

# COMPUTER LAB TECHNOLOGY TO SUPPORT INFORMATION SYSTEMS PROGRAMS

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## Abstract

*For a number of years the "Annual UCLA Survey of Business School Computer Usage" (begun in 1984, published in 1985) benchmarked information technology assets available to business school students. The survey was cosponsored by the AACSB for a number of years and was used by schools of business to judge the level of technology that supported students. The last of these surveys was in 1999.*

*The need to document a broad sample of current information technology available to students is as strong today as it has been in the past. The difference today is in the types of technology used and the programmatic goals supported by the technology. The UCLA survey of computer resources focused on computers in open labs, staffing for student labs, dollars spent per student, and similar measures. Today a focus is needed that describes the types of resources used and staffing to assist students and faculty in specialized circumstances. The survey developed here will address the information technology needs for skills outlined in the IS2002 model curriculum.*

## Introduction

This is research-in-progress. The Web-based survey instrument has been completed and is shown in Appendix A. Respondents are being recruited from 100 schools - preferably schools offering degrees in Information Systems in both the business school and the school of technology. This is not an open survey, representatives are being picked from schools based upon their experience with information systems programs and their familiarity with resources at their school.

A major impetus for the survey is the IS 2002 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems (Gorgone et al, 2002). The curriculum specifies resources required to support an information systems program and those resources are explained beginning on page 20 of the curriculum guidelines. Appendix 6 of the curriculum guidelines contains specific course learning goals relating to the resources, a number of which require hands-on learning. For example, the analysis and logical design course has a goal to "... develop application skills for implementing databases for applications by operating and testing these databases" (page 46). Such goals cannot be attained without proper computer lab facilities. The four subcategories of technology (page 14) provide the basis for describing technology associated with the courses in the guidelines.

The IS '97 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems (Davis et al, 1997, page 22) also called for computer lab resources. The 1997 UCLA survey (Frاند, 1997) notes that a major change had occurred, about 20% of the reporting schools responded that they had at least some computer labs that were computerless. I.e., schools had at least some "computer labs" which consisted of only connections to the network, no computers were

provided in those particular labs. This was an important change in the view of network connections as a "lab." The importance of network-accessible resources has grown tremendously during the intervening years.

The need to know current information technology available to students is important to schools. It is difficult to determine if the resources made available to your students are comparable to other schools until you know the resources available at those schools. The UCLA survey of computer resources focused on resources needed across the 1984 to 1999 time frame. If you wish to view specific questions, the 1998 questionnaire (Britt et al, 1998) can be downloaded from the UCLA Web site. While it covers many important characteristics, it does not address programmatic needs for computer lab resources. Today a focus is needed that delineates the types of resources used and staffing to assist students and faculty in specialized circumstances. Information systems programs require specialized labs in order to address the IS 2002 curriculum.

These issues are not adequately addressed in the UCLA surveys or other academic literature. One of the few recent articles (Markham et al, 2003) surveyed only six schools. Technology resources are crucial to information systems programs. Curricula for IS programs suggest levels of technology required as well as staffing required based on the courses used in the curricula. The UCLA surveys provided information from which individual schools could judge how it compared to other schools. Today, there is no widely available, academically compiled data to generate that grounding information. Schools need information about lab resources to self-assess their strengths and weaknesses in providing technology to students and programs.

## Survey

The survey (Appendix A) addresses school demographics, student demographics, computer lab resources, network access, staffing, security, and programmatic issues. The survey is Web-based and can be completed in less than ten minutes. Potential respondents will be contacted first to determine their willingness to participate in the survey. The goal is 100 responses for each group - business school and school of technology.

Only schools within the U.S. will be surveyed in this round of research. Issues of technology (ownership by the school, university, or private ownership) can vary greatly in universities outside of the U.S. There are also differences in staffing that do not directly compare to U.S. institutions. A future survey of non-U.S. schools is envisioned but will wait until after the current research has been completed.

The reason that both schools of information technology and business schools are being surveyed is to determine differences in their programmatic needs. Whenever possible, universities with both business school information systems degrees and information system degrees in a school of technology will be surveyed.

Specialized lab resources (such as network communications labs) are targeted since they represent substantial resources aimed at a small portion of the university's student body. Accreditation status will be tested as a differentiating characteristic. I.e. do schools seeking ABET accreditation (Accreditation Board of Engineering and Technology) have more technology resources than schools with AACSB accreditation or schools with no accreditation?

Staffing levels are becoming an increasingly important issue. The use of computer resources requires that the infrastructure - hardware, software, and network - be established and maintained. If adequate staffing cannot be provided, instructors are likely to provide some of these services. The survey captures data to determine how much staffing effort is actually provided by faculty.

