Final Report:
The Recycling Intern
Project: 1993-94

By

Peter Collier
Project Director

Nan Stark
Assistant Project Director

June, 1994

Recycling Education Projects
Center for Urban Studies
Portland State University
Portland, OR. 97207-0751
(503) 725-4020
(503) 725-5199 FAX
http://www.upa.pdx.edu.centers.html#CUS
This report details the Recycling Intern Project, sponsored by Portland Youth Advocates, under a grant from the Collins Foundation, and operated by faculty at The Center for Urban Studies, Portland State University.
EXECUTIVE SUMMARY
PORTLAND YOUTH ADVOCATES’
RECYCLING INTERN PROJECT 1993-94

Background
The Recycling Intern Project was an experience in community-based learning targeted at Roosevelt High School students who lived in and around the Columbia Villa/Tamarack Housing Development. The project involved youth in local recycling and waste stream-related issues, and also promoted on-going recycling activities at the Columbia Villa complex.

Originally designed as an after-school course for between ten and twelve participants, the acquisition of additional resources allowed the project to be expanded to serve 35 to 40 students as part of the curriculum for the Natural Resource Pathway science classes at Roosevelt High School.

The expanded project had two main parts:
- the Recycling Awareness Program: two, six-week classes at Roosevelt, taught by a team of Portland State University students and two high school-aged recycling interns; and
- the new Recycling Intern Project: an arrangement where Roosevelt students, who also lived at Columbia Villa, became part of the team teaching the Recycling Awareness Program; while engaged in additional recycling promotional activities outside of the school project.

The Recycling Awareness Program
The Recycling Awareness Program consisted of four elements:
- a series of informational presentations - Made by members of the teaching team, topics include: types of materials which can be recycled and how to prepare them for recycling; a history of recycling with a local emphasis; the 3 R’s: “Reduce, Reuse, Recycle;” composting; packaging/wise consumerism; and waste characterization.
- field research - Eight weeks of field observations of selected recycling collection systems at Columbia Villa conducted by teams of Roosevelt students.
- production of recycling videos - Each Natural Resource Pathway science class produced three recycling promotion videos.
- “kids-teaching-kids” - A multi-level educational program where students at one level became the teachers at the next level. The Portland State University program staff taught
the college students and interns, who then taught the high school students, who then taught the elementary school students.

The Recycling Awareness Program utilized several innovative teaching techniques:
- credibility enhancing activities,
- video technology to promote: commitment, motivation, role identification, student bonding, and empowerment; and
- a program to increase students’ feelings of self-efficacy.

**New Recycling Intern Project**
The new Recycling Intern Project utilized Roosevelt students living at Columbia Villa as part of the Recycling Awareness Program teaching team. These student interns:
- supervised the field research conducted by other Recycling Awareness Program members,
- directed the data entry process,
- facilitated communication between the Roosevelt students and the project staff, and
- communicated feedback to Columbia Villa residents as to the effectiveness of their recycling efforts.

**Outcomes and Conclusions**
The combination of the Recycling Awareness Program and the new Recycling Intern Project met all of the goals of the original Recycling Intern Project:

1) to increase the level and quality of recycling participation at the Columbia Villa/Tamarack Housing Development through a community education program.

Recycling participation at the Columbia Villa/ Tamarack Housing Development was measured using a “Participation Rating System” developed by the Recycling Education Projects at Portland State University. It was primarily a measure of recycling quality. There were two key dimensions to the rating system: 1) the amount of time it took the hauler to rectify the problem, and 2) the volume of recycling materials involved. Depending upon the amount of time needed to rectify the recycling problem, and the volume present, collection systems were rated on a scale which utilized values from “no stars” (lowest) to “five stars” (highest). The average participation rating score for all the monitored collection systems before the Recycling Awareness Program was 2.56 stars; after the program, 2.78 stars. While some systems improved more than others, overall the Recycling Awareness Program and the new Recycling Intern Project seemed to be associated with an improvement in recycling at Columbia Villa.
2) to offer learning experiences in the areas of recycling and community organization to local youth. The participants in the Recycling Awareness Program learned valuable lessons in both recycling and community organization. Both of the recycling interns, as well as the other student participants, showed significant improvement in level of recycling information, frequency of enactment of recycling related behaviors, and level of identification with the role “recycler.”

3) to incorporate community-based learning experiences into the relevant curriculum at Roosevelt High School. The greatest single benefit of expanding the original Recycling Intern Project was the opportunity to incorporate the project into the Natural Resources Pathway science curriculum at Roosevelt High School. The Recycling Awareness Program is scheduled to be conducted again at Roosevelt High School during the 1994-95 school year with a new class of sophomores. The materials used in the 1993-94 program have been collected, and are currently being organized into a packet of lesson plans so that teachers at Roosevelt and other high schools can continue the Recycling Awareness Program even after the collaborative effort with Portland State University is finished.
TABLE OF CONTENTS

Introduction .......................................................................................................................... 1
Setting ................................................................................................................................. 1
Recycling Background ....................................................................................................... 1
Evolution of Recycling Intern Project .............................................................................. 2
   Original Design ............................................................................................................ 2
   Natural Resource Pathway Program ......................................................................... 2
   Portland Educational Network ................................................................................ 3
Definitions ........................................................................................................................ 3
Recycling Awareness Program ......................................................................................... 4
   Program Components ................................................................................................. 4
      Information Presentations ..................................................................................... 4
      Field Research ...................................................................................................... 5
      Production of Recycling Videos ......................................................................... 5
      "Kids Teaching Kids" ....................................................................................... 6
      Celebration ......................................................................................................... 7
Recycling Awareness Program Techniques .................................................................... 7
   "Stair Step of Credibility" ....................................................................................... 7
The Use of Video ............................................................................................................... 8
   commitment ................................................................................................................. 8
   role-identification ..................................................................................................... 8
   empowerment ............................................................................................................ 9
   motivation ................................................................................................................ 10
   bonding instrument ................................................................................................. 10
Self-Efficacy ..................................................................................................................... 10
Measurement Device ...................................................................................................... 11
Recycling Awareness Program Outcomes ..................................................................... 11
Outcomes Related to Recycling at Columbia Villa ....................................................... 11
   Participation Rating System .................................................................................. 12
   Collection System Ratings .................................................................................... 12
Youth-Related Outcomes ............................................................................................... 13
   Measures of Level of Recycling Information ...................................................... 13
   Measures of Recycling-Related Behaviors .......................................................... 14
Conclusions: Recycling Awareness Program ................................................................. 19

Recycling Intern Project .............................................................................................. 20
History of Project ........................................................................................................ 20
Intern's Role in Project ............................................................................................... 21
Field Research ............................................................................................................. 21
Data Collection and Entry ......................................................................................... 22
Communication ........................................................................................................... 23
Documentation ............................................................................................................ 24
Recycling Intern Project Activities ............................................................................ 24
Field Trips .................................................................................................................... 24
Recycling Promotion Activities .................................................................................. 25

Recycling Intern Project Outcomes .......................................................................... 25
Outcomes Related to Recycling at Columbia Villa .................................................. 25
Youth-Related Outcomes ......................................................................................... 26
Measures of Level of Recycling Information ............................................................ 26
Measures of Recycling-Related Behaviors ............................................................... 26
Measures of Level of Role Identification ................................................................ 26
Summary of Youth-Related Outcomes ..................................................................... 27

Final Conclusions: Recycling Intern Project ............................................................... 28

LIST OF TABLES

Table
1 Recall of Recyclable Items ...................................................................................... 13
2 Students with 100% Increase in Number of Items Recalled ...................................... 14
3 Strength of Effect Over Time .................................................................................. 14
4 Example of Positive Recycling Behavioral Improvement ......................................... 15
5 Reuse-Related Behavioral Improvement .................................................................. 15
6 Decrease in Negative Recycling Behavior ................................................................ 16
7 Positive Recycling Behavioral Improvement ............................................................ 16
1993-94 RECYCLING INTERN PROJECT

INTRODUCTION

Portland Youth Advocates’ Recycling Intern Project was a community-based learning course designed to involve Roosevelt High School youth in local recycling and waste reduction issues in their local neighborhoods. At the same time, the project promoted on-going recycling activities at the Columbia Villa/Tamarack Housing Development.

