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ABSTRACT

SUCCEED (Southeastern University and College Coalition for Engineering Education) is an 8-campus coalition of engineering schools formed in 1992 under the sponsorship of the National Science Foundation. In 1997, members of SUCCEED's faculty development and program assessment teams designed a faculty survey of instructional practices and attitudes regarding the climate for teaching on the Coalition campuses. The respondents were asked about the frequency with which they used various teaching techniques (including active learning, team homework, and technology-assisted instruction), their involvement in faculty development programs, and the effects of those programs on their teaching. They were also asked to rate the importance of teaching quality to themselves, their colleagues, and their department, college, and university administrators and in the faculty reward system in their campus. The survey was first administered late in 1997 and a modified version was administered late in 1997. (A third administration will take place in the spring of 2002.) The 1999 survey was sent by e-mail to 1621 faculty e-mail addresses, and a follow-up survey was sent a month later to non-respondents. After blank surveys and duplicates were eliminated from the returns, 586 valid and usable surveys remained, a return rate of 36%. Of those, 75 were excluded from most analyses (except for demographic summaries) because the respondent had not taught undergraduates in the prior 3 years. The demographic profile of the respondents closely matched that of the full faculty with respect to sex, rank, position, engineering discipline, and participation in SUCCEED-sponsored activities. This report summarizes results from the 1999 administration of the survey and itemizes significant differences among groups (sex, rank, position, years of service, SUCCEED involvement, prior attendance at teaching seminars, and Carnegie classification). When possible, the data are compared with the data from the 1997 survey administration to examine changes in faculty teaching practices and attitudes in the intervening 2 years. Survey instrument and survey summary by institution are appended. (Contains 73 tables and 12 figures.) (Author/MM)

SUCCEED

SOUTHEASTERN UNIVERSITY AND COLLEGE COALITION FOR ENGINEERING EDUCATION

1999-2000 SUCCEED Faculty Survey of Teaching Practices and Perceptions of Institutional Attitudes Toward Teaching

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December 2001

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1999–2000 SUCCEED COALITION FACULTY SURVEY OF TEACHING PRACTICES AND PERCEPTIONS OF INSTITUTIONAL ATTITUDES TOWARD TEACHING

Abstract

SUCCEED (Southeastern University and College Coalition for Engineering Education) is an eight-campus coalition of engineering schools formed in 1992 under the sponsorship of the National Science Foundation. In 1997, members of SUCCEED's faculty development and program assessment teams designed a faculty survey of instructional practices and attitudes regarding the climate for teaching on the Coalition campuses. The respondents were asked about the frequency with which they used various teaching techniques (including active learning, team homework, and technology-assisted instruction), their involvement in faculty development programs, and the effects of those programs on their teaching. They were also asked to rate the importance of teaching quality to themselves, their colleagues, and their department, college, and university administrators and in the faculty reward system on their campus. The survey was first administered late in 1997 and a modified version was administered late in 1999. (A third administration will take place in the spring of 2002.)

The 1999 survey was sent by e-mail to 1621 faculty e-mail addresses, and a follow-up survey was sent a month later to non-respondents. After blank surveys and duplicates were eliminated from the returns, 586 valid and usable surveys remained, a return rate of 36%. Of those, 75 were excluded from most analyses (except for demographic summaries) because the respondent had not taught undergraduates in the prior three years. The demographic profile of the respondents closely matched that of the full faculty with respect to sex, rank, position, engineering discipline, and participation in SUCCEED-sponsored activities.

This report summarizes results from the 1999 administration of the survey and itemizes significant differences among groups (sex, rank, position, years of service, SUCCEED involvement, prior attendance at teaching seminars, and Carnegie classification). When possible, the data are compared with the data from the 1997 survey administration to examine changes in faculty teaching practices and attitudes in the intervening two years.

Electronic versions of the complete report and the executive summary may be viewed at

<http://www.succeednow.org/products/99faculty_survey.pdf>
<http://www.succeednow.org/products/99faculty_survey_execsum.pdf>

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Executive Summary

SUCCEED (Southeastern University and College Coalition for Engineering Education) is an eight-campus coalition of engineering schools formed in 1992 under the sponsorship of the National Science Foundation. In 1997, members of SUCCEED's faculty development and program assessment teams designed a faculty survey of instructional practices and attitudes regarding the climate for teaching on the Coalition campuses. The respondents were asked about the frequency with which they used various teaching techniques (including active learning, team homework, and technology-assisted instruction), their involvement in faculty development programs, and the effects of those programs on their teaching. They were also asked to rate the importance of teaching quality to themselves, their colleagues, and their department, college, and university administrators and in the faculty reward system on their campus. The survey was first administered late in 1997 and a modified version was administered late in 1999. (A third administration will take place in the spring of 2002.)

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We initially speculated that faculty inclined to participate in faculty development activities and to use non-traditional instructional methods like active and cooperative learning would be over-represented among respondents to a survey of teaching practices. This fear proved to be unfounded. When the survey asked about participation in SUCCEED-sponsored activities (workshops, seminars, etc.), 42% of 509 respondents reported having participated. An independent database of tenured and tenure-track engineering faculty participants in SUCCEED-sponsored activities (workshops, seminars, etc.) shows that near the end of 1999, 42% of 1563 faculty members had participated. We conclude that the 1999 survey respondents constitute a fair sample of the entire SUCCEED engineering faculty population in every important respect.

This report summarizes results from the 1999 administration of the survey and itemizes significant differences among groups (sex, rank, position, years of service, SUCCEED involvement, prior attendance at teaching seminars, and Carnegie classification). When possible, the data are compared with the data from the 1997 survey administration to examine changes in faculty teaching practices and attitudes in the intervening two years.

Active learning

The instructional method emphasized most heavily in SUCCEED-sponsored teaching workshops is active learning—getting students to do anything in class other than watch and listen to the instructor and take notes. In 1999 many of the survey respondents were using active learning to some extent. Sixty percent reported assigning small group

exercises for brief intervals in their classes, with 22% doing so once a week or more, and 37% reported using active learning for most of a class period, with 8% doing so once a week or more. All of these percentages represent slight but not statistically significant increases from the 1997 values. (We believe that they represent sizeable increases from the values when SUCCEED began in 1992 but we have no data to confirm this belief.) The percentages on individual campuses using active learning varied from 48% to 95%.

Women were much more likely than men to use active learning, associate and assistant professors more likely than full professors to use it, and faculty members at masters institutions more likely than faculty members at research institutions to use it. Participation in teaching seminars was associated with an increased use of active learning and a decrease in the frequency of lecturing for most of every class session.

Team assignments

In the 1999 survey, 73% of the respondents reported giving assignments on which students had the option of working in teams, with 35% doing so weekly or more often; 54% of the respondents reported giving assignments on which teams were required, with 16% doing so weekly or more often; and 82% reported assigning a major team project in some or all of the courses they taught. The percentages of respondents using optional or mandatory team assignments and the percentages doing so weekly or more often each rose by about 7% from 1997 to 1999. The percentages giving optional team assignments on individual campuses varied from 64% to 88%, and the percentages giving mandatory team assignments varied from 49% to 80%.

Those who were actively involved in SUCCEED were more likely to require teams for assignments (71%) than those who had only heard of the coalition (48%). All other subpopulations studied were equally likely to use team assignments. The incidence of team assignments increased from 1997 to 1999 for all of the subpopulations examined.

Technology-based instruction

The most common category of technology applications reported in the 1999 survey was communication between instructors and students: 96% of the respondents reported using e-mail to respond to questions from their students, 75% sent information to the whole class, and 24% posted on-line responses to frequently asked questions. The next highest category involved posting course materials: 66% reported posting syllabi, 60% assignments, 48% problem solutions, 44% lecture notes, 44% links to other web sites, and 38% old tests. Smaller percentages set up on-line communications among the students—32% with class listservs and 11% with chat rooms—and used technology for actual course delivery other than posting lecture notes—16% used on-line tutorials, 7% on-line tests, 5% on-line video, and 4% on-line audio. Similar questions were not asked in 1997, so there is no way to determine the extent to which technology use changed between survey administrations.

The campus-to-campus variations in use of some of the technology applications were greater than the variations seen for any other measured variable. The percentages of the

respondents who posted syllabi on the Web varied from 35% to 84%, the percentages posting old tests varied from 5% to 59%, and the percentages setting up class listservs varied from 10% to 75%. These pronounced variations undoubtedly reflect the fact that some SUCCEED campuses have a fully networked computing environment and make extensive use of instructional delivery tools such as Web-CT and Blackboard, while at other schools with fewer resources and/or more traditional and technology-resistant faculties, most professors have not progressed much beyond e-mail, programming, and word-processing in their computer usage.

Writing assignments

A movement to increase writing content in engineering courses has followed the adoption of EC 2000 as the accreditation standard. The percentage of the survey respondents who reported ever giving writing assignments increased from 84% in 1997 to 88% in 1999, and the percentage doing so weekly or more often increased from 8% to 21%. Men and women were almost equally likely to give writing assignments, and there were also no significant differences across academic ranks or types of institution.

Preparation for classes and contact with students

Faculty members in all categories other than administrators reported spending between 8 and 11 hours a week on preparation for a single course. On average assistant professors spent about two hours more than full professors did. Associate professors reported spending an amount of time roughly midway between the times spent by assistant and full professors, but only the difference between the assistant and full professors was statistically significant.

Faculty members also reported spending an average of 3.9 hours per week outside of office hours with undergraduate students. The greatest amount of time was spent by teaching faculty (5.6 hours), followed by department chairs (4.8 hours), research faculty (3.8 hours), teaching/research faculty (3.5 hours), and administrators other than department heads (3.4 hours), although only the difference between teaching and teaching/research faculty was statistically significant. Faculty at masters institutions spent more time with undergraduates (5.0 hours) than did faculty at research institutions (3.7 hours). Seventy-eight percent of the respondents indicated that they solicited feedback regarding their teaching at times other than at the end of the semester, with 88% of the assistant professors, 81% of the associate professors, and 71% of the full professors doing so.

Instructional objectives and study guides

Writing instructional objectives (or in ABET terminology, course learning objectives) is another instructional method strongly encouraged by both SUCCEED teaching workshops and Engineering Criteria 2000, and the workshops encourage participants to give their objectives to their students in the form of study guides for examinations. The number of respondents who reported usually or always writing instructional objectives

was 65% in 1999, a 5% increase from 1997. Assistant professors were much more likely to write them at all and to write them frequently than were associate and full professors. Similar results were obtained regarding the provision of study guides for tests. In 1999, 80% reported doing so with 60% usually or always doing so, percentages not much different from the 1997 values. Women (48%) were more likely than men (34%) to provide study guides routinely. Attending teaching seminars was positively associated with writing instructional objectives.

Faculty development

Eighty-two percent of the respondents reported having attending one or more teaching workshops on their campuses, 64% attended a meeting or brown-bag lunch dealing with teaching, 62% consulted books, 59% consulted a newsletter or a web site, 40% observed a videotape, 35% participated in a mentoring program, and 13% worked with a teaching consultant. Assistant professors (87%) and associate professors (86%) were more likely than full professors (77%) to attend teaching workshops, and women (27%) were much more likely than men (11%) to work with a teaching consultant. Large campus-to-campus variations were observed, reflecting the different availabilities of faculty development resources and programs on the different campuses.

As previously noted, the use of active learning, team assignments, and other nontraditional instructional methods were positively associated with attendance at teaching seminars. This result by itself does not show that the seminars induced participants to adopt the nontraditional methods: one might expect that professors who choose to attend teaching seminars would be more inclined to use nontraditional methods than would their colleagues who choose not to attend. To determine whether the association was causal rather than merely correlational, the 1999 survey asked the respondents which of several listed instructional methods they had adopted as a consequence of attending teaching workshops, seminars, or conferences. Of roughly 500 respondents, 59% reported that they either began or increased their use of active learning, 43% wrote instructional objectives, 43% used cooperative learning, 28% provided study guides before tests, and 18% participated in a mentoring program. When asked how the changes they made affected their students' learning, 69% of the respondents reported improvements, 6% said that they could see no improvement, and 25% indicated that they had not made any changes.

