



Teaching with Technology



National Study of
Postsecondary Faculty

Use of Telecommunications Technology by Postsecondary Instructional Faculty and Staff in Fall 1998

U.S. Department of Education
Institute of Education Sciences
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Statistical Analysis Report

Executive Summary

The complete report is available at
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Executive Summary

This report examines postsecondary instructional faculty and staff's access to and use of electronic mail (e-mail) and the Internet. Though these telecommunications technologies are rapidly becoming core components of the instructional experience of students in the United States, little descriptive information exists at the national level to address basic questions about technology use and teaching in postsecondary education. The purpose of this study is to respond to this need by answering the following questions: Who has access to telecommunications technologies (in particular, the Internet)? How much and in what ways do they use these technologies for instructional purposes? How does technology use relate to workload and contact with students? The findings of this report are based on a nationally representative sample of instructional faculty and staff who taught one or more classes for credit in fall 1998. These data originate from the 1999 National Study of Postsecondary Faculty (NSOPF:99).¹

¹Sponsored by the U.S. Department of Education's National Center for Education Statistics (NCES), NSOPF:99 was conducted in 1999 and asked a nationally representative sample of faculty and instructional staff about their employment and work activities in fall 1998. According to NSOPF:99, there were approximately 1.1 million faculty and instructional staff employed by public and private not-for-profit 2-year and above postsecondary institutions in fall 1998. Of these, about 976,000 reported having some instructional responsibilities for credit, including teaching classes for credit or advising students about academic activities for credit. Among these individuals, approximately 90 percent, or 882,000 (501,000 full-time and 381,000 part-time), reported teaching one or more classes for credit in fall 1998. These individuals become the core sample of this report. In the interest of brevity, these individuals are referred to as "instructional faculty and staff," "instructional faculty," or simply "faculty" throughout this report, although they are a subset of faculty and instructional staff included in the NSOPF:99.

Access to the Internet, Quality of Computing Resources, and Use of Telecommunications Technologies

Access to the Internet

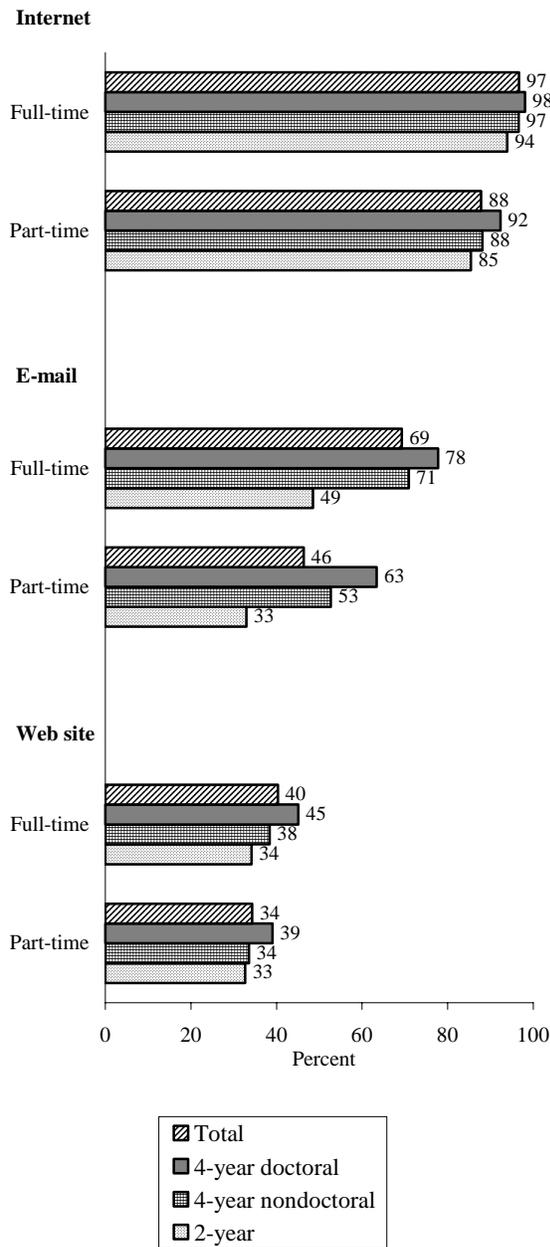
In fall 1998, 97 percent of full-time instructional faculty and staff who taught classes for credit at degree-granting institutions had access to the Internet, including 98 percent of those at 4-year doctoral institutions, 97 percent of those at 4-year nondoctoral institutions, and 94 percent of those at 2-year institutions (figure A). Though part-time instructional faculty and staff were less likely to have access to the Internet compared with their full-time counterparts, a large majority of part-time instructional faculty and staff had access to the Internet (88 percent), including 92 percent of those at 4-year doctoral institutions, 88 percent of those at 4-year nondoctoral institutions, and 85 percent of those at 2-year institutions. Both full- and part-time instructional faculty and staff were more likely to have access both at home and at work than only at work or only at home.

