipalities, to seek alternative strategies for waste storage. Common strategies include the expansion of existent sites, the trucking of waste to other sites with more room, and various waste reduction strategies (O'Connell 106).

Environmentalists advocate for waste reduction strategies because they lessen the harvesting of virgin material extraction³ and reduce the amount of waste entering landfill sites. In addition, landfills present numerous concerns to human and ecosystem health, which will be described later in the review of literature (O'Connell 106). Waste reduction strategies are most commonly, and appropriately, divided into three categories: Reduce, Reuse, and Recycle. For the purpose of this research, recycling⁴ will be examined as a waste reduction strategy. This paper will be looking at recycling on the Illinois Wesleyan University (IWU) in Bloomington, Illinois. The research question to be addressed is: *how can a transition from dual-stream to single-stream recycling be implemented effectively as a way of increasing the rate of recycling on the IWU campus?*

IWU is located in McLean County in the adjunct City of Bloomington and Town of Normal, Illinois. IWU is a liberal arts, undergraduate institution with a student population of about 2000 on a yearly average. While Bloomington and Normal are bordering, and in many aspects intertwined, they use separate waste collection programs. Currently, IWU recycles through the Town of Normal, despite the majority of campus being located in the City of Bloomington, using two large roll-offs⁵, located in the Shirk Athletic Center parking lot. The roll-offs are used by both community members and IWU residence halls, academic buildings, and buildings with other functions. The current recycling program is dual-stream, which requires participants to separate recyclables by type. Recyclables are divided into paper,

¹ The term "natural resources" is used to describe products the earth provides naturally, such as pulp from trees, or fossil fuels.

² The term "waste" describes material disposed of with the purpose of removal to landfill sites. Waste is often synonymous with the term "garbage", but according to the literature on waste reduction strategies and recycling, scholars use the term "waste". In this review of literature, the term waste will be used in order to remain consistent.

³ Virgin material extraction is the harvesting of new or raw material.

⁴ The term "recycling" is used to describe the process of converting waste into a reusable material.

⁵ Roll-offs are large receptacles (roughly the size of a semi-truck trailer) that have an angled hatch for people to deposit recyclable material.

corrugated cardboard, and mixed containers (example: plastic, aluminum, and glass containers).

According to Dan Winters, General Manager for Allied Waste, the McLean County landfill has approximately four years remaining until capacity is reached. For this and other reasons, the City of Bloomington and the Town of Normal have pursued various waste reduction strategies. Normal transitioned to a curbside single-stream recycling program in July of 2012. Single-stream recycling combines all recyclables, until they reach a Materials Recovery Facility (MRF)⁶, where they are sorted by a combination of machines and human employees. Normal provided IWU a one year cushion to readdress recycling procedures before recycling pick up from the roll-offs in the Shirk Center parking lot stopped.

IWU has made two important decisions. The first is to continue a recycling program at IWU. This decision was influenced by IWU's President Wilson, who signed the Talloires Declaration⁷ in 2007, committing IWU to sustainability⁸. The second decision is to transition to a single-stream recycling program. This research is conducted in coordination with IWU, with the purpose being to assess the current waste collection infrastructure and determine key educational strategies to accompany the transition from dual-stream to single-stream recycling. The goal of this research is to increase the rate of recycling on campus.

In order to learn how recycling systems work most efficiently at the collegiate level and in other communities, I will first present a review of the literature. I will next describe the overall research design in order to understand more about barriers to and current perceptions of recycling in the Bloomington-Normal community and the IWU community. Following the research design will be the summary of research findings and discussion. The final section will be the recommendations to IWU, compiled based on the research I conducted.

Review of Literature

Recycling is an important waste reduction strategy. However, despite the modern evolution of recycling since its community-based origins in the 1980's (Scheinberg

⁶ According to Wikipedia, a Material Recovery Facility is a specialized facility that separates and prepares recyclable materials for marketing to end-user manufacturers.

⁷ The Talloires Declaration is a ten-point sustainability action plan catered to University campuses.

⁸ Sustainability, according to the 1987 Brundtland Report, is something that "meets the needs of current generations without compromising the ability of future generations to meet their own needs".

53), it has not solved the problem of waste⁹ in the United States. In order to increase the effectiveness of recycling it is important first to understand the problem of waste, the current recycling programs, and barriers each program presents to its participants. The final piece is to understand what prevents potential participants from participating in recycling and what makes it challenging to recycle effectively for those who do choose to recycle.

The Definition and Examination of the "Problem of Waste" in the United States, Specifically an Analysis of Current Landfill Use

The term "waste" encompasses a variety of ideas and impressions. Waste should refer to a material that cannot be reused or recycled; however, the collection of waste in the United States, is largely unregulated and monitored, which allows for a large array of materials to enter the waste collection stream, including recyclable material, hazardous waste, and food waste. The "problem of waste" stems from the sheer amount of waste generated.

Elizabeth J. O'Connell examined the cultural interpretation of waste in her article, "Increasing Public Participation in Municipal Solid Waste Reduction". O'Connell found that waste is treated as worthless and unattractive. She compared waste disposal to the treatment of the human dead, both are buried or incinerated (105). The average American citizen does not want waste.

Several methods of dealing with waste generated exist. In the United States, the primary method used is deposit in landfill sites. Various landfill designs exist. For the purpose of this research, a general-purpose landfill will be examined. Landfills present a combination of human health and environmental concerns and the obvious existence as a finite option (Slimak 309-310).

"Landfill Disposal Systems" written by Karen M. Slimak appeared in the *Environmental Health Perspectives* journal in 1978. Slimak studied six different types of landfills and found common shortcomings. Landfills are designed to prevent the decomposition of materials. Even so, leachate¹⁰ into ground water contaminates human water sources, jeopardizing quality of drinking water. Compromised drinking water directly affects human health (O'Connell 106). Additionally, eventual landfill wall failure and difficulty in repairing subsurface landfill walls necessitate concern in landfill use (Slimak 309-310).

Environmentally, landfills have negative consequences. Methane gas is one of the most potent greenhouse gases, and landfills are a large producer of anthropogenic¹¹

⁹ The "problem of waste" refers to both how to remove waste and where to put it. Both are considered with the concern of environmental and human health.

¹⁰ A product of water percolating through a solid and leaked some of the constituents, according to the Merriam-Webster online dictionary.

¹¹ Anthropogenic is human induced

methane gas. Some landfills are set up to allow for the capture of methane gas. Methane gas collected from landfills can be used as energy (O'Connell 106). However, the amount released is not comparable to the amount re-captured.

Finally, landfills will fill. Landfills that are full, or near full, generally have high tipping fees¹². As by their nature, landfills are unpopular neighbors, and are responded to with great opposition by those who are already neighbors or are potential neighbors. Landfills, and other waste facilities, are most commonly located near the poorest members of society (O'Connell 106). The acronym "NIMBY" is used to describe the sentiment: not in my backyard. The public who inhabit the middle to upper class economic strata can afford to live away from waste facilities, and prevent the intrusion of proposed facilities, while the lower class cannot (Iyer 42). It is very expensive to expand existent landfill sites, and to build new sites because of opposition from those living near existent or proposed landfill sites.

Recycling as a Waste Reduction Strategy

The three most widely spread waste reduction strategies are: reduce, reuse, and recycle. While recycling, as a stand-alone option, is not sustainable the combination of all three strategies may represent a more viable option (Lyons 298). The primary goals to recycling programs aim to both reduce the amount of material that enters the waste stream, and reduce the need for virgin material extraction.

Landfills, as discussed earlier, represent numerous concerns to the public. In a sustainable existence, landfills would be irrelevant because all material would be able to be repurposed, or safe to biodegrade and add nutrients to the soil. Recycling programs provide participants with the ability to actively minimize the amount of material that enters landfill sites (O'Connell 106). Recycling programs monitored in sixty-seven states in the United States between 1989 and 1996 had a mean diversion of 111% from the waste stream (Folz 339) providing evidence to the effectiveness of recycling as a waste reduction strategy.

Recycling also reduces the need for virgin material extraction. Items that are recycled are able to re-enter the processing realm. There are two types of recyclables, called *closed loop* and *open loop*. *Closed loop* items are able to return in their original format, such as an aluminum can returning as an aluminum can. These items are considered sustainable, as they can be recycled indefinitely. *Open loop* items, while still favorable to items with material that cannot be recycled, will degrade to the point that they cannot be salvaged. They are not considered replacements to virgin material, but they do supplement the amount of virgin material needed in manufacturing (Lyons 286).

¹² Amount charged per ton of waste dumped in landfills (Ann Ford 2).

Introduction to Recycling Programs: Dual-Stream vs. Single-Stream

The two most commonly used recycling programs in the United States are dual-stream and single-stream. Both programs rely upon material processing following collection. Processing of recyclables is increasingly becoming a market-driven business, meaning private contractors own MRFs¹³ and sell the recyclables for profit (Johnson 1). Recyclables are collected and trucked to MRFs, where they are divided, and shaped into bales. The bales of material are sold to processors, who process the material and then sell it back to manufacturers. More than half of the MRFs in the United States, as of May 2012, are set up for single-stream operations, which means they have either machinery designed to separate fiber¹⁴ from containers¹⁵, or human staff to separate. Some facilities operate using both (Johnson 1).