Women (95%) were more likely than men (72%) to try new methods, assistant professors (82%) more likely than associate professors (72%) or full professors (70%) (only the difference between the assistant and full professors was statistically significant), and faculty at masters institutions (90%) more likely than faculty at research institutions (71%). Willingness to try new approaches generally correlated positively with the number of teaching seminars attended.

Rated importance of teaching quality and innovation

From the point of view of the survey respondents, the climate for teaching on their campuses was not particularly good in 1997 and worse in 1999. Most respondents expressed a belief that teaching quality was very important to them, with an average rating of 6.5 on a scale from 1 (not at all important) to 7 (extremely important). They regarded teaching quality as decreasingly important to their department head (5.6), faculty colleagues (5.2), dean (5.1), and top university administrator (5.1). Most believed that teaching quality and teaching innovation (testing new instructional methods, writing textbooks or instructional software) were not particularly important in the faculty incentive and reward system, with average ratings of 3.7 and 3.5 respectively. All significant changes from 1997 to 1999 were in the negative direction.

Women generally gave lower ratings of the importance of teaching to colleagues and administrators and in the reward system than did men, and assistant professors gave lower ratings than associate professors, who in turn gave lower ratings than full professors (again only the difference between assistant and full professors was statistically significant). Administrators consistently rated the importance of teaching to themselves and their colleagues and in the reward system higher than the rest of the faculty did. Predictably, ratings of the importance of teaching quality in the reward system were higher at masters institutions (4.0) than at research institutions (3.7), but both ratings were relatively low.

Conclusions

- *Use of nontraditional instructional methods.* Extensive evidence from cognitive science and empirical classroom research supports the effectiveness of active learning, team-based learning, writing formal instructional objectives, and assigning writing exercises at promoting acquisition of knowledge and skills. While we have no data on the frequency of use of these methods in 1992 when SUCCEED began, we feel confident in saying that they were known to relatively few engineering faculty members and practiced by even fewer. Their use in 1999 by over half of the faculty and in some cases considerably more than half, and the relatively high percentages using them on all of the SUCCEED campuses, suggest that the combined effects of faculty development programs, education-related articles in professional journals, EC 2000, word-of-mouth from colleagues, and pressure from students have had significant effects on faculty teaching practices. We anticipate that the observed trend toward adoption of the new methods will continue as faculty members who have used the traditional ones for decades retire, and their replacements are given training and mentoring in more effective methods starting as soon as they arrive on campus.

- *Technology-assisted instruction.* Engineering education is in a transitional state regarding the use of instructional technology, and the variations observed on the SUCCEED campuses undoubtedly reflect the situation throughout the country. Some

of the SUCCEED campuses have a fully networked computing environment, make extensive use of instructional delivery tools such as Web-CT and Blackboard, and require all engineering students to purchase laptops. These are the schools that make the greatest use of technology for communication and instruction—where over 80% of the instructors post their syllabi on the Web, for example, and over 70% set up listservs for their classes. At other schools with fewer resources and/or more traditional and technology-resistant faculties, most professors have not progressed much beyond e-mail, programming, and word-processing in their computer usage. The full use of instructional technology for course delivery with such tools as on-line test administration and multimedia courseware is still in its early stages on all of the campuses. We anticipate dramatic changes in this situation in the coming years.

- *Participation in and effectiveness of faculty development.* In 1999, 82% of the survey respondents reported having attended one or more teaching workshops on their campuses, with smaller but still substantial percentages participating in other types of faculty development programs. Large percentages of the respondents attributed their adoption or increased use of nontraditional instructional methods to their participation and expressed beliefs that the changes led to improvements in their teaching.

  Our conclusion is that while faculty development cannot claim exclusive credit for the increased use of the instructional methods it has sought to promote in recent years, it has clearly made a major contribution to the increase. Considering the historic reluctance of engineering faculty to participate in campus-wide faculty development programs, engineering schools would do well to strengthen their internal faculty development efforts rather than relying primarily or entirely on campus-wide teaching centers for guidance in improving teaching. Guidelines for the design and implementation of engineering faculty development programs formulated by the SUCCEED Coalition[1] might prove useful in this regard.

- *Rated importance of teaching quality and innovation.* In both 1997 and 1999, most respondents expressed a belief that teaching quality was more important to them than to their colleagues and administrators, and there was general agreement that teaching quality and teaching innovation (testing new instructional methods, writing textbooks or instructional software) were not important in the faculty incentive and reward system. All significant changes from 1997 to 1999 were in the negative direction.

  We infer from these findings that most professors who spend time and energy participating in faculty development programs and learning and implementing new methods do so despite their belief that their efforts will neither be appreciated by their colleagues nor rewarded by their administrators. (There is some comfort in the fact that respondents gave department chairs the second-highest rating after themselves, indicating a belief that those who rise to that level feel that teaching is more important

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[1] R. Brent, R. Felder, T. Regan, A. Walser, C. Carlson-Dakes, D. Evans, C. Malave, K. Sanders, J. McGourty, "Engineering Faculty Development: A Multicoalition Perspective," *Proceedings, 2000 Annual Meeting of the American Society for Engineering Education*, ASEE, June 2000.

than it is to rank-and-file faculty.) Nevertheless, the study also shows that many of them choose to make the effort anyway, which we regard as a tribute to their dedication. The dramatic advances in the quality of American engineering education that might result from putting teaching and research on a more equal footing in the faculty reward system can only be imagined.

Introduction

The SUCCEED Coalition is one of a number of multi-university coalitions sponsored by the National Science Foundation to improve engineering education in the United States. SUCCEED (Southeastern University and College Coalition for Engineering Education) comprises eight engineering schools—Clemson University, Florida A & M and Florida State Universities (which have a joint engineering program), Georgia Institute of Technology, North Carolina A & T University, North Carolina State University, University of Florida, University of North Carolina at Charlotte, and Virginia Polytechnic Institute and State University. SUCCEED was originally funded in 1992 for five years, and its funding was renewed for another five years in 1997.

At the beginning of its second five year funding period, SUCCEED formed several focus teams, including one to coordinate faculty development (FD) activities. As part of the FD program, a survey was designed to track the SUCCEED institution faculty's instructional practices (including their uses of technology), involvement in instructional development programs, and perceptions about institutional support for teaching on their campuses. The survey was first administered in the 1997-98 academic year; a modified version was administered in 1999; and a third administration will take place in the spring of 2002.

This document reports the findings from the 1999 administration of the survey. The respondents were asked to answer questions about their experience and practice in six primary areas: prior involvement with teaching beyond classroom instruction, rated importance of teaching quality and innovation to themselves and colleagues, frequency of use of various teaching techniques for undergraduate instruction, involvement in teaching improvement programs on campus, use of e-mail and the World Wide Web in instruction, and changes in teaching practices that may have resulted from participation in faculty development activities.

The results in the first four of these areas can be compared with the results of the baseline survey administered during the 1997-1998 academic year[2] to measure the impact the SUCCEED Faculty Development Coalition Focus Team has had on faculty teaching practices and institutional environment in the intervening two years. A copy of the 1999 survey instrument appears in Appendix A. This report summarizes responses to each of the questions and itemizes significant differences among groups (sex, rank, position, years of service, SUCCEED involvement, prior attendance at teaching seminars, and Carnegie classification). Where appropriate, comparisons with the 1997 survey are made.

The 1997 survey was designed by Dr. Rebecca Brent and Dr. Richard Felder, co-directors of the SUCCEED Faculty Development Coalition Focus Team, with assistance from Dr. Catherine Brawner of Research Triangle Educational Consultants, a consultant to SUCCEED. The 1999 survey is based on the 1997 survey with modifications made to

[2] The report on that survey, *1997-1998 Faculty Survey of Teaching Practices and Perceptions of Institutional Attitudes Toward Teaching*, is available through ERIC Document Reproduction Service (ED 428 607).

clarify some questions, make it easier for subjects to respond, and add questions on Web and e-mail use and behavioral change. It was administered to all engineering faculty members via e-mail. Dr. Brawner and Dr. Rodney Allen of COMP-AID performed the analysis of the data.

Survey Methodology

Campus Implementation Team leaders from each SUCCEED campus were asked to provide complete lists of engineering faculty members. The survey was first pilot-tested with SUCCEED leadership team members to ensure that instructions were clear and that there were no technical problems, and in early November 1999 it was sent to all 1621 faculty with e-mail addresses provided by the team leaders. A month later faculty who had not responded were sent a follow-up survey. All surveys were returned directly to Dr. Brawner and respondents were assured that no one on their campus would see their individual responses. Respondents were also given the option of mailing their survey to Dr. Brawner to assure anonymity.

Description of Sample

After blank surveys and duplicates[3] were eliminated from the returns, 586 valid and usable surveys remained, a return rate of 36%. Table 1 shows the surveys returned by institution in both 1997 and 1999. The overall increase in responses is accounted for by the substantial increase in responses from Georgia Tech. That increase may in turn reflect the fact that all surveys were returned directly to Dr. Brawner in 1999, whereas in 1997 some were returned through an intermediary on the Georgia Tech campus, which may have raised concerns about confidentiality. NC State shows a much higher population in 1999 than 1997 because of the inclusion of adjunct, visiting, and other faculty titles that were not included in the 1997 mailing.

[3] Duplicate responses were determined by e-mail addresses and, if available, the real names of the respondents. In cases of duplication, the first survey returned was used in the analysis and the second was discarded.

Table 1
Survey responses by institution and year

School	1999 N	1999 n	1999 %	1997 N	1997 n	1997 %
Clemson	145	59	41	141	64	45
FAMU-FSU	73	25	34	72	29	40
Georgia Tech	341	159	47	321	84	26
NC State	265	89	34	199	68	34
NC A&T	75	22	29	81	27	33
UNC-Charlotte	93	35	38	93	34	37
University of Florida	348	98	28	353	98	28
Virginia Tech	281	95	34	289	99	34
Total	1621[4]	582	36	1549	503	32

Ninety-one percent of the 579 respondents who reported their sex were men. Tables 2 and 3 show the respondents' rank by primary academic function and engineering discipline. The mean years as a faculty member was 15 (SD = 10.68) and at the current institution was 12 years (SD = 9.43). The longest service by a current faculty member was 49 years. Assistant professors averaged just over 3 years as a faculty member at their current institution (SD = 3.25), associate professors averaged 11 (SD = 6.36), and full professors averaged nearly 18 (SD = 8.75). There were no significant differences in the demographic make-up of the 1997 and 1999 samples using the Chi-square test for independence.

[4] The total figures have been adjusted for undeliverable and duplicate addresses where possible and reflect the number of e-mail addresses, not total faculty, for each institution.

Table 2
Rank by primary academic function

Rank	Current Position						
	Teaching	Teaching Research	Research	Dept. Head	Other Admin.	Other	Total Row %
Assistant	8 7%	111 90%	3 2%	1 <1%	1 <1%	0 0	124 22%
Associate	15 10%	136 87%	3 2%	2 1%	0 0%	1 <1%	157 27%
Professor	16 6%	184 74%	10 4%	23 9%	15 6%	2 <1%	250 44%
Instructor/ Lecturer	7 64%	0 0%	0 0%	1 9%	0 0%	3 27%	11 2%
Adjunct/ Visiting	4 50%	1 13%	3 38%	0 0%	0 0%	0 0%	8 1%
Emeritus/ Retired	2 29%	3 43%	1 14%	0 0%	0 0%	1 14%	7 1%
Other	0 0%	2 12%	8 47%	0 0%	2 12%	5 29%	17 3%
Total	52 9%	437 76%	28 5%	27 5%	18 3%	12 2%	574 100%

Table 3
Engineering discipline of respondents

Discipline	n	%
Chemical	39	7
Civil and Environmental	112	19
Computer Science*	22	4
Electrical/ECE	109	19
Industrial and Systems	61	11
Ceramics and Materials	26	4
Mechanical and Aerospace	131	23
Other**	78	14

*Computer Science is not in the College of Engineering at all schools. These numbers only represent computer science faculty who are in the College of Engineering.
**Includes: Agricultural, Architectural, Coastal, Engineering Science and Mechanics, Engineering Technology, College of Engineering, Freshman Engineering, Engineering Technology, Mining and Minerals, Nuclear, and Textiles

The demographic profile of the respondents closely matched that of the full faculty with respect to sex, rank, position, and engineering discipline. We initially speculated that faculty inclined to participate in faculty development activities and to use non-traditional instructional methods like active and cooperative learning would be over-represented among respondents to a survey of teaching practices. This fear proved to be unfounded. When the survey asked about participation in SUCCEED-sponsored activities

(workshops, seminars, etc.), 42% of 509 respondents reported having participated. An independent database of faculty participants in SUCCEED-sponsored activities (workshops, seminars, etc.) shows that near the end of 1999, 42% of 1563 faculty members had participated. We conclude that the 1999 survey respondents constitute a fair sample of the entire SUCCEED engineering faculty population in every important respect.

