

PLANNING A COMPUTER LAB: CONSIDERATIONS TO ENSURE SUCCESS

Organizing a computer lab is an expensive and time-consuming endeavor. Here are some points to consider in the process.

Different kinds and sizes of academic computer labs require vastly different levels of planning.

One chemistry professor who was planning a small departmental computer cluster reported that his lab was up and running in a couple of weeks. Others report planning and implementation cycles that span several years.

The length of time required to design a lab depends on many factors, including the size of the lab, its objectives, the complexity of the technology necessary to achieve those objectives, the lab's constituency, the knowledge and experience of the individual responsible for the lab (one person is almost always responsible), the bureaucracy required to gain approval for the lab, and the existence of similar labs at the institution.

When you plan a computer lab, the hardware choices you make are critical, but there are other important considerations as well. That is why we suggest that you start the planning process with these general questions:

- What are the lab's overall objectives and how can those objectives best be met?
- Who will use the lab?
- Where will the lab be located?
- What software and hardware can best meet the lab's overall objectives, population and location requirements?

First, however, we need to define some terms. In the most general sense, academic computing labs can be divided into three

categories: public access labs, limited access labs, and computer classrooms. In a public access lab, students (or other members of the academic or surrounding community) are free to use hardware and software available in the lab, most often on a first-come, first-served basis. A limited access lab is usually under the auspices of one department or school in an institution. Constituents of the lab are the students, faculty, and staff of that department. In a computer classroom, the computer is used as an instructional tool by professors who have chosen to conduct their classes in the lab. In most computer classrooms, one computer is available for each student. The majority of computer classrooms serve as public access or limited access labs during evenings and weekends.

What are the Lab's Overall Objectives and How Can Those Objectives Best be Met?

Although this is perhaps the most important question to consider, it can easily be overlooked in the drive to open a lab in response to an immediate need.

As computer technology advances, and software is written to take advantage of these advances, professors are expanding their view of the pedagogical role that computers can play in an academic environment. For example, physical scientists are embracing the value of supplementing lab experiments with computer simulations; English professors are touting the benefits of computer-based composition programs; and academicians in all disciplines are recognizing the potential that multimedia technologies, such as videodiscs and CD-ROMs hold for presenting

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Lab Notes

complex material in ways that both challenge and motivate.

Acceptance of computers by professors has important implications both for public access and limited access labs and for computer classrooms. Obviously, the need for computer classrooms will grow as more professors view such classrooms as a desirable teaching location.

In addition, professors will increasingly call upon students to complete assignments that require the use of a computer, even if the class itself does not meet in a computer classroom. Although word processing currently occupies about 80 percent of the time students spend in public access and limited access labs, that percentage can only decrease—and overall student computer time increase—as professors revise their teaching methodologies to take advantage of computers' diverse applications.

Before a lab is implemented, then, it's critical to clarify the lab's mission to ensure that it addresses the educational objectives of the department or group supporting the lab. Whenever possible, a computer lab should not be viewed as an isolated entity, but as part of a department-wide or, in some instance, campus-wide computing plan. Ideally, that plan will be organized around a scheme of goals and objectives, with the lab fulfilling one or more of those objectives.

If no academic computing committee exists, you may want to form one as part of the process of designing a lab. That way, you are laying the groundwork for an ongoing commitment to computer use in your department.

Another alternative is to use a lab planning committee as the starting point for an ongoing committee that looks at long-range computing issues for your department. While an ongoing committee certainly is not

essential to the continued success of a lab, it can serve as a useful vehicle for formulating future directions of the lab, assisting with major policy decisions, and so on.

Dozens of decisions must be made in the course of setting up a lab; for those decisions to be made quickly and in a well-coordinated framework, one individual must take on responsibility for overall lab planning and implementation.

Finally, a word should be said about student expectations, since students are the ultimate beneficiaries of computer technology on a college or university campus. Increasingly, computer labs are being viewed by students, not as a bonus, but as an educational resource that, like the library, is part and parcel of attending an institution of higher learning. As a result, the availability and level of sophistication of computer resources is likely to be one of the criteria used by students both to determine their interest in attending an institution and to evaluate the success of that institution in meeting their educational goals.

Who Will Use the Lab?

In the vast majority of labs, students are the major constituency. Before implementing a lab, however, you need to define more precisely who those students are. Try asking yourself these questions:

- Will your lab be open to all students or will it be limited to students in a specific school or department?
- Will students use the lab primarily for word processing, or will your lab equip students with software tools aimed at solving very specialized problems?
- Do you anticipate a student population composed primarily of graduate students, undergraduate students, or both?

The response to each of these questions has significant implications for your lab. For example, a public access lab will require a collection of general-purpose software while the software provided in a limited access (or departmental) lab will be largely determined by subject area. A lab that serves a large graduate student population will need to provide software (and the associated hardware) that supports the computational requirements of graduate student research.

While most public access labs profess to be open to students, staff, and faculty, campuses often report that their labs are used most frequently by students, occasionally by staff, and rarely by faculty. If a primary objective of your lab is to meet staff and faculty computing needs, survey these groups to find out precisely what they need in the way of computing resources, and whether they would be willing to share these resources with students.

Some faculty, for example, need computer facilities for creating multimedia presentations, a capability that is not present in most public access labs. If you find that faculty have distinctly different needs than students, you may want to set up labs exclusively for faculty.

You also will need to decide whether your lab will be open to the surrounding community. While doing so is good public relations for your institution, it also places an additional strain on personnel as well as computing resources. Many labs hold extension courses that are open to the community (and, incidentally, serve as a valuable source of lab revenue).

Where Will the Lab be Located?

Finding a home for a proposed lab is one of the most time-consuming aspects of initiating a new computing facility.

