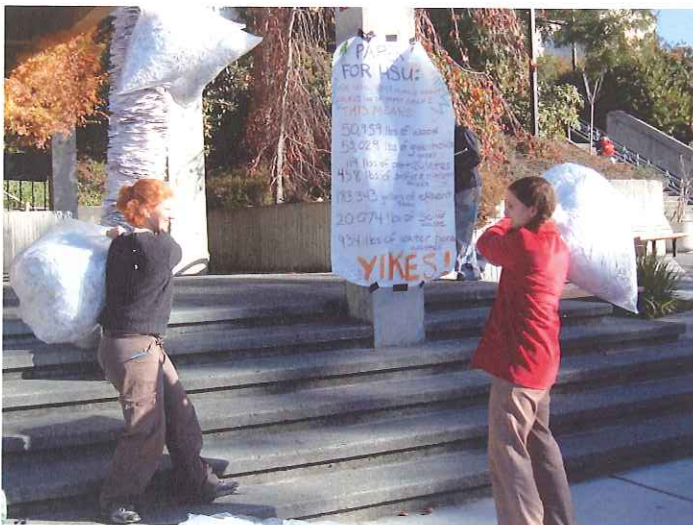


**A Two-Pronged Approach to Reducing Paper Consumption in
Humboldt State University's Academic Computing Labs:
User Education and Pay-Per-Print Printer Technology**

Environmental Science Senior Capstone
ENVS 411: Sustainable Campus
December 6, 2004

Melissa Bodola, Cisco Benemann, Justin Daily,
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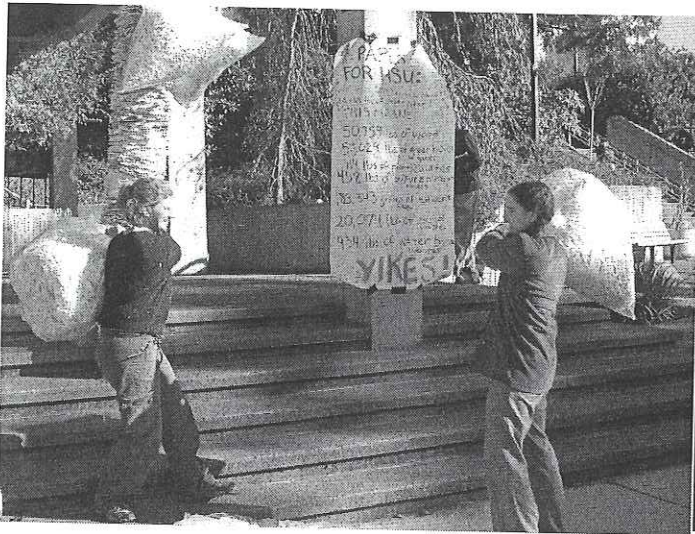


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I. INTRODUCTION

This class is named "Sustainable Campus." The reason it is named Sustainable Campus is because, it is a class where students come together as seniors and look back over their years as students, and try to come up with ideas that could improve the educational experience of other students, or possibly help to improve the workings of the school.

Our group came together because we all had an interest in waste management and waste reduction polices. We all had seen things on campus that generate waste and wanted to see those things reduced. The one thing that had the most potential for immediate improvement was to find ways to reduce the amount of paper printed in the computer labs.

We decided that we would try to make improvements in three different ways. The first was to research what other schools' techniques are. The second was to provide ideas for improvement to H.S.U.to Academic Computing. Our third approach was to try to educate the students and teachers with information that would stimulate conservation of paper printing.

A. DEFINING THE PROBLEM

1. The Problem

- An excessive amount of paper is being consumed and wasted in the Academic Computing computer labs.
- The current printing fee allows students to over-consume paper in the computer labs.
- We live in an over-consumptive society in which paper and printing is a central concept.
- Too many resources (trees, excess dioxin, energy resources for production, pesticide application to grow trees) are being used to produce the amount of paper being consumed in the Academic Computer labs.
- Students and Staff at Humboldt State University are not fully aware of how much paper is being used or wasted on campus.

2. Symptoms

- The cost of all the printing that the students pay for with their \$5 fee will likely in the future exceed the amount of money needed to pay for total printing costs.
- 10.5 tons of paper is being printed in labs.
- A large amount of paper ends up in the recycling bins directly next to the printers, therefore there is no incentive to print responsibly.

3. Causes

- The current \$5 student fee allows students to print an unlimited amount of paper in the labs.
- There is a lack of proper education for students and professors that would help to reduce paper consumption.
- Blackboard use has increased, leading professors to provide/assign more readings and leading students to print everything they get.

- The fact that copy machines cost money and the printers are free promotes printing multiple copies.
- Students don't relate printing with cost.

B. OUR APPROACH

We formed a two-pronged approach to our project. In order to fully address the problem, we decided to look at the various technology options designed to reduce printing and to take on an education component. We would educate both students and professors about how much waste HSU creates, why conservation needs to happen, and then show them responsible printing options.

II. BACKGROUND RESEARCH

The paper consumption at Humboldt State University has been steadily increasing over the past six years. The student fee for printing is \$5.00 per semester per student, and students are able to print an unlimited amount of paper. As given by R.J. Wilson from Academic Computing the following represents the rising costs for paper since 1998(Appendix F):

Year	Total Amount
1998-1999	\$10,104.00
1999-2000	\$20,893.00
2000-2001	\$15,786.70
2001-2002	\$11,302.75
2002-2003	\$12,857.00
2003-2004	\$14,808.65
2004-2005 (est.)	\$18,000.00

With the increased amount of online readings, Blackboard posted readings, ONCORES and other digital materials, students are turning to printing in the computer labs rather than buying books or pre-printed packets from the HSU bookstore. According to Academic Computing, during the 2003-2004 school year, over 4 million pages were printed in the Interdisciplinary Technology Facilities. This is equivalent to over 8,000 reams of paper or about 1 1/8th reams per student (one ream = 500 sheets)(Appendix F). Not only is this creating an incredible amount of waste, Academic Computing has said that if the current rate of paper use continues, they may not be able to afford all of the paper needed with the \$5 student fee.

likely to be the median so much lower at Davis?

As far as measuring the amount of wasted paper that comes from Academic Computing it is tricky to really know for sure. There are recycle bins in the labs that can be used to measure what is "thrown away" straight from the printer however it is nearly impossible to really see how long each piece of paper is used for and where it ultimately winds up. It is undeniable however to say that eventually all paper gets recycled or put in the trash eventually.

According to a Web-Based Calculator found at <http://www.ofee.gov/recycled/descript.htm> the following depicts the waste involved in producing the amount of pages printed at HSU last year. These numbers depict the amazing amount of energy and waste that goes into paper production alone.

(These calculations were done for 10.5 tons of paper with 30%-recycled content)

Wood in pounds

Total: 50,960

Solid Wastes in pounds

Total: 20,074

Effluent Flow in gallons:

183,343

Atmospheric Emissions in pounds

Net Greenhouse Gases (CO2 Equivalents): 53,029
 Nitrogen Oxides: 182
 Particulate: 114
 Sulfur Oxides: 182
 Hazardous Air Pollutants: 16
 Volatile Organic Chemicals: 46

Waterborne Wastes in pounds

Absorbable Organic Halogens: 13
 Biochemical Oxygen Demand: 67
 Chemical Oxygen Demand: 762
 Suspended Solids: 96

Energy Usage in BTUs

Total: 350,930

Fossil Fuel Derived: 157,423 lbs.

