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The 4-H Computer Refurbishing Program: An Implementation Model

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Abstract

The 4-H Computer Refurbishing Program was implemented as a service learning project for the 2006 National 4-H Technology and Leadership Conference. The specific goals of the program were to decrease the number of computers discarded each year and provide 21st century job skills to youth. The program was introduced as a model 4-H'ers could take back to their communities to start their own refurbishing efforts. The model is comprised of the following three steps: 1) program planning, 2) inventory management, and 3) technology training.

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Introduction

Over 48.5 million computers in the U.S. are discarded each year. One and a half million of those end up in landfills, while another 31.5 million are sent to other countries where they are disassembled, releasing toxins into the environment (Mantzaris, 2005). To combat this growing problem, 4-H'ers at the 2006 National 4-H Technology and Leadership Conference gave new life to older, but still usable, computers by refurbishing donated computers, and presenting them to a local charity for distribution. The project benefits the environment by decreasing the number of discarded computers, while at the same time providing youth technology training, an important 21st century job skill (Markus A. Foster Educational Institute, 2006).

The goal of this computer refurbishing project implementation model is to assist youth development leaders and volunteers to establish a similar program in their communities. In addition to the model, specific examples from the 2006 National 4-H Technology and Leadership Conference computer refurbishing program are provided. The three steps to develop a computer refurbishing project include:

- Program planning,
- Inventory management, and
- Technology training.

About Service Learning

When students use classroom skills to build a wheelchair ramp or teach their peers CPR or grow vegetables for a food bank or build and maintain nature trails, they are engaged in service learning (Richardson, 2006). Service learning combines youth development and community improvement to enrich the lives of youth participants, adult mentors, and community leaders. Because it focuses

equally on student growth and community problem solving, service learning steers real-world education toward projects that promote the public good (National 4-H Council, 2002).

The 4-H Computer Refurbishing Model

Step 1: Project Planning

The first step in implementing a computer refurbishing program is to develop a plan of work. Planning considerations include:

- Determination of minimum computer specifications,
- Acquisition and storage of donated computers,
- Determination and installation of appropriate computer operating system,
- Distribution of refurbished computers, and
- Calculation of costs needed to carry out the program.

Minimum Specifications

The first step in project planning is to determine the minimum specifications for the donated computers and monitors. Each operating system has minimum requirements for effective performance. For example, Windows 2000 requires:

- 133 MHz Pentium-compatible central processing unit (CPU),
- 64 MB RAM,
- 2 GB hard drive with 650 MB free,
- CD-ROM or DVD drive,
- VGA monitor, and
- Keyboard

Potential donors should know the minimum requirements when contacted regarding the donation. When in doubt, collect the manufacturer, model number, and serial number to look up the technical specifications of the donated computer.

Acquisition and Storage

Once the minimum specifications are determined, potential donors can be identified and contacted regarding possible donations. After donors are identified, transportation of the donated computers must be considered. In county Extension offices, donors were asked to bring the computers directly to local offices. Plan in advance for storage and workspace that will be needed.

Determine Operating System

The third step in project planning is to determine what operating system (OS) will be installed on the refurbished computers. For security reasons and to ensure optimum performance, each hard drive should be reformatted and a new OS installed. Microsoft offers low cost operating systems through the Microsoft Authorized Refurbisher (MAR) program.

Distribution of Refurbished Computers

The fourth project planning step involves deciding how computers will be distributed to the community after they have been refurbished. A well thought out distribution plan will minimize transportation costs while serving the community at the same time.

Budget

Finally, during the planning process, evaluate potential expenses based on expected donations and create a program budget. The program will incur costs, such as storage or transportation, even though the donated computers are free. Items to consider in the budget include:

- Transportation costs;
- Equipment costs (toolkits, cleaning supplies);
- Replacement keyboards, mice, and memory upgrades;

- Storage and facility costs; and
- Training materials.

Step 2: Inventory Management

The second step of the implementation model is to examine how equipment and software will be sorted and managed. It is important to test computers to make sure they work properly. Manage your inventory by identifying computers that are ready to be refurbished from those that are non-functioning.

Step 3: Volunteer Training

The main workforce for the project is comprised of adult and youth volunteers. Training is an important component in the program model, because the volunteers may have little experience working with computers. Computer refurbishing training can be done in a few hours in person or on-line. Topics that should be covered include:

- Computer terminology,
- Removing and installing hardware components, and
- OS installation.

For the 2006 Technology Conference, five separate training workshops were held over a period of 2 months to train volunteers.

Implementation Results from the National 4-H Technology and Leadership Conference

The three-step model was successfully implemented at the 2006 National 4-H Technology and Leadership Conference. Approximately 200 delegates refurbished over 90 computers in 4 hours. Fifteen adult volunteers were trained prior to the conference and assisted the youth.

During implementation of the project the following problems were experienced: inadequate staff involved in the inventory process, electrical power for equipment, insufficient cleaning supplies, and unexpected hardware issues. The first problem we faced was during the inventory process. Because of the large number of computers and monitors donated, the inventory process became very cumbersome. All equipment had to be powered on and checked, which required a great deal of time and manpower. A number of staff members and student workers spent many hours inventorying equipment prior to the event.

One immediate problem during the event was the logistics of getting power to each CPU. Because so many computers and monitors were drawing electricity at the same time, we had to balance the electrical load on more than one circuit in the building. Our solution was to purchase additional extension cords and power strips to tap electrical outlets that ran on separate circuits.

Moreover, the computer equipment was extremely dirty, requiring more cleaning kits than available on-site. No solution was immediately available, so participants were asked to conserve and share. An important lesson derived from the project is the cleaning kit to computer ratio should be around one kit for every two computers.

Another issue that came to light is that not all computers we had available for the project and carefully inventoried were salvageable. About 10% of the computers had hardware problems beyond our expertise and, therefore, were not refurbished. These computers were stripped of components and reused.

Overall, the project was very successful. The trained volunteers kept the youth and adult participants on track and organized. The youth participants were able to dismantle and clean the computer systems efficiently and with relative ease. In addition, volunteers were remarkably adept at diagnosing and trouble shooting hardware and software problems. Many participants were refurbishing multiple computers at one time. In the end, it became an impromptu competition to see who could refurbish the machines the fastest.

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