Quality of Computing Resources

About 46 percent of full-time faculty and 41 percent of part-time faculty who taught classes for credit at doctoral-granting institutions rated their institution's quality of computing resources as good,² with an additional one-third of full-time

²Quality of computing resources reflects the average of respondents' ratings of their institution's personal computers and local networks, centralized (main frame) computer facilities, Internet connections, and technical support for computer-related activities.

Figure A.—Percentage of postsecondary instructional faculty and staff who had access to the Internet, and who used e-mail and course-specific Web sites, by employment status and institution type: Fall 1998



NOTE: This figure includes only instructional faculty and staff who taught one or more classes for credit. E-mail use was only for communicating with students.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999 National Study of Postsecondary Faculty (NSOPF:99).

faculty (32 percent) and one-quarter of part-time faculty (25 percent) rating the quality of computing resources as excellent. Both full- and part-time faculty at 4-year doctoral institutions were less likely than those at 4-year nondoctoral and 2-year institutions to rate the quality of their institution's computing resources as poor.

Use of Telecommunications Technologies

Although access to the Internet was widespread for postsecondary instructional faculty and staff in fall 1998 (figure A), the use of e-mail to communicate with students in classes was relatively lower both for full-time faculty (69 percent) and for part-time faculty (46 percent). The use of course-specific Web sites for classes was also lower—40 percent for full-time faculty and 34 percent for part-time faculty. Overall, full-time faculty were more likely than their part-time counterparts to use e-mail and course-specific Web sites. The use of e-mail and course-specific Web sites also varied by type of institution: overall, faculty at 4-year doctoral institutions were more likely than those at 4-year nondoctoral and 2-year institutions to use e-mail to communicate with students and were also more likely to use course-specific Web sites.

Instructional faculty and staff's use of e-mail to communicate with students in their classes was related to the level of students taught as well as to the age and principal field of teaching of faculty and staff. For example, as the age of full- and part-time instructional faculty and staff increased, their use of e-mail decreased. On average, faculty who taught both undergraduate and graduate students were more likely to use e-mail to communicate with students in their classes (81 percent of full-time and 65 percent of part-time faculty), compared with those who taught only undergraduates (66 percent of full-time and 44 percent of part-

time faculty). Principal field of teaching also made a difference. For example, 82 percent of full-time and 65 percent of part-time engineering/computer science faculty used e-mail to communicate with students, while about one-half of full-time and 30 percent of part-time health sciences faculty used e-mail to communicate with students.

Relationship of Internet Access and Quality of Computing Resources to Instructional Use of Technology

Full- and part-time instructional faculty and staff who rated their institution's computing resources as either good or excellent were much more likely to use e-mail to communicate with students in their classes than were those who rated their institution's computing resources as poor. In addition, instructional faculty and staff's use of e-mail to communicate with students in their classes and use of course-specific Web sites was associated with their level of access to the Internet. Those who had access both at home and at work were more likely to use e-mail and course-specific Web sites than those who had access only at work, had access only at home, or had no access. However, of those who had access to the Internet both at home and at work, full-time instructional faculty and staff were more likely to use e-mail to communicate with students in their classes (78 percent) than were their part-time counterparts (64 percent).

When taking into consideration the quality of computing resources, Internet access, and other academic and demographic characteristics of faculty, these variables accounted for 24 percent of the variance in faculty use of e-mail and 6 percent of the variance in faculty use of course-specific Web sites.³ When multivariate models were used

to control for interrelationships among variables, postsecondary instructional faculty and staff who had access to the Internet both at home and at work were still more likely to use e-mail and course-specific Web sites than were those who had access only at home or only at work. Postsecondary instructional faculty and staff at 4-year doctoral institutions were also more likely to use e-mail and course-specific Web sites than were those at 4-year nondoctoral or 2-year institutions even when availability and quality of resources and other academic and demographic characteristics were taken into account.

Instructional faculty's principal field of teaching was also related to use of telecommunications technologies, while controlling for the covariation among variables. With the exception of four teaching fields (business, education, humanities, and social sciences), instructional faculty and staff who taught in the field of engineering and computer sciences were more likely to use e-mail than those who taught in other disciplines. Faculty who taught in engineering and computer sciences were also more likely than those who taught in other disciplines (except for business and vocational education) to use course-specific Web sites.

