NEA HIGHER EDUCATION RESEARCH CENTER

Update

VOLUME 8 • NUMBER 1 • FEBRUARY 2002

Instructional Technology Comes of Age

Introduction

Instructional technology is no longer an exotic, cutting edge issue in higher education. Technology has become a daily part of the educational process for most faculty members. This report reviews the perceptions of the chief academic computing officer on campus of how well prepared faculty members in various academic departments were to use technology as a resource, which were the most important academic and instructional computing policies, procedures, and resources on campus, and what institutions saw as the single most important instructional technology issue over the next two to three years. Finally, the report presents an overview of how the chief academic computing officer perceived the use of information technology on the campus.

This report was developed using data from *Campus Computing 2001*, published by Kenneth Green with the Campus Computing Project in Encino, California. This is an annual survey of academic computing. The survey includes responses from 590 colleges.

Are Faculty Members Well Prepared to Use Technology?

Table 1 (page 2) is divided into three parts: 1) instruction, 2) scholarship and research, and 3) Internet and web resources. Each part establishes the percent of chief academic computing officers that rate the faculty members at their institutions in different academic departments as to how well prepared they are to use technology as a resource. Table 1 reports the percentage that perceives their faculty to be ranked above average (either 4 or 5 on a 5-point scale, 5 being excellent, 1 being poor) in preparedness for technology use.

In general, faculty members in engineering, science, and business were perceived to be the most likely to be well prepared to use technology in instruction. The exception to this was in community colleges, where the faculty members in occupational programs received the highest score for well preparedness. In most cases, faculty members in fine and performing arts and humanities were rated as the least well prepared. Again, community colleges represented an exception, where education and social science faculty members were considered least prepared.

The next section on scholarship and research is less revealing. While faculty members in public universities received the highest marks and those in community colleges received the lowest ratings, this reflects differences in their missions.

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Table 1

How well prepared are faculty members for using technology as a resource?

	All Institutions*	Private Institutions	Public Universities	Other Public 4-Year	Public 2-Year
NUMBER OF RESPONDENTS	590	258	63	120	146
For instruction					
Business	65.6	62.3	67.2	71.2	65.9
Biological and physical sciences	62.1	67.2	62.7	63.9	51.5
Engineering	61.2	55.9	72.5	67.6	57.5
Mathematics	57.7	61.7	56.9	57.3	51.1
Occupational programs	53.4	45.0	54.2	44.0	68.2
Overall campus preparation	50.2	48.1	55.0	50.9	51.1
Education	45.5	43.4	57.9	58.3	31.3
Social science	40.0	42.6	37.9	47.3	30.0
Fine/performing arts	36.7	34.2	43.9	39.0	35.8
Humanities	31.5	28.6	34.5	33.6	33.6
For scholarship & research					
Biological and physical sciences	59.5	66.2	77.6	63.3	29.9
Engineering	55.2	54.0	80.4	61.3	37.4
Business	54.2	56.3	66.1	64.9	30.9
Mathematics	52.1	56.4	68.4	56.8	27.8
Social science	45.4	48.1	51.8	50.0	30.2
Overall campus preparation	44.9	47.0	66.7	45.5	26.3
Occupational programs	43.6	43.5	54.2	46.2	36.1
Education	40.1	37.4	59.3	50.9	22.0
Fine/performing arts	33.3	33.3	48.2	30.5	27.7
Humanities	31.7	31.6	41.1	30.6	27.7
Internet & web resources					
Biological and physical sciences	67.0	69.8	74.6	69.4	56.3
Business	67.0	63.4	75.9	73.0	63.7
Engineering	59.6	56.5	76.9	65.3	50.9
Occupational programs	55.7	48.9	54.2	54.3	64.8
Overall campus preparation	54.8	53.4	65.6	58.3	48.8
Mathematics	53.7	53.6	50.9	60.4	49.2
Education	51.0	52.1	67.9	59.3	32.1
Social science	48.7	50.0	51.7	51.8	42.3
Fine/performing arts	43.3	43.3	50.0	38.1	44.8
Humanities	41.6	40.3	44.8	45.5	38.8

*Detail does not sum to the total, as there were three reporting institutions that could not be classified by Carnegie classification but are reported in the total.