The Recycling Intern Project had three major objectives:

- to increase the level and quality of recycling participation at the Columbia Villa/Tamarack Housing Development through community education.
- to offer learning experiences in the areas of recycling and community organization to local youth, and
- to incorporate community-based learning experiences into the relevant curriculum at Roosevelt High School.

Setting

Roosevelt High School is located at 6941 NE Central Ave., in the St. Johns area of Portland, Oregon. The Columbia Villa/Tamarack Housing Development is a low-income, Housing Authority of Portland complex located approximately five minutes from Roosevelt High School. There are 458 units in the Columbia Villa section; 120 units in the Tamarack section. This project was conducted exclusively at the Columbia Villa section of the complex.

Recycling Background

Columbia Villa was the first public housing complex in the state of Oregon to have multifamily recycling collection systems. In the summer of 1989, students from the Recycling Education Projects (REP) at Portland State University, along with youth recycling interns, initiated recycling collection. Since that time, Columbia Villa -- due to its large size and high turn-over rate of residents -- has been the focus of several other recycling education efforts.

During 1992-93, the REP conducted a year-long, City of Portland-sponsored project to increase recycling participation at the Columbia Villa/Tamarack Housing Development. A highly successful sub-project involved the utilization high school-aged youth as spokespersons to the larger community in an effort to reduce problems associated with recycling at this complex (Collier, et al., 1993).
Evolution of Recycling Intern Project

The Recycling Intern Project was expanded in several areas in the process of reaching its final state.

Original Design

As initially proposed, the Recycling Intern Project consisted of a team of three “teachers” -- the project director, a graduate assistant, and a youth intern (qualification: must live in the Columbia Villa complex, and attend Roosevelt H.S.). This team was scheduled to teach 2 different groups of 5 to 6 high school youth about recycling and waste reduction issues as part of a five week “after-school” class.

Natural Resource Pathway Program

Conversations with teachers from the Natural Resource Pathway Program at Roosevelt High School indicated significant interest in their school participating in an expanded version of this class. They saw this as a vehicle for developing community-based learning experiences in the area of recycling for students in the Natural Resources Pathway classes. It was proposed that the expanded Recycling Intern Project be incorporated as part of the curriculum for the sophomore-level, Natural Resources Pathway science class for the 1993-94 school year.

This was a tremendous opportunity for the Recycling Intern Project to realize one of its major objectives -- “to incorporate community-based learning experiences into the relevant curriculum at Roosevelt High School.” Roosevelt services the students who live in and around Columbia Villa.

Another positive benefit derived from the expansion of the project to the high school, was the opportunity to increase the number of participating youth. Instead of working with two groups of 5 to 6 students, as originally planned, the expanded project called for having the teaching team present their material to two classes of high school sophomores. Each class consisted of between 18 and 24 students. The original plan allowed 10 to 12 students to participate; the expanded plan allowed the participation of 36 to 48 (an increase of between 250 and 300%).

Several problems needed to be addressed before the expanded project could be implemented. The two largest problems concerned lack of resources, or more specifically, insufficient funding for a project of this size, and the shortage of teaching personnel. A solution for these problems was found in time to keep the project on schedule.
Portland Educational Network

The Portland Educational Network (PEN) is a state-funded resource institute located at Portland State University. Under the Endangered Urban Children and Youth Grant, their goals include seeking to develop classes at Portland State, and at other educational institutions, which bring students into the community to work on local issues. They agreed to sponsor a two-term course at Portland State University taught by the principal investigator of the Recycling Intern Project, Peter Collier. The course was titled “Impacting People Impacting the Environment: The Social Psychology of Recycling I & II.”

The development of this series of courses addressed both of the earlier problems simultaneously. First, additional funding from PEN alleviated the problem of “insufficient resources.” PEN’s support included a graduate assistant for the project, classroom supplies (which were utilized for both the Portland State University courses and the high school classes), video documentation support, and transportation for taking the high school classes on field trips.

Second, adding the Portland State University class effected the second problem -- “a shortage of teaching personnel” -- in two ways. First, the Portland State University course provided six students to assist in teaching the class on recycling at Roosevelt High School. Second, the additional funding from PEN, freed up previously dedicated funds, under the original Recycling Intern Project, which then allowed for the hiring of a second high school intern for the project.

Definitions

Before the expanded course that was taught at Roosevelt High School during the 1993-94 school year can be described, the clarification of some definitions are necessary.

The Recycling Awareness Program: the community-based educational program taught to students in the Natural Resource Pathway science classes, at Roosevelt High School, by the team of high school interns and Portland State University students. Parts of the original Recycling Intern Project are included in this larger program.

The Recycling Intern Project: that portion of the larger Recycling Awareness Program that involved the two student interns, as well as the additional activities they carried out beyond those included in the Roosevelt classes.

The Social Psychology of Recycling I & II: the two-term course at Portland State University, which prepared students for the Recycling Awareness Program at Roosevelt.
RECYCLING AWARENESS PROGRAM

The “Social Psychology of Recycling” courses at Portland State University, conducted during Fall term, 1993, and Winter term, 1994, prepared the team of college students for teaching the Recycling Awareness Program at Roosevelt. During this period was also the first time the high school interns interacted with the college students.

Program Components
University students did not have to already be knowledgeable about waste reduction to participate in this class; over 1/2 of the students had no background in recycling. The Portland State University courses prepared the students by having them go through the different tasks that would make up the Recycling Awareness Program.

Each Portland State University student practiced presenting their recycling information for the Roosevelt class. Then, along with the interns, they conducted two weeks of field observations in the setting that would later be utilized with the Roosevelt class. Finally, they developed their own three-minute video on recycling, geared to the high school audience. This was an important experience because the Portland State University students would eventually lead groups of high school students as they produced their own recycling videos.

The Recycling Awareness Program at Roosevelt High School had four main parts:
   • Information presentations;
   • Field research;
   • Production of recycling videos; and
   • Kids teaching kids.

Information Presentations
Members of the student teaching team made informational presentations to the Natural Resource Pathway science classes on a variety of recycling and waste stream reduction-related topics.
Topics included:
   - Types of materials which can be recycled, and how to prepare them for recycling;
   - History of recycling, with a local emphasis;
   - The 3 R’s: Reduce, Reuse, Recycle;
   - Composting;
   - Packaging/Wise Consumerism;
- Waste characterization: what is thrown away; how individuals can reduce the amount of garbage that they generate;
- Language materials (i.e., recycling information for non-English speakers)

Field Research
The teaching team of interns and college students initially modeled the data collection procedures for the class of high school students in the classroom. They demonstrated the correct techniques for monitoring the quality and amount of recycling set-outs found at a collection system, as well as how to correctly record the field data that they collected.