Methodology

The data obtained from the SUCCEED Faculty Development Survey were analyzed using standard statistical methods. Responses were classified according to respondents' sex, rank, position, years of service, level of involvement with SUCCEED, prior attendance at teaching seminars and the Carnegie classification[5] of the respondents' schools. They were tested to determine if there were any significant differences in response within these categories. The data were analyzed using SPSS® for Windows ™ version 8.0, a popular statistical package for social science research.

Responses to questions were analyzed using either t-tests or one-way analysis of variance (ANOVA) with the Bonferroni multiple comparisons procedure used to compare mean responses among the various groups. Because of the nature of these tests, it is possible for the ANOVA to report a significant difference in the mean responses of the subgroups without the Bonferroni test identifying which of the groups is significantly different from the others. This is most likely to occur when the reported significance level of the ANOVA is near $p = .05$. In other cases, where the p-value of the ANOVA indicates a higher significance, the Bonferroni test may report that Group A is significantly different from Group C, but that Group B is statistically indistinguishable from both A and C. The significant differences will be pointed out in the text and in the tables through the use of subscripts, where columns that have different subscripts have significantly different means and those that share a subscript have statistically indistinguishable means. The F-statistic reported in the tables is the result of the ANOVA and significant values indicate that the means of the groups reported in the tables are significantly different using the scales in the following paragraph.

Levene's test for equality of variances was used with the t-tests to determine the appropriate degrees of freedom. If the degrees of freedom indicated in the report are reported to the tenth (e.g., 872.4 or 78.0), Levene's test indicated that the variances were not equal. In order to calculate the t- or F-statistics in these analyses, the following scale was used: Never = 0, One or more times a semester = 1, One or more times a month = 2, one or more times a week = 3, and Every class = 4. Other similarly worded response sets were anchored by Never = 0 and proceeding in order to the most often. Chi-square

[5] Carnegie Foundation for the Advancement of Teaching, 2000: See http://www.carnegiefoundation.org/classification/. Clemson, Florida, Florida State, Georgia Tech, NC State, and Virginia Tech are classified by the Carnegie Foundation as Doctoral/Research Universities – Extensive while FAMU, NCA&T, and UNC-Charlotte are classified as Masters Colleges and Universities I. These categories correspond with the 1994 classifications of the same institutions as "Research" and "Masters" used in the 1997 report. For the purposes of this report, the FAMU-FSU College of Engineering is classified as a Masters institution.

were anchored by Never = 0 and proceeding in order to the most often. Chi-squared analysis were used for categorical data. For the purpose of determining significant differences, alpha was set at 0.05.

To identify significant differences among groups, it was necessary to eliminate certain low-incidence groups from further analysis within these groups or to combine categories[6]. Taking this step improves the likelihood that significant differences found among the groups are meaningful rather than simply a statistical artifice. These adjustments may slightly alter the total sample means reported in different contexts. For instance when comparing faculty members by rank a mean might be 3.4 but when comparing them by position, the reported mean might be 3.5 because more respondents were included. The following adjustments to the data were made:

- Within the rank category, only assistant professor, associate professor, and (full) professor categories were investigated. This decision eliminated 53 people who listed their rank as instructor/lecturer, adjunct/visiting, emeritus/retired, or other, or who did not list their rank.
- Within the current position category, only teaching, teaching/research, and administration categories were investigated. In addition, department chairs were combined with "dean's office/other administration" category in some instances, particularly to compare the 1999 results with the 1997 results. This decision eliminated 19 people who listed their position as research or other.
- Within the level of involvement in SUCCEED category, the 4 people who indicated that their involvement level was "other" were eliminated.

In addition, in order to get a more realistic portrayal of those faculty who teach undergraduates, those 75 people who indicated that they had not taught undergraduates during the prior three years were asked to answer demographic questions only. This is a substantive change from the 1997 survey where those faculty members were not systematically eliminated and therefore people in that circumstance may have provided information about their teaching behavior that was not current.

In order to compare the 1999 with the 1997 survey, adjustments needed to be made to both data sets to make them comparable. These were as follows:

- From 1997, the level of involvement in SUCCEED variable combined the responses "actively involved" and "project leader" into "actively involved" to match the 1999 response choices.
- A number of questions in 1997 had the response choices:
  - One to three times per week
  - One to three times per month
  - One to three times per semester
  - Never

[6] For example, an "instructor/lecturer" who was also a woman would be excluded from analyses of the data by rank but included in analyses by sex.

The corresponding questions in 1999 added the choice of "every class." When the response sets were combined, "every class" was combined with "one or more times per week" to yield a response set like that above.

- The 1997 survey "teaching quality" (e.g., "please rate the importance of teaching quality to you") responses were in the range 0-10 where 0 = "not at all important" and 10 = "extremely important." The 1999 survey "teaching quality" responses were in the integer range 1-7 where 1 = "not at all important" and 7 = "extremely important." To compare teaching quality on the same scale, the 1997 responses were mathematically transformed to the 1999 scale using the formula $y = 1+0.6x$ (where x is the 1997 response) and rounded to the nearest integer. It is assumed that the responses are approximately continuous and linear in the ranges 0-10 and 1-7. Therefore 0 converts to 1, 1 and 2 to 2, 3 and 4 to 3, 5 to 4, 6 and 7 to 5, 8 and 9 to 6, and 10 to 7.

Findings

Involvement in teaching seminars, workshops, and conferences

Table 4 shows the number of teaching seminars, workshops, and conferences attended by the respondents in their careers and the number attended during the previous academic year. In 1999, only those respondents who had taught in the prior three years were asked this question while in 1997 all respondents answered it. This difference may account in part for the higher percentages of respondents in 1999 who attended workshops in the prior academic year.

Table 4
Attendance at teaching seminars, workshops, or conferences

# of teaching seminars %	Career 1997	Career 1999	# of teaching seminars %	Prior academic year 1997	Prior academic year 1999
None	15	10	None	44	41
1-2	26	21	1	30	23
3-5	29	31	2	16	20
6-10	16	16	≥3	9	16
>10	13	23			
N	497	510	n	496	506
Since you began teaching, about how many seminars, workshops, conferences, etc., have you attended that were specifically related to teaching?			From September 1996 [August 1998] through August 1997 [July 1999], how many seminars, workshops, conferences, etc., did you attend that were specifically related to teaching?		

Younger faculty members were more likely than their full professor counterparts to have attended a teaching seminar in the past year. Participation increased for assistant and associate professors while holding relatively constant for full professors. Those who did attend teaching seminars in the prior year attended more in 1999 than they did in 1997. The number of career teaching seminars has increased as well for all ranks, as shown in Tables 5 and 6.

Table 5
Teaching seminars attended past year

	Rank and Year					
	Assistant 99	Assistant 97	Associate 99	Associate 97	Professor 99	Professor 97
0	30%	35%	38%	45%	46%	47%
1	23%	32%	26%	30%	22%	30%
2	24%	18%	22%	17%	16%	15%
3+	23%	15%	14%	8%	16%	8%

Table 6
Career teaching seminars

	Rank and Year					
	Assistant 99	Assistant 97	Associate 99	Associate 97	Professor 99	Professor 97
0	11%	19%	6%	9%	10%	15%
1-2	30%	32%	15%	28%	21%	21%
3-5	36%	35%	37%	31%	25%	27%
6-10	11%	8%	23%	21%	14%	18%
>10	13%	6%	20%	11%	30%	19%

Table 7 shows the level of involvement in SUCCEED-sponsored activities in 1997 and 1999. The percentages of respondents who have attended a Coalition program or been actively involved in SUCCEED in 1999 equals the percentage of tenure track faculty (42%) who are known to have attended SUCCEED-sponsored activities through 1999.

Table 7
Level of involvement in SUCCEED programs

% responding N =	1999 509	1997 499
Don't know anything about the SUCCEED Coalition.	8	8
Heard of the Coalition but haven't been involved with it.	50	56
Attended a Coalition program but have not actively participated.	26	13
Been involved as a PI, CIT team member, or CFT member (actively involved)	16	21
Other	<1	<1
Number of respondents	509	499

Rated importance of teaching quality and innovation

Respondents were asked to rate on a scale of 1 to 7 – with 1 meaning "not at all important" and 7 meaning "extremely important" – the importance of teaching quality to themselves, their department faculty colleagues, their department head, their dean, and the top administrator at their university. They were also asked to rate on the same scale the importance of teaching quality and of teaching innovation (testing new methods, writing textbooks or instructional software) in their institution's faculty incentive and reward system (recognition, raises, tenure, promotion).

As shown in Table 8, respondents rated the importance of teaching quality to themselves quite highly. They also gave their department chairs fairly high ratings—significantly higher than they gave their colleagues, their dean, or their top administrator—but significantly lower than they gave themselves. In fact, all of the pairs of means except those that share the subscript "a" are significantly different from each other at the $p \leq .0005$ level.

Table 8
Rated importance of teaching quality and innovation

Importance of	To	Mean	Std. Dev.	N
Quality	Respondent	6.50	.71	511
Quality	Colleagues	5.21_a	1.24	507
Quality	Dept. Head	5.58	1.31	506
Quality	Dean	5.14_a	1.49	496
Quality	Top Administrator	5.10_a	1.52	487
Quality	Reward System	3.71	1.49	504
Innovation	Reward System	3.50	1.42	501

These results are substantially similar to those from 1997 with a few exceptions. The average rating of the importance of teaching quality to colleagues decreased significantly from a mean of 5.42 to a mean of 5.21, $t(961.2) = 2.979$, $p = .003$, and the rated importance of teaching innovation in the institutional reward system has decreased from 3.72 to 3.50, $t(982) = 2.517$, $p = .012$. The lowered rating for the importance of teaching quality to colleagues was evident as well in a few of the subgroups as shown in Table 9.

Table 9
Change in rated importance of teaching quality to colleagues from 1997 to 1999

	1999		1997		Difference		
Group	M (SD)	n	M (SD)	n	M (SE)	t (df)	p
Male	5.26 (1.19)	423	5.45 (.96)	397	-.18 (.08)	2.43 (800.3)	.015
Research Institution	5.19 (1.21)	403	5.44 (.97)	373	-.25 (.08)	3.14 (758.9)	.002
Teaching Faculty	4.93 (1.47)	45	5.48 (1.05)	44	-.54 (.27)	2.02 (79.6)	.047
Teaching/Research Fac.	5.17(1.21)	377	5.35 (.99)	341	-.18 (.08)	2.14 (709.1)	.033
Attended 1 teaching seminar last year	5.19 (1.15)	108	5.61 (.93)	142	-.41 (.14)	3.04 (202.3)	.003
Attended ≥10 teaching seminars in career	4.97 (1.21)	111	5.35 (1.04)	62	-.38 (.18)	2.09 (171)	.038

In addition, as shown in Table 10, the rated importance of teaching quality and of innovation in the institutional faculty reward structure decreased significantly from 1997 to 1999 at research institutions, as did the rated importance of teaching innovation among those who attended one teaching seminar in the prior year.

