

“Factors Influencing the Number of Computers in Libraries:
An Exploratory White Paper”

Foreword

As chair of the Standards Committee of ACRL’s College Libraries Section, I received emails from a number of librarians engaged in planning new or renovated libraries. They sought an official ACRL document that would provide guidance on how many computer workstations should be planned for their project. But, the 2004 *Standards for Libraries in Higher Education* consciously had moved away from such quantitative measures.

There being no relevant benchmarks, the Committee commissioned a White Paper to make the case for guidelines to help planners. (“Guidelines” in ACRL parlance help implement “standards.”) However, the brief White Paper finds that the actual factors are far too complex and evolve too rapidly for quantitative guidelines to be meaningful. The CLS Standards Committee accepted this paper on March 31, 2006.

Jules Tate (Louisiana State University at Alexandria), Chair, CLS Standards.

2006

Factors Influencing the Number of Computers in Libraries: An Exploratory White Paper

By

Debbie Malone (DeSales University)

Bethany Levrault (Southwest Kansas Library System)

Michael J. Miller (Queens College, CUNY)

In the past decade, college libraries have undergone significant changes in their utilization of information technology and computing. These changes have impacted service in several diverse ways. Perhaps most significantly, the increased use of computing services on campus has increased the need for standards and guidelines for college campuses to follow in the strategic planning process. Although several useful standards exist for more firmly established library services such as information literacy and library mission statements, standards for information technology are a much thornier issue.

It will take some time for appropriate standards to be developed for the myriad issues that surround information technology use in college libraries. The sheer rate of change may make any technology-related standard obsolete as soon as it is determined. At this time, however, the most pressing question related to computers in college libraries concerns the lack of a standard to follow in determining the ideal ratio of *number of workstations* to college FTE. The general consensus on many listservs and in some information technology departments is that a standard would be extremely difficult to develop because of the sheer number of factors to consider. In addition, the implementation of a ratio, like other standards, would undoubtedly be hindered by the more practical issues such as funding and staffing. Nevertheless, the call for a guideline has persisted.

Existing Standards & Guidelines

A scan of the existing standards shows that although information technology issues have been addressed in a qualitative fashion, there are no real quantitative or firm guidelines to follow to determine the ideal number of workstations for a particular library. *Standards for Libraries in Higher Education* (2004) suggests a ratio of computer workstations to combined student faculty and FTE as an input measure to use when evaluating a library, but leave the actual ratio up to the reader to determine. Although these standards mention that one should consider that “college requirements for student ownership of desktop or laptop computers could affect the need for work stations within the library,” this is the only guideline mentioned related to the issue. *Guidelines for Media Resources in Academic Libraries, 2006* states that the “library should establish an ample and stable budget for the maintenance and purchase of media equipment.” (4.2) It goes on to state that “necessary equipment to access media resources should be available,” (5.3) but it does not mention computers specifically or provide guidance on numbers. Although these standards are useful for resource evaluation in general, they are not helpful for this specific question.

Other information technology standards outside of the library profession, such as the *EDUCAUSE Core Data Survey* (2003), are similarly silent on this issue. EDUCAUSE is “a nonprofit association whose mission is to advance higher education by promoting the intelligent use of information technology” (“About EDUCAUSE” 2003) and is often

used as a source for standards for information technology in higher education. However, although the *Core Data Survey* identifies many useful issues in its annual survey of academic institutions, such as funding, security, and identity management, it too does not identify a specific ratio of workstations for a college campus. Its biggest advantage, however, is helping to identify the issues and factors that would affect the number of workstations, but it does not supply a number. For an overview of the factors identified in the *Core Data Survey*, see Spicer and DeBlois (2004).

Survey of Ratios Available

A survey of the library literature finds only a single article written that mentions a specific ratio of library computers to FTE. Keyes (2001) performed a survey on the Community and Junior Colleges listserv and found that the average ratio of number of library workstations to FTE was 94:1. Because the *n* (sample size) for this study is rather small, with only 23 colleges responding, the results should be viewed with caution. In addition, this survey polled only community college libraries and so may not have general applicability across all types of college libraries.