Next, the high school class was broken into smaller “monitoring groups,” each accompanied by several members of the teaching team. The class was then transported to the Columbia Villa Housing development, which is located approximately five minutes from Roosevelt High School. Once at the complex, each monitoring group collected data on designated recycling collection systems at different locations throughout the complex. Using portable scales, the students weighed recycling containers for different types of recyclables and assessed the sites for proper usage and participation.

The field research component allowed for several learning opportunities. First, the high school students were trained in methods of data gathering and analysis in a real life setting. Second, they experienced the group process while working in the field. Finally, the students learned first-hand, about some of the issues that a community must address in order to conduct a successful multifamily recycling program.

Production of Recycling Videos
As mentioned earlier, the college students produced a 3-minute pro-recycling video which was geared to the high school audience. It served as an introduction for the high school students to the topic of recycling, and also started them thinking about what they would do if given the chance to make their own recycling video. Eventually, each of the three smaller, “monitoring groups” developed a short video promoting recycling.

The process of making videos in small groups ensured participation of all students and enhanced the opportunities for individual mentoring. In the small group sessions, students worked in a format which gave each of them an individual responsibility to help in a team effort. The interns and college students assisted the small groups of high schoolers in producing their own recycling videos.
The Roosevelt students participated in brainstorming to create a concept for their videos, then they developed a rough script. All ideas and suggestions were validated as students took turns writing down what was said. The high school students used information they received from the teaching team’s presentations to develop their ideas into video form. They gave each other feedback as the script was developed.

The groups then worked together in creating costumes and gathering props. Each group rehearsed their final script over several class meetings, and then were videotaped. Each student’s part in the final video production underscored their individual importance to the group. Everyone had a role in developing the video, and everyone had a spoken part in it as well. During this entire process, the identity of each high school student as a recycler was being reinforced, culminating in their individual statements to the camera at the end of the video: “My name is ______, and I recycle!” The videos were edited into the finished products, using background music chosen by the students. The groups of high school students used these videos in their subsequent presentations to the grade school students. At the end of the class celebration, each student was given a copy of their group’s video.

"Kids Teaching Kids"

“Kids teaching kids” was an approach to learning that was different and exciting. Students of various levels taught each other after receiving training and information on the subject of recycling. The teaching team of college students and high school interns were presented information on recycling by the Portland State University instructors. They then were assigned topics upon which to base their information presentations. Next, the students were required to research their particular topics. They presented their topics to each other in preparation for their presentations to the high school students. In this way, they all received extensive information on recycling issues prior to going to the high school.

Then, as part of the Recycling Awareness Program at Roosevelt, each member of the teaching team gave her/his presentation, and provided the class with a handout relating to the topic being covered. The Portland State University students went from being “students” to now being “teachers.”

As noted above, the field research section of the high school class worked the same way. After learning how to conduct monitoring and observations of recycling systems as a class, the teaching team instructed the high school students about measurement of recyclables collected at the housing development.
The video production process followed the same plan -- first the team of interns and college students learn, then they taught the high school class. However, here the process had an additional step.

Upon completion of the videos and preparation for presentations, the entire Natural Resource Pathways science class went to a local grade school, which serviced the children who live in Columbia Villa and the surrounding areas. Here, the Roosevelt students became the teachers. Members of the different small groups spoke to third, fourth and fifth graders about recycling, and showed the videos they made. They also provided interactive opportunities to involve the younger students in the presentation, and left them with buttons to reinforce their new identities as recyclers.

Celebration
At the end of the “Recycling Awareness Program,” the contributions of the Roosevelt students in promoting recycling in the community were acknowledged in a “celebration.” All the participants - high school and college students, interns, and faculty - joined together for a celebration of the success of the program.

Local merchants donated food and beverages for the post-program party. The celebration stayed consistent with the theme of the program by only using either products packaged in recyclable containers, or those whose wastes could be composted.

The celebration completed the circle. Not only did the students feel that they had impacted the community through their promotional activities, they also realized that the community appreciated and acknowledged their efforts.

Recycling Awareness Program Techniques
Several innovative techniques were utilized in the Recycling Awareness Program that warrant further discussion.

"Stair Step of Credibility”
Part of the goal of the Portland State University course, “The Social Psychology of Recycling,” was to facilitate the Portland State University students and interns credibility as spokespersons for recycling by the time they started teaching at Roosevelt. A “credible message source” is important to persuasive communication. Credibility has 2 parts - “trustworthiness” and “expertise” (Hovland, et al., 1953). The teaching team of students were seen as more trustworthy
by the Roosevelt High School students because they were younger and more “cool” than the teachers.

The multi-faceted Portland State University class was structured to “make” each student an expert about some area of recycling. The combination of trustworthiness and expertise work together; it then becomes “natural” for the high school students to see the Portland State University students as credible role models.

The Recycling Awareness Program continued the development of this sequence of credible message sources through a pattern of structured activities and the presentation of information from one level to another. The students at one level became the teachers at the next.

The Use of Video
The Recycling Awareness Program utilized video in several innovative ways.

commitment
At the end of the different video projects, each student looked into the camera and said “My name is ______ and I recycle.” This was designed to increase student commitment to “acting like” a recycler. This is based on extensive literature on the use of public commitment as a social influence technique. Of particular importance are studies that show that attitudes which are publicly stated are less likely to change, and that the public expression of attitudes serve to increase the performance of behaviors consistent with those attitudes (Kiesler, et al., 1971; Pallak, et al., 1980; Burn & Oskamp, 1986).

role-identification
The program component (described under commitment) where, at the end of each video, each student looked into the camera and said “My name is ______ and I recycle,” was also a tool that increased identification with the pro-social role, “recycler.”

This concept is grounded in Symbolic Interactionist theory, and is based on the work of Mead (1934) and Cooley (1902). Mead proposed that the “self” has two components: the “I” - the subjective representation of self (my view of self “inside my head”); and the “me” - the reflexive self in society (how other people react to the self I present; do they affirm it or contradict it?). Cooley’s contribution is something he called “The Looking Glass-Self”: the idea that our self concept develops as a result of a social mirror provided by other people with whom we interact.
For example, a youth may have one view of him/herself inside his/her head, while other people don’t see the person in that way (for example a young woman could think of herself as athletic but everyone else thinks she’s clumsy; a boy could think of himself as a popular with girls, but everyone else sees him as the nerd he was in 6th grade). In Mead’s terms, this is a “non-match” of the “I” / “me.” So the youth is not very motivated to put much effort into this area of “self” because she/he doesn’t feel others see the real person “inside.”

Then someone intervenes. A coach may notice a girl is tall, though uncoordinated, and decide she’s a basketball player. The coach starts treating her as an athlete, her skills improve, and now the “I” / “me” match. In Cooley’s terms, the mirror reflects back almost the same image she had of herself in her head. It could be the same with the boy mentioned earlier. A girl decides the boy is cute, and sees him as a boyfriend, so he starts acting like one. In each of these cases, the intervention required another person to see how the subject was acting, recognize a different meaning in that subject’s actions than most other people noticed, begin to see the subject in a more positive way, and thus validate that person's internal view of self. When the two sides of self match, a person is eager to continue in this role because she/he feels good about who she/he is.