Dual-stream recycling requires participants to separate recyclable material into two categories: fiber and containers. This requires participants to understand what can and cannot be recycled and the ability to appropriately place items in the corresponding receptacles. Preparation of certain materials is also required. For example, certain recycling programs require the removal of caps from bottles and pop tabs from cans. Also consistent across programs, is the prohibition of food waste on recyclable items. This usually requires the participant to rinse off any leftover food waste, or remove contaminated areas, such as grease on the bottom of a pizza box; the top may still be recycled (Brown 1).

In comparison, single-stream recycling requires participants to combine all recyclable material into one receptacle-- fiber and containers are placed together. This similarly requires participants to know what can and cannot be recycled. Limitations on type of material that can and cannot be recycled continue to exist in single-stream recycling programs, as well as the preparation of certain materials.

Advantages and Disadvantages to Dual-Stream Recycling

Advantages

Early community recycling programs used a dual-stream model. Dual-stream recycling, therefore, has the advantage of established infrastructure. Receptacles in public buildings, compartmentalized haulers¹⁶, and to some extent, participant knowledge of the program are all advantages of “being there first”. For this reason, there is little up front cost to dual-stream recycling programs, only the cost of operations (Scheinberg 67).

¹³ Material Recovery Factory. A MRF sorts and bales recyclables by type to then sell to processors.

¹⁴ Fiber is the term for paper and paper board.

¹⁵ Containers is the term for glass, aluminum, and certain plastics.

¹⁶ Waste collection automobiles

Dual-stream MRFs have lower operational costs, compared to single-stream facilities because they have less steps – meaning when the recyclables reach them they are already partially sorted into containers and fiber (paper). This advantage directly benefits MRFs, which corresponds to lower sale prices to processors, manufacturers, and eventually to consumers purchasing items made out of recycled materials (Hennigan 1).

Disadvantages

Dual-stream recycling programs risk contamination¹⁷ of collected recyclables due to the complication of sorting for the individual participant (Hennigan 1). There is more opportunity for confusion simply because there are more choices of receptacles to deposit items in. Depending on the municipality, there are different levels of allowable contamination. Once the level is passed contaminated recyclables are counted as waste, and deposited in landfill sites.

Additionally, the complication of sorting is a significant barrier to participation. Dual-stream recycling programs often have lower recovery rates¹⁸ and rates of participation than single-stream programs (Fickes 2).

Advantages and Disadvantages to Single-Stream Recycling

Advantages

The economic advantage of single-stream recycling programs exists because the recovery rate is increased. It is cheaper for manufacturers to use recycled material than to purchase virgin material. The increased recovery rate is also an environmental advantage, as reduced virgin material extraction helps protect ecosystem health. The expected amount of recovered materials is anywhere from a ten to twenty percent increase during a transition to single-stream recycling from dual-stream recycling (Fickes 3). The Metro Waste Authority of Des Moines, Iowa reported a twenty percent increase in recycling tonnage upon switching to single-stream recycling from a dual-stream recycling program (Davis 16). Despite economic disadvantages, which will be examined later, single-stream recycling provides municipalities with a monetary net gain higher than with dual-stream programs (Fickes 2).

It is important to note that an increased recovery rate does not necessitate an increased participation rate; however, single-stream programs often do just that. The same Metro Waste Authority also claimed increased community participation

¹⁷ Contamination is any non-recyclable material found in recycling receptacles, that decreases the ability of recyclables to be recycled.

¹⁸ A recovery rate is the percent increase in total tonnage of recycled material (Fickes 2).

rates of ninety percent (Davis 16). The increased participation rate is attributed to the ease of use, or convenience, of single-stream recycling. It comes down to it being easier to throw things in one of two receptacles (one being recycling and the second being waste), rather than one of three receptacles (one being fiber, two being containers, and the third being waste).

It has also been found that single-stream recycling programs decrease the amount of contamination in recyclables. The same study in Des Moines, conducted by Metro Waste Authority found significantly decreased contamination rates, leaving only four percent of recycled material too contaminated by non-recyclable material to process (Davis 16).

Disadvantages

The economic incentive to single-stream recycling is pitched against the disadvantage of *converting* to single-stream from a dual-stream system. Single-stream programs have a large up-front cost, in waste collection infrastructure, the conversion of haulers, and in educational campaigns. It is not until the system is in place that haulers begin seeing economic savings (Fickes 2). Haulers save monetarily, because it is more efficient to pick up a single stream of recyclables, rather than multiple streams. While haulers save, MRFs expect an increase in cost of about three dollars per ton of recyclables because of the increased work load. The increase in cost here, directly affects MRFs, but is felt remotely by manufacturers and consumers (Fickes 2).

Opponents to single-stream recycling claim that placing all recyclables into one stream increases contamination and depreciates the value of recyclables (Waste and Recycling News 1). Auburn, Maine chose to revert back to dual-stream recycling after a failed attempt at single-stream. The largest complaint was broken glass mixing with paper and cardboard and depreciating the value of the fiber. The contaminated fiber was repurposed for roadways, but the people of Auburn wanted their paper to be used in the creation of more paper (Waste and Recycling News 2).

Barriers to Recycling and Strategies to Increase the Rate of Recycling

Assumptions Made in Recycling Campaigns

There are common assumptions made in recycling education campaigns. The assumption is made that positive recycling behavior and attitude is connected to positive environmental attitude and behavior. The assumption is also made that environmental knowledge influences positive environmental attitude and behavior (McKenzie-Mohr 2). For this reason, recycling education campaigns aim to increase environmental knowledge with the intent of creating a positive environmental attitude. Recycling education campaigns often target *why* you should recycle, rather than *how* to recycle. In a study conducted on high school and junior high students in the Western United States (location was anonymous in the literature), it was found

that students already knew why to recycle, because of educational presentations in classrooms sponsored by the Environmental Services Department. Simultaneously, students displayed a lack of knowledge on how to recycle, as displayed by waste audits conducted at the schools. When educational programming shifted to encompass how to recycle, the rate of successful recycling increased (Prestin 1021).

Lack of Awareness and Visibility of Waste in Communities

As described earlier, there is a negative perception of waste in society and general wish for it to be made invisible. Consequentially, landfill sites are out of sight for communities who can lobby with enough power to prevent it. In a study of recycling rates dependent on economic strata in the United States, it was seen that those whose annual income is in the lower class have the highest rate of recycling, followed by those in the middle class. The upper class had the lowest rate of recycling (Iyer 42). Those who perceived waste as “an immediate threat” were more likely to recycle or practice other waste management strategies (O’Connell 110).

Generally, there is poor awareness of the consequences attributed to landfill sites, among the general public, which acts as a major obstacle to recycling initiatives (O’Connell 107). Recycling and other waste reduction strategies are not viewed as an immediate threat and therefore are easily ignored or pushed back in people’s minds. In the same study of middle school and high school students, it was reported that students were not aware of the consequences of throwing away aluminum cans or plastics, whereas they could directly relate recycling paper to saving trees. Because the students were able to identify how recycling paper would positively affect them, paper had a higher rate of being recycled than other items (Prestin 1019).

Strategies

The goal is to raise awareness and visibility of waste in communities in order to decrease the amount of material put into the waste stream. In order to do this, a study of the University of Northern British Columbia (UNBC) found that campus community members paid attention to issues that were highly visible and impacted their daily life more than any other type of issue (Smyth 1007). As a strategy to combat the invisibility of waste on the Prince George campus of the UNBC, students organized a dumpster dive. The students who participated in the dumpster dive pulled all disposable coffee cups to the side, strung them together and created a display that was hung from the ceiling of high traffic hallways in community buildings. The display was attached to signs that stated the amount of waste produced from single-use coffee cups. The point of the display was to raise awareness on campus of the consumption of disposable coffee cups. A combination of faculty, staff, and students provided anecdotal feedback to the display, claiming the display was successful in reducing their consumption habits (Smyth 1014).

This strategy (using the display) brought waste to the forefront of people's minds, as they were forced to encounter it, in not one location, but many. It was a relevant issue, as UNBC had just determined, through a waste characterization study, that 5000 disposable coffee cups were sent to landfills every week from the Prince George campus. The display was able to increase awareness and visibility of waste and therefore decrease the number of disposable coffee cups entering the waste stream, as more people brought a reusable coffee cup than had occurred before (Smyth 1015).

Lack of Immediate Incentives for Participants in Recycling Programs

There is little visible evidence that recycling makes a difference for either communities of people or the individual. Home composting of food scraps initiatives are able to directly improve the quality of backyard soil (a visible improvement, or gain), whereas recycling provides no immediate return. The incentive recycling programs provide is often felt at long-distances, or in the long-term. For example, recycling paper results in less trees being cut down. The majority of people in the United States live in urban and suburban areas and therefore are not living in close proximity to areas of forestry and are not exposed to the disadvantages of forestry. In recycling paper, it is not immediately evident that habitats are being saved from erosion, etc. because recycled paper replaces the need for newly forested trees, consequentially saving forested areas.