Although it provides no mention of an actual ratio, Simpson (2002) provides some numerical data that may be useful when calculating the number of workstations needed. However, because the article was written for a school library media center, its results should also be viewed with caution. Simpson divides computer use into four types: administrative, personal productive, class (or group) productive and online public access catalog (OPAC). For each type, she provides a formula for determining the number of computers that will be needed for each. For example, for the “class productive” category (i.e., student group research or group assembling of a project), she cites the formula (*maximum number of classes in the library x average class size*) / *ideal group size* as a way of determining the number of workstations allocated for class productive use. After numbers for all four computer use types are calculated, they are simply added to determine the total number of computers needed

2005 Study on Current Practices

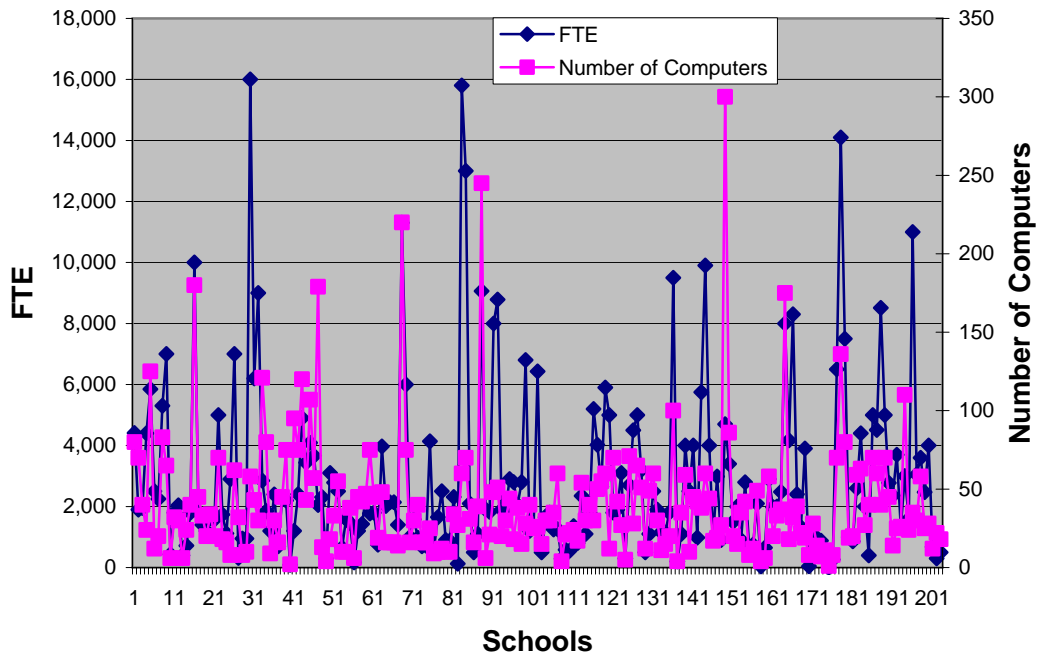
In the summer of 2005, the authors designed an online survey on this subject in an effort to provide information on current practices in libraries. Questions asked included number of FTE (Full time equivalent students) for fall 2005, number of computer workstations available to students in the library building(s), the patron entry head count for 2004-2005, whether wireless access was available in the building, whether laptops were available for circulation, and whether students were required to purchase their own laptops. Open-ended questions were also asked on how wireless access has changed student use of library workstations and what other factors effect decisions to increase/decrease the number of workstations.

We received 225 usable responses of which 140 were from private colleges, 39 were from public colleges, 44 from community colleges, and 2 from propriety institutions. The number of computers in these libraries ranged from two at a small 90 FTE college to 300 at a 4700 FTE community college.