Finally, when taking the interrelationships among other variables into account, instructional faculty and staff who rated their institution's computing resources as good or excellent were more likely to use course-specific Web sites than were those who rated the computing resources as poor.

ate, with correlations ranging in absolute value from .001 to .295. The most important factor in accounting for the variance in e-mail use was Internet access, with a correlation of .290 between having Internet access both at home and at work and e-mail use, and a correlation of -.295 between having no Internet access and e-mail use. The correlations of the independent variables to use of Web sites all represented small effect sizes, ranging in absolute value from .001 to .130 (having Internet access both at home and at work). See appendix B for details.

³Bivariate correlations showed that the effect sizes of the independent variables on use of e-mail were small to moder-

The likelihood of using e-mail and course-specific Web sites was also higher for instructional faculty and staff who taught both undergraduate and graduate students than for those who taught only undergraduates.

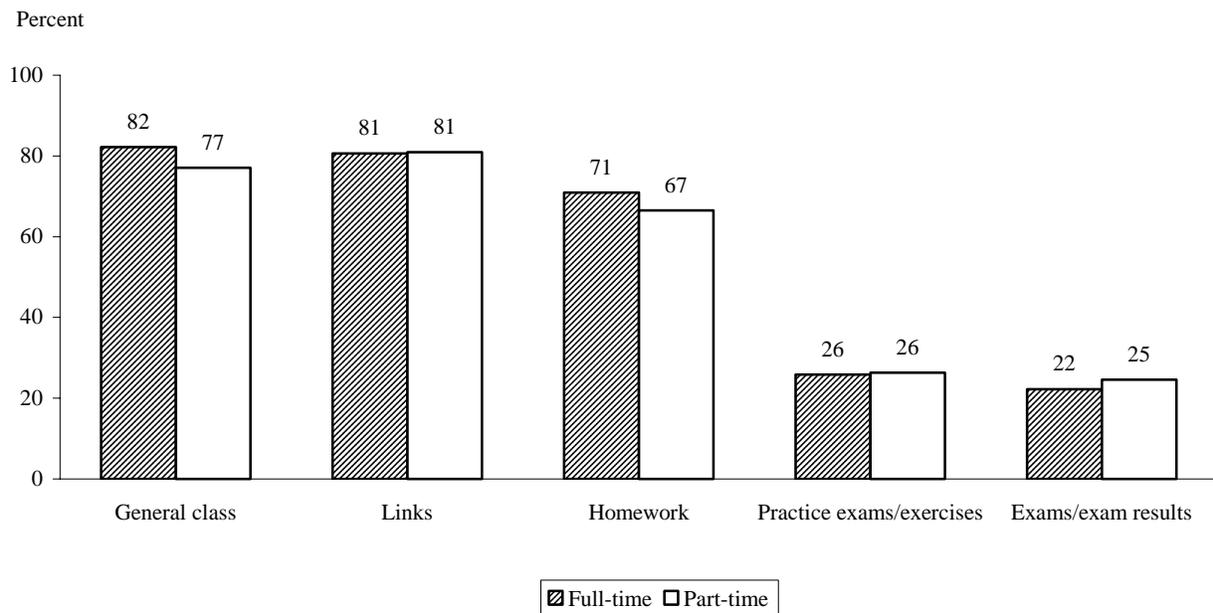
Teaching and Technology Use

Instructional faculty and staff at degree-granting institutions reported on the volume of e-mail use and how they used course-specific Web sites in fall 1998. Both full- and part-time instructional faculty and staff reported spending an average of 2.7 hours per week responding to students' e-mail communications. Instructional faculty and staff who used course-specific Web sites were more likely to use these Web sites to post general class information and links to other information

than for any of the other purposes examined (i.e., posting homework, practice exams/exercises, or exams/exam results) (figure B).

There was an association between type of institution and telecommunications technology use. Among full-time instructional faculty and staff who used e-mail to communicate with students in fall 1998, those at 4-year doctoral institutions reported that an average of 39 percent of their students e-mailed them, compared with 29 percent of students at 4-year nondoctoral institutions and 22 percent of students at 2-year institutions. Similarly, among part-time instructional faculty and staff who used e-mail, those at 2-year institutions reported that an average of 23 percent of their students e-mailed them, compared with 40 percent of students at 4-year doctoral institutions and 34 percent of students at 4-year nondoctoral institutions.

Figure B.—Among postsecondary instructional faculty and staff who used course-specific Web sites, percentage using Web sites for various teaching purposes, by employment status: Fall 1998



NOTE: This figure includes only instructional faculty and staff who taught one or more classes for credit and who also used course-specific Web sites.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999 National Study of Postsecondary Faculty (NSOPF:99).