Strategies

A study comparing recycling strategies and promotions at Big Ten Universities in the United States found that student-recycling behavior was positively affected by public goal setting and by receiving feedback on their rate of recycling. The combination of goal setting and feedback on the goal made recycling more visible to students (Kaplowitz 613). Students were able to see progress towards their goal immediately, which encouraged further recycling behavior.

Barriers to Recycling as a Societal Norm

While recycling can be a societal norm in certain communities, that is not always the case in the United States. When recycling is not a societal norm it requires participants to make the individual decision to recycle. In comparison, throwing out waste is a societal norm, and takes no extra thought or attention—it is a reaction (Iyer 34).

Strategies

“People are more likely to recycle when they observe others in their vicinity recycling” (O’Connell 109). Strategies to garner acceptance incorporate creating an example for potential participants to follow. A study presented in *Fostering Sustainable Behavior* by Doug McKenzie-Mohr, found that using this principle was

effective at increasing the rate of showers being turned off while the user soaped up in a male shower room at the University of California Santa Cruz's athletic complex. A sign was placed inside the male shower room encouraging "showers be turned off while users soap up" (63). The study found that when the prompt was used alone only 6% of users turned off the shower to soap up. However, when the sign was coupled with an example, such as an accomplice to the study entering the shower room and turning the water off while he soaped up, the rate increased to 49% (63).

Another strategy to embed recycling as a societal norm is to access the feeling of "community unity". McKenzie-Mohr presented the example of "We Compost" stickers, used in Nova Scotia, Canada. Stickers were distributed to those who composted in their backyard (determined by a phone survey) and placed on curbside containers. The stickers had multiple positive benefits. The stickers announced to the community that the household composted. In order to remain consistent in the eyes of the community, the household was more likely to continue composting. Secondly, the sticker made an invisible behavior visible. This increased the likelihood that other households would begin to compost (McKenzie-Mohr 77-78).

Lack of Convenience to Recycling in Dual-Stream and Single-Stream Programs

Recycling can be inconveniently complicated. Many items require special attention before entering the recycling stream, such as food containers. These items must be cleaned of food debris before entering the recycling stream, which takes both time and energy. Additionally, there are items that can be recycled, but cannot enter the municipal recycling stream, such as batteries and light bulbs. These items have to be taken to special drop-off sites or stored until a special collection event.

The availability of recycling receptacles may also be limited. Waste receptacles are often provided at more frequent rates than recycling receptacles. Thus, it requires time and energy to locate a recycling receptacle for the individual. At times, recycling receptacles are unavailable. When recycling receptacles are unavailable it is up to the person to decide whether to carry their recyclable until they locate a recycling receptacle, or to deposit it in a waste receptacle. A study conducted at the University of Houston Clear Lake found that potential recyclers stated that time was a factor in deciding to recycle or not to recycle (O'Connor 711).

Incomplete or no knowledge of how or when to recycle particular items is another significant barrier (Kaplowitz 614). Incomplete knowledge of how to recycle or what items to recycle presents two potential problems: the first is that recyclable items will be placed in waste receptacles and enter landfill sites. The second problem is that non-recyclable items will be placed in the recycling receptacle and cause contamination of recyclables. A study conducted in Galway, Ireland in 2005, found the main reason residents chose not to recycle was the inconvenience of sorting recyclables into various receptacles (O'Connell 108). A similar study

conducted in the United States in 2009, also found separating recyclables as a significant inconvenience and barrier to participants (O'Connell 109).

Strategies

This literature search was only able to identify a few strategies to make recycling special items, and items that require preparation, easier. One strategy was presented at Big Ten Universities in the United States: educate participants on how to prepare recyclables and where to drop-off special recyclables (Kaplowitz 614).

In order to make recycling receptacles more accessible and available, UNBC conducted a waste characterization study by first mapping out the location of recycling and waste receptacles and then monitoring the type of waste generated from particular areas, as well as large waste creators, such as food services. The study concluded that the rate of recycling was higher in areas where recycling receptacles were as convenient if not more conveniently located than waste receptacles (Smyth 1011). The same study of Big Ten Universities in the United States concluded that it was important that recycling receptacles be as convenient as possible. If possible, every waste receptacle should be paired with a recycling receptacle. Receptacles should be located as close to places where waste and recyclables is generated as possible (Kaplowitz 613). Additionally, utilizing a single-stream recycling program makes it easier for potential participants.

In accordance with the placement of recycling receptacles, clearly identifiable signage should be attached. Signs should focus on the question of *what* to recycle, rather than *why* to recycle (Iyer 44). A study conducted in Fayette County, Kentucky found that knowledge of why to recycle did not increase the recycling rate; however knowledge of how and what to recycle did (Morgan 34). Signs should be noticeable, self-explanatory, positive, and as close to the recycling receptacle as possible (McKenzie-Mohr 90). Additionally, utilizing a single-stream recycling program makes it easier for potential participants.

Conclusion

From the literature, it is evident that it is important to reduce the amount of waste that enters landfill sites and reduce the demand for virgin resources. Recycling is an important strategy because it combats both issues. There are significant barriers to recycling on both an individual and community level. However, there are many strategies to combat the barriers to recycling. Strategies include, making the benefits to recycling more visible, making it easier on the participant, and specific educational campaigns. While recycling has enabled communities to divert a significant amount of waste, there is a lot of room for improvement.

Research Design and Methodology

Purpose of this Research

The purpose of this research was to assess the current waste collection infrastructure and determine key educational strategies to accompany the transition from dual-stream to single-stream recycling at Illinois Wesleyan University (IWU). The research question that was addressed was: *how can a transition from dual-stream to single-stream be implemented effectively as a way of increasing the rate of recycling on the IWU campus?* Carl Teichman, the Director of Government and Community Affairs, along with a small group of IWU staff members, was given the responsibility to select a company to recycle with, and determine the most effective way to transition from dual-stream to single-stream. This research was completed as a supplement to research conducted by IWU, and Teichman.

The Illinois Wesleyan University Community

Illinois Wesleyan University (IWU) is an undergraduate liberal arts institution located in the Bloomington-Normal, Illinois community in central Illinois. The total enrollment for the Fall 2012 semester was 2,013 students, dispersed between the College of Liberal Arts (79%), the College of Fine Arts (13%), and the School of Nursing (8%). Students enrolled at IWU are required to live on campus, in either a residence hall or sorority/fraternity house for their first two years. Following the first two years, students are given the opportunity to move off-campus, if they choose. In addition to the enrolled students, the IWU community includes 468 full-time and part-time staff members, and is open for use to members of the Bloomington-Normal community. The University lies primarily in the City of Bloomington; however, parts of the campus branch into the Town of Normal ("Illinois Wesleyan: Facts").

The City of Bloomington has a population of a little over 74,000, while the Town of Normal has a population of almost 58,000, according to a census taken in 2011. Bloomington and Normal choose to operate together in many dimensions, such as the public transit service; however, waste and recycling collection is handled separately (Sprouls 1). As of July 2012, when Normal transitioned to single-stream recycling, both Bloomington and Normal were operating using a curbside pick up single-stream recycling program (Bloomington having implemented a curbside single-stream recycling program several years prior in May 2010). Michael Brown, the Executive Director of the EAC¹⁹, said that recycling was key to prolonging the lifespan of the McLean County landfill, alongside other waste reduction strategies.

¹⁹ Ecology Action Center. The EAC is an environmental not-for-profit operating in Central Illinois. The EAC specializes in recycling programs and works closely with McLean County, the City of Bloomington, and the Town of Normal in regards to recycling programs.

The countywide goal for recycling is 40%, just above the 37.5% rate recorded in 2010 (Ann Ford 2).

Research Design

This research was conducted using a qualitative design. An in-depth literature review, one-on-one interviews, and observation were conducted between September and November 2011 as key methods and are described below. The research methods were based on the barriers and strategies to recycling presented in the review of literature. The most often cited barrier was inconvenience, which through mapping recycling receptacles compared to waste receptacles, illuminated patterns and gaps in IWU's current recycling system. The most effective strategies pointed towards the elimination of inconvenience and campaigning using a target community. For this reason, interviews were conducted with the listed key informants in the Bloomington-Normal area to understand the demographic of McLean County. Additionally, the interviews with members of the IWU community aimed to uncover specific trends in recycling behaviors and barriers specific to the IWU community.

Review of Literature

In order to understand how recycling programs work most efficiently at the collegiate level and in other communities a review of the literature was conducted. Sources included a combination of peer reviewed journals, periodicals, and websites (such as the Ecology Action Center web page).

