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ABSTRACT

The primary purpose of this study was to gather information concerning programs that are in place to address increasing academic computing needs in order to: provide information concerning strategies that universities and schools of business are using to meet demand for computer hardware, software, and printing; identify master plans and programs being pursued to satisfy anticipated future needs; and address programs in place that coordinate the migration and/or retirement of existing computers. A survey instrument was sent to deans of 792 AACSB (American Assembly of Collegiate Schools of Business) member schools. A total of 135 surveys were returned; over half of the schools that responded have plans in place that allow them to meet technology demands in the future and that address the migration and/or retirement of existing computers. Findings are summarized related to issues addressed in the master plans, time frames for hardware replacement, and differences between universities with master plans and other universities. Three tables present data on funding of new equipment purchases, tests of significance of master plans for meeting future needs, and tests of significance for master plans for equipment retirement. A copy of the questionnaire with tabulated responses is appended. (MES)

A National Study Assessing Computer Technology Master Plans to Meet Needs of College Students & Faculty

By:

Cindy H. Randall

A NATIONAL STUDY ASSESSING COMPUTER TECHNOLOGY MASTER PLANS TO MEET NEEDS OF COLLEGE STUDENTS & FACULTY

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INTRODUCTION

Modes of communication are changing, global and local networks have greatly increased in significance, and basic computer literacy is almost a universal requirement in the workplace (Rubel 1996). It has become clear that relevant education must provide students with computer tools and technologies that will be an inevitable part of their lives (Brown 1998). Our students, who will spend their working lives in the twenty-first century, must come to perceive the computer and its related information technologies as an extension of themselves, as we have so long perceived the calculator (Britt 1997).

To meet this challenge, universities should be scrambling to equip campuses with adequate hardware and software. But what is adequate? Should money be put in hard-wired computer labs when students could simply bring a laptop to class and plug into the network? Should laptops be provided? Is this financially feasible and/or justifiable in light of student demographics? Faculty development is another critical issue. Retraining of faculty is a necessity if computers are to be incorporated into all disciplines. (Candiotti 1998)

BACKGROUND

Some schools are successfully meeting this challenge. Western Kentucky University has implemented a universal computing network at a cost of $3.3 million that networks all labs, classrooms, offices, and dorm rooms (Anderson 1996). At UCLA's Anderson Graduate School of Management, students are required to purchase their own laptop and can access the network from every desk in every classroom, reading room, or breakout room (Frand 1996). Using a technology fee of $475 per semester, Valley City State University in North Dakota has placed a laptop in the hands of every student (Blodgett 1996). The University of Minnesota charges students $300 per term for a technology-access fee (Morken 1997). Drexel University simply attaches the bill for the computer to the bill for tuition (Biros 1998).

What is the impact of such fee hikes on enrollment? At Minnesota, enrollment has actually increased 20 percent in the three years since the technology-access fee was invoked. Other universities are experiencing this same phenomenon. It appears that increases in cost, offset by perceived benefits in a computer-enhanced learning environment, are acceptable to students (Burg 1998).

Some universities are receiving technical and financial support from industry to help them meet this technology challenge. IBM has implemented a Global Campus project and has set up what is known as ThinkPad Universities. Both Wake Forest and Seton Hall are participating in this project. IBM is providing products, service, and support to allow the restructuring of both administrative services and teaching and learning environments. Each freshman receives a notebook computer for an extra $1000 tuition at Seton Hall, $3000 at Wake Forest (this price tag will also help offset training costs). Internet and university network access is available from dorm rooms. These computers will actually be owned by the university, to allow fast response to complaints concerning damaged or defective equipment. Every computer in inventory will be replaced every 2 years. Seton Hall estimates that this project will cost $15 million over the next 5 years. (Guy 1997)

Since few schools have the luxury of support from a corporate giant like IBM, the vast majority of universities need a consistent, ground-up strategy that starts with long-range plans for computer purchase and distribution, networking, training, maintenance, and curriculum development. Some schools that have such plans have been very successful in their implementation. Others schools are building a technological Tower of Babel. A national survey that assesses where universities are in their attempt to meet the technology challenge may help all

schools better understand this challenge and permit them to be better equipped as we approach the next century.

The primary purpose of this study is to designed to gather information concerning programs that are in place to address increasing academic computing needs. This study should generate data that will (1) provide valuable information concerning strategies that universities and schools of business in general are using to meet demand for computer hardware, software, and printing; (2) identify master plans and programs being pursued to satisfy anticipated future needs; and (3) address programs in place that coordinate the migration and/or retirement of existing computers.