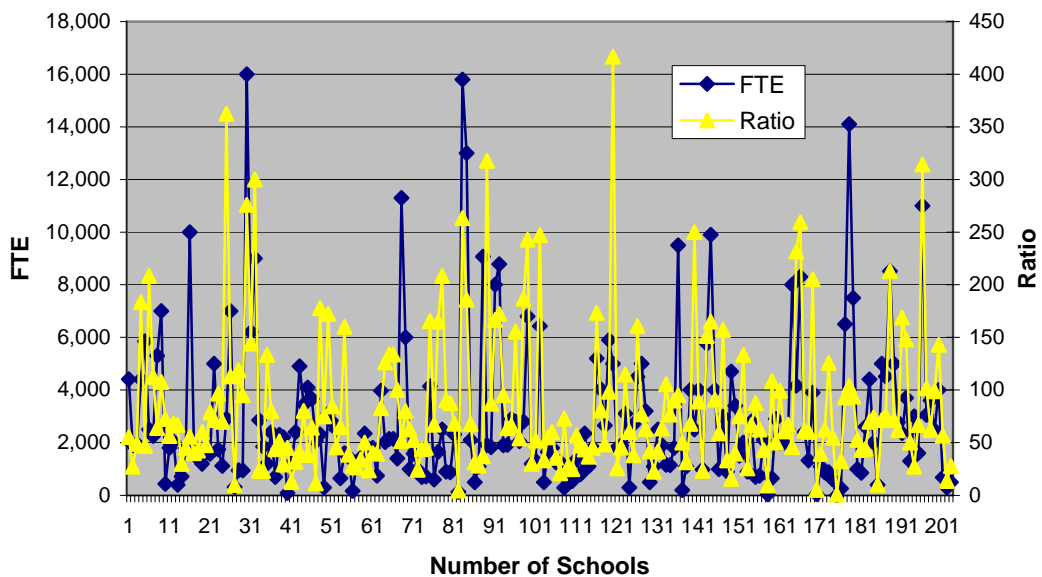
The ratio of FTE to computers in the libraries ranged from 5:1 at a 125 FTE tribal college to 417:1 at a 5000 FTE community college. Correlation studies were run and showed no significant relationship between FTE and the number of computers in libraries. That is, the number of computers available to students in libraries does not

increase or decrease with differences in FTE. There are other factors at work. Graph 1 (FTE and Numbers of Computers) and Graph 2 (FTE and Ratio) below display the wide variety of factors found. We excluded 22 responses from this analysis due to insufficient data for these items.

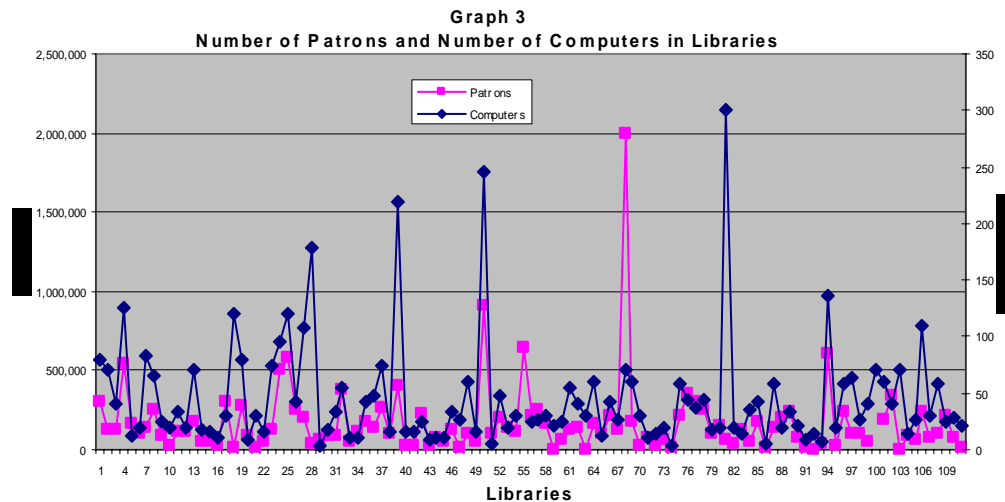
Graph 1
FTE and Number of Computers in Libraries



Graph 2
FTE and Computers in Libraries Ratio



Another question asked for the number of patrons entering each library on a yearly basis. We wanted to know if the number of people in the library was related to the number of computers provided. A correlation was completed, and no significant relationship was found. The numbers of computers available for public use in college libraries does not increase or decrease with variations in the number of patrons using the library building. Chart 3 below illustrates the range of responses. We had to eliminate 114 responses to due lack of data on the number of patrons for a sample size of 111 responses. This sample size is thus much smaller than those in our previous charts.