In the Recycling Awareness Program, the camera takes the place of the other people. Instead of another person having to “translate” the subject’s actions into a version of who that person really is, the subject gets to see him/herself on camera, acting just like a recycler (because of the structured activities of the program). From there it’s a small step to the person saying, “I guess I really am a recycler” or “I guess I really do care about what happens to my community.” Now that the person has told everybody he/she is a recycler it’s easier on their self-concept to do whatever extra work she/he has to do to be a recycler, rather than exerting less effort by not doing the work and having to accept self-definition as a phony who says one thing and does another.

**empowerment**

The process of developing the videos (at Portland State University or Roosevelt High School) was designed to allow the students the maximum amount of freedom in determining what they were going to use for a topic in the video, which visual images were used, dialogue selection, costume creation, and choice of music. Even though the group leaders subtly directed the video so that it fell within certain guidelines, the students made the final decisions. Just as in the other aspect of course design, where students on one level were turned into teachers on the next level, the amount of control that students felt when they conducted these successful projects
empowered them. The feelings of being in control of what happens to them in what is typically a “no-control” area (i.e. school), motivated the students to continue with the class.

**motivation**

Just the presence of the camera in the classroom increases the likelihood of students trying their best. One of the problems that teachers have to deal with is the issue of students who feel they have to act “cool” (non-responsive, unenthusiastic) in order to “fit in” with what they think are peer expectations. But these students usually never get a chance to see how childish and “stupid” they appear to others when they act so lifeless and bored. People always wanted to jump around and show-off for the camera. When the camera was on them (even if it was not recording) almost every student chose to act in a positive and animated manner so that they looked “good” on video, and to themselves, rather than “cool” for their friends.

**bonding instrument**

The use of “hip” music in the Portland State University video served to let the Roosevelt High School students know that, as opposed to their parents, the college students were “with it.” Both groups listened to the same music. It served as a common ground. The high school students then brought in their own favorite music to use in the video, and at the same time, tried to impress the college students with how “hip” their musical taste was. Similar taste in music, as well as an interest in music videos, served as an initial bond between the Portland State University class and the Roosevelt students, which then made conducting the rest of the class easier.

**Self-Efficacy**

Bandura (1986) argued that whether or not people will undertake particular actions in the environment, attempt to perform certain tasks, or strive to meet certain goals depended on whether or not they believed they would be successful in performing those actions. In time, both the Portland State University and the Roosevelt High School students realized that their efforts impacted the local community.

Field work provided Roosevelt students with the opportunity to positively impact recycling participation in a local public housing development -- Columbia Villa. Students collected data that measured the volume of recycling at the complex. After collecting data over a period of one month, the recycling interns led a group that passed out flyers to the Columbia Villa residents. These flyers gave feedback on the previous month’s recycling efforts, as well as explained what and how to recycle.
The students knocked on doors and personally went over what was stated on the flyers. This allowed the group of students to have a first hand understanding of how their field research could increase the recycling participation rates over time. This led to increased motivation to stay active in the community for both Portland State University and Roosevelt High School students.

Measurement Device (See Appendix I for a copy of Device)
A questionnaire was administered to the program participants on three separate occasions:

* “t-1” -- (October, 1993) at the beginning of the 7th period “Recycling Awareness Program”
* “t-2” -- (December, 1993) at the end of the 7th period and the beginning of the 6th period Recycling Awareness Program; and
* “t-3” -- (March, 1994) at the end of the 6th period “Recycling Awareness Program”

(See Appendix II for program design)

The device had three main sections:
1) a measure of student knowledge about recycling, indicated by the number of potentially recyclable items the student was able to identify;
2) measures of positive and negative recycling-related behaviors, figured in terms of responses to twelve questions concerning recycling, using a three-position scale, and
3) measures of the importance of the role “recycler,” figured in terms of response to 5 questions, using a 9 point Likert scale.

RECYCLING AWARENESS PROGRAM OUTCOMES

Outcomes of this program need to be considered in two different areas:

- those relating to the amount of participation and quality of recycling at Columbia Villa, and
- those associated with the youth participants in the Recycling Awareness Program.

Outcomes Related to Recycling at Columbia Villa
A sub-set of the 35 recycling collection systems at Columbia Villa were targeted for the monitoring and observation program with the Roosevelt students. Nine adjacent collection systems (slightly more than 25% of the total number) were included in the field observations. All of these systems had at least three weeks of observations conducted before the first feedback flyer was distributed, and at least two weekly observations conducted after the first feedback flyer but before the second one. The feedback flyers, as noted earlier, provided the residents who
lived near each system with specific information regarding the effectiveness of their recycling efforts.

**Participation Rating System** (Collier, et. al, 1993)

Recycling participation was defined as:

1. the generation of recyclable items, and
2. the proper preparation and separation of recyclables.

The participation rating system utilized in this study was primarily a measure of recycling quality. There are two key dimensions to the rating system:

1. the amount of time it would take the hauler to rectify the problem, and
2. the volume of recycling materials involved.

The rating system utilized valued from “no stars” (lowest) to “five stars” (highest):

- **no stars**: site with potential recyclable materials so contaminated that the hauler must return them to the source for further preparation and separation.
- **one star**: required more than 10 minutes of hauler time to rectify situation.
- **two stars**: required 5 to 10 minutes of hauler time to rectify.
- **three stars**: required less than 5 minutes of hauler time to rectify.
- **four stars**: no contamination; low to medium volume.
- **five stars**: no contamination; high volume.

**Collection System Ratings**

Of the nine systems which were monitored and analyzed:

- 3 systems increased in the quality of recycling set-outs; one of these also showed a substantial increase in the amount of materials collected.
- 1 system, originally rated highly in terms of quality, fell off dramatically over the first three weekly observation periods. After the first feedback flyer was distributed, there was an increase in the quality level of recycling set-outs almost back to the original level of the first observation. In addition, there was a substantial increase in the amount of materials collected.
- 4 systems stayed the same in terms of quality level: one poor, two average, and one good, even after the first feedback flyer was distributed.
- 1 system decreased in the quality of recycling set-outs.
The average participation rating score for all nine systems **before** the Recycling Awareness Program was **2.56 stars**; **after** the program, **2.78 stars**. While some systems improved more than others, overall the Recycling Awareness Program seemed to be associated with an improvement in recycling at Columbia Villa.

**Youth-Related Outcomes**

The two Natural Resource Pathway science classes (6th and 7th period) were each tested immediately before (“pre-program”) and immediately after (“post-program”) participating in the Recycling Awareness Program. In addition, a control group of natural science students, taught by the same teacher at Roosevelt, was given the identical test at the beginning and end of the Recycling Awareness Program. These tests used a series of measures addressing level of recycling information, recycling related behaviors, and role identification to determine the effects of program participation on students.