III. CONTEXT OF THE SITUATION

A. Laws and Regulations

- In order to change student fees, you have to go through the Associated Students and the Student Fee Advisory Committee.
- To implement a new technology in the academic computing labs, Bill Cannon and RJ Wilson need to be consulted.

B. Biophysical

- In order to produce paper trees are being cut down, dioxins are released in the atmosphere, and fossil fuels are being used for production/transportation.
- Toxic chemicals are being used in the recycling process.

C. Social, cultural, political, economic realities

- Social/cultural: The culture of HSU is environmentally friendly, students may be supportive of printing responsibly.
- Political: There are politics involved in the \$5 fee that we pay for printing (some of it goes to scholarships for Educational Opportunity Program participants). Academic Computing is in support of an agreeable change to the current printing system. If the fee increases students may be in objection to this.
- Economics: if it is shown that a pay-per-print system would save Academic Computing money, students support a Pay-per-print system, and the EOP will not lose their money, it is more likely that a new system will be adopted.

D. What has been done; here and elsewhere.

- There has been lots of attempts at education/eco-guilt on this campus.
- Other campuses have installed software/hardware for a Pay-per-Print systems (see table ??????).
- In 1997 there was a student referendum that supported a pay-per-print system, however since the technology wasn't really up to par, it didn't happen at that time.

IV. GOALS AND OBJECTIVES

These are the goals that we created when we embarked upon this project:

GOAL: To reduce paper waste in Academic Computing computer labs on campus.

OBJECTIVE: To reduce the amount of paper purchased (therefore used) by Academic Computing by 10% by the end of Spring 2007 semester & 15% by the end of the Spring 2010 semester.

V. WHAT ARE THE ALTERNATIVES?

When deciding how to go about reaching the goals and objectives we set, our group decided upon a set of proposed alternatives that we would enact. To do this, we started by having a brainstorming session to come up with any ideas that we could think of off the tops of our heads. (Appendix X) Then, we went through these proposals and winnowed out the ones that wouldn't be feasible.

Next, we had to narrow down which proposals we would actually focus our time on this semester. To do this, we came up with a set of 10 objective criteria upon which to weight our proposals on. (Appendix X) After using this Weighted Criteria Matrix, we selected the following proposals to pursue:

Selected Proposals

Students
C. Printer information on desktop of computer
D. Paper Day in Quad- table with info and facts
H. Put info on CRP website
I. Bulk email
K. Smash a bunch of printers in the Quad
Professors
L. Presentations at department meetings-how professors can conserve paper (possible fact sheet)
N. Bulk email with facts about saving paper
O. Re-use readings that are handed out (collect them when done or at end of semester)
Technology
T. Pay per print software, based on log-in with Student ID
U. Implementing higher percent recycled, or higher grade of recycled paper

Note: The above Selected Proposals are those which we priority to in our available time. When time allowed, we attempted to implement some of the other proposals as well.

VI. IMPLEMENTATION STRATEGIES

Below is a list of steps that we planned to take in order to fulfill the goals of the Selected Proposals.

C. Printer Information on Desktop

Our group will compile information on how to reduce printing, and give this to Academic Computing so they can add this information to the Interdisciplinary Technology Computer Lab computer desktop backgrounds that are on all the computers. The information will include recommendations about responsible printer usage. We will do the compiling of information to give to Academic Computing as we anticipate that academic computing would be too busy to do it themselves. Academic Computing shares an interest in reducing paper waste, but does not have the time to do this kind of work themselves.

D. Paper Day in Quad.

Our group as a whole will have a table on the quad with facts and displays about paper usage on campus to target the student population. The display will be on exhibit on December 3rd. It will have displays and interesting factoids to get people's attention. The tactic will be to use attention-getting facts and displays to get people to take an interest in our event. We anticipate people will be receptive to the information as we will be simply offering tips about printing, not saying that they should not print at all. We want to acknowledge that every student needs to print at some time during the semester but also convey that printing responsibly will make a difference in our world.

H. Put Information of Campus Recycling Program (CRP) Website

We will submit information about responsible printing to Alec Cooley, who will add this to the CRP website. It will be a simple addition and edit to the website to be done by the end of the semester. We acknowledge that this solution only hits a certain number of people who visit the website; however, we feel it is at least one more facet to make the information available. We anticipate that those who read the information will be receptive as they already have exhibited interest by taking the time to read the CRP's website already.

I. & N. Bulk E-Mail

During the week of November 1st, a member of our group will submit information to be bulk e-mailed about our event on December 3rd. This tactic is a way to reach a lot of people about our event without using paper. The idea is that a few people will read it and tell their friends about it.

K. Smash a Bunch of Printers

Our group will demonstrate that we want to reduce printer waste by smashing printers in the Quad on December 3rd. We will have broken, unfixable printers donated. The purpose of smashing the printers is to get people's attention so that they will learn the more important facts that will be displayed. We anticipate that students will be excited about the idea since making a mess and destroying property is fun.

T. Pay Per Print Software

It is anticipated that Academic Computing will do this on their own time schedule. We will present a clear, well-documented information on how to change our current printing system (where each student pays \$5/semester and has unlimited access to printing) to a pay-per-print software that emphasizes saving paper (and therefore money-which will appeal to Academic Computing). We will show how other schools have made the change to a pay-per-print system and how much money they saved in the end. We anticipate that Academic Computing will see the major savings at other schools and will want to make the change themselves.

U. Higher percentage of recycled paper

With our recommendations, Academic Computing will be the ones to make any changes in the labs. Since we will be providing them with information on how much the cost difference will be, where to buy this paper and how to order it, they will begin to purchase a higher grade percent post-consumer-waste paper (pcw) when they make future paper purchases. This will be an alternative to the 30% pcw recycled paper they normally buy and will be purchased on the same purchasing schedule that currently exists. We anticipate that academic computing does not want to use 100% pcw because they believe that it clogs the printers. They just don't want to spend more money on cleaning printers. Also they do not want to spend more on paper. But we anticipate that with the information we present, they will be more assured at the ease of switching to a higher grade pcw. We intend to present to them detailed, well-documented information on how to change, how much it will cost and how easy it is to maintain.

VII. MONITORING AND EVALUATION PLAN

The following is the plan that we made prior to starting our project that would help us to monitor and evaluate our project's goals and objectives.

We will present and hand-over our recommendations to Alec Cooley with the Campus Recycling Program, who will be the person in charge of evaluating whether or not we have achieved our Goals and Objectives.

GOAL: To reduce paper waste in Academic Computing computer labs on campus.

OBJECTIVE: To reduce the amount of paper purchased (therefore used) by Academic Computing by 10% by the end of Spring 2007 semester & 15% by the end of the Spring 2010 semester.

A. Technology

- When we turn this over, it will be in a formatted table that shows the amount of paper used in the Academic Computing labs in the past and in the present. The table will contain empty fields so that Alec Cooley can fill in the blanks about paper usage at the end of every semester until Spring 2010. This will show progress over time. This table will also contain fields that demonstrate changes to printing technology (if any) that have occurred. (Appendix Z)
- At the end of Spring 2007 and 2010, Alec Cooley will take this information and present it to Academic Computing.