## Analyzing the data

Survey statistics will play the central part of the analysis. School demographics will be captured on the surveys and ANOVA will be performed to determine if certain characteristics dictate different levels of technology support. For example, there is general belief that private schools provide greater levels of technology yet most previous research fails to affirm that belief. School size, courses required of students, graduate program requirements, size of school, and similar characteristics may provide differentiation among schools.

The statistics generated by the survey will be used for informative purposes as opposed to normative purposes. There is not a "correct" level of technology or "best practice" that can be applied to all schools. However, results will be presented based upon school and programmatic characteristics so that schools reviewing the results can make comparisons to their particular circumstances.

Although the schools asked to participate in the survey as well as potential respondents will be known to the researchers, all responses will be anonymous. The size of the survey will prevent the researchers from deciphering which school or respondent gave particular answers on the instrument. This is important in order to solicit unbiased feedback.

Results will be presented in quartiles, in addition to standard descriptive statistics, so that readers can assess where their school is located along the continuum of resources reported in the study. We are not trying to present normative results but rather benchmark results upon which schools and academics can assess their position in the spectrum of resources available.

## Conclusion

The IS 2002 Curriculum specified resources and learning goals that can only be met with adequate computer resources. Increasingly, those resources are being met via specialized computer labs. Schools of business and schools of information technology are both impacted by the curriculum guidelines and both have a stake in how schools meet the computer resource needs.

The UCLA surveys, which ended in 1999, provided a valuable service for schools. They provided a view of resources available at a wide range of schools. The demographic breakdown allowed schools to identify schools demographically comparable and then self-assess their state of resources along the spectrum of resources available to schools in the survey.

It would greatly facilitate a school's self-assessment if a body of data about computer resource delivery is available. Preliminary results will be available for presentation at the conference.

## References

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- Markham, Scott, Kordsmeier, William, and Gatlin-Watts, Rebecca (2003, July) Computer availability and applications in selected European business schools, *Journal of Information Systems Education*, 14 (2), 173-180.

# Appendix A

## Survey of Computer Lab Technology and Support

The purpose of the survey is to collect data on the technology used in computer labs, support for those labs, and security issues raised by lab access. Please note that the term "IS" is used throughout the survey to represent Information Systems. In the context of this survey we use the term to encompass programs in management information systems, information systems, information technology, and any blending of the three.

Your responses are **anonymous**. After your anonymous responses have been submitted you will be asked if you wish to receive a summary of the collected data.

### School Demographics

School demographics can play a role in the quantity and quality of computer lab resources. The questions below are characteristics commonly used to describe schools.

Is your school public or private?

- No Response  
 Public (supported mainly by governmental monies)  
 Private (supported mainly by non-governmental monies)

What is the AACSB accreditation status of your school?

- No Response  Not Accredited  Accredited  Seeking Accreditation

What is the ABET (Accreditation Board of Engineering and Technology) accreditation status of your school?

- No Response  Not Accredited  Accredited  Seeking Accreditation

What degrees are offered within your school? (Please check all that apply.)

- Bachelors  
 MBA  
 MS/MA of IS  
 Phd

Which of the following courses are taught at your school? (Please check all that apply.)

- |  |  |
|--|--|
| <input type="checkbox"/> Undergraduate core IS           | <input type="checkbox"/> MBA core IS           |
| <input type="checkbox"/> Undergraduate DBMS              | <input type="checkbox"/> MBA electives in IS   |
| <input type="checkbox"/> Undergraduate Analysis & Design | <input type="checkbox"/> MA/MS of IS core      |
| <input type="checkbox"/> Undergraduate E-Commerce        | <input type="checkbox"/> MA/MS of IS electives |
| <input type="checkbox"/> Undergraduate Networks/Telecomm | <input type="checkbox"/> PhD core IS           |
| <input type="checkbox"/> Undergraduate Programming       | <input type="checkbox"/> PhD electives in IS   |

How many students (undergraduate and graduate combined) are in the IS major?

- |  |                                  |
|--|----------------------------------|
| <input checked="" type="radio"/> No Response | <input type="radio"/> 250 to 299 |
| <input type="radio"/> less than 100          | <input type="radio"/> 300 to 349 |
| <input type="radio"/> 100 to 149             | <input type="radio"/> 350 to 399 |

- 150 to 199
- 200 to 249
- 400 to 449
- 450 or more

How many students (undergraduate and graduate combined) are in your school?

- No Response
- less than 500
- 500 to 999
- 1,000 to 1,499
- 1,500 to 1,999
- 2,000 to 2,499
- 2,500 to 2,999
- 3,000 to 3,499
- 3,500 to 3,999
- 4,000 or more

How many students (undergraduate and graduate combined) are in your university?

- No Response
- less than 5,000
- 5,000 to 9,999
- 10,000 to 14,999
- 15,000 to 19,999
- 20,000 to 24,999
- 25,000 to 29,999
- 30,000 to 34,999
- 35,000 to 39,999
- 40,000 or more

Student Information

What are the student requirements for owning a PC?