Table 10

Importance of teaching quality and innovation in the institutional faculty reward system

Research Institutions	1999 M (SD)	n	1997 M (SD)	n	Difference M (SE)	t (df)	p
Importance of teaching quality in reward system	3.63 (1.48)	403	3.84 (1.39)	373	-.21 (.10)	2.07 (774)	.039
Importance of teaching innovation in reward sys.	3.49 (1.43)	403	3.73 (1.39)	373	-.24 (.10)	2.35 (774)	.019
Attended 1 teaching seminar last year							
Importance of teaching innovation in reward sys.	3.46 (1.35)	108	3.83 (1.28)	142	-.37 (.17)	2.20 (248)	.029

Significant differences were found among the 1999 subgroups on a number of the teaching quality variables. Not surprisingly, respondents who were actively involved in SUCCEED rated the importance of teaching quality to themselves significantly higher (M = 6.68, SD = .57) than did respondents who had heard of SUCCEED but weren't involved in it (M = 6.42, SD = .76). Full professors rated the importance of teaching quality to themselves (M = 6.58, SD = .68) and their colleagues (M = 5.38, SD = 1.11) significantly higher than did assistant professors (M = 6.35, SD = .71 to themselves and M = 4.98 and SD = 1.19 to their colleagues). Ratings of associate professors fell in-between those of the two other faculty ranks and were not significantly different from either. Not surprisingly, faculty at research institutions rated the importance of teaching quality in the reward system significantly lower than did faculty at masters institutions, 3.63 to 4.03, $t(499) = 2.002$, $p = .046$.

Table 11 on the following page shows that women rated the importance of teaching quality to their colleagues and their department chair and the importance of quality and innovation in the institutional reward system significantly lower than did their male counterparts.

There were significant differences in ratings of the importance of teaching quality in the reward system between respondents with different primary academic functions. Administrators, who included department heads and members of the deans' offices, generally rated the importance of teaching quality to upper level administrators higher than teaching and teaching/research faculty did. They also indicated that teaching quality was a more important part of the institutional reward system than did rank and file faculty, although interestingly, there was no significant difference in the perception of the importance of teaching innovation in the reward structure. Table 12 on the next page displays the significant results.

Table 11

Importance of teaching quality by sex of respondents

Importance of:	Male M (SD)	n	Female M (SD)	n	Difference M (SE)	t(df)	p
Teaching Quality to You	6.50 (.70)	456	6.53 (.71)	49	-.03 (.09)	.247 (503)	.805
Teaching Quality to Colleagues	5.27 (1.19)	453	4.63 (1.52)	48	.65 (.23)	2.858 (53.2)	.006
Teaching Quality to Dept. Head	5.63 (1.30)	452	5.10 (1.39)	48	.53 (.20)	2.674 (498)	.008
Teaching Quality to Dean	5.19 (1.45)	442	4.88 (1.70)	48	.32 (.22)	1.425 (488)	.155
Teaching Quality to Top Admin.	5.16 (1.50)	433	4.75 (1.64)	48	.41 (.23)	1.778 (479)	.076
Teaching Quality in Reward System	3.77 (1.47)	450	3.21 (1.52)	48	.56 (.22)	2.521 (496)	.012
Teaching Innovation in Reward System	3.56 (1.40)	447	3.02 (1.45)	48	.54 (.21)	2.531 (493)	.012

Table 12

Importance of teaching quality by primary academic function

Importance of:	Teaching M (SD)	n	Teaching/Research M (SD)	n	*Administration* M (SD)	n
Teaching Quality To You	6.80_{a} (.45)	50	6.45_{b} (.71)	405	6.72_{ab} (.53)	29
Teaching Quality To Colleagues	5.00_{a} (1.46)	49	5.18_{a} (1.21)	402	5.48_{a} (1.09)	29
Teaching Quality To Dept. Head	5.57_{a} (1.43)	49	5.50_{a} (1.31)	401	6.48_{b} (.74)	29
Teaching Quality To Dean	4.90_{a} (1.56)	49	5.11_{a} (1.47)	392	6.00_{b} (1.09)	28
Teaching Quality To Top Admin.	4.71_{a} (1.61)	48	5.10_{a} (1.52)	385	5.93_{b} (1.12)	28
Teaching Quality In Reward System	3.66_{ab} (1.40)	47	3.66_{a} (1.49)	402	4.38_{b} (1.29)	29
Innovation in Reward System	3.62_{a} (1.55)	47	3.46_{a} (1.43)	399	3.79_{a} (1.08)	29

Note: Means in the same row that do not share a subscript are significantly different at the $p < .05$ level using the Bonferroni test.

Frequency of use of instructor-centered teaching techniques

Respondents were asked to "think of a typical undergraduate lecture course that you teach. We would like to know how frequently you use certain teaching techniques." The techniques asked about may be subdivided into instructor-centered methods (lecturing for most of a class session, using live or multimedia demonstrations, and addressing questions to the class as a whole), in-class activities, and methods related to assignments, communicating with students, preparing for class, and soliciting feedback from students. This section will report the findings related to instructor-centered methods.

An overwhelming majority of faculty members lecture for most of the class period most of the time. Similarly, most of them address questions to the entire class at least once a week. Fewer use demonstrations that often, but nearly all report using demonstrations at least once a semester. (See Table 13.)

Table 13
Use of instructor-centered teaching techniques

	Lecture		Demonstrations		Question Class	
	n	%	n	%	n	%
Never	11	2	42	8	3	<1
≥ once/semester	4	1	146	29	4	1
≥ once/month	25	5	166	33	14	3
≥ once/week	168	33	125	25	86	17
Every Class	301	59	30	6	401	79
Total	509	100	509	100	508	100

Within the 1999 sample, there are differences among certain subpopulations in their use of instructor-centered teaching techniques. As shown in Tables 14-18 below, most of the differences are with respect to lecturing for most of a class period and using demonstrations in class. Generally, those who had attended more teaching seminars in 1998-1999 or in their careers and those who were more involved in SUCCEED were less likely to lecture all the time and more likely to use demonstrations more often. Specifically, those who were actively involved in SUCCEED were significantly less likely to lecture for most of every class period than those who had not heard of SUCCEED and those who had heard of it but weren't active. Those who attended three or more teaching seminars in the past year were significantly less likely to lecture every class period than those who attended fewer than three. Similarly, those who attended more than 10 teaching seminars over the course of their careers were significantly less likely to lecture every class period than those who attended two or fewer. Although the Bonferroni multiple comparisons procedure did not yield any specific group differences in the means for using demonstrations, the ANOVAs were significant for SUCCEED involvement and number of career teaching seminars.

Table 14

Lecture most of class period by involvement in SUCCEED

n =	Don't know anything$_a$ 40	Heard, not involved$_a$ 254	Attended program$_{ab}$ 130	Actively involved$_b$ 79
Never	0	1.2	3.1	5.1
≥ once/semester	0	0.4	0.8	2.5
≥ once/month	5.0	3.1	5.4	10.1
≥ once/week	22.5	31.1	35.4	39.2
Every Class	72.5	64.2	55.4	43.0
	$F(3, 499) = 7.418, p \leq .0005$			

Table 15

Lecture most of class period by 98-99 teaching seminars

n =	0_a 205	1_a 115	2_a 101	3 or more$_b$ 83
Never	1.5	0.9	1.0	6.0
≥ once/semester	1.0	0	0	2.4
≥ once/month	3.9	0.9	5.9	12.0
≥ once/week	27.8	34.8	40.6	34.9
Every Class	65.9	63.5	52.5	44.6
	$F(3, 500) = 8.31, p \leq .0005$			

Table 16

Lecture most of class period by career teaching seminars

n =	0_a 48	$1\text{-}2_a$ 105	$3\text{-}5_{ab}$ 159	$6\text{-}10_{ab}$ 80	$>10_b$ 116
Never	2.1	1.9	1.3	1.3	4.3
≥ once/semester	0	1.0	1.9	0	0
≥ once/month	4.2	3.8	4.4	3.8	7.8
≥ once/week	14.6	25.7	32.1	42.5	42.2
Every Class	79.2	67.6	60.4	52.5	45.7
	$F(4, 503) = 3.42, p = .009$				

Table 17

Frequency of using demonstrations by involvement in SUCCEED

n =	Don't know anything 40	Heard, not involved 253	Attended program 131	Actively involved 79
Never	12.5	9.9	5.3	3.8
≥ once/semester	32.5	32.4	22.1	27.8
≥ once/month	30.0	28.9	38.2	36.7
≥ once/week	25.0	23.7	26.7	24.1
Every Class	0	5.1	7.6	7.6
	$F(3, 499) = 3.32, p = .026$			

Table 18

Frequency of using demonstrations by career teaching seminars

n =	0 48	1-2 105	3-5 160	6-10 79	>10 116
Never	12.5	10.5	9.4	6.3	4.3
≥ once/semester	37.5	32.4	26.3	30.4	23.3
≥ once/month	20.8	28.6	34.4	38.0	35.3
≥ once/week	25.0	23.8	26.9	20.3	25.0
Every Class	4.2	4.8	3.1	5.1	12.1
	$F(4, 503) = 2.651, p = .033$				

On the other teacher centered variable, directing questions to the entire class, women are more likely to do so every class than are men although nearly all of both sexes do so one or more times per week(see Table 19).

Table 19

Direct questions to the entire class by sex

% asking questions n =	Male 454	Female 48
Never	0.7	0
≥ once/semester	0.9	0
≥ once/month	2.9	2.1
≥ once/week	17.8	10.4
Every Class	77.8	87.5
	$t(72.6) = 2.15, p = .035$	

Comparison of 1999 and 1997 responses. On average, 1999 respondents lectured slightly but significantly less and used demonstrations more often than the 1997 respondents did, as shown in Table 20.

Table 20

Use of instructor centered techniques in 1999 and 1997

% using technique N =	Lecture 1999 509	 1997 468	Demonstrations 1999 509	 1997 465
Never	2.2	1.1	8.3	13.8
≥ once/semester	0.8	1.1	28.7	32.5
≥ once/month	4.9	2.8	32.6	33.5
≥ once/week	33.0	29.3	24.6	16.8
Every Class	59.1	65.8	5.9	3.4
	$t(971.8) = 2.38, p = .017$		$t(972) = 4.14, p \leq .0005$	

Four subgroups -- full professors, faculty at research institutions, teaching/research faculty, and men -- reported significantly lower lecture frequencies in 1999 than 1997.

These same four groups, along with faculty at masters institutions, teaching faculty, those who attended 0 or 1 teaching seminar in the last year, and those who attended 0 or 3-5 career teaching seminars reported an increased use of demonstrations in 1999 compared with 1997. This is shown in tables 21-24 on the following pages.

Table 21

Lecture most of class period by significant subgroup

% lecturing	*Full Professors*		Research Institution		Teaching/Research		Men	
Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	219	198	431	384	404	361	455	407
Never	3.7	1.0	1.6	1.0	1.7	1.4	2.2	1.2
≥ once/semester	0.5	0.5	0.9	1.3	0.5	0.3	0.9	1.2
≥ once/month	3.2	2.0	4.2	1.8	4.5	3.0	4.6	2.7
≥ once/week	34.7	29.8	32.5	27.6	33.4	26.3	32.5	28.5
Every Class	58.0	66.7	60.8	68.2	59.9	69.0	59.8	66.3
	t (400.9) = 2.33, p = .020		t (812.9) = 2.11, p = .035		t (762.6) = 2.27, p = .023		t (860.0) = 2.05, p = .041	

Table 22

Frequency of using demonstrations by significant subgroups

% using demos	Full Professors		Research Institutions		Masters Institutions	
Year	1999	1997	1999	1997	1999	1997
n =	219	198	430	383	76	82
Never	8.2	19.7	9.3	14.6	2.6	9.8
≥ once/semester	28.8	33.3	29.3	31.6	26.3	36.6
≥ once/month	36.1	27.3	31.6	33.7	35.5	32.9
≥ once/week	20.1	16.7	24.0	16.7	28.9	17.1
Every Class	6.8	3.0	5.8	3.4	6.6	3.7
	t (415) = 3.71 p ≤ .0005		t (811) = 3.40, p = .001		t (156) = 2.72, p = .007	

Table 22 cont.