B. Education

- This document will be a list of strategies and steps along with a timeline for student leaders with CRP to implement.
- Each semester, the new CRP directors will have this information and decide how they want to implement it.

VIII. EDUCATION

A. Summary of Our Approach:

We broke into two education teams for our paper waste reduction project. The team members not involved in the technology section were assigned to either Student Education or Professor Education. The purpose of this was to relay our message to as much of the campus as possible. We realized that it is mostly the students who are printing in the labs, however the professors have an influence on how much the students are printing through assignments and digitally-assigned readings.

For the Student Education element, we chose to collect facts and wasted paper for displays, and then have a dissemination of knowledge event on the quad, as a "Paper Waste Awareness Day." By making ourselves available in a central location with facts and statistics on HSU campus paper waste, we felt that we were making the presence of the issue known to the students. We also gave room for students to ask questions of us about the issue, and put our faces to the cause. Students could identify us and other supporters as like-minded, and able to unify with them against paper waste (See Paper Day summary below). The idea of advertising through a bulk email was accomplished however we did not smash a printer because it apparently made Academic Computing feel threatened and that was not our goal.

Another idea for educating students that we attempted unsuccessfully was adding information to the desktops of computers with short detailed ideas of printing responsibly. Printing responsibly includes printing two or more pages per sheet if possible. Also, if printing a PowerPoint lecture, printing six slides per page reduces the amount of paper used dramatically. Easy instructions could be provided on how to do this (Appendix J), as we anticipate that students are simply not aware of the process.

The subgroup in charge of Professor Education first began by doing a bit of scoping for professor interest. One group member started putting out her feelers by attempting to submit assignments via email. This tactic was accepted by two of her teachers and rejected by another. Half of her six different teachers this semester allowed her to turn in assignments on paper that had already been printed on one side. These reactions to her efforts symbolized an interest in paper waste reduction.

The Professor Education subgroup scheduled a meeting with the Natural Resource Department faculty, based upon the assumption that this department had a vested interest in natural resource conservation. (Appendix X) The results were a total mixed bag, but were informative. During the meeting the project representatives handed out a survey to obtain ideas about effective ways to share printer-responsibility information with other instructors. (Appendix X) These ideas could be used in the future for teach-ins with the teachers.

Reflection: Targeting both students and professors seemed to be a successful approach. Going to the Department meeting is the best way we found to target as many professors

Getting
students to
sign a pledge
to reduce
paper usage
has been shown
to be effective

as possible at once. Perhaps having the department head show support before students begin to talk would influence professors to take more of an interest. It is important to remember that professors often do not respond to emails, fill out surveys given to them by students (unless they are handed to them, but even then, not always), or like to listen to students speak to them during a meeting. It is essential to have professors on your side before the meeting begins, and to let teachers come up with any teaching tactics seemingly on their own.

B. Summary of the Paper Day

The weather was sunny and cold. Three of us hauled our paper tree out into the quad. With the help of an onlooker, we hoisted the tree up to its standing height: eight feet of paper on ten feet of post. It would have been difficult to walk through the quad that afternoon and not be curious about the meaning of the large piece of modern art. We took turns sitting on the bags of shredded paper, more comfortable than any beanbag chair.

Few people stopped at our table. Individuals asked questions about what it was that we as a group wanted to accomplish. We showed them ridiculously wasteful print jobs, and some shining examples of print jobs with several slides per page. We asked if these people knew much about formatting their print jobs, and what opinions they might have to share about paper waste on HSU campus. Every person talked to hoped for all of the same things our group dreamed of. These students salivated over thoughts of doubled-sided printers in all of the computer labs, 100 percent recycled paper, and people who think before they print.

Several people stopped to read our signs. They contained paper use factoids. The statistics of paper use on Humboldt State's campus are riveting. Funny enough, many comments throughout the day were about the messages that we chalked upon the pavement in the quad area. Chalking was the most effective method of advertisement that we could have bargained for. Less than two weeks before finals, not many students seemed to have the time to loiter in the quad. Our direct eye-catching displays were a number one priority for us in planning the event.

We determined that we did not desire to give out copious amounts of information via flyers (as this would contradict our goal of paper waste reduction). We realized that the most lasting impression we could provide would be to simply make our message as abruptly visual as possible, catch the attention of passers by, and provide a comfortable space to invite dialogue into. We thought through all of the utilization of paper that we embarked upon. Our banners came from the clubs' office recycled banner bin. Also, we hoped that the tree that we constructed could be reused as a display at other events before it left on the path to becoming recycled. Our group brainstormed not only the source of the problem, the creation of waste, but how to further implement the intermediate phase of reuse before recycling.

Some things that we would do differently in the future include:

- Having the paper day earlier in the semester, thus increasing the interest level at the event.
- Advertising more by way of mouth, and through in-class announcements, or by getting a radio slot.
- Providing a speaker that is well informed about the topic.
- Requiring more quad space, not sharing with clubs, unless they would like to promote paper waste reduction. This would require more advanced booking of the quad.

IX. Technology

Summary of Approach:

There are a few different options to choose from if we were to change the printing system currently in place at HSU (free for all with no limits on student printing). We have done some research on a few other schools across the country and programs they have implemented to reduce paper usage on their campuses.

One new option is to implement network login on all lab computers with advanced print manager software to keep track of who is printing how much. With a quota instead of no limits, the students will reconsider how much they actually need to print and thus total paper usage will decrease. Many other schools have done the same and it proves to work well. (Appendix L) It has been proven (Appendix K) that the installation of such a system has the potential to lower total paper usage by 40-70%. A common choice is the Pharos UniPrint software system combined with card swiping machines at every set of printers. HSU already has card-swiping machines at the copy machines in the library. The next step is to add them to each computer lab as well. This would fill the financial gap within the universities paper use and conserve our natural resources at the same time.

Implementing this idea would require an investment in the necessary upgrades so even though this is the most effective way to reduce paper use on campus, it is also the hardest to manifest. The first thing that should have to happen is to get the student opinion on the fee change idea through a vote. The next step would be a collaboration between the students and Academic Computing to secure the needed funding for the new software and equipment. Finances would have to be set in a way as to ensure that EOP doesn't lose their funding from the printing fee.

X. Conclusion

Due to the scope of this project, the ultimate goals we set will take a cooperation of people years into the future to accomplish. But with this background information, we hope to streamline the process for others. The best way to reduce large amounts of paper use is to implement a pay-per-print software/hardware system in all computer labs. For this to be done, it will take the students' permission (which may involve a vote) and some accounting work to change the fees, due to the funds-sharing with EOP. We hope that our efforts will be a solid support structure to promote conservation of paper use at HSU. The following are some ideas for people who will take this to the next level.

Looking to the Future:

- Talk to people who know secretaries
- Spend considerable time planning the timeline as soon as the project idea has solidified
- Plan brainstorming meetings with staff during the first couple of weeks of the semester
- Do all assessment activities during the first few weeks, meaning surveying of staff and students
- Make plans based not only upon what we determine as key aspects within our group. Make plans that take into consideration the perspectives of the other students and the professors.
- Continue to coalition build. Look for more allies within student groups and department heads.