**Measures of Level of Recycling Information**

The number of correct “potentially recyclable items” a student recalled was used as a measure of level of recycling information. Both the 6th and 7th period classes showed significant increases in the mean number of items recalled post-program, as compared to pre-program.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recall of Recyclable Items</strong></td>
</tr>
<tr>
<td>“How many different recyclable items can you think of?”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>class</th>
<th>pre-program mean # items</th>
<th>post-program mean # items</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>6.18</td>
<td>9.38</td>
<td>52%</td>
</tr>
<tr>
<td>7th period</td>
<td>5.50</td>
<td>9.43</td>
<td>72%</td>
</tr>
<tr>
<td>control</td>
<td>6.82</td>
<td>7.34</td>
<td>8%</td>
</tr>
</tbody>
</table>

6th period: n=13; 7th period: n=14; control: n=17

While both the 6th and 7th period classes’ mean number of items increased significantly post-program, certain individual students recorded gains in excess of 100%.
Table 2
Students with 100% Increase in Number of Items Recalled

<table>
<thead>
<tr>
<th>class</th>
<th>% students</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>27%</td>
</tr>
<tr>
<td>7th period</td>
<td>43%</td>
</tr>
</tbody>
</table>

6th period: n=13; 7th period: n=14.

Included in the research design of this project (See Appendix II), was a re-test (t-3), 3 months after the post-program measure, for the group which participated in the program during Fall semester (the 7th period class). Results of the re-test indicated that the post-program effects endured with the passing of time.

Table 3
Strength of Effect Over Time

<table>
<thead>
<tr>
<th>class</th>
<th>pre-program (t-1) mean # items</th>
<th>post-program (t-2) mean # items</th>
<th>re-test (t-3) mean # items</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th period</td>
<td>5.50</td>
<td>9.43</td>
<td>8.40</td>
<td>72%</td>
</tr>
<tr>
<td>7th period</td>
<td>5.50</td>
<td></td>
<td></td>
<td>53%</td>
</tr>
</tbody>
</table>

t-1: n=14; t-2: n=14; t-3: n=10.

Measures of Recycling-Related Behaviors
Students were presented with a list of 12 recycling-related behaviors -- some positive and some negative. They were asked to indicate the frequency (“regularly,” “occasionally,” or “never”) with which they engaged in each behavior over the previous 6 week period. Note: The Recycling Awareness Program lasted 6 weeks, so that the post-program measure reflects the student’s behavior during the period she/he was participating in the program.

When analyzing this data, there are at least two areas of interest:

1) those students whose behaviors changed post-program, and
2) those students whose behavior did not change because they were already optimally engaging in the action in question (e.g. “regularly” engaging in positive behaviors; “never” engaging in negative ones.)

Both classes showed significant changes post-program in terms of specific positive recycling behaviors. An example of a type of “positive recycling behavior” addressed corrugated cardboard recycling.
Table 4
Example of Positive Recycling Behavioral Improvement

“In the last six weeks, how frequently have you bundled up cardboard to be recycled?”

<table>
<thead>
<tr>
<th>class</th>
<th>% post-program improvement</th>
<th>% “no change” but operating at optimal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>58%</td>
<td>34%</td>
</tr>
<tr>
<td>7th period</td>
<td>62%</td>
<td>38%</td>
</tr>
</tbody>
</table>

6th period: n=13; 7th period: n=14.

Interestingly, other “areas” of behaviors, where post-program change were most noticeable, were different for each class. The 6th period class showed improvement in several behaviors relating to the “reuse” of materials.

Table 5
Reuse-Related Behavioral Improvement

“In the last six weeks, how frequently have you:” (6th period only)

<table>
<thead>
<tr>
<th>behavior</th>
<th>% post-program improvement</th>
<th>% “no change” but operating at optimal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>“reused grocery bags”</td>
<td>58%</td>
<td>25%</td>
</tr>
<tr>
<td>“saved used motor oil in a plastic jug for recycling”</td>
<td>42%</td>
<td>10%</td>
</tr>
</tbody>
</table>

n=13

It should be noted that the change in behavior relating to “oil recycling” was particularly significant, because the harmful consequences for the environment associated with the irresponsible dumping of used motor oil.

While the 7th period class exhibited some change in the behaviors relating to “reuse,” the most significant change occurred with regard to “negative” recycling related behaviors. In this class, students dramatically decreased the frequency of which they displayed several of these behaviors.
Table 6
Decrease in Negative Recycling Behavior

“In the last six weeks, how frequently have you:” (7th period only)

<table>
<thead>
<tr>
<th>behavior</th>
<th>% post-program decrease</th>
<th>% “no change” but “never” enacted behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>smashed a glass bottle in the street</td>
<td>46%</td>
<td>46%</td>
</tr>
<tr>
<td>thrown out plastic milk jugs w/ trash</td>
<td>62%</td>
<td>8%</td>
</tr>
</tbody>
</table>

n=13

When the 7th period class was re-tested (t-3) 3 months after the post-program measurement, all of the behavior-related effects were still very strong.

Table 7
Positive Recycling Behavioral Improvement: Effect Over Time
(t-1/t-3 comparison)

“In the last six weeks, how frequently have you bundled up cardboard to be recycled?”

<table>
<thead>
<tr>
<th>class</th>
<th>% post-program improvement</th>
<th>% “no change” but operating at optimal level</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th period</td>
<td>60%</td>
<td>40%</td>
</tr>
</tbody>
</table>

n-1: n=13; t-3: n=10

Table 8
Decrease in Negative Recycling Behavior: Effect Over Time
(t-1/t-3 comparison)

“In the last six weeks, how frequently have you:” (7th Period Only)

<table>
<thead>
<tr>
<th>behavior</th>
<th>% post-program decrease</th>
<th>% “no change” but “never” enacting behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>smashed a glass bottle in the street</td>
<td>60%</td>
<td>30%</td>
</tr>
<tr>
<td>thrown out plastic milk jugs w/trash</td>
<td>60%</td>
<td>10%</td>
</tr>
</tbody>
</table>

n-1: n=13; t-3: n=10

Measures of Level of Role Identification

Students were presented with 5 questions concerning the personal importance of recycling, which were scored on a 9-point Likert scale (from “strongly disagree” to “strongly agree”). These items were taken directly from Callero’s (1985, 1992) measure of the importance of the role “blood donor.”
Several interesting tendencies were noted in responses to these questions. For example, half of the 7th period class indicated they thought more about recycling at the end of the Recycling Awareness Program than before they participated. More than half of the same class stated they would experience a greater sense of loss if they were “forced to give up recycling” after participating in the program than before.

Both 6th and 7th period classes indicated that participating in the program clarified their feelings about recycling.

Table 9
Change in Feelings about Recycling

(Do you agree or disagree with the statement) “I really don’t have any clear feelings about recycling”?

<table>
<thead>
<tr>
<th>class</th>
<th>% registering greater disagreement with statement post-program</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>64%</td>
</tr>
<tr>
<td>7th period</td>
<td>75%</td>
</tr>
</tbody>
</table>

6th period: n= 13; 7th period: n=14

The most revealing information about the effects of participating in the Recycling Awareness Program on student identification with the role “recycler” came from comparing the two Natural Resource Pathway classes with the control group.

Table 10
Change in Individuals’ Levels of Identification with Role “Recycler”

(Do you agree or disagree with the statement) “Recycling is an important part of who I am”?

<table>
<thead>
<tr>
<th>class</th>
<th>% greater agreement with statement post-program</th>
<th>% greater disagreement with statement post-program</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>55%</td>
<td>18%</td>
</tr>
<tr>
<td>7th period</td>
<td>62%</td>
<td>15%</td>
</tr>
<tr>
<td>control</td>
<td>36%</td>
<td>64%</td>
</tr>
</tbody>
</table>

6th period: n= 13; 7th period: n=14; control: n=11

A comparison of each group’s mean scores over time on this key question indicates that what is occurring is not merely relative change within the two classes which participated in the Recycling Awareness Program.
Table 11
Change in Groups’ Mean Levels of Identification with Role “Recycler”

(Do you agree or disagree with the statement) “Recycling is an important part of who I am”?