% using demos	Men		Teaching Faculty		Teaching/Research	
Year	1999	1999	1999	1997	1999	1997
n =	455	404	50	49	404	357
Never	8.1	15.3	4.0	24.5	8.9	12.0
≥ once/semester	29.0	31.7	22.0	18.4	29.2	35.6
≥ once/month	32.5	32.7	40.0	32.7	31.7	32.5
≥ once/week	24.6	16.6	26.0	22.4	24.8	16.0
Every Class	5.7	3.7	8.0	2.0	5.4	3.9
	$t(857) = 4.08, p \leq .0005$		$t(94.0) = 2.45, p = .016$		$t(759) = 3.26, p = .001$	

Table 23

Frequency of using demonstrations by teaching seminars last year

% using demos	0		1		2		3 or more	
Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	205	201	116	144	100	77	83	42
Never	10.2	17.9	9.5	13.2	5.0	7.8	6.0	4.8
≥ once/semester	31.7	34.8	26.7	32.6	28.0	29.9	25.3	26.2
≥ once/month	29.3	29.9	31.9	38.9	38.0	32.5	33.7	35.7
≥ once/week	24.4	15.9	28.4	11.8	24.0	26.0	20.5	21.4
Every Class	4.4	1.5	3.4	3.5	5.0	3.9	14.5	11.9
	$t(404) = 3.19, p = .002$		$t(258) = 2.39, p = .017$		$t(175) = .515, p = .607$		$t(123) = .12, p = .905$	

Table 24

Frequency of using demonstrations by career teaching seminars

	0		1-2		3-5		6-10		more than 10	
	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
	48	66	105	116	160	144	79	77	116	61
Never	12.5	25.8	10.5	13.8	9.4	11.8	6.3	13.0	4.3	6.6
≥ once/semester	37.5	37.9	32.4	37.1	26.3	29.9	30.4	36.4	23.3	18.0
≥ once/month	20.8	21.2	28.6	31.9	34.4	42.4	38.0	36.0	35.3	39.3
≥ once/week	25.0	12.1	23.8	14.7	26.9	14.6	20.3	16.9	25.0	31.1
Every Class	4.2	3.0	4.8	2.6	3.1	1.4	5.1	7.8	12.1	4.9
	t (112) = 2.03, p = .045		t(219) = 1.79, p = .074		t (302) = 2.18, p = .03		t(155) = .743, p = .459		t(175) = .454, p = .65	

In-Class Activities

Respondents were asked how often they put students into groups for some or most of a class period to answer questions or solve problems. As can be seen in Table 25 below, 60% of respondents reported doing so for brief intervals during class at least once during the semester and just under 40% did so for most of a class period.

Table 25
Put students into groups during a class period

	For brief intervals		For most of class	
	n	%	n	%
Never	202	39.7	318	63.0
≥ once/semester	104	20.4	88	17.4
≥ once/month	93	18.3	59	11.7
≥ once/week	80	13.7	30	5.9
Every Class	30	5.1	10	2.0
Total	509	100	505	100

There were significant differences among all of the subgroups except primary position with respect to putting students into groups for brief intervals. In addition, there were significant differences by Carnegie classification, SUCCEED involvement, teaching seminars in 1998-1999, and career teaching seminars with respect to putting students into groups for most of class.

Women (73%) were more likely than men (59%) to put students into groups for brief intervals during the semester, and far more likely to do so once a week or more (40% of the women vs. 20% of the men). There was no significant difference between men and women in reported likelihood of putting students into groups for most of class. These frequency distributions are shown in Table 26.

Table 26
Put students into groups by sex of respondent

% putting students in groups n =	For brief intervals		For most of class	
	Male	Female	Male	Female
	455	48	451	48
Never	41.3	27.1	64.7	50.0
≥ once/semester	21.3	12.5	16.9	22.9
≥ once/month	17.6	20.8	10.9	16.7
≥ once/week	14.1	31.3	5.3	10.4
Every Class	5.7	8.3	2.2	0
	$t(501) = 3.07$, $p = .002$		$t(497) = 1.55$, $p = .121$	

Full professors (51%) were less likely than associate professors (64%) or assistant professors (70%) to put students into groups for brief intervals, and the assistant professors (26%) and associate professors (23%) were more likely than the full professors

(17%) to do so more than once a week. There were no significant differences in the professor ranks in putting students into groups for most of class. See Table 27.

Table 27
Put students into groups by rank

% putting students in groups n =	For brief intervals			For most of class		
	Assistant$_a$ 111	Associate$_a$ 149	Professor$_b$ 218	Assistant 111	Associate 146	Professor 217
Never	29.7	36.2	49.1	57.7	59.6	70.0
≥ once/semester	21.6	19.5	20.2	24.3	17.8	12.9
≥ once/month	22.5	20.8	13.8	11.7	15.1	9.7
≥ once/week	17.1	18.8	11.9	4.5	6.8	4.6
Every Class	9.0	4.7	5.0	1.2	0.7	2.8
	$F(2, 471) = 6.512, p = .002$			$F(2, 471) = .99, p = .372$		

Faculty members at masters institutions were more likely to put students into groups for brief intervals and for most of class than were faculty members at research institutions. See Table 28.

Table 28
Put students into groups by institution type

% putting students in groups n =	For brief intervals		For most of class	
	Research 430	Masters 76	Research 426	Masters 76
Never	41.2	30.3	66.4	43.4
≥ once/semester	21.4	15.8	16.9	19.7
≥ once/month	17.7	21.1	9.9	22.4
≥ once/week	14.2	25.0	4.9	11.8
Every Class	5.6	7.9	1.9	2.6
	$t(504) = 2.68, p = .008$		$t(94.64) = 3.617, p \leq .0005$	

Faculty members who have been actively involved in SUCCEED and those who had attended a coalition program were more likely to report that they put students into groups for brief intervals than those who had not heard of the coalition or those who had heard of the coalition but were not involved in it. Involved faculty members were also significantly more likely to put students into groups for most of class than were those who were not involved. (See Tables 29 and 30.)

Table 29

Put students into groups for brief intervals by involvement in SUCCEED

% putting students in groups n =	Don't know anything$_a$ 40	Heard, not involved$_a$ 254	Attended program$_b$ 131	Actively involved$_b$ 78
Never	55.0	50.4	24.4	24.4
≥ once/semester	30.0	22.0	16.8	16.7
≥ once/month	5.0	14.6	26.0	23.1
≥ once/week	5.0	10.6	23.7	24.4
Every Class	5.0	2.4	9.2	11.5
	$F(3, 499) = 21.81, p \leq .0005$			

Table 30

Put students into groups for most of class by involvement in SUCCEED

% putting students in groups n =	Don't know anything$_{ab}$ 39	Heard, not involved$_b$ 252	Attended program$_{ac}$ 130	Actively involved$_c$ 78
Never	66.7	73.0	53.8	44.9
≥ once/semester	20.5	15.1	19.2	20.5
≥ once/month	7.7	7.9	13.8	21.8
≥ once/week	5.1	3.2	9.2	10.3
Every Class	0	0.8	3.8	2.6
	$F(3, 495) = 11.22, p \leq .0005$			

Attending more teaching seminars during the 1998-1999 academic year and throughout the respondent's career were both associated with a higher likelihood of putting students into groups for brief intervals or most of class. Those who attended three or more teaching seminars during 1998-99 (74%) were significantly more likely than those who attended 0 (49%) or 1 (59%) to put students into groups for brief intervals. Similarly, those who attended two teaching seminars (73%) were more likely to do so than those who attended none (49%). Those who attended three or more teaching seminars in 1998-99 (55%) were more likely than any other group (44% - 28%) to put students into groups for most of class. (See Table 31.)

Table 31

Put students into groups by seminars in 1998-99

% putting students in groups n =	For brief intervals				For most of class			
	0_a 205	1_{ab} 116	2_{bc} 101	$\geq 3_c$ 82	0_a 202	1_a 114	2_a 101	$\geq 3_b$ 83
Never	50.7	41.4	26.7	25.6	72.3	64.9	56.4	44.6
≥ once/semester	20.5	19.0	21.8	20.7	16.3	12.3	25.7	16.9
≥ once/month	16.1	18.1	25.7	15.9	5.9	14.0	12.9	21.7
≥ once/week	9.8	18.1	20.8	20.7	4.5	7.0	5.0	9.6
Every Class	2.9	3.4	5.0	17.1	1.0	1.8	0.0	7.2
	$F(3, 500) = 12.20, p \leq .0005$				$F(3, 496) = 10.29, p \leq .0005$			

Those who had not attended any teaching seminars were significantly less likely to put students into groups for brief intervals than were those who had attended at least three during their careers. Similarly, faculty members who had not attended any teaching seminars in their careers appear to be less likely to put students into groups (19%) than were those who attended one or more (30% - 40%) although the difference between the groups is not significant. See Table 32.

Table 32
Put students into groups by career teaching seminars

% putting students in groups n =	*Groups for brief intervals* 0_a 48	$1\text{-}2_{ab}$ 105	$3\text{-}5_b$ 160	$6\text{-}10_b$ 80	$>10_b$ 115	Groups for most of class 0 47	1-2 104	3-5 158	6-10 80	>10 115
Never	68.8	41.9	37.5	32.5	33.0	80.9	68.3	60.1	56.3	59.1
≥ once/semester	18.8	23.8	18.1	21.3	20.9	10.6	17.3	19.6	18.8	16.5
≥ once/month	2.1	15.2	25.0	17.5	19.1	4.3	6.7	12.7	15.0	15.7
≥ once/week	8.3	12.4	15.0	23.8	17.4	4.3	6.7	4.4	8.8	6.1
Every Class	2.1	6.7	4.4	5.0	9.6	0	1.0	3.2	1.3	2.6
	$F(4, 503) = 5.32, p \leq .0005$					$F(4, 499) = 2.39, p = .05$				

There were no significant differences on the whole between the 1997 and 1999 responses with respect to putting students into groups during class, as shown in Table 33.

Table 33
Put students in groups in 1999 and 1997

Year n =	For brief intervals 1999 509	1997 464	For most of class 1999 505	1997 466
Never	39.7	42.0	63.0	59.7
≥ once/semester	20.4	17.5	17.4	20.8
≥ once/month	18.3	23.3	11.7	11.8
≥ once/week	15.7	13.8	5.9	6.4
Every Class	5.9	3.4	2.0	1.3
	$t(971) = 1.06, p = .29$		$t(969) = .361\ p = .71$	

Assignments

This section reports frequencies with which respondents assigned homework to individuals (as opposed to teams), gave students the option of working in teams to complete homework, required students to work in teams to complete homework, assigned at least one major team project, and gave writing assignments (exercises that required verbal explanations and not just calculations). Table 34 shows the overall frequency distributions for the 1999 respondents.

Table 34
Assignments

	Individual Homework		Team Optional		Team Required		Writing Assignment	
	n	%	n	%	n	%	n	%
Never	40	7.9	135	26.8	234	46.2	61	12.1
≥ once/semester	33	6.5	89	17.7	126	24.9	175	34.7
≥ once/month	94	18.5	100	19.8	65	12.8	160	31.7
≥ once/week	226	44.5	91	18.1	53	10.5	79	15.7
Every Class	115	22.6	89	17.7	29	5.7	29	5.8
Total	508	100	504	100	507	100	504	100

Table 34 cont.

	Assign one major team project	
	n	%
Never	88	17.5
In some, but not all, courses I teach	286	56.7
In every course I teach	130	25.8
Total	504	100

As Table 35 shows, 71% of the faculty members who were actively involved in SUCCEED ever required their students to work in teams, as opposed to 57% of those who had attended at least one SUCCEED program and roughly 49% of those who had never attended a program. Similarly, 28% of the active faculty assigned team homework once a week or more, as opposed to 17% of the attending faculty and 12-15% of the non-attending faculty.

Table 35
Require teams for homework by level of involvement in SUCCEED

% requiring teams n =	Don't know anything$_{ab}$ 39	Heard, not involved$_{a}$ 252	Attended program$_{ab}$ 131	Actively involved$_{b}$ 79
Never	51.3	52.4	42.7	29.1
≥ once/semester	15.4	25.4	26.7	26.6
≥ once/month	17.9	10.3	13.7	16.5
≥ once/week	10.3	9.1	9.2	17.7
Every Class	5.1	2.8	7.6	10.1
	$F(3, 497) = 6.80, p \leq .0005$			

Differences between 1999 and 1997 respondents

1999 respondents were significantly more likely than 1997 respondents to give students the option of working in teams, require them to work in teams, and give a writing assignment, as shown in Table 36. The reader should note that the "every class" and one or more times per week categories were combined for the 1999 sample to allow for

comparison, which may have impacted the significance tests. In the discussion that follows, "weekly" should be understood to mean once a week or more frequently.