Some More Ideas on How We Can Continue Educate (Some of these we can still do. Some we must pass off):

- Keep asking if we can present at different department meetings to professors
- Do announcements in classrooms about upcoming events, workshops, or resources that can be collected.
- Have an area designated for collected information and resources, and have that area advertised – for our group and/or for others to access
- Make tiny, pocket-sized tip sheets for printing on one-sided paper, to be passed out on Paper Day
- Forward the designs for all flyers, posters, and table tents to a staff person who can keep the resources on-hand for any future Humboldtians interested in educating about paper

References

People we contacted at Humboldt State University:

- **Cannon, Bill** (Head of Academic Computing)
- **Collins, Pat** (IT Consultant, in charge of implementing the technology in the GIS lab)
- **Cooley, Alec** (Solid Waste Manager at Plant Operations/Advisor to the Campus Recycling Program)
- **N.R. Department:** Dick Hansis, Steven Steinberg, Steve Martin, Michael Smith, Caroline Weidner
- **Sustainable Campus Task Force** members(Club on Campus)
- **Wilson, R.J.** (Academic Computing, main contact for questions or comments)
- **Winkler, Michael** (Student Activist at HSU)

Web sites that we consulted:

- http://www.tappi.org/paperu/all_about_paper/earth_answers/howmuch4.htm
- <http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/paperandglass.html>
- <http://www.ofee.gov/recycled/descript.htm>

Contacts for ideas about pay per print systems:

- sarahs@UTKPP.PP.UTK.EDU www.utk.edu
- john.bucher@oberlin.edu www.oberlin.edu
- <http://clm.ucdavis.edu/rooms/printing/printingpoliciesfaq.html>

APPENDICIES

APPENDIX A

Original Brainstorm

Students:

- Posters in Academic Computing
- Printer Friendly booklet for more detailed info.
- Using "eco-guilt" and "eco-rewards"
- Printer information on desktop of computer
- Paper Day in Quad- table with info and facts
- Tabling with consumption info and reduction methods (printer ed)
- Paper tree (or any other presentation) quantifying wasted paper
- Simple printer education posters for labs
- Have a "Print-Free Day!"
- Paper display-creative display made of wasted paper in quad
- Offer workshop (possibly)
- Classroom presentations (PSA's)
- Use library display case
- Put info on CRP website
- HSU Paper Reduction Day
- Protest Printing Day
- Smash printing
- Bulk email
- Pledge drive for semester
- Smash a bunch of printers in the Quad
- Collect and make resources, free paper binders at our tabling gigs.

Professors:

- Presentations at department meetings about how professors conserve paper (possible fact sheet)
- Code material that professors put on Blackboard as mandatory or optional
- Put more on blackboard...encourage students to read on computer
- Bulk email with facts about saving paper
- Re-use readings that are handed out (collect them when done or at end of semester)
- Reward professors from each dept. who use the least amount of paper.
- If professors use blackboard, do a small presentation to students on how to print two pgs. Per sheet, 6 slides per page, etc.

Technology:

- No-action action: one time fee, no quota
- One time fee with quota
- Typewriters
- Duplex Printers
- Pay per print software, based on log-in with Student ID
- Pay per print, bases on Swiping student ID (Hardware)
- Implementing higher percent recycled, or higher grade of recycled paper

APPENDIX B

First Winnowing

Students	Professors	Technology
<ul style="list-style-type: none"> • Posters in Academic Computing 	<ul style="list-style-type: none"> • Presentations at department meetings about how professors conserve paper (possible fact sheet) 	<ul style="list-style-type: none"> • No-action action: one time fee, no quota
<ul style="list-style-type: none"> • Printer Friendly booklet for more detailed info. 	<ul style="list-style-type: none"> • Code material that professors put on Blackboard as mandatory or optional 	<ul style="list-style-type: none"> • One time fee with quota
<ul style="list-style-type: none"> • Printer information on desktop of computer 	<ul style="list-style-type: none"> • Bulk email with facts about saving paper 	<ul style="list-style-type: none"> • Pay per print software, based on log-in with Student ID
<ul style="list-style-type: none"> • Paper Day in Quad-table with info and facts 	<ul style="list-style-type: none"> • Re-use readings that are handed out (collect them when done or at end of semester) 	<ul style="list-style-type: none"> • Pay per print, bases on Swiping student ID (Hardware)
<ul style="list-style-type: none"> • Have a "Print-Free Day!" 	<ul style="list-style-type: none"> • If professors use blackboard, do a small presentation to students on how to print two pgs. Per sheet, 6 slides per page, etc. 	<ul style="list-style-type: none"> • Implementing higher percent recycled, or higher grade of recycled paper
<ul style="list-style-type: none"> • Paper display-creative display made of wasted paper in quad 		
<ul style="list-style-type: none"> • Use library display case 		
<ul style="list-style-type: none"> • Put info on CRP website 		
<ul style="list-style-type: none"> • Bulk email 		
<ul style="list-style-type: none"> • Pledge drive for semester 		
<ul style="list-style-type: none"> • Smash a bunch of printers in the Quad 		

APPENDIX C

Table 1: Criteria

Criteria		Numerical Weight for Each Criteria/10 pts.
1.	Saves the universe. (bonus point)	1/10
2.	Meets the educational goals of students at @ HSU	2/10
3.	Is feasible monetarily.	3/10
4.	Saves the university money over the long-term.	4/10
5.	Is convenient for the printer-users.	5/10
6.	Provides for a sustainable environmental ethic.	6/10
7.	Furtheres the solidarity around conservation @ HSU.	7/10
8.	Is feasible time-wise.	8/10
9.	Uses the least amount of natural resources.	9/10
10.	Uses the least amount of paper.	10/10
Total		45 points possible

Table 2: Proposals

Students	
A.	Posters in Academic Computing
B.	Printer Friendly booklet for more detailed info.
C.	Printer information on desktop of computer
D.	Paper Day in Quad- table with info and facts
E.	Have a "Print-Free Day!"
F.	Paper display-creative display made of wasted paper in quad
G.	Use library display case
H.	Put info on CRP website
I.	Bulk email
J.	Pledge drive for semester
K.	Smash a bunch of printers in the Quad
Professors	
L.	Presentations at department meetings about how professors conserve paper (possible fact sheet)
M.	Code material that professors put on Blackboard as mandatory or optional
N.	Bulk email with facts about saving paper
O.	Re-use readings that are handed out (collect them when done or at end of semester)
P.	If professors use blackboard, do a small presentation to students on how to print two pgs. Per sheet, 6 slides per page, etc.
Technology	
Q.	No-action action: one time fee, no quota
R.	One time fee with quota
S.	Pay per print software, based on log-in with Student ID
T.	Pay per print, bases on Swiping student ID (Hardware)
U.	Implementing higher percent recycled, or higher grade of recycled paper