SOURCE: The Campus Computing Project, Kenneth C. Green, Campus Computing 2001: The 12th National Survey of Computing and Information Technology in American Higher Education, 2001.

The last section of Table 1 presents information on how well prepared faculty members in different departments were perceived to be in using Internet and web resources. Science, business and engineering faculty members again led the list. Although faculty members in public universities tended to have higher marks across the board and community colleges lower marks, the difference was not as consistent as was found for scholarship and research.

Important Academic and Instructional Computing Policies, Procedures, and Resources on Campus

Table 2 displays the percent of institutions that had specific information technology instructional policies, procedures and resources in place on their campuses. Support for faculty development of instructional software and courseware was at, or near, the top in all institutional sectors. Forty-two percent of the colleges indicated that they rewarded faculty members for courseware development and the same percent indicated that they had policies regarding ownership of web-based resources developed by faculty members. The item

Table 2

Percentage of institutions that have or provide academic and instructional computing policies, procedures and resources

	All Institutions*	Private Insti-tutions	Public Univer-sities	Other Public 4-Year	Public 2-Year
NUMBER OF RESPONDENTS	590	258	63	120	146
Support for faculty developing instructional software/courseware	80.1	71.0	95.5	86.0	84.4
Technology resource center focusing on use of IT	74.1	62.2	100.0	80.0	78.3
Agreements/licenses for duplication of software products	71.1	68.0	89.4	78.3	62.0
Projects for developing desktop instructional software/courseware	64.3	55.1	89.6	75.2	59.9
Program to provide supplemental IT training for IT staff	54.9	56.3	66.7	52.1	49.3
Plan for using Internet for marketing to off-campus audiences	50.1	58.9	60.6	46.6	32.4
ADA-compliant web pages	49.4	33.8	79.4	60.5	53.2
Support for faculty developing software for their research	45.8	40.6	71.2	58.7	31.9
Plan for integrating IT into the curriculum	43.3	40.6	38.8	53.7	41.5
Plan for using Internet resources in distance education	42.0	28.0	45.5	52.9	55.6
Program for rewarding courseware development	41.7	29.9	53.7	49.6	50.4
Policy regarding ownership of web-based resources developed by faculty	41.7	28.3	58.5	59.2	43.0
Plan for using Internet resources in instruction	41.4	39.9	40.3	43.0	43.4
Assess impact of IT on instructional services and academic programs	33.9	31.7	39.1	38.0	31.9
Maintain library of academic courseware	29.5	24.4	31.8	35.8	32.1
Program assessing the impact of IT on instruction	22.2	21.3	25.4	24.8	20.1
Program to reward use of IT in faculty review/promotion process	17.7	19.0	13.6	22.3	13.5

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SOURCE: The Campus Computing Project, Kenneth C. Green, Campus Computing 2001: The 12th National Survey of Computing and Information Technology in American Higher Education, 2001.

with the fewest institutions answering in the affirmative was a program to reward the use of information technology in faculty review and promotion decisions.

In general, public universities were the most likely to have specific information technology policies and programs in place. One of the interesting exceptions to this is that 56 percent of the community colleges indicated they had plans to use the Internet in distance education, which was greater than any of the other educational sectors. This seems in conflict with the information in Table 1 that showed community colleges ranking lower than most of the other sectors in the percent of faculty members using Internet and web resources in their teaching.