Table 36
Types of assignments in 1999 and 1997

% reporting activity	Individual Homework		Team Optional		*Team Required*		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997
N =	506	467	504	454	507	465	504	465
Never	7.9	7.1	26.8	34.4	46.2	55.1	12.1	15.7
≥ once/semester	6.5	6.6	17.7	24.2	24.9	25.2	34.7	48.4
≥ once/month	18.2	31.7	19.8	17.2	12.8	10.1	31.7	28.2
≥ once/week	67.4	54.6	35.7	24.2	16.2	9.7	21.4	7.7
	$t(973) = 1.91$, $p = .057$		$t(956) = 4.28$, $p \leq .0005$		$t(968.9) = 3.65$, $p \leq .0005$		$t(962.4) = 6.07$, $p \leq .0005$	

Differences by Rank. Within the primary faculty ranks, assistant professors were more likely in 1999 to give students the option of working in teams to do homework than they were in 1997, with 76% of them doing so at some point during the semester compared with 65% of 1997 respondents. Associate professors were more likely to require students to work in teams at some point during the semester in 1999 (57%) than they were in 1997 (42%). They were also more likely to give a writing assignment at least once a month in 1999 (58%) than they were in 1997 (37%). Full professors in 1999 were more likely to give students individual homework at least once a week (75% vs. 57% in 1997); more likely to give them the option to work in teams to do homework (39% weekly in 1999 vs. 26% in 1997); and more likely to give a weekly writing assignment (22% in 1999 vs. 8% in 1997). These frequencies are shown in Tables 37, 38, and 39 respectively.

Table 37
Assignments of assistant professors in 1999 and 1997

% reporting activity Year	Individual HW		Team Option		Team Required		Writing	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	110	87	108	86	110	87	109	86
Never	8.2	4.6	24.1	34.9	46.4	56.3	7.3	8.1
≥ once/semester	9.1	8.0	24.1	26.7	26.4	20.7	39.4	51.2
≥ once/month	27.3	37.9	20.4	20.9	12.7	10.3	34.9	31.4
≥ once/week	55.5	49.4	31.5	17.4	14.5	12.6	18.3	9.3
	$t(195) = .17$, $p = .864$		$t(192) = 2.32$, $p = .021$		$t(195) = 1.04$, $p = .297$		$t(193) = 1.87$, $p = .062$	

Table 38

Assignments of associate professors in 1999 and 1997

% reporting activity Year	Individual HW		Team Option		Team Required		Writing	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	149	153	146	149	148	153	149	153
Never	7.4	7.2	26.0	34.9	42.6	57.5	10.1	18.3
≥ once/semester	6.7	5.2	18.5	21.5	27.7	23.5	32.2	45.1
≥ once/month	20.1	34.6	23.3	17.4	10.8	9.8	38.3	28.8
≥ once/week	65.8	52.9	32.2	26.2	18.9	9.2	19.5	7.8
	$t(300) = 1.07$ $p = .287$		$t(293) = 1.92$ $p = .056$		$t(299) = 2.903$ $p = .004$		$t(300) = 4.06$ $p \leq .0005$	

Table 39

Assignments of professors in 1999 and 1997

% reporting activity Year	Individual HW		Team Option		Team Required		Writing	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	218	199	219	192	218	197	215	198
Never	7.8	8.0	27.9	32.8	50.0	53.8	13.5	17.7
≥ once/semester	4.6	6.5	14.6	25.0	22.9	26.9	36.3	50.5
≥ once/month	12.8	28.1	18.3	16.7	13.8	10.7	27.9	24.2
≥ once/week	74.8	57.3	39.3	25.5	13.3	8.6	22.3	7.6
	$t(415) = 2.23$ $p = .026$		$t(409) = 2.82$ $p = .005$		$t(413) = 1.61$ $p = .108$		$t(407.6) = 4.20$ $p \leq .0005$	

Differences by Carnegie Classification. Faculty members were more likely in 1999 than in 1997 to

(a) assign individual homework weekly (66% in 1999 vs. 56% in 1997 at research institutions, 72% in 1999 vs. 50% in 1997 at masters institutions);

(b) allow their students to work in teams to complete their homework. (73% in 1999 vs. 64% in 1997 at research institutions, 75% in 1999 vs. 71% in 1997 at masters institutions);

(c) allow team homework weekly (35% in 1999 vs. 23% in 1997 at research institutions, 41% in 1999 vs. 29% in 1997 at masters institutions);

(d) require team homework (53% in 1999 vs. 44% in 1997 at research institutions, 58% in 1999 vs. 51% in 1997 at masters institutions);

(e) require team homework monthly or more frequently (28% in 1999 vs. 19% in 1997 at research institutions, 33% in 1999 vs. 24% in 1997 at masters institutions);

(f) give writing assignments weekly (21% in 1999 vs. 8% in 1997 at research institutions, 23% in 1999 vs. 7% in 1997 at masters institutions).

Although not all of the differences were statistically significant, the consistent increases in use of permitted and required team homework and writing assignments from 1997 to 1999 suggest that faculty development efforts in the period between surveys (which

emphasized teamwork and writing) were effective. All of the distributions for both types of institutions in both years and the corresponding significance levels are shown in Table 40.

Differences by Sex. Frequency distributions for men and women respondents are shown in Table 41. Both men and women were generally more likely to give individual homework, allow or require teams for homework, and give a writing assignment in 1999 than they were in 1997. Noteworthy results (not all of which are statistically significant) were as follows:

(a) The percentage of respondents allowing team homework rose for both women and men, but the increase was more pronounced for women (79% in 1999 vs. 61% in 1997) than for men (72% in 1999 vs. 66% in 1997). A similar pattern was observed for the percentages allowing team homework weekly (34% in 1999 vs. 15% in 1997 for women; 36% in 1999 vs. 25% in 1997 for men);

(b) The percentage of women requiring team homework rose substantially for women (60% in 1999 vs. 44% in 1997), less so for men (53% in 1999 vs. 45% in 1997). A similar pattern was observed for the percentages requiring team homework monthly or more frequently (34% in 1999 vs. 15% in 1997 for women; 36% in 1999 vs. 25% in 1997 for men);

(c) The percentages of men and women giving weekly writing assignments rose dramatically from about 8% in 1997 to about 22% in 1999. The percentages giving writing assignments monthly or more frequently were greater for women in both years but the increase was roughly the same for both sexes (62% in 1999 vs. 45% in 1997 for women; 52% in 1999 vs. 35% in 1997).

Table 40

Assignments in 1999 and 1997 by Carnegie Classification

% reporting activity	Research								Masters							
	Individual Homework		Team Optional		Team Required		Writing Assignment		Individual Homework		Team Optional		Team Required		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	430	383	426	375	429	383	427	384	76	84	76	79	76	82	75	81
Never	8.4	6.5	27.0	35.5	47.1	56.4	11.7	16.7	5.3	9.5	25.0	29.1	42.1	48.8	14.7	11.1
≥ once/semester	6.3	5.5	17.8	24.5	24.9	24.8	35.4	47.7	7.9	11.9	17.1	22.8	25.0	26.8	30.7	51.9
≥ once/month	18.8	32.4	20.2	16.8	11.7	10.4	31.9	27.9	14.5	28.6	17.1	19.0	18.4	8.5	32.0	29.6
≥ once/week	66.5	55.6	35.0	23.2	16.3	8.4	21.1	7.8	72.4	50.0	40.8	29.1	14.5	15.9	22.7	7.4
	$t(811) = 1.01$ $p = .31$		$t(799) = 4.18$ $p \leq .0005$		$t(808.9) = 3.63$ $p \leq .0005$		$t(808.5) = 5.66$ $p \leq .0005$		$t(158) = 2.38$ $p = .018$		$t(153) = 1.31$ $p = .193$		$t(156) = .79$ $p = .43$		$t(139.5) = 2.04$ $p = .043$	

Table 41

Assignments in 1999 and 1997 by Sex

% reporting activity	Female								Male							
	Individual Homework		Team Optional		Team Required		Writing Assignment		Individual Homework		Team Optional		Team Required		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	48	47	47	46	48	48	48	47	454	407	451	395	453	404	450	405
Never	6.3	6.4	21.3	39.1	39.6	56.3	12.5	14.9	8.1	7.1	27.5	33.9	47.2	55.4	12.0	16.3
≥ once/semester	12.5	6.4	19.1	28.3	37.5	27.1	25.0	40.4	5.7	6.9	17.5	23.8	23.4	24.0	35.8	48.4
≥ once/month	12.5	48.9	25.5	17.4	10.4	12.5	39.6	36.2	18.9	30.0	18.8	17.2	12.8	10.1	31.3	27.4
≥ once/week	68.8	38.3	34.0	15.2	12.5	4.2	22.9	8.5	67.2	56.0	36.1	25.1	16.6	10.4	20.9	7.9
	$t(93) = 1.35$ $p = .18$		$t(91) = 2.73$ $p = .008$		$t(94) = 1.63$ $p = .106$		$t(93) = 1.86$ $p = .066$		$t(859) = 1.66$ $p = .098$		$t(844) = 3.63$ $p \leq .0005$		$t(854.9) = 3.18$ $p = .002$		$t(852.2) = 5.63$ $p \leq .0005$	

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Differences by Position. The teaching/research faculty reported that they gave individual homework, allowed and required students to work in teams to complete that homework, and gave writing assignments more often in 1999 than in 1997. There was no significant difference between years for teaching faculty and the only significant difference for administrators was that they gave writing assignments more often in 1999 than in 1997. The results for all three groups are shown in Tables 42-44.

Table 42
Assignments of teaching faculty in 1999 and 1997

% reporting activity	Individual Homework		Team Optional		Team Required		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	50	49	49	48	50	49	50	48
Never	2.7	3.1	36.7	33.3	44.0	55.1	24.0	18.8
≥ once/semester	12.9	9.7	18.4	16.7	24.0	22.4	28.0	47.9
≥ once/month	5.6	8.8	14.3	12.5	18.0	14.3	30.0	25.0
≥ once/week	80.0	65.3	30.6	37.5	14.0	8.2	18.0	8.3
	t(97) = .903 p = .369		t(95) = .589 p = .558		t(97) = 1.26 p = .211		t(96) = .983 p = .328	

Table 43
Assignments of teaching/research faculty in 1999 and 1997

% reporting activity	Individual Homework		Team Optional		Team Required		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	403	360	400	348	402	357	399	358
Never	8.2	7.8	26.3	37.4	47.8	57.7	10.8	16.5
≥ once/semester	5.7	6.9	16.5	23.6	24.6	22.1	36.1	48.6
≥ once/month	20.1	33.3	21.0	17.2	10.7	9.2	31.6	26.8
≥ once/week	66.0	51.9	36.3	21.8	16.9	10.9	21.6	8.1
	t(761) = 2.18 p = .029		t(746) = 4.99 p ≤ .0005		t(757) = 2.99 p = .003		t(754.9) = 5.19 p ≤ .0005	

Table 44
Assignments of administrators in 1999 and 1997

% reporting activity	Individual Homework		Team Optional		Team Required		Writing Assignment	
Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	29	44	29	44	29	44	29	44
Never	10.3	6.8	24.1	15.9	37.9	31.8	6.9	6.8
≥ once/semester	13.8	6.8	20.7	34.1	27.6	47.7	27.6	52.3
≥ once/month	13.8	31.8	24.1	25.0	24.1	15.9	48.3	36.4
≥ once/week	62.1	54.5	31.0	25.0	10.3	4.5	17.2	4.5
	t(71) = .28 p = .778		t(71) = .113 p = .910		t(71) = .63 p = .530		t(71) = 2.08 p = .041	

Differences by teaching seminars attended. The frequency of assigning individual homework at least once a month was around 85% for all groups in both years except for those who attended three or more teaching seminars in the prior year, for whom the frequency increased from 74% to 88%. The percentage of those who attended 6-10 teaching seminars in their careers who gave individual homework monthly increased from 79% to 94% while all other groups remained between 80% and 90%. (See Tables 45 and 49.)

In what may reflect a change of culture in the colleges of engineering, those who attended no teaching seminars in the prior year nonetheless increased their frequency of allowing and requiring students to work in teams to complete their homework.

- In 1997 58% of faculty members gave students the option of working in teams compared with 70% in 1999. (See Table 46.)
- In 1997, 36% of faculty members required students to work in teams to complete homework compared with 48% in 1999. (See Table 47.)