One-On-One Interviews

In order to learn about barriers and current perceptions of recycling in the Bloomington-Normal community I approached key informants and resource agencies in the Bloomington-Normal community. I contacted the Bloomington Publics Works Director, Jim Karch, and the Normal Publics Works Director, Robin Weaver, in order to schedule phone interviews as key informants. I also contacted the Executive Director at the Ecology Action Center (EAC), Michael Brown. The EAC is a resource agency, located in Normal, Illinois, because of its role in the first implementation of recycling in Bloomington and Normal, and its current role as an educational resource for residents of McLean County, where Bloomington and Normal reside. I approached informants through office phones and conducted the interview with Robin Weaver remotely over the phone. I met with Michael Brown at the EAC and interviewed him there. I was unable to interview Jim Karch for the purpose of this research.

In order to understand barriers and current perceptions of recycling on the IWU campus I conducted in-depth one-on-one interviews with a convenience sampling of ten students and four employees of IWU. Student informants were asked if they were interested in participating while at Ultimate Frisbee practice. Additional

students were approached at random in the Center for Natural Sciences, and asked if they were interested in participating. Further communication was conducted through email and cell phone SMS²⁰. Informants were asked to provide their major, year, gender, and residence. Informants were asked open-ended questions about their recycling habits and interest in recycling. Informants were also asked to complete a mini-quiz (see Appendix B) on recyclable items versus non-recyclable items to determine knowledge of recycling on the IWU campus. The interviews lasted no longer than twenty minutes and were all held in the Center for Natural Sciences atrium. I prepared questions prior to the interviews (see Appendix A) and took notes during.

IWU staff informants were selected based upon their office location in order to gain a diversity of perspectives, and approached through email. Office locations selected included the Ames Library, the Center for Liberal Arts (CLA), the English House, and the Office of Residential Life were interviewed. Informants provided their gender, office location, year of employment, and home residence (either Bloomington, Normal, or other). Informants were asked open-ended questions about their recycling habits and interest in recycling. Informants were also asked to complete a mini-quiz (see Appendix B) on recyclable items versus non-recyclable items to determine staff knowledge of recycling on the IWU campus. The interviews lasted no longer than twenty minutes and took place in the interviewee's office on the IWU campus. I prepared questions (see Appendix A) prior to the interviews and took notes during.

In order to learn about the history of recycling on the IWU campus I met with Dr. Abigail Jahiel in her office. I prepared questions beforehand and took notes throughout the interview. In addition I approached Mr. Carl Teichman, the Director of Community and Government Relations. I prepared questions beforehand and took notes throughout the interview.

In order to learn about recycling practices in private areas of the IWU campus: faculty offices and residence hall rooms, I interviewed key informants from the IWU Physical Plant, custodial personnel from various buildings, and Office of Residential Life Sustainability Educators. I approached Bud Jorgenson, the Director of the IWU Physical Plant, by phone, to get contact information for informers. Jorgenson directed me to Dave Shiers, the Manager of Custodial Services. I met with Shiers at his office in the Physical Plant and interviewed him there using questions prepared before hand (see Appendix A). The interview lasted about half an hour. Shiers set up interviews with three custodians, scheduled for the following week, at the Physical Plant and at Munsell Hall.

I met with custodians individually, and interviewed them on their job responsibilities, and issues they saw with waste collection. I specifically asked if they could foresee any challenges to single-stream recycling. One of the custodians

²⁰ Also known as text messaging

interviewed also worked on the labor crew, and was interviewed on responsibilities associated with labor crew in addition to custodial work. Interviews lasted no longer than fifteen minutes each and used questions that were prepared beforehand (see Appendix A). Shiers also recommended I speak with Lawney Gruen, the Supervisor of Labor Services, whom I contacted by phone and interviewed the following week at the IWU Physical Plant. Following the interview, Gruen allowed me to see a waste collection vehicle, and explained the use. I prepared questions for Gruen ahead of time (see Appendix A). The interview lasted twenty minutes. I took notes throughout all interviews conducted.

Observation

In order to learn about the current waste collection infrastructure at IWU, I obtained copies of existing IWU floor plans from the Physical Plant and documented the location and type of visible receptacles labeled as “recycling” and other, including receptacles labeled as “garbage”, “waste” and “non-recyclable” in order to create a map (see Appendix E and F). This data collection had major challenges. The floor plans were taken from copies of original floor plans available at the Physical Plant. The floor plans were of varying availability, reliability, and quality. For this reason, only the buildings Martin Hall, Memorial Center, Hansen Student Center, Ames Library, the Shirk Center, Shaw Hall, Buck Memorial Library, the Center for Liberal Arts, and the Center for Natural Sciences could be observed. Given the buildings listed, some areas were locked and inaccessible to observation. Photographs were taken of the different types of receptacles.

In order to gain a more comprehensive understanding of recycling programs I approached Midwest Fiber²¹ to receive a tour of recycling facilities. I visited Midwest Fiber and received a briefing of the facility, using live video footage from the facility. The Community Relations Specialist, Marie Streenz, provided descriptions and explanations of processes and answered questions as they came up from the footage. I took notes on what I saw and was told, and inquired about details specific to single-stream recycling for the purpose of understanding how IWU should prepare for the transition and common problems with recycling collected.

Summary of Research Findings

Current Recycling Programs in Bloomington-Normal, Illinois

The Town of Normal: Robin Weaver, Director of Public Works

Robin Weaver was interviewed in order to gain insight into the transition from a dual-stream program with collection in several community locations to a curbside single-stream recycling program that took effect in July 2012. Weaver reported a

²¹ Midwest Fiber is a Material Recovery Facility located in Bloomington, Illinois. It services municipalities from Central Illinois.

significant amount of services the Town of Normal provides, including curbside pick up of waste, recycling, leaves, and yard debris. She also said Normal had an electronic recycling and landscape waste drop-off site for residents. The Town of Normal uses separate haulers for waste and recycling, which follow different routes, but pick up recycling and waste for households on the same day. Recycling and waste are both collected weekly.

Weaver reported that the transition to a single-stream curbside program was chosen because there was a lot of demand in the community, and upon assessment of other communities it appeared to be the best option. The major critiques to single-stream curbside came from three directions. She said the first major critique came from long-term recyclers who believed that mixing the recyclables would contaminate them. The second critique was that using haulers to collect waste would increase the carbon footprint. The final critique came from residents who did not want to be charged to recycle. The largest group who supplied the final critique was primarily seniors. The first two critiques were handled by increasing education in the community about single-stream recycling and curbside pick up. Contamination of recycling by broken glass was a concern, but Weaver reported that the MRF technology had improved and that the value of recyclables did not go down with a single-stream system. After studies conducted in Normal, it was found that more carbon emissions were occurring because recyclers were making special trips to community roll-offs, than would be if curbside haulers were used.

In order to promote the new system, the Town of Normal used a consistent graphic, and was present at large community events. In the initial transition there were a lot of questions. Normal sent cards out to all residents including what could be recycled and what could not be recycled, but the cards did not contain everything. Weaver reported that plastic bags were a major source of contamination in recyclables and that they hoped to curb this and other contamination with more education.

Illinois State University: Anonymous, Office of Sustainability

An employee at the Illinois State University (ISU) Office of Sustainability was interviewed in order to learn how ISU transitioned to single-stream recycling, specifically what was effective and what major barriers existed for them. She reported that ISU transitioned in August 2011 because it was cost-effective to do so. The individual reported that the rate of recycling had increased. ISU uses its own hauler to take recycling to Midwest Fiber and picks up recyclables up to three times a week, depending on the campus building.

She said that ISU began educating community members about the single-stream program the month that it was implemented. ISU did not purchase any new receptacles, but rather retrofitted existent receptacles (see Appendix D). She noted that ISU used a drill bit on paper slots to add a circle, and added new signage. She said that locating recycling and waste receptacles for new signage and drilling was

not a concern because ISU has maps of all buildings with receptacles marked, for use in custodial training.

Executive Director of the Ecology Action Center, Normal, Illinois: Michael Brown

Michael Brown was interviewed in order to gain perspective on the role the Ecology Action Center plays in recycling initiatives in McLean County as well as the effectiveness of the transition to single-stream recycling that took place in Normal and Bloomington, Illinois. Brown reported that the current role of the EAC is to act as a resource to the community on environmental issues and to encourage sustainable behaviors and practices as both a way to make the environment healthy and to promote human health. The EAC's biggest partners are municipalities, and receives some funding from municipalities for their work. He said that one of the functions of the EAC is to remain up-to-date on recycling information.

Brown described several recycling education programs the EAC sponsors. One is the "Waste Reduction Program" which is conducted in fourth grade classrooms. The goal is to educate students on how to recycle and what to recycle, so that they can build a foundation, but also so that they'll take their lessons home and teach their parents. Brown said that this program alone wasn't enough, that effective recycling campaigns target people from multiple directions. During Normal's transition to single-stream the EAC acted as a professional resource. The EAC conducted a literature review and survey of other communities to determine how to proceed. He said that one interesting comparison that has yet to be made is the effectiveness of recycling programs in Bloomington compared to Normal, Illinois.