<table>
<thead>
<tr>
<th>class</th>
<th>mean t-1</th>
<th>mean t-2</th>
<th>mean t-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th period</td>
<td>4.82</td>
<td>4.8</td>
<td>5.23</td>
</tr>
<tr>
<td>7th period</td>
<td>3.57</td>
<td>4.43</td>
<td>5.2</td>
</tr>
<tr>
<td>control</td>
<td>4.88</td>
<td>XXX</td>
<td>3.71</td>
</tr>
</tbody>
</table>

6th period: n= 13; 7th period: n=14; control: n=11

The 7th period class’s participation in the 6 week Recycling Awareness Program began at the t-1 testing time and finished at the t-2 testing time. The 6th period class’s participation in the 6-week Recycling Awareness Program began at the t-2 testing time and finished at the t-3 testing time.

Before either Natural Resource Pathway science class participated in the program (at t-1), the control group had the highest mean role identification score (on this question) of all three classes. At the t-2 testing point, the 7th period class, which had just completed the 6 week Recycling Awareness Program, had made a substantial increase in its mean role identification score. The 6th period class’s score remained constant, which was expected as they were just beginning the Recycling Awareness Program. By the t-3 testing point, the mean role identification scores for both the 6th and 7th period classes were virtually the same, and substantially higher than the control group score, which actually decreased over the time of this study.

Summary of Youth-Related Outcomes
In this section, we have examined the effects of participation in the Recycling Awareness Program on the Roosevelt High School students. Three groups of measures were utilized -- a set addressing level of recycling information, a set concerning recycling related behaviors, and a series of questions relating to degree of role identification. Each group of measures substantiated the claim that being part of the Recycling Awareness Program had a positive effect on likelihood of the participating students taking on the pro-social role, “recycler.”

Measure of Level of Recycling Information:
- Both the 6th and 7th period classes showed significant increases in the mean number of items recalled post-program vs. pre-program, as compared to the control group.
Measures of Recycling-related Behaviors:

- In general, both classes demonstrated greater frequency of enacting positive recycling-related behaviors post-program.
- Specifically, the 6th period class enacted several positive behaviors relating to “reuse” more frequently post-program.
- The 7th period class decreased the enactment of several negative recycling-related behaviors post-program.

Measures of level of Role Identification:

- Students in both classes reported clarifying their feelings about recycling after participating in the program.
- Students in both classes reported a substantial increase in identification with the prosocial role, “recycler,” post-program, as compared to the control group.
- The increase in role identification was substantial and objective, not merely relative change within the two classes.

Finally, it is important to note that the effects noted above did not become extinguished, but endured over time. In fact, the 7th period class’s identification with the role, “recycler,” actually increased in the 3 month period after they completed the Recycling Awareness Program.

CONCLUSIONS: RECYCLING AWARENESS PROGRAM

The Recycling Awareness Program met all the stated goals of the original Recycling Intern Project:

1) to increase the level and quality of recycling participation at the Columbia Villa/Tamarack Housing Development through community education. Using the “Participation Rating System,” described earlier, the average participation rating score for all the monitored collection systems before the Recycling Awareness Program was 2.56 stars; after the program, 2.78 stars. While some systems improved more than others, overall the Recycling Awareness Program seems to be associated with an improvement in recycling at Columbia Villa.

2) to offer learning experiences in the areas of recycling and community organization to local youth. The participants in the Recycling Awareness Program learned valuable lessons in both recycling and community organization. The student participants showed significant improvement in level of recycling information, frequency of enactment of
recycling related behaviors, and level of identification with the role “recycler,” post-
program, compared to pre-program.

3) to incorporate community-based learning experiences into the relevant curriculum at
Roosevelt High School. The greatest single benefit of expanding the original Recycling
Intern Project was the opportunity to incorporate the project into the natural Resources
Pathway science curriculum at Roosevelt High School. The Recycling Awareness
Program is scheduled to be conducted again at Roosevelt High School during the 1994-95
school year with a new class of sophomores. The materials used in the 1993-94 class
have been collected, and are currently being organized into a packet of lesson plans so
that teachers at Roosevelt and other high schools can continue the Recycling Awareness
Program even after the collaborative effort with Portland State University is finished.

While the goals of the original Recycling Intern Project were all realized in the Recycling
Awareness Program, there is an additional element in the expanded Recycling Intern Project
which has not been fully described. This element concerns the activities of student recycling
interns. This material will be described in the next section of this report.

**RECYCLING INTERN PROJECT**

Youth interns have played an integral part in recycling promotion at Columbia Villa since the
inception of multifamily recycling services at the complex in 1989. High school interns helped
construct the original recycling collection systems which were used at Columbia Villa from

**History of Project**

Starting during Winter, 1992, and continuing through Spring, 1993, members of “Youth on the
Move,” a Multnomah County Sheriff’s Department sponsored youth group at Columbia
Villa/Tamarack, participated in activities to improve the quality of recycling at the complex.
Together with members of the Recycling Education Projects, from Portland State University,
these youths went door-to-door throughout the housing development and informed residents
about the problems associated with recycling contamination. Significant improvement in
recycling setouts was noted for 3 to 6 months after the completion of the youth intervention.

Based on these experiences, it was clear that the youth of Columbia Villa were a valuable
resource which could to be used to promote recycling at that complex. When the original
Recycling Intern Project was expanded in the public schools as the Recycling Awareness Program, the additional funding made available by the expansion allowed for the hiring of two youth recycling interns, as opposed to the one intern originally budgeted for. These interns were to be Roosevelt High School students who lived in the Columbia Villa complex.

Contacts established during the earlier recycling promotion programs were utilized to publicize the project, and subsequent interviews were conducted with interested members of the “Youth on the Move” group who met the intern qualifications. Intern #2, a male senior, and intern #1, a female junior, were selected to participate in the project.

**Intern’s Role in Project**
The job description for the recycling interns had four components:

* **Field Research**: Interns assisted in all aspects of the field research project, including monitoring of recycling systems, community education efforts, and the “Kids-teaching-Kids” activities. They supervised Recycling Awareness Program participants in different situations.

* **Data Collection and Entry**: Interns participated in data collection connected with the monitoring of the targeted recycling systems. They learned how to enter the collected data into computers.

* **Communication**: Interns served to facilitate communication between project staff and youth participants.

* **Documentation**: Interns assisted staff in the documentation of project accomplishments.

**Field Research**
The student interns were active members of the teaching team that conducted the Recycling Awareness Program at Roosevelt High School. They worked with the PSU students three weeks before the beginning of the Roosevelt High School program.

While the members of the teaching team were taught how to conduct monitoring and observations at the field site, the interns helped the Portland State University students gain some insights into the reality of recycling at Columbia Villa.
students had visited the housing complex previously, so the fact that the interns knew their way around this large complex was very helpful.

When it was time to take the Roosevelt students from the Recycling Awareness Program into Columbia Villa to conduct field observations, the interns served as crew chiefs for different monitoring groups. They explained to the Roosevelt students how to properly conduct field observations, as well as how to evaluate the quality of recycling setouts using the “Participation Rating System.”