Similarly, in 1997, 32% of those who had attended no career teaching seminars required teams for homework compared with 32% in 1999. (See Table 51.)

There were a few other significant differences based on teaching seminars attended.

- 54% of faculty members who attended 3-5 career teaching seminars gave their students the option of working in teams at least monthly in 1999 compared with 38% of those faculty in 1997. (See Table 50.)
- 60% of faculty members who attended two teaching seminars in the previous year required students to work in teams in 1999 compared with 45% in 1997. (See Table 47.)

More faculty members are also giving students writing assignments at least monthly.

- Among those who attended no teaching seminars in the prior year, 49% did so in 1999 compared with 32% in 1997;
- Among those who attended one teaching seminar in the prior year, 57% did so in 1999 compared with 36% in 1997;
- Among those who had attended 1-2 career teaching seminars, 48% did so in 1999 compared with 34% in 1997;
- Among those who had attended 3-5 career teaching seminars, 48% did so in 1999 compared with 32% in 1997;
- Among those who had attended 6-10 career teaching seminars, 56% did so in 1999 compared with 30% in 1997. See Tables 48 and 52.

Table 45

Assign homework to individuals by teaching seminars last year

% reporting activity Year	0		1		2		3 or more	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	203	203	116	143	101	78	83	42
Never	6.4	8.4	8.6	5.6	8.9	5.1	8.4	9.5
≥ once/semester	8.4	2.5	5.2	6.3	5.9	12.8	3.6	16.7
≥ once/month	19.2	36.9	12.1	27.3	18.8	23.1	26.5	38.1
≥ once/week	66.0	52.2	74.1	60.8	66.3	59.0	61.4	35.7
	t(404) = 1.34 p = .18		t(257) = .755 p = .451		t(177) = .477 p = .64		t(123) = 2.33 p = .021	

Table 46

Option to work in teams by teaching seminars last year

% reporting activity Year	0		1		2		3 or more	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	201	196	116	142	101	75	81	40
Never	30.3	41.8	25.0	25.4	25.7	32.0	23.5	35.0
≥ once/semester	20.9	19.9	18.1	31.7	13.9	21.3	13.6	22.5
≥ once/month	15.9	17.3	21.6	17.6	19.8	18.7	27.2	12.5
≥ once/week	32.8	20.9	35.3	25.4	40.6	28.0	35.8	30.0
	t(395) = 2.79 p = .006		t(256) = 1.67 p = .096		t(174) = 1.75 p = .083		t(119) = 1.63 p = .107	

Table 47

Require teams for homework by teaching seminars last year

% reporting activity Year	0		1		2		3 or more	
	1999	1997	1999	1997	1999	1997	1999	1997
n =	202	201	116	143	101	78	83	42
Never	51.5	63.7	45.7	45.5	39.6	55.1	43.4	47.6
≥ once/semester	24.8	19.9	27.6	34.3	25.7	25.6	20.5	16.7
≥ once/month	8.9	8.0	12.1	11.2	18.8	9.0	15.7	19.0
≥ once/week	14.9	8.5	14.7	9.1	15.8	10.3	20.5	16.7
	t(394.5) = 2.54 p = .011		t(257) = .93 p = .354		t(177) = 2.29 p = .023		t(123) = .38 p = .705	

Table 48

Give a writing assignment by teaching seminars last year

% reporting	0		1		2		3 or more	
activity Year	1999	1997	1999	1997	1999	1997	1999	1997
n =	202	201	115	144	100	76	83	43
Never	13.9	20.9	11.3	12.5	13.0	13.2	8.4	4.7
≥ once/semester	37.6	47.3	31.3	51.4	34.0	46.1	34.9	48.8
≥ once/month	26.7	26.9	39.1	29.9	27.0	25.0	36.1	34.9
≥ once/week	21.8	5.0	18.3	6.3	26.0	15.8	20.5	11.6
	t(387.6) = 4.52 p ≤ .0005		t(257) = 3.31 p = .001		t(174) = 1.53 p = .127		t(124) = .95 p = .346	

Table 49

Assign homework to individuals by career teaching seminars

% reporting	0		1-2		3-5		6-10		> 10	
activity Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	47	66	105	117	159	145	80	76	116	63
Never	10.6	9.1	6.7	3.4	10.1	10.3	3.8	7.9	7.8	3.2
≥ once/semester	4.3	1.5	8.6	6.0	8.8	3.4	2.5	13.2	5.2	12.7
≥ once/month	17.0	36.4	23.8	29.9	14.5	35.9	21.3	22.4	17.2	31.7
≥ once/week	68.1	53.0	61.0	60.7	66.7	50.3	72.5	56.6	69.8	52.4
	t(111) = .51 p = .608		t(220) = .79 p = .431		t(302) = 1.03 p = .306		t(137.6)= 2.53 p = .012		t(177) = 1.15 p = .253	

Table 50

Option to do homework in teams by career teaching seminars

% reporting	0		1-2		3-5		6-10		> 10	
activity Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	47	66	104	114	158	139	78	75	116	59
Never	44.7	53.0	26.0	29.8	25.9	29.5	25.6	34.7	22.4	33.9
≥ once/semester	12.8	16.7	20.2	24.6	20.3	32.4	15.4	22.7	15.5	15.3
≥ once/month	10.6	15.2	19.2	16.7	17.7	16.5	25.6	16.0	22.4	23.7
≥ once/week	31.9	15.2	34.6	28.9	36.1	21.6	33.3	26.7	39.7	27.1
	t(89.3) = 1.56 p = .123		t(216) = 1.09 p = .277		t(294.5)= 2.49 p = .013		t(151) = 1.65 p = .102		t(173) = 1.84 p = .068	

Table 51

Require teams for homework by career teaching seminars

% reporting	0		1-2		3-5		6-10		> 10	
activity Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	47	67	104	115	159	143	80	77	116	62
Never	68.1	80.6	49.0	54.8	46.5	47.6	45.0	44.2	35.3	58.1
≥ once/semester	12.8	14.9	26.0	20.9	23.9	35.0	22.5	32.5	31.0	12.9
≥ once/month	8.5	1.5	6.7	12.2	21.6	8.4	20.0	14.3	15.5	14.5
≥ once/week	10.6	3.0	18.3	12.2	17.0	9.1	12.5	9.1	18.1	14.5
	t(70.6) = 2.05 p = .044		t(217) = .84 p = .402		t(298.2)= 1.76 p = .08		t(155) = .71 p = .478		t(176) = 1.76 p = .08	

Table 52

Give a writing assignment by career teaching seminars

% reporting	0		1-2		3-5		6-10		> 10	
activity Year	1999	1997	1999	1997	1999	1997	1999	1997	1999	1997
n =	46	66	103	116	159	143	80	77	115	62
Never	23.9	25.8	14.6	15.5	9.4	11.2	6.3	19.5	13.0	11.3
≥ once/semester	28.3	37.9	37.9	50.9	42.1	56.6	37.5	50.6	21.7	33.9
≥ once/month	23.9	28.8	26.2	28.4	31.4	26.6	32.5	20.8	40.0	40.3
≥ once/week	23.9	7.6	21.4	5.2	17.0	5.6	23.8	9.1	25.2	14.5
	t(84.2) = 1.49 p = .139		t(192.6)= 2.57 p = .011		t(298.0)= 3.16 p = .002		t(155) = 3.87 p ≤ .0005		t(175) = 1.30 p = .194	

Class Preparation and Student Feedback

This section describes faculty members' preparation for their undergraduate classes and their interactions with their students. Respondents were asked to comment on time spent preparing for lectures, frequency of writing instructional objectives and study guides, time spent with students, and solicitation of feedback from students.

On average, faculty members reported spending just over 9 hours per week preparing for their undergraduate courses. Women appear to spend about 1.5 hours more than men, but this difference is not quite statistically significant. Research and masters faculty also spend between nine and 10 hours per week preparing, but again, the difference is not significant. Assistant professors (10.3 hours) spent more time than did associate professors (9.3 hours) and full professors (8.4 hours), but only the difference between assistant professors and full professors is statistically significant. Teaching faculty (11.1 hours) spent more time preparing than did teaching/research faculty (9.2 hours), research faculty (8.9 hours), department chairs (6.1 hours), and other administrators (5.6 hours), but only the difference between teaching faculty and department chairs is statistically significant. The complete results are shown in Tables 53-56.

Table 57 shows the variation of preparation time with number of workshops attended. The preparation time appears to increase with the number of workshops attended as long as at least one workshop was attended - with the time spent by faculty members who attended three or more teaching workshops in 1998-99 academic year (10.5 hours) being

significantly greater than the time spent by those who only attended one (8.2 hours). A greater average time was spent by those who attended no workshops (9.3 hours) than by those who attended one, which might mean that attending one workshop led to an increase in the efficiency of the preparation, but since this difference is not statistically significant too much should not be made of it.

Table 53
Average hours of preparation time by sex

	Female	Male
n	48	448
Mean	10.6	9.0
Std. Dev.	5.96	5.27
	t(494) = 1.94, p = .052	

Table 54
Average hours of preparation time by Carnegie classification

	Research	Masters
n	424	75
Mean	9.1	9.8
Std. Dev.	4.75	7.94
	t(83.6) = .72, p = .472	

Table 55
Average hours of preparation time by rank

	Assistant	Associate	Professor
n	109	146	216
Mean	10.3_a	9.3_{ab}	8.4_b
Std. Dev.	5.43	6.20	4.49
	F(2, 468) = 4.76, p = .009		

Table 56
Average hours of preparation time by position

	Teaching	Teaching/ Research	Research	Dept. Chair	Admin.
n	50	399	14	21	7
Mean	11.1_a	9.2_{ab}	8.9_{ab}	6.1_b	5.6_{ab}
Std. Dev.	9.03	4.78	5.46	2.64	2.70
	F(4, 486) = 4.21, p = .002				

Table 57

Average hours of preparation time by 98-99 teaching seminars

	0	1	2	3 or more
n	202	114	98	83
Mean	9.3_{ab}	8.2_{a}	8.9_{ab}	10.5_{b}
Std. Dev.	6.08	4.06	4.66	5.57
	$F(3, 493) = 3.40, p = .018$			

Instructional objectives are formal statements of what the faculty member expects the students to be able to do to demonstrate mastery of the course content. Nearly two thirds of the respondents reported that they always or usually write instructional objectives for their courses and only 12% indicated that they never did. There was no significant difference among groups in the 1999 sample; however, the 1999 group on the whole was more likely to write instructional objectives than was the 1997 group. Assistant professors and faculty members at research institutions were more likely to write instructional objectives in 1999 than they were in 1997, but there was no difference over the two years in the other professorial ranks or at masters institutions. The data are summarized in Tables 58 and 59.

Table 58

Write instructional objectives in 1999 and 1997 by Carnegie classification

	Total		Research Institutions		Masters Institutions	
Year	1999	1997	1999	1997	1999	1997
n =	505	497	428	407	75	90
Never	12.3	19.3	12.1	20.4	12.0	14.4
Sometimes	22.6	20.7	22.7	19.7	22.7	25.6
Usually	22.6	20.9	22.9	21.1	21.3	20.0
Always	42.6	39.0	42.3	38.8	44.0	40.0
	$t(991.6)=2.24, p=.025$		$t(817.2) = 2.20, p=.029$		$t(163) = .69, p = .492$	

Note: The total number of respondents exceeds the sum of research and masters respondents because not all respondents indicated their institution.

Table 59

Write instructional objectives in 1999 and 1997 by rank

	Assistant Professors		Associate Professors		Professors	
Year	1999	1997	1999	1997	1999	1997
n =	111	95	147	161	218	212
Never	6.3	11.6	11.6	18.6	14.2	22.2
Sometimes	20.7	28.4	23.8	23.0	24.3	17.9
Usually	25.2	23.2	23.8	14.9	19.7	21.7
Always	47.7	36.8	40.8	43.5	41.7	38.2
	$t(204) = 2.08, p = .039$		$t(305.9) = .84, p = .404$		$t(428) = 1.18\ p = .238$	

One possible indicator of a culture change on the campuses is that those faculty members who attended *no* teaching related seminars in the previous year nonetheless wrote instructional objectives significantly more often in 1999 than they did in 1997. Eighty-six

percent of the 1999 group wrote instructional objectives at least sometimes compared with only 73% of the 1997 group, with the mean response moving closer to "usually" from 1.64 to 1.89 on a scale of 0-3, $t(419.3) = 2.20$, $p = .028$. This result might be attributable in part to a growing awareness of ABET Engineering Criteria 2000, the new engineering program accreditation system that mandates the formulation of course learning objectives (which are synonymous with instructional objectives).