Table 3

Percent of institutions reporting the listed issue as the single most important information technology issue over the next 2 or 3 years

	All Institutions*	Private Institutions	Public Universities	Other Public 4-Year	Public 2-Year
NUMBER OF RESPONDENTS	590	258	63	120	146
Assist faculty to integrate technology into instruction	31.5	38.8	35.6	21.2	26.1
Provide adequate user support	15.4	14.4	11.9	20.3	14.1
Upgrade/replace administrative IT/ERP systems	2.6	10.4	20.3	13.6	13.4
Finance replacement of aging hardware/software	11.7	12.4	5.1	11.0	14.1
Hire/retain qualified IT staff	11.0	11.6	3.4	11.9	12.0
Provide online/distance education via the web	8.4	6.0	5.1	10.2	12.7
Provide student portal services	4.2	4.4	6.8	5.1	2.1
Integrate academic and administrative computing	2.6	0.4	5.1	3.4	4.2
Integrate e-Commerce into campus services	1.9	1.2	5.1	2.5	1.4
Move toward campus-wide wireless networks	0.5	0.4	1.7	0.9	0.0

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SOURCE: The Campus Computing Project, Kenneth C. Green, Campus Computing 2001: The 12th National Survey of Computing and Information Technology in American Higher Education, 2001.

Most Important Information Technology Issues in the Next Two to Three Years

All types of institutions indicated that assisting faculty members in integrating technology into instruction was the most important issue facing them over the next two to three years. Providing adequate user support came in a distant second in all but public 4-year colleges. This result suggests that human skills are the most important issue in implementing information technology, far outpacing the need for new equipment or information technology support staff.

Evaluation of Information Technology on Campus

Table 4 provides information on how well information technology has been implemented on the campus. The respondents had very positive views about the contribution of information technology to instruction. Eighty-five percent of the respondents believed technology has improved instruction on their campus. Over one-half of the respondents also felt that faculty members had unreasonable expectations about user support. This may represent the classic conflict where computer experts believe that more casual users are not making enough effort on their own to learn how to use the technology.

It appears that relatively few colleges required students to

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Table 4

Uses of information technology on campus

	All Institutions*	Private Institutions	Public Universities	Other Public 4-Year	Public 2-Year
NUMBER OF RESPONDENTS	590	258	63	120	146
Technology has improved instruction on my campus	84.9	80.6	84.1	92.5	86.1
Our administrative systems provide effective support for conducting college business	77.1	77.4	66.1	77.3	80.6
My campus does a good job of planning our short- and mid-range technical needs	73.5	73.1	71.4	77.3	72.9
Faculty have unreasonable expectations about user support	52.5	55.3	44.4	51.7	52.8
Access to Internet 2 by Fall 2002 is essential to long-term needs	30.5	20.2	84.1	35.8	18.2
Colleges should permit commercial advertising on campus websites/portals	16.7	13.2	14.8	18.5	21.7
We plan to require all students to own a computer by Fall 2003	12.5	18.1	12.7	14.3	0.7

*Detail does not sum to the total, as there were three reporting institutions that could not be classified by Carnegie classification but are reported in the total.

SOURCE: The Campus Computing Project, Kenneth C. Green, Campus Computing 2001: The 12th National Survey of Computing and Information Technology in American Higher Education, 2001.

own computers. This may reflect the fact the most students have computer access already. Most campuses have computers available in computer labs, the library, or other locations on campus. As the price of computers continues to drop, it is probable that more students will buy computers in the future as a matter of convenience.

Conclusion

Roughly two-thirds of faculty members in the sciences, engineering, mathematics and occupational programs were perceived to be well prepared to use information technology. Roughly one-third of the faculty members in the humanities and arts were thought to be well prepared to use instructional technology. This variance among academic fields may reflect the character of the disciplines they teach or the interests of the individuals in these fields.

Most colleges supported faculty members who developed instructional software or courseware, but were much less likely to provide direct rewards for the activity. Only 18 percent of the colleges considered information technology in faculty review and promotion decisions.

While over one-half of the community colleges had plans for distance education, just over one-quarter provided help to faculty members who were trying to integrate technology into their classes. This disconnect

between plans and support may thwart longer-term success in implementing distance education in the community colleges.

Overall, the results displayed the continuing integration of technology into the instructional programs of colleges. The effort varied by academic department and type of institution. Human resources continued to be the most important part of the information technology plans on campuses.

Ownership of web resources developed by faculty members was unresolved in over one-half of the institutions, as were rewards for faculty members who developed information technology materials. These issues have the potential to slow the development of information technology materials and provide a point of contention between faculty members and the institutions for which they work.

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