We also discovered that 144 or 64% of our 225 respondents provide wireless access in their buildings and only 12 (5%) of responding institutions require their students to purchase laptops. Circulating laptops were provided by 87 (39%) of respondents.

One open-ended question asked about changes in student use of library workstations once wireless access was available. Many respondents said that they were seeing numerous students using laptops in the wireless areas of the library, but there was no decline in the use of workstations as a result. One librarian stated: “We find that students have highly individualized preferences for desktops or laptops, and we are pleased that we can offer both.”

Another open-ended question asked about other factors influencing the decision to add workstations in the library or to maintain the status quo. The responses can be grouped in the following manner:

Factors for adding workstation	Factors for maintaining the same number of workstations
Expansion of the library	Lack of space for additional computers
Growing demand for access to electronic resources	Budget constraints/cost of furniture and equipment
Increased library instruction	Limited electrical capacity
Replacing print references frees space for workstations	Need for technical support
	Adding network jacks instead of workstations
	Adding circulating laptops instead of workstations

Many libraries are experiencing increased demand for computers in their libraries. One respondent commented: "Demand for computer workstations continues to grow. We could double the number of computers and I am not sure if that would meet the demand." Another librarian stated: "There are very few academic task students can do which do not require a computer!"

Factors Impacting Number of Computers

If FTE and the number of patrons in libraries do not significantly impact the numbers of computers available in academic libraries, what factors are influencing decisions on technology? In the list below, a number of contributing factors are presented. These factors may be mediated by such overriding issues as level of funding and staffing. Careful consideration of all of the issues discussed here could make strategic planning for the number of computers in an academic library more systematic.

Impact Factors

- 1) College requirements for student ownership of desktop or laptop computers

Very few of our responding institutions required their students to purchase personal computers. However, some libraries explained that large numbers of their students did own personal computers and this fact was easing the tension on the library to provide additional access.

"We are planning on phasing out our laptop loans by the fall 2006 due to the increasing number of students with personal laptops and the increasing number of buildings with wireless capabilities. This is our plan...subject to revision."

- 2) Presence or absence of a campus wireless network, or the planned establishment of such a network

Many of our respondents said that the wireless environment dramatically changed their attitude toward adding workstations. More electrical outlets for laptops seem to be becoming the priority.

As one respondent said: "We will probably not increase the number of computer workstations, since we have a variety of network jacks and wireless that can be used by laptop users. If we added computers it would probably be laptops for checkout purposes."

"Overtime since the college is moving to more wireless access, the reliance on laptops may increase, which could decrease the number of hard wired workstations."

Another respondent said: "Wireless access has simply increased the amount of activity. Students bring their own laptops, checkout ours, and use all our hard-wired workstations."

Others stated that wireless access meant the library will not have to add wired workstations as student enrollment increases.

Yet. Some libraries stated that they could not add these outlets without extensive renovation.

3) Presence or absence of IT/library collaboration

With more computers and systems in the library, technical support for them becomes a larger issue. Not all libraries can afford to hire a support person. Dependence on institutional information technology staff can be a fine solution in some cases but not in all cases. One librarian in our survey said: "We need a full-time technical support position to assist the library with all its computer needs. This includes staff computers, the online catalog computers, the research/instruction computers and the wireless access."

4) Space and cost issues

One librarian commented: "Adding computers is limited by the electrical capacity of building circuitry and budgetary constraints." Many respondents complained about lack of space for more workstations. One library mentioned: "As we replace some large print references with online versions, we are able to free space for more desktops."