Inside the classroom, the interns played the roles of “trouble-shooters,” moving from one small group to another depending upon which group required assistance. Sometimes this assistance took the form of being one of the group leaders (when a Portland State University student was absent); at other times they worked one-on-one with individual students who were having difficulty completing class assignments.

During the process of developing the class recycling videos, the interns helped in a variety of ways: they built props, wrote cue cards, read an absent student’s part during rehearsal. One of the interns actually ended up being in one of the class videos, when a Natural Resource Pathway student was absent on the day the video was being filmed. The intern learned his part in a just a few minutes, then went on camera and did an excellent job.

Data Collection and Entry
The student interns were active participants in the data collection process. First, because they had already taken the “Role Measurement Device” themselves before the commencement of the Recycling Awareness Program at Roosevelt High School, the interns were able to assist in the computer testing of the Natural Resource Pathway students. At times, as many as 10 Roosevelt students were computer tested simultaneously. It required the coordinated efforts of the project director, assistant project director, and all the members of the teaching team to make sure the role measurement information was being correctly collected. The role measurement testing was conducted at three different times in the course of this study.

Second, as members of the teaching team, the student interns participated in two weeks of field observations and monitoring of the recycling collection systems at Columbia Villa before the beginning of each term’s Recycling Awareness Program at Roosevelt. Once the program began at the high school, the interns served as leaders for the crews of Roosevelt students as they conducted their field observations of the Columbia Villa collection systems. Because they were
already familiar with the specifics of weighing the recycling setouts, as well as the intricacies of the “Participation Rating System,” the interns helped insure the accuracy and quality of field data collected.

Finally, the interns entered all of the field observation data collected in the Recycling Awareness Program at Roosevelt into files, using Apple laptop computers. They received instruction in how to arrange the collected data in table forms. These tables were used by the other members of the teaching team to help Roosevelt students to learn about a variety of related topics -- means, net vs. gross weights, and projecting the level of future setouts.

Communication
The student recycling interns facilitated communication in two general areas:

- between the Roosevelt students who participated in the Recycling Awareness Program, and the project staff, and
- between the residents of Columbia Villa and the participants in the Recycling Awareness Program.

Because both recycling interns were “upper-class persons” -- intern #2 was a senior; intern #1 was a junior -- and the Roosevelt students in the Recycling Awareness Program were all sophomores, the interns were viewed with respect by the other students. The fact that these two, older students had decided to be part of the Recycling Awareness Program made participating in the program more “desirable” for the younger students. The interns served as positive role models, and demonstrated to the sophomores what they themselves might be capable of if they continued in the Natural Resource Pathway.

Also, the interns spoke the “same language” as the other students. When it was time for the class to complete an in-class assignment, and some students were having difficulties, the interns worked with each of them one-on-one with a great deal of success.

The two recycling interns served as the primary “communication vehicle” for getting information to the residents of Columbia Villa. At two different occasions during the course of the Recycling Awareness Program, the interns prepared handouts -- based on summarized field observation data -- that informed Columbia Villa residents about the effectiveness of their recycling efforts. They developed a different flyer for each recycling collection system, so that the residents who used a particular system would get feedback on the collection system they utilized themselves. Then the interns went door-to-door, throughout the complex. They passed out the feedback
flyers and talked to residents about why it was important for them to participate in the recycling efforts at Columbia Villa. This was a highly successful way of communicating this important information. It also served to break the problem of improving recycling participation and quality down to a level that most residents could grasp, and even more important, be willing to participate at. This element of the Recycling Awareness Program was critical in improving recycling at the targeted collection systems at Columbia Villa.

Documentation
The student recycling interns assisted in the documentation of the Recycling Awareness Program/Recycling Intern Project in three different ways:

- First, each intern kept a journal during the course of the project in which they recorded their thoughts and observations on their experiences.
- Second, both interns were interviewed at the end of the Recycling Intern Project. These interviews were captured on videotape.
- Finally, both interns learned how to use the video camcorder. Each intern took turns videotaping different segments of the project, and some of this footage is included in the video documentation of this project.

The two student recycling interns satisfied all of the job-related expectations associated with being part of the Recycling Awareness Program. However, there was more to the Recycling Intern Project than just their roles in the larger Recycling Awareness Program.

Recycling Intern Project Activities
Another goal of the project was to expose the interns to recycling related experiences in their local community. With this in mind, project staff took the interns on several field trips.

Field Trips
The first field trip was to the Portland Recycling Company, a neighborhood recycling drop-off center located five minutes from Roosevelt High School. The two interns familiarized themselves with the wide range of materials collected at this location, and videotaped some excellent footage of the drop-off center’s operation. When the two Natural Resource Pathway classes participating in the Recycling Awareness Program later made field trips to Portland Recycling, the interns served as “guides,” showing the other students the various aspects of the drop-off center operation.
Other field trips were to the Metro South Transfer Station (one of two locations where garbage from the City of Portland is compacted, loaded on trucks, and then shipped to the landfill); K & B Recycling Company (a regional recycling collection company, which handles large volumes of recyclable materials); and McFarlane’s Bark and Compost (a commercial operation where yard debris is turned into bark dust and compost materials).

**Recycling Promotion Activities**

The student interns made several trips to the REP offices on the campus of Portland State University. It was here that the interns developed the different feedback flyers used to inform Columbia Villa residents about the effectiveness of their recycling efforts.

One area of concern, for REP’s 1993-94 Targeted Sites Program, was “how understandable” the project’s current flyer promoting general recycling was to the general public. The student interns developed their own general recycling promotion flyer, using simpler language and more eye-catching graphics. They then went door-to-door, distributing the flyer to all the residents of Columbia Villa. Feedback received on the interns’ recycling promotion flyer was utilized by the Targeted Sites Program during the revision of their own flyer. The interns also helped distribute multi-lingual versions of recycling promotion materials to the manager of a large apartment complex located between Columbia Villa and Roosevelt High School.

**RECYCLING INTERN PROJECT OUTCOMES**

The new Recycling Intern Project positively impacted recycling behavior at the Columbia Villa Housing Development. In addition, participating in the project positively impacted the two student interns.

**Outcomes Related to Recycling at Columbia Villa**

As noted earlier, the overall level of recycling quality and participation, as measured by changes in scores using the “Participation Rating System,” improved at Columbia Villa, post-program compared to pre-program. The Recycling Intern Project was an important element in the larger Recycling Awareness Program.

The student interns provided the community a feedback mechanism for the Recycling Awareness Program. They organized the field observation data collected by the Natural Resource Pathway science classes into feedback flyers for each area serviced by different specific collection systems. The interns also distributed these flyers so that residents could know how effective their personal recycling efforts were.
Youth-Related Outcomes
The student interns also were tested pre- and post-project, using the “Role Measurement Device” described earlier. The goal was the same, to determine the effects of project participation on the interns, through the use of a series of measures addressing level of recycling information, recycling related behaviors, and role identification.

Measures of Level of Recycling Information
The number of correct potentially recyclable items a student recalled was used as a measure of level of recycling information. Both the student interns showed significant increases in the number of items recalled post-project, as compared to pre-project.

Table 12
Interns’ Recall of Recyclable items
“How many different recyclable items can you think of?”