Table 3: Weighted Criteria Matrix

Proposals	Criteria										Total Points/ 55
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	
Students											
A.	0	2	2	2	5	3	5	7	6	7	39
B.	0	2	3	4	3	5	7	4	8	5	41
C.	0	1	3	4	5	6	7	7	9	10	52
D.	1	2	3	2	4	6	7	3	9	10	47
E.	1	2	3	3	0	6	6	2	9	10	42
F.	0	1	3	1	5	6	7	4	9	8	44
G.	0	1	3	1	5	6	7	4	9	8	44
H.	0	2	3	2	4	6	7	8	8	7	47
I.	0	2	3	2	4	6	7	8	8	7	47
J.	1	2	3	3	0	6	6	2	9	10	42
K.	1	2	3	1	5	6	7	6	7	7	45
Professors											
L.	0	2	3	2	5	5	3	1	8	10	39
M.	0	2	3	2	5	5	3	1	8	9	38
N.	0	2	3	2	4	6	7	8	8	7	47
O.	1	2	3	4	5	6	7	4	9	10	51
P.	0	2	3	2	5	5	3	1	8	9	38
Technology											
Q.	0	2	3	0	5	0	0	8	0	0	18
R.	0	1	3	4	2	4	5	2	9	10	40
S.	0	1	3	4	4	3	6	5	9	10	45
T.	0	1	3	4	2	4	5	2	9	10	40
U.	1	2	3	1	5	6	7	7	9	10	51

Table 4: Selected Proposals

Students
C. Printer information on desktop of computer
D. Paper Day in Quad- table with info and facts
H. Put info on CRP website
I. Bulk email
K. Smash a bunch of printers in the Quad
Professors
L. Presentations at department meetings about how professors conserve paper (possible fact sheet)
N. Bulk email with facts about saving paper
O. Re-use readings that are handed out (collect them when done or at end of semester)
Technology
T. Pay per print software, based on log-in with Student ID
U. Implementing higher percent recycled, or higher grade of recycled paper

Note: The above Selected Proposals are those which we are giving priority to in our available time, although if we find that we have more time available, we may try to implement some of the other proposals as well.

APPENDIX D

Timeline for the last 7 weeks!

10/25 This week:

- Joanna & Melissa send email to RJ and Steve Martin
- Joanna reserve quad for Dec. 3rd

11/1:

- Make paper factoids for CRP Website, paper day, bulk emails, professor meetings and AC labs -all of us in class
- Thurs.-meeting with NR Dept-Cisco, Julie & Melissa
- Justin-make bulk mail email
- Joanna-email RJ again, also Alec
- Tina & Joanna- write up this week's assignment
- Cisco-type up this week's assignment
- Melissa-write out agenda/survey for NR Dept meeting
- **Implementation Strategies due Wednesday**

11/8:

- Tina-type up revised timeline
- In class- work on completing compiled factoids- email to Alec by end of week.

11/15:

- Justin & Tina present all info about tech. to RJ
- Joanna, Cisco, Melissa, Julia prepare for Paper Day on Quad
- **Monitoring Evaluation plan due Wed.**

11/22

- **Thanksgiving Break!!!**

11/29:

- Group get together and compile all data to create final paper
- Group prepare final presentation
- **PAPER DAY on Friday!**

12/6

- **Final Presentations**

APPENDIX E

Surveys Presented to Natural Resource Professors:

Problem:

EXCESSIVE PAPER USE EXCEEDS THE BUDGET FOR PRINTING!

CURRENT PAPER USE IS NOT IN LINE WITH HUMBOLDT STATE'S ENVIRONMENTAL ETHIC.

Can Blackboard be to blame?

Survey:

1. How do you feel about receiving assignments via the digital drop box in Blackboard?

2. If you have difficulties using Blackboard as an alternative to receiving paper documents, would you please explain your conflict?

3. Do you expect students to print pages from Blackboard (lectures, readings, and etc.)?

4. If you require printing, what is a rough estimate of the amount of pages you require per semester?

5. Do you have any suggestions about how to reduce paper usage?

APPENDIX F

Notes:

Meeting with Bill Cannon, Michael Winkler, & Alec Cooley 9-24-04

Who are the main purchasers of paper on campus?(Academic Computing, The University Center, Department Labs) We have already spoken with Academic Computing. A meeting was set up with Alec Cooley (Solid Waste Manager at Plant Operations), our group members and Bill Cannon (head of Academic Computing). Bill Cannon agrees with us that too much paper is being used and wasted at HSU. To him, this is seen as spending too much money (more than they have) and he wants to help us out with our project to save money.

Our \$5 printing fee covers paper and toner, it does not cover any maintenance fees. This fee was passed in April of 1997 despite a student vote favoring a pay per page system, because this technology was too expensive and not efficient enough at the time of the vote. The fee used to be split between Dept. labs and AC, however, AC now consumes all of it, in part, because information that was once printed in Dept. Labs is now put on blackboard for students to print in AC. 1/3 of the printing fee goes to financial aid to help fund EOPS, which is approximately \$25,000. The percentage was decided and passed by the trustees and the fee committee. This is the most controversial area surrounding pay per page implementation. Any "fees" that are changed or implemented must be passed through the fee committee. Any "fees" must have a percentage of there total value given to EOPS. Therefore, changing the current system could have deleterious effects on an already dwindling amount of aid for less privileged students.

The next idea is double-sided printers. Bill Cannon said the ones that he has looked into run about \$4-5,000. The biggest problem with them is that they are slow, cause more jams, and require more maintenance. All the printers have an approximate lifespan of 13 years. However, there are some grant funds available via the Integrated Waste Management Board who will match funds for up to \$50,000.

Reflection:

Nobody had any idea how much paper we actually use. This is surprising, since apparently neither does Academic Computing. They dominated the conversation for the majority of the time, theorizing about what could be done, but never coming up with any solid on the ground ideas. Bill Cannon was willing to talk about the issues, but seemed very apprehensive about actually trying to do anything about the problem, as a means of steering clear of what appeared would be an administrative nightmare for someone in his position. When I told him that we were a group of students that were ready and willing to begin hands on activist work on the ground, he was supportive, but showed very little actual enthusiasm, nor did he share many ideas about what he thought someone in my position should be doing. With little or no communication between the top-heavy administration and the uninvolved student population, the future of paper sustainability looks bleak at best.

APPENDIX G

Notes:

Meeting with Alec Cooley as a group 9/27/04

Tech:

1. Charge per sheet → check on feasibility, look at other schools, what's been done?
2. What are the best method to reduce paper consumption? → Look at other schools

Ideas: swipe card, code on screen, quota or pay per print, double sided printers

Education:

1. Students → how not to consume so much, why not to consume so much, how do we keep people's attention, create a template for future semesters, multiple pathways
2. Professors → department meetings, dean introduces us to department chairs, 400-500 professors on campus, code materials on blackboard as mandatory and optional

APPENDIX H

Notes:

Meeting Tina & Julia went to with the Sustainable Campus Task Force 9/15/04

We found out that Michael Winkler & SCTF are also working on this project. They had very similar ideas as our group in terms of outreach, printing education, and another possible vote for what to do about the problem (as if it mattered what students vote for). I left my e-mail address agreed to continue meeting with them in hopes that we could join forces to make a bigger impact. However, I was never informed about any further meetings, or any other kind of information.

APPENDIX I

This chart is to be filled out throughout the next few years to track any kinds of changes in the printing system at Humboldt State University's Academic Computing computer labs. These changes will attest whether or not we have reached our goals and objectives:

GOAL: To reduce paper waste in Academic Computing computer labs on campus.

OBJECTIVE: To reduce the amount of paper purchased (therefore used) by Academic Computing by 10% by the end of Spring 2007 semester & 15% by the end of the Spring 2010 semester.