University requirements	School/Major requirements
<input type="checkbox"/> Required	<input type="checkbox"/> Required
<input type="checkbox"/> Suggested	<input type="checkbox"/> Suggested
<input type="checkbox"/> Not required	<input type="checkbox"/> Not required
<input checked="" type="checkbox"/> No Response	<input checked="" type="checkbox"/> No Response

How would you rate PC availability for students using computer labs?

Open Labs	Specialized IS Labs
<input type="checkbox"/> Excellent	<input type="checkbox"/> Excellent
<input type="checkbox"/> Good	<input type="checkbox"/> Good
<input type="checkbox"/> Adequate	<input type="checkbox"/> Adequate
<input type="checkbox"/> Not Enough	<input type="checkbox"/> Not Enough
<input type="checkbox"/> Poor	<input type="checkbox"/> Poor
<input checked="" type="checkbox"/> No Response	<input checked="" type="checkbox"/> No Response

How would you rate the computer skills of students in your classes?

- No Response
- (no skills)   
  1   
  2   
  3   
  4   
  5   
  6   
  7   
 (excellent skills)

Network Connection Options

The manner in which students gain access to computer resources may affect their use. It may also impact support requirements. Please indicate the approximate percentages that apply to network connections at your **entire university**.

Classroom Percentages	wireless network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
	wired network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
Computer Lab Percentages	wireless network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
	wired network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
Dormitory Percentages	wireless network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
	wired network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
General Campus Areas Percentages	wireless network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response
	wired network access	0% <input type="checkbox"/>	10% <input type="checkbox"/>	30% <input type="checkbox"/>	50% <input type="checkbox"/>	70% <input type="checkbox"/>	90% <input type="checkbox"/>	100% <input type="checkbox"/>	<input checked="" type="checkbox"/> No Response

How is *off campus* access to *on campus* computing resources made available to students? (Please check all that apply.)

- general Web access
- VPN to campus resources
- dial-up or direct login to campus computing

Does your university use computer resources administered off-campus for course work?

*General resources* for classes such as those hosted by WebCT, BlackBoard, or a similar resource?

No Response

(never)  1  2  3  4  5  6  7 (each semester)

*Special resources* for classes such as those for ERP, communications, SQL servers, or a similar resource?

No Response

(never)  1  2  3  4  5  6  7 (each semester)

How frequently have you *personally* made Web server, database server, or file server resources available to your students? This means you would run and administer the server yourself - possibly in your own office.

No Response

(never)  1  2  3  4  5  6  7 (each semester)

How would you rate the overall network connection options at your school?

No Response

(extremely bad) 1 2 3 4 5 6 7 (excellent)



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### Specialized Lab Resources

Which types of specialized computer resources are available for IS students? (Please check all that apply.)

Open Lab	Remote Access	Dedicated Lab	Not Available	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Web server for Web page and/or form development
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Web server setup and administration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	wired communications setup and administration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	wireless communications setup and administration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	multi-tier application development
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DBMS queries and/or programming
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DBMS installation and administration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ERP queries and/or programming
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ERP setup and administration
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SAD tools (CASE, UML, others)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	collaboration tools (NetMeeting, P2P, others)

How would you rate the overall *open computer lab* resources at your school?

No Response

(extremely bad)    1    2    3    4    5    6    7    (excellent)

                      

How would you rate the overall *dedicated computer lab* resources at your school?

No Response

(extremely bad)    1    2    3    4    5    6    7    (excellent)

                      

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### Staffing and Support

How much full-time equivalent *staff* and *student* support is available? We are interested in school and department staffing levels, not university levels. You may enter a value such as 1.5 if one and a half full-time equivalent positions exist.

School # of Staff	<input type="text"/>	Department # of Staff	<input type="text"/>
School # of Students	<input type="text"/>	Department # of Students	<input type="text"/>

How would you rate the overall *open computer lab* staffing and support at your school?

No Response

(extremely bad)    1    2    3    4    5    6    7    (excellent)

                      

How would you rate the overall *dedicated computer lab* staffing and support at your school?

No Response

(extremely bad)  1  2  3  4  5  6  7 (excellent)

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### Security Issues

Which of the following security measures are in place? (Please check all that apply.)

- user accounts and passwords
- account permissions to files and folders
- biometric data
- virtual private network (VPN)
- network traffic monitoring
- logs of access to labs and/or servers

How important is security for computer labs and computer resources at your school?

No Response

(no importance)  1  2  3  4  5  6  7 (extremely important)

How has the importance is security for computer labs and computer resources **changed** at your school in the last 3 years?

No Response

(much less important)  1  2  3  4  5  6  7 (much more important)

Overall, how would you rate the security of computer resources at your school?

No Response

(extremely bad)  1  2  3  4  5  6  7 (excellent)