Consequently, the search for a location should be one of the first tasks lab planners tackle. When choosing a location, consider the lab's intended users and where they congregate, the purpose of the lab (for example, the library is an appropriate location for a lab to be used by students preparing papers), the level of security the lab demands, and, of course, the available space on campus—as well as the suitability of that space for the lab.

There are numerous reasons for and against locating campus labs in one central location. An argument can be made that, in the case of public access labs, computing resources as well as personnel can be administered more efficiently in a centralized facility. On the other hand, there are obvious benefits to locating computer classrooms and limited access labs close to the population they serve. In most instances, this means locating such facilities in a classroom building. Faculty are more willing to teach in labs if they are located near their offices. Also, students working on assignments in labs will be more likely to seek out a professor for assistance if the professor's office is near the lab.

When a primary objective of a lab is serving students living on campus, many campuses have chosen to locate their public access labs in residence halls. Dorms sometimes have more expendable space (such as infrequently used study or recreation rooms) than other locations on campus. In addition, dorm labs can often be kept open longer than labs located in buildings that, for security reasons, must be locked in the early evening. Many campuses report that dorm labs have higher usage rates than other labs on campus because they're more conveniently located.

Soon after a location has been agreed upon, lab planners will need to consult with representatives from the organization that

has agreed to house the lab. In order to resolve such issues as who will be responsible for which lab functions and who will pay for each of the lab's operating expenses.

WHAT HARDWARE AND SOFTWARE CAN BEST MEET THE LAB'S OVERALL OBJECTIVE, POPULATION AND LOCATION REQUIREMENTS?

Determining a lab's objectives and finding technology to meet those objectives is definitely a chicken-and-egg problem. You can't decide precisely how a lab will be used until you know what technology is available. On the other hand, you can't choose the technology until you know how it will be used.

If you are setting up a computer classroom or a limited access lab, begin by investigating how individuals in departments at other institutions are integrating software into their curricula. Contact those individuals; review the software they are using; and, where appropriate, visit their classes.

If you are setting up a public access lab, choosing the software and hardware used in the lab is a bit more straightforward.

PROVEN LAB PLANNING TIPS

While no foolproof formulas exist for planning, and implementing an academic computer lab, we can offer words of advice from people who have done it. The following suggestions are the result of interviews with some who have already forged this ground.

Allow sufficient planning and implementation time.

Full implementation of most labs takes a minimum of 12 to 18 months, and this does not include the initial planning time.

Setting up a lab requires coordinating the efforts of numerous organizations, including the computing center, the sponsoring department, buildings and grounds crews, your institution's purchasing department, and each of the vendors supplying the lab. Remember that if the lab is ever to be part of a campus-wide network, it will have to be given some blessing by the campus-wide networking center. The best planned labs run into snags, so try to allow for them at the outset.

If possible, arrange for released time for the lab coordinator.

After the administration has approved the initial lab plan, the lab coordinator will need to perform a multitude of tasks, including finding a lab site and coordinating the transformation of the site into a computer lab; selecting, ordering, and installing computer equipment; and, in some instances, developing a curriculum for use in the lab. For these tasks to be accomplished, the lab coordinator should ideally be released from his or her normal responsibilities. Lab coordinators report that implementing a lab is at least a half-time job.

If you are planning a limited access lab and a campus-wide computer center exists, make sure you keep the center's administration aware of the plans for your lab.

The computer center may be able to provide you with valuable technical assistance. In addition, the center may have made purchasing arrangements that can substantially reduce the price you must pay for both software and hardware. Finally, the computer center will be able to inform you of any incompatibilities between your proposed lab and plans for future campus-wide networks.

Build lab startup costs into the lab's initial equipment budget.

Setting up a lab, including electrical modifications, furniture purchases, and so on, can easily cost half as much as the computer equipment used in the lab.

Estimate the lab's annual maintenance budget as part of the planning process.

Many institutions report that they were unprepared for the expense of maintaining a lab, particularly staffing costs and the costs of replacing obsolete hardware and updating software. (Most institutions project a three- to four-year equipment replacement cycle.)

Build flexibility into all equipment proposals.

Hardware prices and model numbers change frequently. If your proposal is tied to precise prices and model numbers, you'll run into trouble when the specifications change. Whenever possible, design your proposal so that you can make substitutions where appropriate. Also be sure to include costs for shipping and computer insurance.

Limit the number of software packages you purchase and support.

Most academic computer labs are limited in the support they can provide. In the long run, users will benefit if you provide quality support for one or two software packages per application category (word processing, spreadsheet, page layout, and so on) rather than cursory support for dozens of packages.

Talk to campus technology champions early on.

Contact people in your department (or, where appropriate, in other departments)

who have expressed an interest in or knowledge of computer technology. Find out what vision they have of the direction that academic computing should take on your campus in coming years.

Encourage faculty to plan ahead for their use of the lab.

Faculty should be encouraged to reserve class time for their courses in a computer lab several months before their courses begin. Although faculty may not realize it, several tasks must be completed by the lab staff before such a classroom is ready for faculty use. Tasks include ordering appropriate software, checking software compatibility with existing hardware and other software packages, scheduling class meeting times, and, in some instances, scheduling out-of-class lab time when students can complete their assignments. Faculty need to be aware of these tasks if they are to understand the importance of reserving time in computer classrooms months in advance.

Promote the lab.

In a computer classroom, this means offering seminars on how the classroom is being used, and inviting other faculty and administrators to observe classes held in the classroom. If you have opened a limited access lab that isn't being used to its fullest capacity, contact a related department to discuss ways in which the two departments can share the benefits—as well as the expense—of the lab. Some institutions report that certain limited access labs are actually underutilized because the sponsoring department has not promoted the lab outside the department.