	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Paper Used in AC-reams/student	?	1 1/8 th					
Amount of money spent by AC on printing	\$14,808.65	\$18,000.00 (est.10/04)					
Duplex Printing	none	none					
New software installed to track printing	none	none					
New hardware installed to track printing	none	none					
New types of student education to reduce printing	N/A	See above					
New types of professor education to reduce printing	N/A	See above					

Appendix J

How to print 2 sheets per page:

1. Go to file → Print
2. Click on Options/Properties
3. Go to layout → click on the arrow that says how many pages per sheet you want
4. Click OK
5. Click OK

How to print six slides per page:

1. Go to file → print
2. The computer knows you are printing from power point
3. Click on slides → handouts
4. The amount of slides per page will be a choice
5. Click on six slides per page
6. Click OK

Appendix K

UC Davis reasoning to change to a pay-print-system:
<http://lm.ucdavis.edu/pubs/printing/>

Printing in the Computer Rooms

By Peter Blando and Tim Leamy
Information Technology

November 2, 1999

Executive Summary

The following report provides a brief description of the current free printing policy at the campus' central computing facilities. It provides an analysis of the fiscal impact and projections of future funding needs to support printing in the computer rooms. In addition, the report identifies the primary reasons for the growth of printing and options of how to deal with this growth. For comparison, policies of other universities as well as policies of UC Davis departments are included. While this document provides options as to how the campus can address the issue of support for printing, this is not intended as a planning document. It is intended primarily to provide information on this issue.

This document focuses primarily on the printing in publicly accessible computer rooms managed by Information Technology under its Lab Management unit. The report excludes analysis of computer rooms operated by departments other than Information Technology and those that are restricted from public access.

From the data summarized in this report, the campus can expect a growing demand for printing and associated increase in support costs. The information age and the shift to more on-line accessible documents has led to students printing more every year. Furthermore, the absence of hard quotas or charges for printing has resulted in possible indiscriminate printing.

Several universities face the same problems. Their solutions for cost recovery have been varied with some charging per page and others charging a flat rate for a specific quota. Campus departments have primarily used access limits to limit the number of people who can print. Several options were presented along with specific

advantages and disadvantages.

The Division of Information Technology hopes that the campus can review the information presented here and determine the most appropriate course of action.

Contents

- Background
- Costs of Printing
- Causes of Printing
- Comparison to Other Universities
- Options for Cost Recovery

Background

Historically, Information Technology has supported free printing in the computer rooms. Over the past few years printing costs have increased dramatically. Since methods for detailed print accounting were established, printing has grown 212 percent. For example, the number of pages printed per quarter rose from 580,000 in Winter 1996 to 1,826,000 in Spring 1999. The graph below shows the pages printed per quarter. Charting a straight trend line projects nearly two million pages to be printed in Fall 1999.

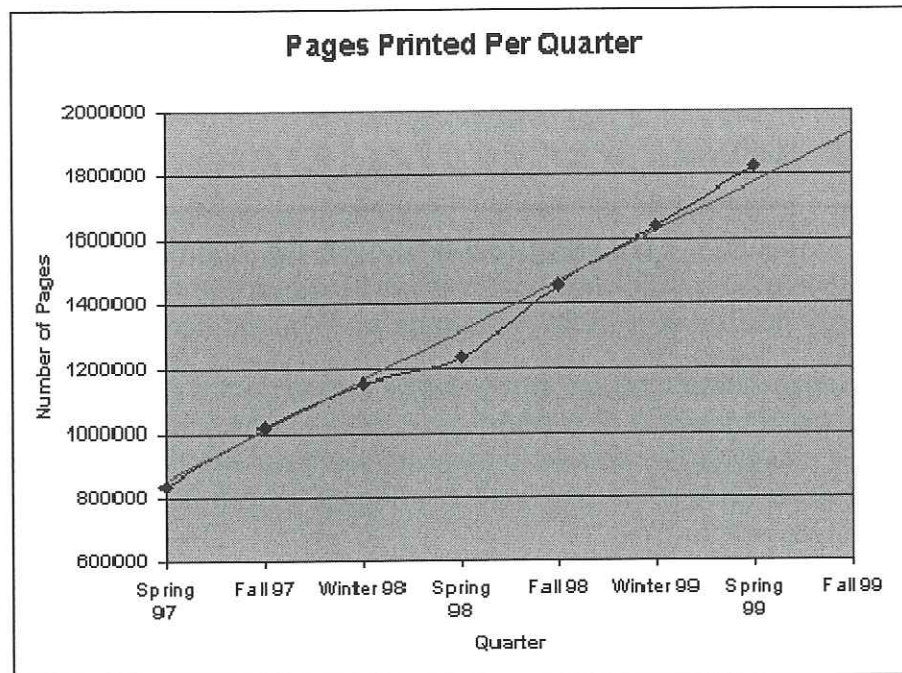


Figure 1

The rate of change can be attributed to both an increase in the number of users and the rise of the average number of pages printed. Since Fall 1995, there has been a doubling in the number of people printing each quarter and a quadrupling of the average number of pages printed. The graph below identifies this trend over time. By Spring 99, the average pages printed remained just under 160 pages and increasing sharply in comparison to the number of people printing. This could be due to the limit in the capacity and availability of the computer rooms to serve additional users.

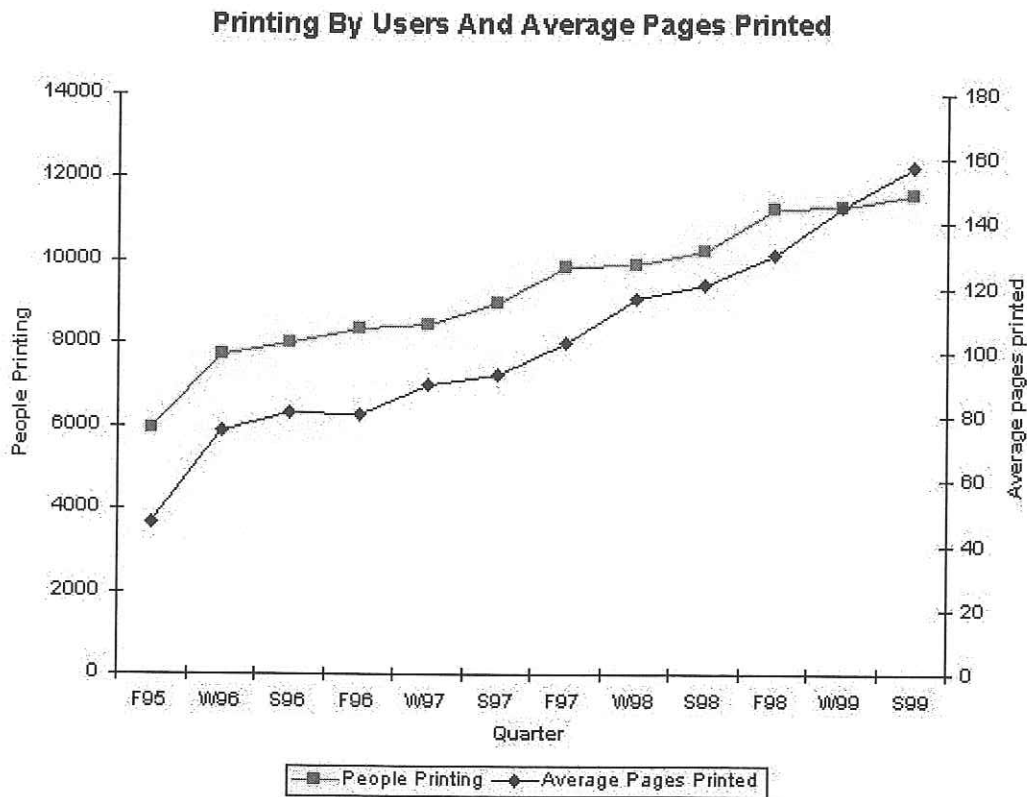


Figure 2

An overall increase can also be associated with the rise of people printing more than 100 pages but less than 800. The number of people printing in the upper ranges have varied significantly and showed decreases at certain quarters. The table below summarizes this information.