RESEARCH METHODOLOGY

A survey instrument was sent to all deans of all 792 AACSB member schools. In the cover letter, the investigator explained the purpose of the study and included the survey instrument (see Appendix A) as well as a request that the survey be passed on to the individual who is most qualified to complete the questionnaire. One hundred, thirty-five surveys were returned for a 17 percent response rate.

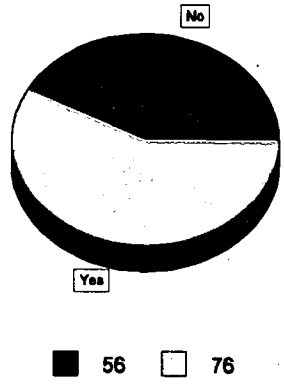
These surveys were summarized using SPSS for Windows. In addition to frequencies, SPSS was used to ascertain whether or not there was any significant differences between responses from universities that had master plans in place to address future technology demands and those universities that did not. Chi square goodness of fit tests were also used to compare universities that had plans in place to address the migration and/or retirement of existing computers and information technologies and those universities that did not.

FINDINGS

Over half of the schools that responded have plans in place that allow them to meet technology demands in the future and that address the migration and/or retirement of existing computers.

To summarize the results of the survey instrument, most schools dispose of old computers by recycling them, generally using state funds for new equipment purchases (see Table 1). Almost all schools support computer labs and Microsoft Office. Few require that students purchase laptop computers. The vast majority of schools have teaching labs, generally with ink jet printers available in the labs, which are manned by technicians. While most schools do not charge for printing, many have imposed a student technology fee (45.2% with the median fee being $50 per term). The majority of those responding to the survey either have docking stations or have plans to install docking stations within their labs. Most are not moving to a paperless classroom at this time. The majority of schools are trying to standardize software as well as hardware. For a breakdown of responses by question, see Appendix A.

MASTER TECHNOLOGY PLAN



MASTER RETIREMENT PLAN

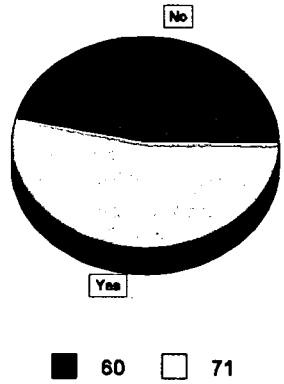
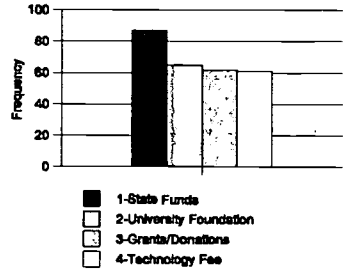


TABLE 1
FUNDING OF NEW EQUIPMENT PURCHASES



Seventy-six of the 135 universities responding have a plan in place to address future technology demands. These plans varied, but many stated that a university committee oversees the spending of technology monies and that this committee assesses and prioritizes needs. Additional issues addressed in master plans included:

1. Increasing monies dedicated to improving instructional technology, including distance learning and high tech classrooms equipped with data projectors capable of computer/video and audio projection.

2. Yearly equipment purchases, with computer labs receiving top priority in equipment replacement and old equipment being filtered down to academic offices.

3. Moves toward laptop computers (some schools hope to require students to purchase laptops in the near future).

4. Building infrastructures that allow every class, every desk, every dorm room to be connected to the Internet.

5. Standardization of hardware and software.

6. Increase the amount of budget monies available for technology needs.

7. Strategies that allow schools to take advantage of the power of the World Wide Web, movement toward Web based instruction in the classroom.

8. Increase in the use of such collaborative tools as Lotus notes.

9. Year 2000 compliancy.

Seventy-one of the 135 universities responding have a plan in place to address the migration and/or retirement of existing computers and information technologies. These plans varied, but most proposed a time frame in which hardware would be replaced.. To summarize these plans:

1. Twenty-seven percent stated that replacement of equipment was performed on a three-year cycle.

2. Thirteen percent replace equipment on a four-year cycle.

3. A few schools replace equipment on a two-year cycle.

4. One school reports that lab equipment is placed annually, another that one lab is replaced each year.

5. Another noted that equipment is upgraded, not replaced.

6. Most noted that old lab equipment (with most schools stating that new equipment went first to labs) was filtered down to faculty (based on classes taught and research agenda) and departmental offices. One stated that old equipment was placed in typing labs.