"We would only increase [workstations] if forced to do so by the administration. Unless we continue to take over study spaces for workstations, there's no more room available."

5) The number of other computer labs on campus

Many librarians commented that even with other computer labs available on campus, students still heavily use the computers in the library. This might be due to the library's longer hours and the other resources available.

"New Student Union is being built near library, and computer labs will be included. This will relieve the pressure for the library to increase [workstations] at all, but we don't see a significant reduction either."

"The library ambience makes it a popular place to do word processing, despite the large number of available computers in labs."

6) Level of computer access available in the dormitories

Even on campuses where students have easy network access in their dormitories, they still may need or want to use computers in the quiet of the library. One of our respondents commented on students' need to complete group projects:

"Students need places to work together on projects using computers, which they cannot do late at night in our dorms. Many students do not have their own

computers yet, or all the specialized software they need. So we still need lab computers in the library close to the physical resources and the librarians to help with research.

Of course, on campuses in which computer access in the dormitories is very limited, this factor can play a larger role in library decisions about workstations.

7) Alternatives to workstations, i.e. PDAs, internet accessible cell phones

New and smaller personal computing devices with increased functionality and connectivity may impact library hardware needs substantially in the coming years.

Some respondents said that students do not like to carry their laptops with them. One librarian suggested more students would carry and use smaller devices such as PDAs or iPods if the functionality improved.

8) Presence or absence of laptop checkout

Many of our respondents stated that checkout of laptop computers has become very popular in their libraries, and that with wireless access, circulating laptops may be an alternative to purchasing workstations. One librarian commented:

“If we added computers it would probably be laptops for checkout purposes.”

“When funding becomes available, we intend to add about 20 more wireless computers for library checkout.”

9) Number of computer applications that are available solely in the library

Many libraries have specialized software on their workstations due to institutional purchase of a limited number of licenses for some software applications. One respondent noted: “Students sometimes use the workstations [in the library] because they have specialized software available no where else or because they are the only machines connected to printers.”

Creating a standard for the number of computers an academic library should make accessible to users is a difficult, if not impossible, task in an era when technology is changing at an ever increasing pace. Each institution has unique needs and constraints which need to be weighed in the planning process. The nine impact factors listed above are intended as starting points in the conversation on the current and future computer needs of individual libraries.

References

- “About EDUCAUSE” (2003). Retrieved June 25, 2004 from the EDUCAUSE Web site:
<http://www.educause.edu/about/membership.asp#WHAT>
- ACRL Environmental Scan. (2003). Retrieved March 21, 2004 from Association of College & Research Libraries Web site:
<http://www.ala.org/ala/acrl/acrlpubs/whitepapers/whitepapersreports.htm>
- ACRL. Guidelines for Media Resources in Academic Libraries (2006) Retrieved March 18, 2006 from web site:
<http://www.ala.org/ala/acrl/acrlstandards/mediareources.htm>
- Crockett, C., McDaniel, S., & Remy, M. (2002). Integrating services in the information common: Toward a holistic library and computing environment. *Library Administration & Management*, 16, 181-186.
- Drew, B. (2002). The wireless student & the library. *Library Journal*, 127, 16-18.
- Dugan, R.E. (2002). Managing technology in an assessment environment. *The Journal of Academic Librarianship*, 28, 56-58.
- Dugan, R.E. & Herson, P. (2002). Outcomes assessment: Not synonymous with inputs and outputs. *The Journal of Academic Librarianship*, 28, 376-380.
- Dugan, R.E. & Ou, C. (2002). Keeping me awake at night: Some issues and questions about managing technology. *The Journal of Academic Librarianship*, 28, 406-409.
- The fate of the undergraduate library. (2000). *Library Journal*, 125, 38-41.
- EDUCAUSE Core Data Survey. (2003). Retrieved June 16, 2004 from the EDUCAUSE Web site: <http://www.educause.edu/coredata/reports/2002/>
- Eureka College: Computer labs. (2004). Retrieved June 4, 2004 from Eureka College Web site: <http://www.eureka.edu/CompServices/labdesc.asp>
- Goshen College: Why GC? Technology! (2002). Retrieved June 4, 2004 from Goshen College Web site: <http://www.goshen.edu/its/general/whygctech.shtml>
- Guernsey, L. (2000). Unplugged on campus, but always connected. *The New York Times*, April 20, G1.
- Guidelines for Media Resources in Academic Libraries (2006) Retrieved March 18, 2006 from web site: <http://www.ala.org/ala/acrl/acrlstandards/mediareources.htm>
- Haden, W.R. (2001). Implementing a comprehensive IT plan: A small-college response. *EDUCAUSE Review*, Sept/Oct, 12-13.
- Keyes, A.M. (2001). Establishing a ratio for the number of computers compared to FTE in community college libraries – a brief survey. *Community & Junior College Libraries*, 10, 51-55.