Brown reported that another important tool that the EAC uses is an annual waste audit²². The eventual goal is to track patterns. The waste audits have only been conducted for the previous four years and no patterns have yet been noted. The results of the waste audit are not publically available, but are shared with municipalities. Brown said that they do encourage businesses and smaller entities to conduct their own waste audits, and even offers to share equipment with them.

Brown said that the current goal for a countywide recycling rate was 40% and that McLean County had almost reached that rate, but that the rate went down when the recession hit in 2007. He was unsure why the rate of recycling went down, but did note that the sheer amount of waste produced went down significantly as well. He attributed the decline to the reduced amount of disposable income. Brown noted that Bloomington and Normal represented some unique difficulties because they border and share so much. He said that the biggest challenge in encouraging people to recycle is "reaching those who are hard to reach".

²² A waste audit is designed to quantify the waste stream. It is also referred to as a "Dumpster Dive" later in this section.

Midwest Fiber

Midwest Fiber is a Material Recovery Facility located in the City of Bloomington. The facility is designed to operate using a single-stream recycling program and uses a combination of human employees and machines to sort recyclables. The facility sells bales²³ of recycling to a variety of processors, located both locally and internationally. The interviewee reported the two primary contaminants were plastic grocery bags and needles. Needles were especially disruptive because they require the entire facility to shut down until the needle is contained. For detailed notes on the Midwest Fiber facility please reference Appendix D.

Current Recycling Program at Illinois Wesleyan University

IWU Student Perceptions and Knowledge of Recycling

Interviews with students at IWU were important to understand how students recycle at IWU and what may impact their decision to recycle. Ten students were interviewed using a question guide, detailed in Appendix A. All students reported that they considered themselves to have a positive environmental attitude, when it was explained as “someone who generally supports environmental sustainability programs and practices”. However, of these ten students only seven recycled at their residence (one was in residence halls, and two were off-campus living in Bloomington). Five of those interviewed said they recycled on-campus, only when it was convenient.

Informants reported on how difficult they felt it was to recycle on campus using a sliding scale, “one” represented a lot of difficulty, and “ten” represented no difficulty. The scores ranged from 5.5 to eight. Informants were asked to use the same scale to report on their knowledge of recycling, explained as “how to recycle, when to recycle and what to recycle” (“one” represented no knowledge and “ten” represented immense knowledge). The scores ranged from a score of five, to a score of nine, suggesting that students thought they were semi-able and very able to appropriately recycle. However, three participants asked to lower their score after participating in the recycling quiz, detailed in Appendix C.

All ten informants reported that they recycled at their parent’s house using a single-stream recycling program. Nine of the ten said they grew up recycling. When questioned about the location of their parent’s house all ten were found to live in the suburbs of Chicago. All ten participants said they would support a transition to single-stream recycling; however, only nine reported that they would support more recycling infrastructure on campus (being described as more recycling receptacles). Multiple interviewees used statements like, “it just makes sense to recycle” throughout their interview. The most common item to recycle was consistently paper.

²³ Large cubes of recycling packed together by material and bound by wire.

In analyzing the results of the recycling quiz (see Appendix B), student's scores fluctuated. During the first question of the quiz, students were asked to identify which items could not be immediately recycled, or recycled at all. There were ten correct answers (see Appendix C). Scores fluctuated between three and nine out of ten. Only three out of ten students were able to identify that the recycling numbers were located on plastics and only one of those three knew which numbers could be recycled. However, two other informants were able to identify which numbers could be recycled. Answers varied for the final question, which asked students to identify which items required special attention before recycling, and asked them to describe what to do to prepare the item or where to take it. Most students were able to identify at least one of the correct answers, however there was large variability in what answer they could and could not identify.

This strategy of interviewing students using a convenience sampling presented some limitations. A random sampling would have provided a more accurate representation of findings. Because a convenience sampling was used the data is slightly skewed. Most informants were in their fourth year at IWU. Additionally, the quiz was first attempted during interviews and presented some difficulty. Interviewees had some trouble understanding the questions on the quiz. Misunderstandings here may have skewed the results. Thus pretesting and revising the question guide (see Appendix B) would have improved this method.

IWU Greek Life Participation in Recycling

Anonymous IWU Fraternity Member

An anonymous fraternity member was interviewed in order to know whether or not recycling took place in fraternity houses. While he could not speak for all houses, he reported that his fraternity (Tau Kappa Epsilon) did not have a recycling program set up. He reported that there were approximately four waste receptacles available, and that he would sometimes take his recyclables to campus to recycle. He said he did not know if recycling at his fraternity had been pursued in the past.

He said the most common item placed in the waste that could be recycled was aluminum cans or glass bottles. He said that he would support recycling at his fraternity house and that he would support single-stream on-campus and at his fraternity house.

IWU Staff Perceptions and Knowledge of Recycling

Interviews with IWU staff (who have offices in CLA, Ames, English House, ORL) were important to examine how staff recycles on campus and what may impact their decision. Four staff members were interviewed, using the question guide, detailed in Appendix A. The four staff members who were interviewed, all claimed to have a

positive environmental attitude. Interviewees also all claimed to recycle both on and off-campus.

When asked about the difficulty of recycling on-campus interviewees chose not to use the provided sliding scale. Informants did, however, report consistently that it was easy for them to recycle in areas where they spent a lot of time (such as office, or building), but when meetings or other events were scheduled elsewhere, it was more challenging to recycle. Informants reported their knowledge of recycling between eight and nine, using the same sliding scale (“one” representing no knowledge and “ten” representing immense knowledge). Informants expressed some nervousness when asked to take the recycling quiz (Appendix C).

All four staff members said they began recycling as adults. While all four reported that they would support a transition to single-stream recycling, three said they would support more recycling infrastructure, such as added recycling receptacles. Informants reported paper being the most commonly recycled item.

In analyzing the results of the recycling quiz, staff scored significantly better than students. Three out of four staff members reported that paper soda pop cups could be recycled and two reported that paper coffee cups could be recycled. Only two reported that aluminum foil could be recycled. All four informants were able to identify the plastic recycling numbers, but only one could accurately report which numbers could be recycled. Finally, all informants were able to determine which items required special attention before recycling, and identify how to either prepare the item or where to take it to be recycled. It is important to identify the limitation to this analyses based on the revised questionnaire provided to IWU staff as compared to students.

The Collection of Waste and Recyclables

IWU Manager of Custodial Services: Dave Shiers

Dave Shiers was interviewed as the Manager of Custodial Services at IWU, using a question guide located in Appendix A. Shiers explained that there were three shifts of custodians, based in different areas. Custodial responsibilities ranged from removing waste and recyclables to cleaning the building’s floors. The protocol for removing waste is that there is a clear plastic bag in recycling receptacles in order to identify if contamination has occurred. However, it is not the responsibility of the custodian to check for contamination. Waste receptacles are lined with a black plastic bag. Custodians are responsible for taking out the lining of both recycling and waste receptacles, tying it off and dropping it outside of the building in a specified location, where the labor crew comes and picks both up.

Shiers reported that the custodial workload had not increased with the implementation of recycling. He stated, “Either way the bags have to come out”. Custodians are trained on the job, first working alongside an experienced custodian.

In office buildings, custodians are responsible for entering each office and removing waste and recyclables. While receptacles are located in different locations in each office, custodians become very familiar with their location. When questioned about a rumor that IWU did not recycle, Shiers reported that he had not heard the rumor, but that it may have stemmed from a few incidents in the past where custodians have thrown out bags of recyclables. He said that when incidents are reported, more often than not, the incident involves a temporary custodian, and is immediately corrected.

IWU Custodians

Through Dave Shiers contact was made with three custodians. Custodians were chosen based on their willingness to be interviewed and the location that they worked in. One was located in the Shirk Center, one in the Center of Liberal Arts, and one in Munsell Hall. The objective in choosing a custodians working in different buildings was to gain perspective on recycling across the campus. All three custodians had been employed at IWU before the implementation of recycling and all reported that collecting recyclables did not increase their workload.

Center of Liberal Arts at IWU

The custodian at the Center of Liberal Arts (CLA) reported that he was one of two custodians working in the building. His responsibility was the bottom floor and the communal areas on the second floor. He chose to dump smaller office receptacles into larger lobby receptacles for both waste and recycling, so that the liners could be reused, but reported that the Physical Plant did not require this. He said that paper recycling did not use a liner because the corners of paper shred the bags. The custodian also elaborated on the history of using black bagged liners and clear bag liners.

When asked if there was significant contamination of recycling receptacles he said there was not. He did however comment that when it was obvious that something was recyclable in the waste receptacle he would pull it out and place it in the appropriate receptacle. When asked if he would support a transition to single-stream recycling the CLA custodian said yes. He said that he did not feel that CLA needed any additional receptacles, as waste receptacles were already paired with recycling. He did foresee problems with contamination and thought that clear signage would aid in the transition.