7. Several schools have moved to lease agreements and no longer purchase equipment.

8. One school stated that replacement costs are born by both the college needing the equipment (25% of expense) and the students using the equipment (75% of expense).

Chi-square goodness of fit tests were run to compare master plans in both meeting future needs and in the retirement and/or migration of old equipment to all other survey questions. In comparing schools with and without formal plans to address future technology demands, eight questions were significant at the .05 level (see Table 2). Universities that did have formal master plans on meeting needs of the future were significantly different from other universities in the following areas:

1. Of universities that donate old equipment when no longer useful, 70% have master plans.

2. Of universities that require that students purchase laptops, 91 % have a master plan. In fact, of universities that provide a laptop to students, 100% have a master plan.

3. Of universities that use technicians to man computer labs, 66.7% have master plans.

4. Of universities that plan to move to a paperless classroom, 75% have master plans.

5. Of universities that have formal plans for the retirement of old equipment, 81.4% also have master plans.

6. Of universities that are attempting to standardize printers, 66.2% have master plans.

7. Of universities that support laptop computers, 79.2% have master plans.

8. Of universities that support both laptop computers and computer labs, 81.8% have master plans.

In comparing schools with and without formal plans to address the retirement and/or migration of existing computers and information technologies, ten questions were significant at the .05 level (see Table 3). Universities that did have formal master plans for the retirement of old equipment were significantly different from other universities in the following areas:

1. Of universities that donate old equipment when no longer useful, 66% have master retirement plans.

2. Of universities that finance the purchase of new computers and/or software using foundation/endowment accounts, 63.5% have a master retirement plan.

3. Of universities that have a master plan to address future technology needs, 77% have a master retirement plan.

4. Of universities that handle technology maintenance with full-time technicians provided by their college or school of business, 62% have master retirement plans.

5. Of universities that have technicians manning their computer labs, 62.1% have master retirement plans.

6. Of universities that have plans to move toward a paperless classroom, 77.4% have master retirement plans.

7. Of universities that are attempting to standardize computers, 63.4% have master retirement plans.

8. Of universities that are attempting to standardize printers, 70% have master retirement plans.

9. Of universities that support laptop computers, 73.9% have master retirement plans.

10. Of universities that impose a student technology fee, 63.3% have a master retirement plan.

TABLE 2
TESTS OF SIGNIFICANCE MASTER PLANS FOR MEETING FUTURE NEEDS

Dependent Variable:	Independent Variable:	Pearson's r
Plans for future technology needs	Donate retired computers	.040
Plans for future technology needs	Laptops are required	.010
Plans for future technology needs	Labs are manned by technicians	.010
Plans for future technology needs	Plans to move to a paperless classroom	.030
Plans for future technology needs	Master plan for retirement of old equipment	.000
Plans for future technology needs	Attempting to standardize printers	.040
Plans for future technology needs	Supporting labs and laptops	.010
Plans for future technology needs	Supporting laptops	.015

TABLE 3
TESTS OF SIGNIFICANCE MASTER PLANS FOR EQUIPMENT RETIREMENT

Dependent Variable:	Independent Variable:	Pearson's r
Plans for equipment retirement	Donate retired computers	.040
Plans for equipment retirement	Finance equipment with foundation $$	.050
Plans for equipment retirement	Have master plans for future needs	.000
Plans for equipment retirement	Use full-time technicians from within COBA for maintenance	.050
Plans for equipment retirement	Man computer labs with technicians	.020
Plans for equipment retirement	Intend to move toward paperless classroom	.005
Plans for equipment retirement	Are attempting to standardize computers	.001
Plans for equipment retirement	Are attempting to standardize printers	.000
Plans for equipment retirement	Support laptop computers	.040
Plans for equipment retirement	Impose a technology fee	.050

CONCLUSIONS

In the face of rapidly changing technology and dynamically increasing computer hardware and software needs, universities need to formally address how they will meet demands in the near and distant future. Industry is expecting employees to be more than simply computer literate, students are scrambling to acquire these skills, and the universities who meet this challenge will have the opportunity to shape education in the 21st century.

All universities must accept budget constraints. These monetary limitations force all colleges, departments, faculty, and staff to fight for each dollar allocated. Technology needs continue to swallow a larger and larger slice of the pie. To be equitable and to place a university in a competitive position in years to come, a formal master plan needs to be devised that will address the monies allocated to technology needs and how these dollars will be best spent.