	People printing more than a certain amount of pages				
	> 100	> 200	> 400	> 800	> 1200
F95	680	207	52	11	4
W96	1738	706	183	37	11
S96	1994	838	214	25	8
F96	1813	792	265	74	40
W97	2360	1050	278	42	16
S97	2570	1204	363	49	10
F97	3055	1538	493	73	16
W98	3676	1883	582	38	2
S98	3841	2095	719	62	4
F98	4511	2572	886	66	6
W99	5105	3046	1050	83	7
S99	5580	3424	1217	97	11

Table 1

Table 1 indicates that a little over 10 percent of the users print more than 400 pages each quarter. In Spring 99, the median number of pages printed was 94.

Costs of Printing

The annualized cost of supporting printing has also increased. Over the past two years, the campus has spent over \$130,000 in printer related supplies and maintenance. This year, it is projected that the unit will spend another \$84,000 on those same items. Adding the cost for purchasing new printers on the replacement cycle, the costs are projected to exceed \$104,000 for 99-2000.

	97-98	98-99	99-00 (Projected)
Toner	\$ 29,396	\$32,493	\$35,917
Paper	\$26,972	\$31,484	\$36,750
Maintenance	\$3,731	\$6,661	\$11,892
Life-Cycle Costs*	\$13,067	\$15,867	\$19,600
Total	\$73,166	\$86,505	\$104,159

Table 2

* Life-cycle costs considers an average cost per printer times the number of total printers divided by three, the estimated life cycle of the printer

The above costs do not include support costs incurred to maintain printers and print queues. Support costs cover computer room consultant, hardware support, and staff support time. Note that there is a substantial loss of consultation time due to the time spent dealing with printer issues.

Hardware Support	\$ 1,700.00	4hrs/week
	\$ 72,000.00	Consultants spend roughly 20 percent of their time maintaining the printer or answering questions pertaining to printing. The total estimated costs for consultants is \$360,000 per year.
Consultant		
Lab Manager	\$ 9,340.00	8hrs/week at PAII levels
Total	\$ 83,040.00	

Table 3

If all costs are included, free printing will cost the campus close to \$190,000 during the 99-2000 fiscal year.

The computer rooms have a combined theoretical capacity to print 413 pages per minute, the actual rate is much lower due to the types of print jobs sent. Recent data shows an average of 32 pages per minute (25,000 pages per day) can be expected for Fall 2000.

Causes of the Growth of Printing

There are undoubtedly many reasons why printing usage has been increasing. Through surveys and observations Lab Management has identified the following:

- **Increased Use of the World Wide Web (WWW) for Delivery of Class Materials**

For many classes the World Wide Web has replaced the copy centers as the standard means for distributing class material. Consider the following two examples:

1. In the past an instructor would place a copy of his class materials at a copy shop where students could purchase them. Now many instructors are placing course materials on the WWW. Students then open the course webpages in a computer room and print them out immediately. There is evidence to suggest that students still prefer to study from paper because they mark up the text and write notes in the margins.
2. An instructor places class notes or materials on the web instead of providing copies to their students.

These examples show how duplication costs are transferred from the students or academic departments to a single organizational unit. Instructors are now reportedly instructing students to print out material at the computer rooms if they wish to have a hard copy.

- **Increase in the Number of Computer Literate Students**

As the percentage of computer literate students increases more students expect to use computers to do their coursework. This in turn means that more and more of their own class assignments are being printed in the computer rooms. The majority of reports and class papers are still submitted to instructors in paper form.

- **No Incentive to Print Responsibly**

Resources which are free are often abused. It is difficult to encourage users to print responsibly when there is no incentive to do so. Multiple printing of the same document, using a printer as a copier, and indiscriminate printing are wasteful. Though some departments impose hard print quotas, IT has chosen not to set hard quotas for printing. At this time, only warning letters are sent via email to students who print in excess of 400 pages and again at 800 and 1200 pages.

Other Issues

- **Time and Resource Waste from Inappropriate Printing**

Many class web pages contain graphics or other multimedia items which are

difficult and time consuming to print. For example, there are some PowerPoint slide shows which have been transferred to the web. In these web presentations each page translates into a 30MB print job. When a student attempts to print the series of web pages s/he can tie up a printer for hours. In many other cases trying to print multimedia data supported by plug-ins simply prints out blank pages.

- **Paper Waste**

Lab Management currently recycles an enormous amount of paper each week. Print jobs which have never been picked up is all too common. Typically, this occurs when a large number of students print graphic intensive or several pages of class notes simultaneously. Print queues are sometimes held up for over one and a half hours and students simply leave. They would later return to send the same material to the printer.

Other Universities

Other universities have faced this same issue. Although there are various approaches, a vast majority of other universities charge for printing. In fact, many have been charging for printing for the past six years.

- **UC Berkeley**

Students set up their accounts every semester. When they set up the account, they can select a printing account and pay \$10.00 for 200 pages of printing (plus a 50 page buffer) or they can select a free non-printing account.

- **UC Santa Cruz**

Laser printing costs \$.10 per page and is only available in staffed Instructional Computing labs. Color Printing costs \$1.00 per page. Printing requires a print card that is available for purchase at multiple locations on campus. No cash is accepted in the computer labs. With the exception of the vending machines, print cards are not available for purchase at the computer labs themselves.

- **Cornell**

ATS provides both laser printing at cost via Net-Print, as well as dot matrix draft printing at no charge. The laser printing costs 6 cents per page. Billing is done through the bursar.

Other UC Davis Departments

Campus departments have established their own methods for controlling printing but have not devised a method for cost recovery.

- **College of Engineering**

Has a hard print quota of 250 pages per student per quarter. Once the quota is reached, the student must submit a ream of paper (500 pages) to be able

to print up to another 250 pages.

- **Other Colleges or Departments**

No established print quota or print monitoring system. Restrictions are based by limiting access on computers to specific majors. Typically, computers that are able to print within these departments only have specialized software and excludes word processors and web browsers.

Options for Cost Recovery

- **Per page charge for printing**

There would be a small charge (\$0.05 - \$0.15) for every page printed. This solution would encourage users to print responsibly, only what is needed.

Advantages:

- Recovers some of the cost of printing.
- Provides an incentive to reduce printing.
- Targets users who print the most.

Disadvantages:

- It would pose an administrative burden on the campus to charge over 10,000 students every quarter.
- Issues such as refunds for jammed and toner streaked print jobs may cause an additional burden on front line staff.