The Shirk Center at IWU

The custodian at the Shirk Center reported that he was one of four custodians working at Shirk. His responsibilities were to clean the two bathrooms upstairs, classrooms, offices, and the bathroom downstairs. He also provided information on the history of the different colored plastic bag liners. He reported that generally

collecting recycling did not increase his workload, but sometimes there would be large amounts of cardboard collected from the offices.

He reported a large amount of contamination in recycling receptacles, and a large amount of recyclables found in the waste receptacle. He also noted that there was a lot of littering at the Shirk Center, especially after large events. He said he would support a transition to single-stream, that it would make it easier on him. He said that he felt there were enough recycling receptacles in the Shirk Center, but that he would not be opposed to more. He felt that better signage would aid in decreasing contamination.

Munsell Hall at IWU

The custodian at Munsell Hall reported that he was one of four custodians for both Munsell and Ferguson Hall. His responsibilities were to clean both lobbies and Munsell Hall floors four and six, the breezeway, and to buff the basement floors. Floors four and six are both male floors. He also provided information on the history of the different colored liners and thought that they were very effective.

He reported a large amount of contamination in recycling receptacles, and noticed the past few years had been especially bad. The most common item he saw contaminating recycling receptacles was food waste. He said that he also removed recyclables from the waste when he saw them and that it seemed as if half the bag of waste was recyclables. He also noticed that custodians working on girls floors brought out a lot more bags of recyclables than he did, working on the boys floors. He said he would support a transition to single-stream recycling, but was concerned about contamination. He was unsure whether single-stream recycling would increase contamination rates or not. He also said that he would support more recycling receptacles in the residence hall, but that proper and catchy signage was needed.

Supervisor of Labor Services at IWU: Lawney Gruen

Lawney Gruen was interviewed in order to understand how much contamination occurs in bags of recyclables collected by the labor crew on campus and whether or not he would support a transition to single-stream recycling. Gruen reported that there were four full-time staff on the labor crew that were responsible for picking up all recycling and waste bags placed outside of buildings by the custodians on a daily basis and depositing waste in the dumpster and recycling in the proper section of the Shirk Center roll-offs. He reported that they also employed student workers but that they were unreliable and often did not show up. He said that at times they have had to pull from the custodial staff because of work load. He said that the labor crew would be willing to meet with hall staff and custodians once a semester to discuss waste removal and contamination in specific areas. He did note; however, that the bags of recycling are not labeled as to where they come from, so there is not a convenient way of telling where the most contamination is occurring.

Gruen reported a few instances of clear bags being used for waste receptacles and vice versa, but not a consistent problem. He did say there was little communication between the custodial staff and labor crew, besides his personal contact with Dave Shiers. He said that he would be in favor of single-stream recycling, but that contamination of recyclables was a major issue. Gruen said that labor crew may have to throw six out of fifteen bags of recyclables in the waste because of contamination a day. He said that there was no training on how to tell if something is contaminated, because it is obvious, and most often because of food waste. He also reported that cardboard boxes were consistently not broken down, which added time and effort to his workload.

IWU Environmental Studies Program Director: Dr. Abigail Jahiel

Shiers reported that several dumpster dives had been conducted in the past and that Dr. Abigail Jahiel had run them. With the purpose of understanding the history of dumpster dives on the IWU campus, and data collected, I interviewed Dr. Jahiel. Jahiel reported that the first dumpster dive was conducted in 2002 as part of the Environment and Society course. She said that dumpster dives had been conducted, through the course, at least once annually, up until 2008. Jahiel said that students who participated were surprised and affected by the dumpster dive; however, there was no way to assess whether participation in the dumpster dive correlated with an increased rate of recycling.

The data collected was organized in percentages. The dumpster dives reported the percent attempted to be recycled, the percent contaminated, and the percent successfully recycled. Each “dive” reported that the most contamination occurred in residence halls.

Residence Halls and the Office of Residential Life at IWU

*Assistant Dean of Students for Campus Life and Director of Residential Life:
Matthew Damschroder*

Matthew Damschroder was interviewed in order to gain a more inclusive perspective of recycling in the residence halls. Residence halls were singled out because they showed the most contamination based on the dumpster dives conducted in 2002 through 2008. Damschroder reported that the Office of Residential Life (ORL) Resident Assistants (RA's) go through a small recycling training game, where they are placed in teams and asked to sort recyclables according to different receptacles. In addition, they are required to participate in a small moodle²⁴ course over the summer.

²⁴ Moodle is online learning software available free, commonly used among IWU staff

ORL developed the Sustainability Educator²⁵ (SE) position as a response to the formation of the GREENetwork²⁶ and other campus sustainability projects. He said that “ORL owned it” and implemented a variety of programs, including the SE position, in order to promote sustainability. He said the position had changed quite a bit from its original conception. Damschroder reported that the Coordinator for the SE’s is a Graduate Assistant. The Coordinator does not receive a lot of training specific to recycling, but does go through an intensive three-week training where the fundamentals of campus sustainability are included.

In regards to the infrastructure of recycling in residence halls, Damschroder reported that the goal was for every room to be provided with a recycling receptacle. He said he would be surprised if even 50% of receptacles remain in the rooms, as there is no inventory conducted. Technically, Damschroder reported, the inventory students are asked to complete at the beginning and end of each academic year include the recycling receptacles, and are priced at thirty dollars; however, they haven’t charged students in recent years for missing receptacles.

When asked about a rumor that IWU does not recycle, Damschroder reported that he had heard it before. His response in the past to students who approached him with concerns was to encourage them to ride along with the labor crew at Physical Plant.

Finally, when asked about the results of dumpster dives²⁷, conducted in the past, Damschroder said that the results had been looked at and used with the decision to purchase more recycling receptacles in residence halls, such as the receptacles that were placed in Dodds Hall. Damschroder reported that contamination he saw primarily was “good-willed contamination”, or contamination stemming from a lack of understanding of what can be recycled and how to recycle.

ORL Resident Assistants and Resident Director at IWU

Two Resident Assistants (RAs) and one Resident Director (RD) were interviewed. RAs are students who apply to ORL staff for the RA position. The RA position is a live-in resource for students living in the building, and an acting authority to maintain rules and conduct in the residence hall. The RD position is also live-in, but

²⁵ Sustainability Educators are students who are stationed in a residence hall for their work study position through the Office of Residential Life. SE’s are charged to educate their peers on sustainability issues, including recycling.

²⁶ GREENetwork, formed in 1998 at IWU, is a coalition of students, faculty, staff that work towards creating a more sustainable campus. The GREENetwork currently meets once a month and is currently co-chaired by Carl Teichman among others.

²⁷ Waste assessment method, designed to analyze how much material was attempted to be recycled, how much of that was actually able to be recycled, and how much could have been recycled, but was not in order to generate a recycling rate.

is a full-time staff member who oversees the residents and the RA's. The RAs and RD were interviewed in order to gain perspective on recycling within the residence halls, their own personal training in sustainability, and the effectiveness of the SE in educating residents on recycling.

One RA reported receiving training in recycling, while the other RA interviewee said she did not receive training in recycling education. Both RA's reported that they may have received some papers about recycling, but they could neither remember if papers for recycling had existed, or if they had read them. The RD reported no formal training in recycling. The RA's both reported that they had not been given information on the role of the SE, other than that they were required to work with them on specific programs²⁸ with them. The RD did report knowledge of the SE position.

When asked if the RAs and RD talked to their residents about recycling all three reported that they neither talked nor encouraged their residents to recycle, but that it may be possible to in one of their programs. All three thought that recycling in residence halls was important. All three supported a transition to single-stream recycling and either more recycling receptacles in residence halls, or the removal of waste receptacles from common areas.

When asked what could improve recycling in residence halls both RAs reported that better and more consistent signage would help, as well as joint programming. They also expressed interest in more training in recycling. When asked if they would be interested in meeting with their custodian once a month to discuss waste and recycling removal both RA's and the RD expressed interest, believing that it may be beneficial.

Sustainability Educator Coordinator at IWU: Helen Woldemichael

Helen Woldemichael was interviewed in order to understand how the Sustainability Educator (SE) position currently operates to increase the rate of recycling in residence halls and reduce the amount of contamination. She was also interviewed in order to gain an assessment of the effectiveness of the SE position at monitoring recycling in the residence halls. She reported that she did not receive formal training on recycling for this position and that to improve her position additional training on environmental issues would be helpful.

When asked about improvements made to the SE position, Woldemichael reported that she worked with an SE and Matthew Damschroder to re-asses the SE position and improve it for the following year. She thought that, when compared to the previous year, the SE position had improved and that the most important difference was that SE's are now able to bounce ideas off each other. She felt that the SE

²⁸ Programs refer to activities hosted in the residence halls by ORL staff members (RAs, RDs, and SEs)

position was effective at increasing the rate of recycling and reducing contamination in the residence halls with the right person, and that she felt the current SE's were passionate about their work and effective. She did however note it was hard to fill the positions, as there was not a large applicant pool.