Many universities are implementing such plans. These plans address dollars budgeted, equipment purchases, standardization of hardware and software, infrastructures that will allow students Internet access from most anywhere, high technology classrooms, Web based instruction, software tools, and laptop computers. This is a checklist about which every university is or should be concerned. It is interesting to note that when a Chi Square Goodness of Fit Test was performed, there was no significant difference between the size of the university and whether or not the university has a technology master plan. Nor is there a significant difference between universities with master plans in place when examining

whether or not a university has AACSB accreditation. Nor is there a significant difference between universities with master plans in place when examining whether or not a university is public or privately funded. All universities are recognizing the needs for such a plan.

For the most part, equipment retirement or migration is tied in with technology master plans. Addressing the cycle of equipment replacement and the migration of existing equipment is a necessary part of most technology plans.

As the turn of the century beckons, we are experiencing sweeping changes in how information is stored, retrieved, processed, and delivered. Universities must incorporate this evolving technology into their labs, classrooms, and classes in order to be have the competitive advantage in recruiting students. How this technology and computer equipment will be made available is best addressed through a comprehensive plan that maps out goals and objectives for the university. Those universities with pragmatic approaches to ensuring up-to-date hardware and software will be academic leaders in years to come.

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APPENDIX A
ASSESSMENT OF COMPUTER TECHNOLOGY MASTER PLANS

1. Is there a plan in place that will allow your college to meet future technology demands?
   57.6% Yes
   42.2% No
   If so, please provide a brief overview of your master plan or attach a copy of the plan to your questionnaire.
2. Is there a master plan in place for the migration and/or retirement of existing computers and information technologies?
   54.2% Yes
   45.8% No
   If so, briefly describe your master plan or attach a copy of the plan to your questionnaire.

3. How do you dispose of retired computers? (Please check all that apply.)
   39.3% sell computers
   54.1% recycle
   34.8% donate to charitable organizations
   38.5% other (please specify: return to university warehouse)
4. What sources of funds do you use to finance the purchase of new computers and/or software and printers? (Please check all that apply.)
   45.2% student technology fee (if so, the fee per term is $50.00)
   45.9% grants/donations from industry/vendors
   64.4% state funds
   48.5% university foundation/endowment funds
5. Are you supporting computer labs and/or requiring laptops for students and faculty?
   94.7% labs
   18.3% laptops
   16.8% both
6. If you require students to have a laptop, is this provided and paid for by means of tuition?
   8.9% must purchase
   2.2% is provided
   84.4% not required
7. Do you have teaching labs?
   97.7% Yes (if so, number of labs 2 with average number of workstations 25)
   2.3% No (go to question 8)

   If yes, do your college labs support (Please check all that apply):
   94.7% Microsoft Office
   10.6% Lotus SmartSuite
   28.0% Corel Word Perfect

   What hours are labs open?
   48.9% until classes end for the day/evening
   38.9% until midnight or later
   2.3% 24-hours a day, except weekends
   9.2% 24-hour days, 7 days a week
   .8% times varies with each semester

   Are these labs manned by technicians?
   67.9% Yes
   32.1% No

   If yes, the number of technicians working full time is 3
   the number of technicians working part-time is 6

   How does your college handle printing demands of students and faculty? Are there printers in the labs?
   97.7% Yes
   2.3% No

   If yes, what type of printers do you have? (Please check all that apply.)
   93.3% laser
   26.0% ink jet
   16.8% dot matrix
   3.8%

   Are your students charged for printing?
   25.4% Yes
   74.6% No

   Are docking stations available in your labs for student laptops?
   13.1% Yes
   47.7% No, but they will be in the future
   39.2% No

8. Does your college intend to move towards a paperless classroom?
   25.4% Yes
   74.6% No
   If so, how do you plan to accomplish this?
9. Are you moving toward any of the following means of standardizing computing technology? (Please check all that apply.)
   88.1% standardizing software
   70.1% standardizing computers
   53.7% standardizing printers
10. How do you handle computing technology maintenance? (Please check all that apply.)
   50.4% trained student workers
   64.6% full-time technical support provided by your university
   54.8% full-time technical support provided by your college or school of business
11. Is Year 2000 compliance an issue for your college?
   50.0% Yes
   50.0% No
12. Approximate number of students at your university
   10.7% 0-2500 32.1% 2501-7500 26.0% 7501-15,000
   16.8% 15,001-25,000 14.5% over 25,000
13. Is your university
   71.1% public 28.9% private
14. Does your university have AACSB accreditation?
   65.4% Yes
   34.6% No

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