At 4-year doctoral institutions, 85 percent of full-time and 84 percent of part-time instructional faculty used course-specific Web sites for the purpose of posting general class information, compared with 75 percent of both full- and part-time faculty at 2-year institutions.

Workload and Technology Use

Compared with those who did not use telecommunications technologies, full- and part-time instructional faculty and staff who used e-mail or course-specific Web sites generally reported working more hours per week on average, spending more time on research activities, and spending less time on teaching activities and office hours.

Hours Worked

In fall 1998, full-time instructional faculty and staff worked an average of 53 hours per week, and part-time instructional faculty and staff worked an average of 37 hours per week. Full-time instructional faculty and staff who used either e-mail or course-specific Web sites worked more hours per week on average (55 hours) compared with those who did not use e-mail (50 hours) or did not use course-specific Web sites (52 hours). Among part-time instructional faculty and staff, those who used e-mail worked an average of 39 hours per week, compared with 36 hours per week for those who did not use e-mail. Part-time faculty who used course-specific Web sites worked 43 hours per week, compared with 34 hours per week of those who did not use course-specific Web sites. This relationship between hours worked per week and use or non-use of e-mail and course-specific Web sites was generally found in all types of inst-

itutions with the following exceptions: no difference was found in work hours between full-time faculty who used course-specific Web sites and those who did not use them at 4-year doctoral institutions, and between part-time faculty who used e-mail and those who did not use it at 4-year non-doctoral and 2-year institutions.

Work Activities

In fall 1998, full-time instructional faculty and staff spent an average of 60 percent of their time on teaching activities, 14 percent on research activities, 13 percent on administrative duties, and 13 percent on other activities. Part-time instructional faculty and staff spent an average of 63 percent of their time on teaching activities, 5 percent on research activities, 3 percent on administrative duties, and 29 percent on other activities. Compared with those at 4-year nondoctoral and 2-year institutions, both full- and part-time instructional faculty and staff at 4-year doctoral institutions spent less of their time on teaching activities and more of their time on research. Overall, postsecondary instructional faculty and staff who used e-mail or course-specific Web sites reported spending more time on research activities; those who did not use these resources reported spending a larger percentage of their time on teaching activities. However, this pattern was not generally found when taking into account type of institution. Full-time instructional faculty and staff at 4-year doctoral institutions who used e-mail reported spending more of their time on teaching activities (51 percent) compared with those who did not use e-mail (48 percent). They also spent more of their time on research activities (23 percent) compared with those who did not use e-mail (20 percent).

Classroom Contact Hours and Office Hours

Full-time instructional faculty had an average of 321 student classroom contact hours per week,⁴ and part-time instructional faculty had about 176 student classroom contact hours per week. Full-time instructional faculty who used e-mail to communicate with students reported fewer average classroom contact hours (306 hours per week) than their colleagues who did not do so (353 hours per week). The average number of office hours per week was 6.5 hours for full-time instructional faculty and 2 hours for part-time faculty. The average number of office hours for full-time faculty who used e-mail (6.3 hours) was slightly lower than for those who did not use e-mail (7 hours).

Conclusion

In fall 1998, access to the Internet was common for postsecondary instructional faculty and staff. In addition, 69 percent of full-time faculty and 46 percent of part-time faculty used e-mail to communicate with students in their classes, and about one-third of both full- and part-time faculty used course-specific Web sites.

While the overall findings in this report indicate increasing integration of telecommunications technologies in postsecondary settings, there are three caveats. First, this study showed wide differences between full- and part-time faculty in access

to and use of telecommunications technologies. Without exception, full-time faculty reported more access to the Internet and more use of e-mail and course-specific Web sites than did part-time faculty.

Second, Internet access and the quality of computing resources were important factors in the use of telecommunications technologies. Postsecondary instructional faculty and staff who had access to the Internet both at home and at work were significantly more likely to use e-mail and course-specific Web sites than those who had access only at home or only at work. Clearly, the amount of Internet access was a main indicator of use for both e-mail and course-specific Web sites, and it remained important after controlling for other variables. After controlling for other variables, the quality of computing resources also remained a significant factor in the likelihood of using course-specific Web sites: overall, instructional faculty and staff who rated their institution's computing resources as good or excellent were more likely to use course-specific Web sites than were those who rated the computing resources as poor.

Finally, the type of institution was shown repeatedly to be a key factor. In particular, postsecondary instructional faculty and staff at 4-year doctoral institutions were significantly more likely to use e-mail and course-specific Web sites than those at 4-year nondoctoral or 2-year institutions.

⁴Total student contact hours were calculated as follows: For each for-credit class taught (a maximum of 5 classes could be reported by respondents), the number of hours per week spent teaching the class was multiplied by the number of students in the class. The products were then summed to obtain the total number of student classroom contact hours.