When asked about the frequency of contamination of recycling in the residence halls she said it was reported about 60% of the time by SEs on their weekly sustainability rounds²⁹. She noted that floors of women generally recycle better than floors of men.

Sustainability Educators at IWU

Two SE's were interviewed, with the purpose of understanding how the SE position approaches recycling within residence halls and how effective the role of an SE is at increasing the rate of recycling and decreasing contamination. Both SEs interviewed had been employed with ORL as an SE for at least two years. The SE position requires SE's to check for contamination of recycling receptacles once a week. SEs are encouraged, but not required to fix contamination of recycling. Both SE's reported that they found contamination in every recycling receptacle, every time they checked. They also both reported that they often found recyclables in waste receptacles. The most common type of contamination they both found was food waste. The most common form of recyclable found in the waste receptacle was plastic bottles, such as soda pop bottles. Both SE's reported that signage was not present when they started at the residence hall and that consistent signage would help improve recycling rates.

When asked to reflect on the effectiveness of their position and what would make the position better, one SE felt that any effect she had on recycling in the residence hall was negligible at best, while the other reported no impact on recycling. Both SE's felt that the most effective aspect of their position was in providing "developers"³⁰ to residence hall staff, and in working with other SE's at campus-wide programs. Both SE's reported receiving no training on how to recycle or educate their peers and voiced frustration with co-workers taking their work seriously.

Illinois Wesleyan University's Transition to Single-Stream Recycling

²⁹ Sustainability rounds require SEs to check recycling receptacles for contamination and report if it occurs, check for water leaks in shower heads and facets, whether lights are left on in communal areas, and if signs and prompts are present throughout the residence hall.

³⁰ Developers are small educational activities designed to increase knowledge of sustainability topic.

Director of Government and Community Affairs at IWU: Carl Teichman

Carl Teichman was interviewed in order to gain perspective on how IWU is approaching the transition to single-stream, and what barriers currently exist to making the transition. Teichman was selected because of his role on the recycling transition committee, including other IWU staff members, to look at local recycling companies and make a recommendation to IWU.

Teichman reported that a large problem with transitioning to single-stream recycling at IWU, is where to place the roll-offs and how to secure them? The roll-offs were purchased by IWU, and Teichman is hopeful that they will be able to continue to be used. Teichman was concerned that if the roll-offs remained at the Shirk Center community members would continue to deposit their recyclables there. IWU will not be offering recycling services to the community when the transition occurs because IWU will now have to pay to recycle. They are taking several considerations under advisement in their decision to relocate the roll-offs. They're wondering if this would make it more or less efficient for Physical Plant.

The second challenge Teichman described was the current infrastructure of recycling receptacles on campus. He reported the committee's goal is to have every waste receptacle paired with a recycling receptacle. The recycling committee will have to assess where recycling and waste receptacles are located currently in order to make a recommendation to the Vice President of Business and Finance at IWU for purchase of new receptacles.

According to Teichman, IWU plans to orient staff to single-stream recycling during the summer of 2013, by implementing it in all academic buildings. Residence halls would be excluded, until August 2013. Students will receive additional information over the summer. The goal is to have the single-stream recycling program fully implemented by August 2013. The target rate of recycling Teichman presented was realistically 60 to 75%, but he ultimately wished for 100%.

Observations and Mapping of Waste and Recycling Receptacles at IWU

See Appendix F for pictures of current recycling receptacles used on the Illinois Wesleyan campus. See Appendix G for floor plans of IWU buildings, with recycling and waste receptacles labeled. In general, it is clear that there are more waste receptacles than recycling receptacles available on the IWU campus. It is also worth noting that a variety of recycling receptacles exist, with a collection of different signage attached. In some cases, small blue receptacles with a recycling symbol printed on the side of the receptacle, were used as waste receptacles. Not all buildings on campus were surveyed, and not all receptacles were photographed.

Discussion of Findings and Limitations

Several methods were used to answer the question: *how can a transition from dual-stream to single-stream recycling be implemented effectively as a way of increasing the rate of recycling on the Illinois Wesleyan University campus?* The first method I used was to conduct a review of the literature. The literature advised targeting a specific community. For this reason two overarching methods were pursued to collect information on current perceptions and barriers to recycling in both the Bloomington-Normal community and the community of Illinois Wesleyan. I used both one-on-one interviews and observation. In total I interviewed twenty-nine members of the IWU community and three members of the larger Bloomington-Normal community in order to determine the best strategies of implementing a transition from dual-stream to single-stream and recycling education in general. I also visited Midwest Fiber to understand more about MRFs and assessed the current recycling and waste receptacle infrastructure on the IWU campus through creating a map with available floor plans of buildings. Below a discussion of the findings is provided.

Perceptions and Knowledge of Recycling on the Illinois Wesleyan University Campus

The results from the ten one-on-one interviews with IWU students showed a gap in perception and actual knowledge of how and what to recycle. It is important to note here that only ten out of roughly 2000 students were interviewed. The small sample size was a limitation to this method. All students interviewed, felt that they had a positive environmental attitude and knew how to recycle. However, when questioned about their specific recycling practices and given the recycling quiz (see Appendix C), their perception of themselves fell short of actual sustainable behavior. When questioned about why they did not recycle, or what made it difficult to recycle, answers included: location of receptacle, amount of receptacles, but did not include knowledge of how or what to recycle. This observation compliments the idea recorded in Matthew Damschroder's interview, where he said contamination in residence halls was "good natured contamination", or resultant from lack of knowledge, rather than lack of interest in recycling.

In comparison, the one-on-one interviews with the four IWU staff members did not exhibit the same perception/knowledge gap. Again, it is important to note the small sample size taken and possible limitations with assuming the sample speaks for the entire population. All staff felt that they had a positive environmental attitude and knew how to recycle. When questioned about their specific recycling practices, they were able to identify how and what they recycle. The results from their recycling quiz showed more knowledge of recycling as well. Many staff members commented that this was something that IWU did [meaning recycling]. When contrasting students against staff it is clear that there is a divide in knowledge, and that staff are generally more knowledgeable. However, staff did report that the majority of their time on campus is spent in one location, rather than many different locations. So while staff may know how to recycle, knowledge of where to recycle was an issue when meetings or other events were held in unfamiliar areas.

When questioned about a rumor that IWU does not recycle most informants reported that they had heard the rumor before. There was no indication that students had approached campus administration about concerns stemming from the myth, or that administration—including the Physical Plant, ORL staff, and GREENetwork—had worked to abolish the myth on campus.

Interviews conducted with students and staff were initially designed to be compared against each other, and therefore had many overlapping questions. The recycling quiz was given to students first, who expressed confusion with the wording of the questions. The questions were reworked for the staff interviews, but contained the same type of question. This represented a significant limitation in the research design.

Recycling in the Greek System at IWU

One interview was conducted with a member of Tau Kappa Epsilon fraternity. From this interview it is evident that there is no recycling program at Tau Kappa Epsilon and that there are a large number of potentially recyclable items produced.

This represents a gap both in the methodology of this research and in the current recycling infrastructure. While the informant from TKE reported interest in a recycling program he is not a representative sample. More research would have to be conducted into interest, specifically at TKE, and whether recycling programs exist in the larger Greek System.

Communication Between Building Staff and Physical Plant Staff at IWU

Interviews with RA's, RD's and RCA's compared to interviews with custodial and labor crew staff suggested that there was little communication between entities, but that all were interested in meeting at either a monthly, or semester basis. All entities felt that improved communication would decrease the rate of contamination in recycling.

Communication between building staff, custodial staff, labor crew and the general IWU community is limited. The responsibility of advertisement for recycling is not generally assigned, and at least within the residence halls, falls to SE's, who are not trained in what can and cannot be recycled, or in how to approach community action based work.

The lack of communication creates a lack of accountability among members of the IWU community. Knowledge of recycling and waste collection practices is largely invisible to the majority and therefore not seen as important. The invisibility of waste is a major deterrent to encouraging recycling initiatives, as seen in the literature review.

Lack of and Quality of Signage at IWU

Consistent across interviews with custodial staff and interviews with SE's, and students was the request for signage on recycling receptacles. Interviews with students suggested that signs were hard to identify at times, as there was not a consistent type of sign. As proof, SE's reported that they had to put new signs up and did not collaborate on signage as part of their job description. Regarding contamination, custodians reported that improved signage would decrease the amount of contamination. Custodians also expressed the need for signage directly on or above recycling and waste receptacles. This finding was consistent with strategies presented in the literature review.

When looking at the photographs of recycling receptacles (see Appendix F) it is clear that a variety of receptacles for recycling and waste exist. In addition, there is a huge diversity in signage, as signs are not removed when they are updated. The confusion this elicits acts as a major deterrent to potential recyclers.

Physical Infrastructure of Recycling Receptacles Compared to Waste Receptacles

IWU students reported one of the significant barriers to recycling currently was the lack of recycling receptacles. They either reported that they did not exist in some areas, specifically Presser Hall, and the Shirk Center, or that they did not know where they were. When comparing this sentiment to the maps (see Appendix G), it is clear that there are fewer recycling receptacles than waste receptacles, and that they are not always placed together. In addition, the location of receptacles is often hidden.