- Las Positas College library technology plan. (1999). Retrieved January 22, 2004 from Las Positas College Library Web site:
<http://lpc1.clpccd.cc.ca.us/lpc/lrc/techplan.html>
- Library and technology services. (2004). Retrieved June 4, 2004 from Alvernia College Library and technology services Web site:
<http://www.alvernia.edu/is/educause.htm>
- Media resources in academic libraries. (1999). Retrieved January 22, 2004 from Association of College & Research Libraries Web site:
<http://www.ala.org/ala/acrl/acrlstandards/guidelinesmedia.htm>
- Monash University Library: Information services – Strategic plan 2004-2006. (2003). Retrieved June 4, 2004 from Monash University Library Web site:
<http://www.goshen.edu/its/general/whygctech.shtml>
- Oden, R.A., Temple, D.B., Cottrell, J.R., Griggs, R.K., Turney, G.W., & Wojcik, F.M. (2001). Merging library and computing services at Kenyon College: a progress report. *Educause Quarterly*, 4, 18-25. Retrieved January 22, 2004:
<http://www.educause.edu/ir/library/pdf/eqm0141.pdf>
- Penn College information technology services: Technology highlights. (2004). Retrieved June 4, 2004 from Pennsylvania College of Technology Web site:
http://www.pct.edu/its/technology_highlights.htm
- SUNY College at Oneonta: Information technology services. (2003). Retrieved June 4, 2004 from SUNY College at Oneonta Web site:
http://its.oneonta.edu/about_tech/2002_tech_survey.htm
- Simpson, C. (2002). Information technology planning: Computers in the school library – how many are enough? *Knowledge Quest*, 31, 23-26.
- Spicer, D.Z., & DeBlois, P.B. (2004). Fifth annual EDUCAUSE survey identifies current trends. *EDUCAUSE Quarterly*, 2, 8-22. Retrieved June 7, 2004 from
<http://www.educause.edu/asp/doclib/abstract.asp?ID=EQM0422>
- St. Norbert College catalog: Computer services. (2004). Retrieved June 4, 2004 from St. Norbert College Web site: http://www.snc.edu/catalog/info_computer.htm
- Standards for community, junior, and technical college learning resource programs (1994). Retrieved March 21, 2004 from Association of College & Research Libraries Web site:
<http://www.ala.org/ala/acrl/acrlstandards/standardscommunity.htm>
- Standards for libraries in higher education. (2004). Retrieved October 9, 2005 from Association of College & Research Libraries Web site:
<http://www.ala.org/ala/acrl/acrlstandards/standardslibraries.htm>

Tech@Westminster: Social technologies. (2004). Retrieved June 4, 2004 from Westminster College Web site:
<http://www.westminstercollege.edu/technology/index.cfm?parent=927&detail=952&content=1001>

Wheaton vision 2005: a report from the committee on the library, technology, and learning (2000). Retrieved January 22, 2004 from Wheaton College Web site:
http://www2.wheatonma.edu/KACC/LTLC/Vision_2005.html

Wulf, WM.A. (2003). Higher education alert: The information railroad is coming. *EDUCAUSE Review*, 38, 12-21. Retrieved June 17, 2004 from
<http://www.educause.edu/ir/library/pdf/erm0310.pdf>