<table>
<thead>
<tr>
<th>Intern</th>
<th>Pre-project # items</th>
<th>Post-project # items</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>7</td>
<td>10</td>
<td>43%</td>
</tr>
<tr>
<td>#2</td>
<td>7</td>
<td>10</td>
<td>43%</td>
</tr>
</tbody>
</table>

n=2

Measures of Recycling-Related Behaviors
The student interns were presented with a list of 12 recycling-related behaviors -- some positive and some negative. They were asked to indicate the frequency (“regularly,” “occasionally,” or “never”) with which they engaged in each behavior over the previous 6-week period. While both interns indicated that they had engaged in some recycling-related actions before becoming part of the Recycling Intern Project, each intern’s behaviors were impacted in different areas as a result of participating in the project.

Intern #1 reported saving “used motor oil in a plastic jug for recycling” for the first time, after participating in the project. All other behaviors stayed consistent with pre-project levels.

Intern #2 reported making changes in the frequency of both positive and negative recycling related behaviors after participating in the project. Level of “cardboard recycling” and “recycling anything in a recycling collection system” increased post-project; while the frequency of “throwing empty paper cups or food wrappers on the ground” and “throwing plastic milk jugs out with the rest of the trash” decreased.
Measures of level of Role Identification

Student interns were presented with 5 questions concerning the personal importance of recycling. These were scored on a 9-point Likert scale (from “strongly disagree” to “strongly agree”).

As with the Natural Resource Pathway science class students, the interns’ results on the “Role Identification” questions showed several interesting trends. Post-project, both agreed, to a greater degree, that they “had clear feelings about recycling,” and that, for each of them, being a recycler “means more than just reducing the amount of trash I throw away.”

On the key question, “Recycling is an important part of who I am,” each intern showed the positive effects of participating in the project. Intern #1’s score (on a nine-point scale) increased from “4” (pre-project) to “7” (post-project). Intern #2’s score increased from “5” (pre-project) to “7” (post-project).

Summary of Youth-Related Outcomes

In this section, the effects of participation in the Recycling Intern Project on the student interns was examined. Three groups of measures were utilized -- a set addressing level of recycling information, a set concerning recycling related behaviors, and a series of questions relating to degree of role identification. The results of these measures suggested that being part of the Recycling Intern Project had a positive effect on likelihood of the participating students taking on the pro-social role, “recycler.”

Measure of Level of Recycling Information:

- Both student interns showed significant increases in the number of items recalled post-project vs. pre-project.

Measures of Recycling-related Behaviors:

- In general, both interns’ recycling-related behaviors were positively impacted, though in different areas, as a result of participating in the project.

Measures of level of Role Identification:

- Both interns reported clarifying their feelings about recycling after participating in the project.
- Both interns reported that their conception of “what a recycler is” changed and became more elaborate after participating in the program.
- Both interns reported a substantial increase in identification with the pro-social role, “recycler,” post-program.
As noted previously, the Recycling Awareness Program met all the stated goals of the original Recycling Intern Project:

1) to increase the level and quality of recycling participation at the Columbia Villa/Tamarack Housing Development through community education.
2) to offer learning experiences in the areas of recycling and community organization to local youth.
3) to incorporate community-based learning experiences into the relevant curriculum at Roosevelt High School.

The new Recycling Intern Project was a critical part of this larger program. Without the assistance of the student interns, it would have been very difficult to realize the “Recycling Awareness Program’s” goals. They made contributions in several key areas:

- The interns were the liaisons between the classes at Roosevelt and the residents of the Columbia Villa housing development.
- The interns provided the feedback mechanism necessary to involve residents in efforts to improve recycling participation and quality at Columbia Villa.
- The interns were integral parts of the teaching team that conducted the Recycling Awareness Program at Roosevelt.
- The interns served as positive role models for the other Roosevelt students.

In addition, the student interns themselves grew and experienced positive change as a result of participating in this project.

- Both student interns showed significant increases in the number of items recalled post-project vs. pre-project.
- In general, both interns’ recycling-related behaviors were positively impacted, though in different areas, as a result of participating in the project.
- Both interns reported a substantial increase in identification with the pro-social role, “recycler,” post-project.

The 1993-94 Recycling Intern Project/Recycling Awareness Program was a success. It was a positive experience for all who took part in it: the Natural Resource Pathway science class students from Roosevelt, the Portland State University students, the student interns, the participating Portland State University and Roosevelt High School faculty, the Clarendon
Elementary School students, and, ultimately, the residents of the Columbia Villa Housing Development.

The Recycling Awareness Program is scheduled to be continued at Roosevelt High School during the 1994-95 school year. It is hoped that programs like this, and the Recycling Intern Project, can be expanded to other sites in different neighborhoods. In this way, these programs can provide opportunities for even more students to learn about recycling and waste stream reduction issues in real-life settings; while, at the same time, positively impact their local communities.
BIBLIOGRAPHY


Appendices
Appendix I

RECYCLING AWARENESS PROGRAM QUESTIONNAIRE

SUBJECT #: _______________ DATE: _______________

In this questionnaire, we are asking people a few questions about RECYCLING. All responses will be confidential. There are no “right” or “wrong” answers.

I. ITEMS

1) Think about a person who recycles. A person who is an active recycler could recycle many different items.

   How Many Different Recyclable Items Can You Think Of?
   (List Them Below)
   A) __________________________
   B) __________________________
   C) __________________________
   D) __________________________
   E) __________________________
   F) __________________________
   G) __________________________
   H) __________________________
   I) __________________________
   J) __________________________
II. ACTIONS

Below is a list of different “Actions”. Place A Mark In the Column that Best Describes YOUR Actions During the Last 6 Weeks.

<table>
<thead>
<tr>
<th>never</th>
<th>occasionally</th>
<th>regularly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
III. IMPORTANCE

INDICATE HOW MUCH YOU “AGREE” OR DISAGREE” WITH EACH OF THE FOLLOWING STATEMENTS.

14) Recycling is something I rarely even think about.

strongly agree  strongly disagree
9-------8------7------6------5------4------3------2------1

15) I would feel a loss if I were forced to give up recycling.

strongly agree  strongly disagree
9-------8------7------6------5------4------3------2------1

16) I really don’t have any clear feelings about recycling.

strongly agree  strongly disagree
9-------8------7------6------5------4------3------2------1

17) For me, being a recycler means more than just reducing the amount of trash I throw away.

strongly agree  strongly disagree
9-------8------7------6------5------4------3------2------1

18) Recycling is an important part of who I am.

strongly agree  strongly disagree
9-------8------7------6------5------4------3------2------1
19) DO YOU HAVE ACCESS TO A RECYCLING SYSTEM - EITHER
YELLOW BINS OR AN APARTMENT COLLECTION SYSTEM?
yes ______ no ______

20) MALE _____ FEMALE _____

21) WHY DID YOU SIGN UP FOR THIS CLASS?

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________

THANK YOU FOR YOUR PARTICIPATION.
## Appendix II

### RECYCLING AWARENESS PROGRAM DESIGN

<table>
<thead>
<tr>
<th>Group</th>
<th>Test #1</th>
<th>Program One</th>
<th>Test #2</th>
<th>Program Two</th>
<th>Test #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group #1 (7th Period)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>N= 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental Group #2 (6th Period)</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>N= 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>N=13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Design Issues:**

* random assignment of groups to treatment. Because this “Recycling Awareness Program” constituted part of the curriculum for the Natural Resources Pathway science classes, it was not possible to randomly assign individual students to groups (i.e., treatment or control)