Another observation from the mapping of waste and recycling receptacles is that some of the recycling receptacles have tinted black plastic liners, rather than clear liners. The tinted black plastic liners indicate to labor crew staff that the contents of the bag are waste, and it is therefore deposited in the waste. However, the color of the receptacle and symbol on the side indicate a recycling receptacle to students. This is a significant deterrent, as it is unclear whether the receptacle is recycling or waste.

The Sustainability Educator Position at IWU

There was a disparity in perception of the SE position between the individual SE's and the entities that work with the SE at ORL. RA's and RD's reported that they felt that SE's were effective at promoting recycling in the residence halls, through the signage they placed on receptacles. Due to the structure of the position, at the time RA's and RD's were interviewed there had been no programming on waste reduction or recycling. SE's, on the other hand, felt that they were having no effect on recycling rates in residence halls. They also felt that there were significant problems with the way the SE position works, and that they could be more effective

if the position were structured differently or if the hiring process was different. Specifically, the SEs said they felt their programming in the residence hall was not effective, and that given their other responsibilities they did not have time to create better programs.

This represents a limitation of this research because there is no way to quantify whether the work of the individual SE has, in fact, made an improvement to the rate of recycling in individual residence halls, as bags are not labeled or recorded, and dumpster dives are not regularly conducted. For this reason, it is impossible to know whether the perception of the SE is correct, or whether the perception of RA's, RD's, the coordinator of the SE's, and the Director of ORL is correct in regards to the effectiveness of the SE position in increasing the rate of recycling and decreasing the amount of contamination.

Recommendations

As previously stated, the purpose of this research is to assess the current waste collection infrastructure and determine key educational strategies to accompany the transition from dual-stream to single-stream recycling at IWU. According to my research of Illinois Wesleyan University, through talking with key staff members, and students, and assessing the current waste and recycling collection infrastructure through mapping, I have found that the most important barriers to recycling on the IWU campus, currently, are a lack of knowledge and inconvenience. Following are recommendations to address these barriers and challenges on the IWU campus.

1. Develop and Utilize Consistent Prompting and Signage

To lessen the impact of these barriers a developed educational strategy should be implemented. The strategy should rely heavily on the effective use of consistent signage, meaning the same signs should be used across campus. Signs should be easy to read, placed either directly on the recycling or waste receptacle or above, noticeable, and positive. Signs should also focus on the question of what to recycle, rather than why you should recycle. This should help amend questions of what to recycle. For items that require special attention, such as containers needing to be rinsed out, or batteries and plastic bags that have to be taken to other locations (such as Hall desks) the use of prompts should be used. It is important to note that prompts, unlike signs, need to be refreshed after certain time periods, or they will lose effect, as they become regular. For this reason I recommend developing a series of prompts to encourage recycling of special items, that are replaced routinely every semester. It is important that old prompts are removed, when new prompts are added, so as not to confuse participants.

2. Train Educators

There should also be more training given to those who are in a position to educate others. The SE position is designed for students to educate students within residence halls. Currently, there is no training on what can and cannot be recycled, or how to recycle certain items. There is also no required participation in recycling education given to RA's or RD's, who are in a position to encourage others to recycle through programming as well. My suggestion here, is more in-depth training of what can and cannot be recycled.

3. Host Creative Programming in Residence Halls

Contamination represents another significant barrier to the rate of recycling. While signs and prompts will help with this, the issue of contamination is largely still invisible to the IWU community. I recommend the implementation of several methods to reduce the amount of contamination. The review of the literature advocates for the use of interventions, or programs, and many of them. For this reason, I have presented several examples of interventions below. According to the research I conducted, the most contaminated areas of campus are residence halls. For this reason, the interventions are directed at students.

a) Encourage students to participate in mini-dumpster dives. Student participation in dumpster dives would simultaneously raise awareness of contamination and monitor the current rate of recycling for a particular area. My suggestion here is to have floors participate in a dumpster dive at intervals, and assess their progress of their recycling rate, and decreased contamination rate.

b) Promote a program that pits halls against each other, or floors against each other, or even boys versus girl's floors, to have the highest rate of successful recycling, excluding bags that are thrown out due to contamination. Offer a prize for the floor that after the set period has the best recycling rate. Publicize progress and results.

c) Ask halls, or floors, to make public commitments to recycle, and set goals. Keep track of their progress towards goals, and announce to campus when goals are met. Hold floors accountable. Have RA's ask residents to sign a written pledge to recycle.

d) Use recyclable material from dumpster dives that was thrown in the waste, to make a display. Place the display in a public area that will catch people's attention. Accompany the display with information to raise awareness.

These programs have the potential to be implemented on a larger scale as well. Have IWU set a goal, and publicize the goal. Make it a separate goal from the McLean County goal. Approach Illinois State University, or Heartland Community College, to conduct a competition between universities. Encourage competition, but supplement it with knowledge so that the practice of recycling continues. Students

are hard to target because they are not permanent. Students rotate in and out consistently. While a community of recyclers is established among the staff, it is hard to establish that among students, who are transitive.

4. Strategize Location of Recycling Receptacles.

The location and availability of recycling receptacles should be strategic. I recommend the implementation of several trial programs, and a follow-up evaluation, in order to determine the best method of recycling collection. I have given several suggestions, based on the literature, and interviews with custodians.

a) Decrease the number of waste receptacles to match the number of recycling receptacles, and place next to each other, *in every circumstance*. For example, every study room in the Ames Library is provided with a waste receptacle. Rather than adding a recycling receptacle to the room, remove the waste receptacle. This will force room users to carry trash and recyclables out of the room, where they will encounter receptacles that are paired together. Use a pilot test and sample population to determine the value of this recommendation.

b) Increase the number of recycling receptacles to match the number of waste receptacles, and place next to each other, *in every circumstance*. Using the same example, rather than removing waste receptacles, add a recycling receptacle, so that room users are given the choice.

In order to decrease the number of receptacles purchased to support the transition I recommend that an attempt at retrofitting current receptacles be made, using the model from ISU.

5. Update University Floor Plans for IWU Campus Buildings

I recommend that the University invest in updated floor plans for all campus buildings, with recycling and waste receptacles marked, for use by custodial staff. This would also help with the retrofitting of receptacles, and signage, as it is not known where all receptacles are located.

6. Improve Communications

I recommend that communication be improved between building staff and custodial and labor crew staff. Monthly meetings to report on problems with recycling and waste collection, triumphs, and barriers, may help both building staff approach recycling education and protocol from a more comprehensive standpoint and will hopefully reduce the amount of contamination, and work for the custodial and labor crew staff. Meetings should be mandatory, but informal. Meetings should include both IWU staff (such as RD's) and student staff (RA's, RCA's, and SE's).

7. Implement Food Composting on a Larger Scale

Recycling contamination was most often reported as due to food waste (not only lack of rinsed containers, but loose food). The literature also suggested that food waste constituted a large portion of the waste stream, with the potential of repurposing. For this reason, I recommend implementing a more accessible composting system on campus. While composting exists on the IWU campus in the student-dining hall, it is limited. Students do not have the ability to collect food scraps from their residence hall room, or in take-away eating locations, with the purpose of composting. I recommend providing receptacles for food scraps in a variety of locations. Ideally, they should be available on every floor of every residence hall and in communal areas, which are popular for eating—such as the Dugout, Hatties, and Tommy's. First it should be implemented as a trial program, as the review of literature and research methods were unable to determine other methods of minimizing food waste.

8. Implement Recycling in Fraternity Houses

Develop a committee of fraternity members (members from all of the different houses) and strategize effective ways of implementing and promoting recycling behaviors localized to their houses.

9. Model Recycling Education After Other Universities

Conduct more research into how other Universities handle their recycling education and promotion. Highlight one agency on IWU's campus to be a comprehensive body of knowledge on recycling and set minimum requirements and goals for this entity.

Conclusion

Due to rising concerns with waste in McLean County, IL, it is necessary to re-evaluate the amount of waste produced. Largely as a consequence of the Town of Normal's transition to curb-side single-stream recycling, and stoppage of roll-off pick up at the IWU campus, scheduled for May 2013, IWU has an imminent need to reevaluate waste collection procedures. For this reason, IWU has chosen to convert their recycling program from dual-stream to single-stream. The goal in this transition is that the rate of recycling will increase, which will act as a benefit to the IWU community in multiple ways, one of which is the stalling of the McLean County landfill filling. While single-stream recycling programs do not necessitate an increased rate of recycling, they do provide participants a more convenient option, which is a major barrier to recycling currently. In order for the transition to single-stream recycling at the IWU campus to be most effective, an educational campaign, and shift in infrastructure of recycling receptacles compared to waste receptacles is a necessary accompaniment.

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*Appendices are included as supplemental files online at
http://digitalcommons.iwu.edu/envstu_seminar/13*

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