- **Per page charge for printing after a number of free pages**

Same scenario as above, but each user would have a number (for example 250) of free pages before s/he is charged for per page.

Advantages:

- Recovers some of the cost of printing.
- Provides an incentive to reduce printing.
- Targets users who print the most.
- May avoid the issue of refunds by emphasizing the "gift" of number of free print pages

Disadvantages:

- Some administrative burden as above, but it would be reduced because of number of users charged.

- Does not recover all costs.
- May encourage the "sale" of free print quotas.

- **Print quotas**

A quota would be set. Printing would be disabled for a user after s/he prints the quota of pages.

Advantages:

- Provides some incentive to reduce printing, but only to print less than the quota.

Disadvantages:

- Users who print over the page limit would not be able to print at all. Extremely unpopular.
- Might encourage user to print up to the quota amount whether or not s/he needs to. Other abuses, such as sharing id's to share individual quota limitations.

- **A Student Fee to Support Printing**

Students could be charged a fee each quarter to support printing. This money would go to support the printers in the computer rooms.

Advantages:

- Recovers some of the cost of printing.

Disadvantages:

- No incentive to reduce printing. In fact, this might even provide incentive to increase printing. "I paid for printing so I'm going to get my money's worth."
- Mandated student fees would need to pass a long process of administrative and political steps to establish.

- **Recharge home departments for printing**

Information about the student's home department could be obtained via the student information system. The department is then charged for the amount printed by students that are designated under their department. This solution is similar to USC's solution for cost recovery of central computing access.

Advantages:

- Recovers the cost of printing.
- Shifts the burden from students to departments.

- Encourages departments to educate instructors on paper saving web page designs.
- Allows departments to return to traditional methods for distributing class materials.

Disadvantages:

- Resistance from department heads on the shift of responsibility.
 - Does not encourage students to reduce printing.
 - May discourage faculty from using technology such as the web.
 - Requires the identification of a single home department for undeclared (exploratory) majors.
- **Stop print support**
The campus could decide to remove the printers from the centralized computer rooms and stop supporting printing altogether.

Advantages:

- Removes all the cost of printing.
- May encourage students to request departments to have departmental print stations.

Disadvantages:

- Dramatic change in service will be unpopular among students and faculty teaching in computer rooms.
- Discriminates against students with no access to computers who need to print documents to study at home.

Comments: pgblando@ucdavis.edu
URL: <http://lm.ucdavis.edu/pubs/printing/>
Last reviewed: Thu, 22-Apr-2004
Last updated: Mon, 24-Apr-2000

The logo for OLM Lab Management features the letters 'OLM' in a large, stylized, bold font. Below 'OLM', the words 'Lab Management' are written in a smaller, cursive-style font.

Appendix L

Comparison of what pay-per-print systems other schools are using:

Name of School	Type of Updated Printing System	Student Population	Recycled Paper	Duplex Printing	Paper Saved
Oberlin College Ohio	Pharos system – Pay Per Print with Net ID and Copy Card (Soft and Hardware)	2,827	100% PCW	Some Available	60%-80%
University of Tennessee at Knoxville	Pharos UniPrint 6.0 pay-for-print with Net ID and Copy Card (Soft and Hardware)	27,300	None	All Labs (Default)	50%-70%
University of California at Davis	Login System that allows 100 pages per quarter. Over this, a fee is charged to student account	~30,000	Unknown	Available and encouraged	Hope to save
Humboldt State University	none	7550	30% PPC	None	N/A

APPENDIX M

A Log of Some of the Hours Spent on Project

9/1	Group- met for first time six people	1hr
9/8	Tina- met with Alec Cooley	1hr
9/8	Group-six people narrow project problem	1.5hrs
9/9	Tina- Research other schools	1hr
9/10	Joanna- Email research	1hr
9/13	Justin- Talked with R.J. Willsion	1hr
9/11	Julia Talked with Mike / W	.5hr
9/13	Group Brain Strom 6 people	1hr
9/16	Julia SCTF meeting	1.5hr
9/14	Julia e-mail M Williams/ D. Faulk	.5 hr
9/16	Tina SCTF meeting	1.5hr
9/20	Tina worked on AS stuff	2hr
9/18	Tina Computer research	.5
9/18	Cisco computer school paper research	.5
9/20	Group Brain session 6 people	2hr
9/19	Collected ideas for educational signs/ basement of surveys / Research other schools policies on paper waste reduction policies. 6 people	1.5
9/20	Researched online for ideas and examples from other Universities and talked with people from AS about ballot initiatives	2hr
9/23	Justin Brainstorm education ideas	1hr
9/23	Tina Joanna , Melissa, Justin, Cisco Group Discussion	2hr
9/27	Tina Julia Joanna , Justin met with Alec Cooley	1hr
9/24	Julia met with bill Cannon, Michel Winkler, and Alec Cooley	1.5 hr
9/29	Justin, Tina, Joanna brainstormed problem statement	1hr
9/29	Justin, Tina, Joanna, Cisco, Melissa wrote the final draft of the problem statement	2hr
10/4	Joanna and Melissa met with Alec Cooley	.75hr
10/4	Justin Computer Research and email correspondence	.5hr
10/4	Group meeting talked about goals and objectives	2hr
10/6	Group meeting brainstorm solutions	2hr
10/8	Drafted and Emailed RJ Wilson	1hr
10/11	Group meeting more brainstorming of solutions	2hr
10/11	Justin Email to other schools	1hr
10/13	Group meeting started weighted criteria matrix	2hr
10/12	Melissa, Tina, Julia Pondering Project	1hr
10/9	Julia check in with Michael Winkler	1hr
10/18	Group meeting matrix related	2hr
10/19	Justin emailing other schools for technology research	1hr
10/20	group meeting matrix	2hr

10/19	Joanna another email to RJ	.5hr
10/20	Justin submit Bulk email for paper day	.5hr
10/25	Group meeting develop timeline/implementation strategies	2hr
10/27	Group meeting implementation strategies	2hr
10/25	emailing professors/departement chairs about meet/present	.5hr
10/28	Justin submit Bulk email for paper day	.5hr
11/1	Tina and Joanna worked on implementation	2hr
11/1	group meeting	2hr
11/3	Cisco typed project	2hr
11/8	Group meeting	2hr
11/8	Cisco talked to Alec to arrange paper pick up	.5hr
11/8	Justin submit Bulk email for paper day	.5hr
11/15	Cisco talked to Alec about dates to collect paper	.5hr
11/15	Group Meeting	2hr
10/28	Justin submit Bulk email for paper day	.5hr
11/?	Meting with professors	1hr
11/29	Group meeting (work on paper display/paper day)	2hr
11/30	Joanna organizing paper and emailing out	2hr
11/30	Justin technology info and table comparison	2hr
11/28	Cisco talked to Alec about paper pick up	.5hr
12/1	Group meeting (more work on paper day)	2hr
12/2	Cisco meet with Alec and picked up paper	3hr
12/2	Made paper tree	4hr
12/3	Paper Day!!!!	4 hr
12/3	Group meeting to finalize paper	4hr
12/4	Cisco typing	.5hr
12/4	Justin adding to final paper	1hr
12/4	Joanna more editing	4hr
12/5	Tina Editing!!!	4hr

8 hours this day

YEAH DAWG!!!!