Faculty members were asked how often they provided study guides to students before tests. Over 60% did so always or usually and 80% did so at least sometimes. There was no significant difference between the 1999 and 1997 samples (see Table 60). In 1999, nearly half of the women (48%) compared with only 34% of the men reported that they always give study guides before tests. The women's mean of 2.13, slightly more than "usually," was significantly higher than the men's mean of 1.72. (See Table 61.)

Table 60
Provide study guides in 1999 and 1997

% providing study guides n =	1999 501	1997 494
Never	20.0	21.5
Sometimes	19.6	20.9
Usually	24.8	26.5
Always	35.7	31.2
	$t(993) = 1.23$, $p = .219$	

Table 61
Provide study guides in 1999 by sex

% providing study guides n =	Female 48	Male 448
Never	8.3	21.2
Sometimes	18.8	19.6
Usually	25.0	24.8
Always	47.9	34.4
	$t(61.0) = 2.60$, $p = .012$	

On average, faculty members reported that they spent slightly less than four hours per week outside of office hours with undergraduate students ($M = 3.9$, $SD = 3.76$). Faculty members at masters institutions reported spending 5 hours per week with their undergraduate students compared with only 3.7 hours spent by faculty at research institutions. (See Table 62.) Likewise, teaching faculty reported that they spent more time with undergraduate students ($M = 5.6$ hours) than did teaching/research faculty ($M = 3.5$), research faculty ($M = 3.8$), department chairs ($M = 4.8$), and other administrators ($M = 3.4$), but only the difference with teaching/research faculty was statistically significant. (See Table 63.)

Table 62
Average time spent with undergraduates by Carnegie classification

	Research	Masters
n	425	75
Mean	3.7	5.0
Std. Dev.	3.61	4.43
	t(92.1) = 2.53, p = .013	

Table 63
Average time spent with undergraduates by position

	Teaching	Teaching/ Research	Research	Department Chair	Other Admin.
n	50	400	14	21	7
Mean	5.6_a	3.5_b	3.8_{ab}	4.7_{ab}	3.4_{ab}
Std. Dev.	5.01	3.39	2.94	4.39	3.21
	F(4, 487) = 4.21, p = .002				

Faculty members who attended three or more teaching seminars in 1998-99 spent significantly more time (4.9 hours) with undergraduate students than those who attended zero (3.6) or one (3.3), as shown in Table 64.

Table 64
Time spent with undergraduates by 98-99 teaching seminars

	0	1	2	3 or more
n	201	116	99	83
Mean	3.6_a	3.3_a	4.2_{ab}	4.9_b
Std. Dev.	3.34	3.06	3.39	5.53
	F(3, 495) = 3.60, p = .013			

Faculty members were asked a simple yes or no question about whether they solicited feedback regarding their teaching from their students during the semester (other than through the end-of-course evaluation). Seventy-eight percent indicated that they did. Assistant professors (88%) were more likely than associate professors (81%) who in turn were more likely than full professors (71%) to solicit such feedback, χ^2 (2, N = 470) = 13.24, p = .001. In addition, those who attended teaching seminars during 1998-1999 were more likely to ask for feedback than those who did not (0 – 71%; 1 – 85%; 2 – 79%; 3 – 84%), χ^2 (3, N = 491) = 11.04, p = .012.

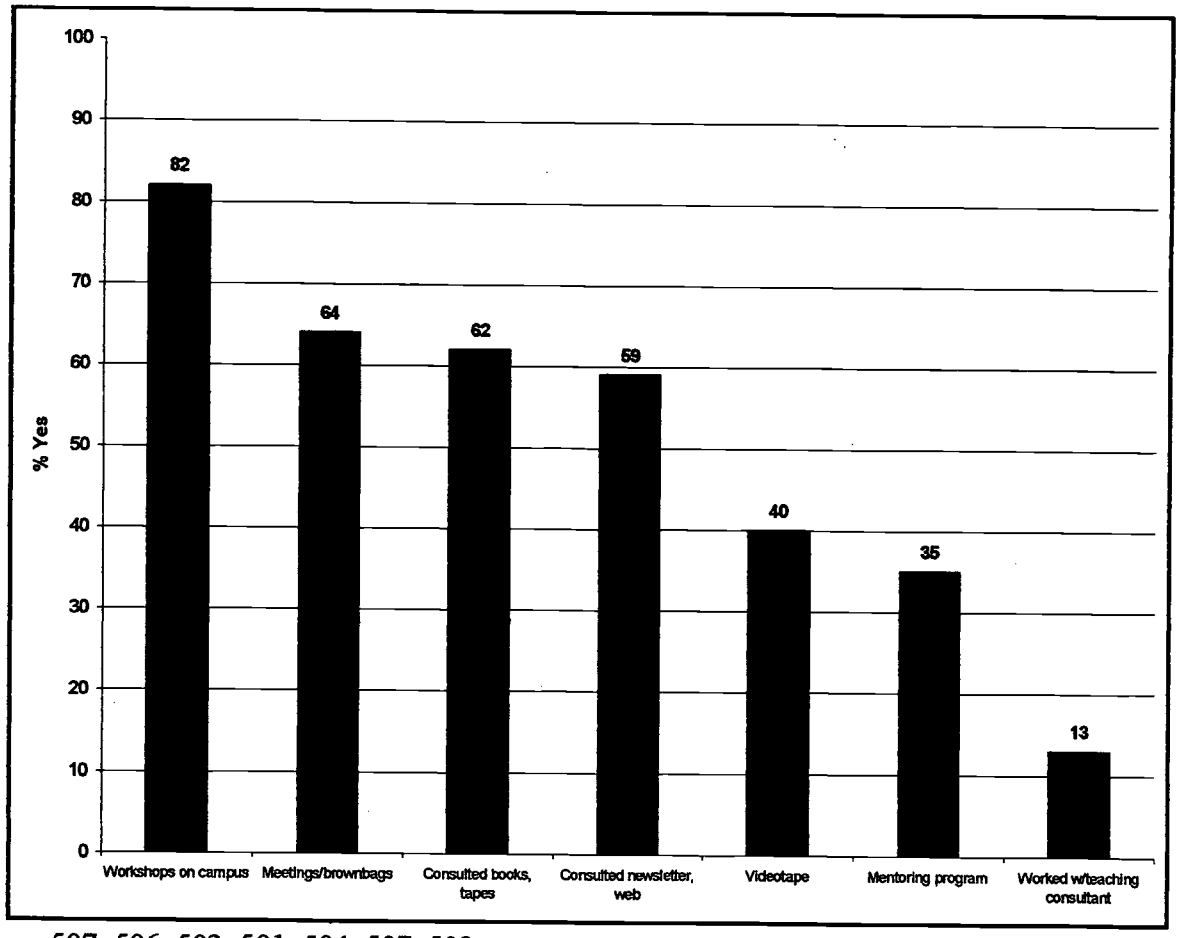
Involvement in Teaching Improvement Activities

In 1999 respondents were asked a series of yes or no questions to assess their use of faculty development services and activities on their campus. Specifically, they were asked which of the following faculty development services they had [ever] used on their campus.

- Attended workshops or seminars.
- Worked individually with a teaching consultant.

- Attended meetings (e.g., discussion groups, brown bag lunches) to discuss professional development.
- Participated in a formal mentoring program (as a mentor or mentee).
- Consulted or borrowed books, tapes, etc.
- Consulted newsletter or web site.
- Had their teaching videotaped.
- Other, specify [ ]

Figure 1 shows the results.



n = 507, 506, 503, 501, 504, 507, 503

Figure 1. Use of faculty development services on campus

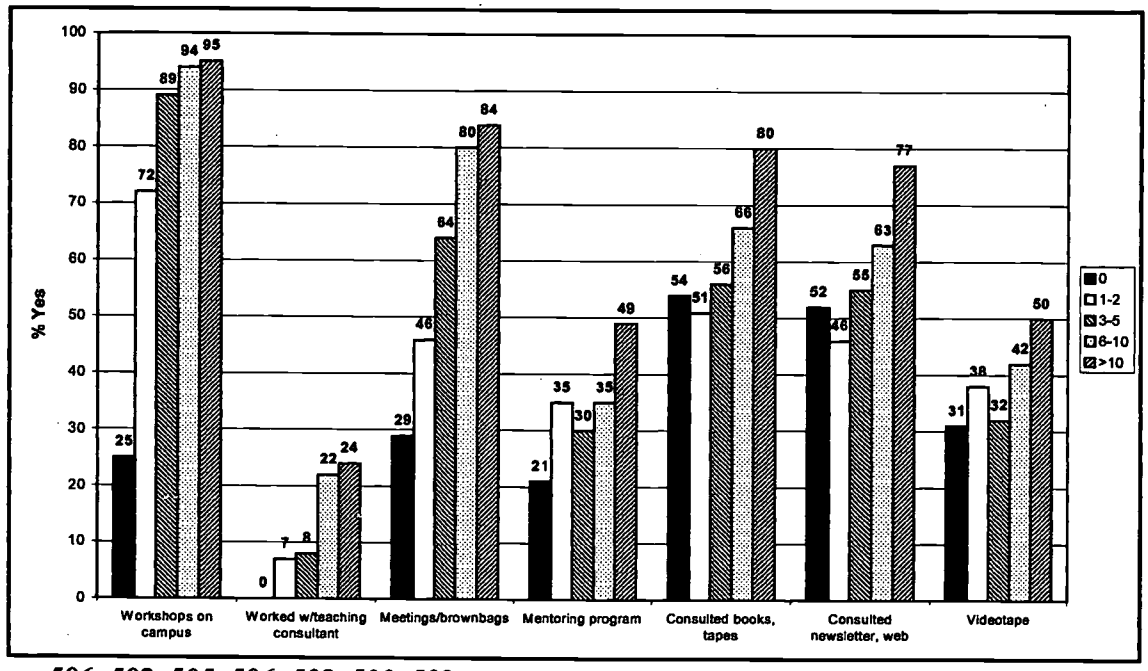
These percentages are very high relative to what might be expected for university and engineering faculty in general and could indicate that the respondents to our survey were more likely than non-respondents to seek outside assistance to improve their teaching.

Various demographic categories were tested for significant differences in the use of faculty development services on campus. The following significant differences were found.

- Although only 13% of the respondents worked individually with a teaching consultant, 27% of the women reported doing so compared with only 11% of the men, χ^2 (1, N = 499) = 10.49, p = .001;
- Although just over one third of respondents indicated that they participated in a formal mentoring program, 59% of administrators reported that they did so compared with 35% of teaching/research faculty and only 26% of teaching faculty, χ^2 (2, N = 482) = 8.79, p = .012;
- Assistant (87%) and associate professors (86%) were more likely to attend teaching workshops on campus than were professors (77%), χ^2 (2, N = 477) = 7.51, p = .023;
- More professors (42%) participated in a formal mentoring program than did assistant professors (36%) or associate professors (29%), χ^2 (2, N = 477) = 7.0, p = .03;
- Associate (66%) and full professors (65%) were more likely to consult books or tapes on teaching improvement than were assistant professors (52%), χ^2 (2, N = 473) = 6.41, p = .041.
- In general, as faculty attended more teaching workshops in their careers, they were significantly more likely to participate in all of the various teaching improvement programs on campus. (See Figure 2):
  - Attended workshops, χ^2 (4, N = 506) = 135.44, p ≤ .0005;
  - Worked with teaching consultant, χ^2 (4, N = 502) = 32.61, p ≤ .0005;
  - Attended meetings, χ^2 (4, N = 505) = 68.95, p ≤ .0005;
  - Participated in a mentoring program, χ^2 (4, 506) = 15.60, p = .004;
  - Consulted books, tapes, etc., χ^2 (4, N = 502) = 24.79, p ≤ .0005;
  - Consulted a newsletter or web site, χ^2 (4, N = 500) = 24.87, p ≤ .0005;
  - Had teaching videotaped, χ^2 (4, N = 503) = 11.43, p = .022.

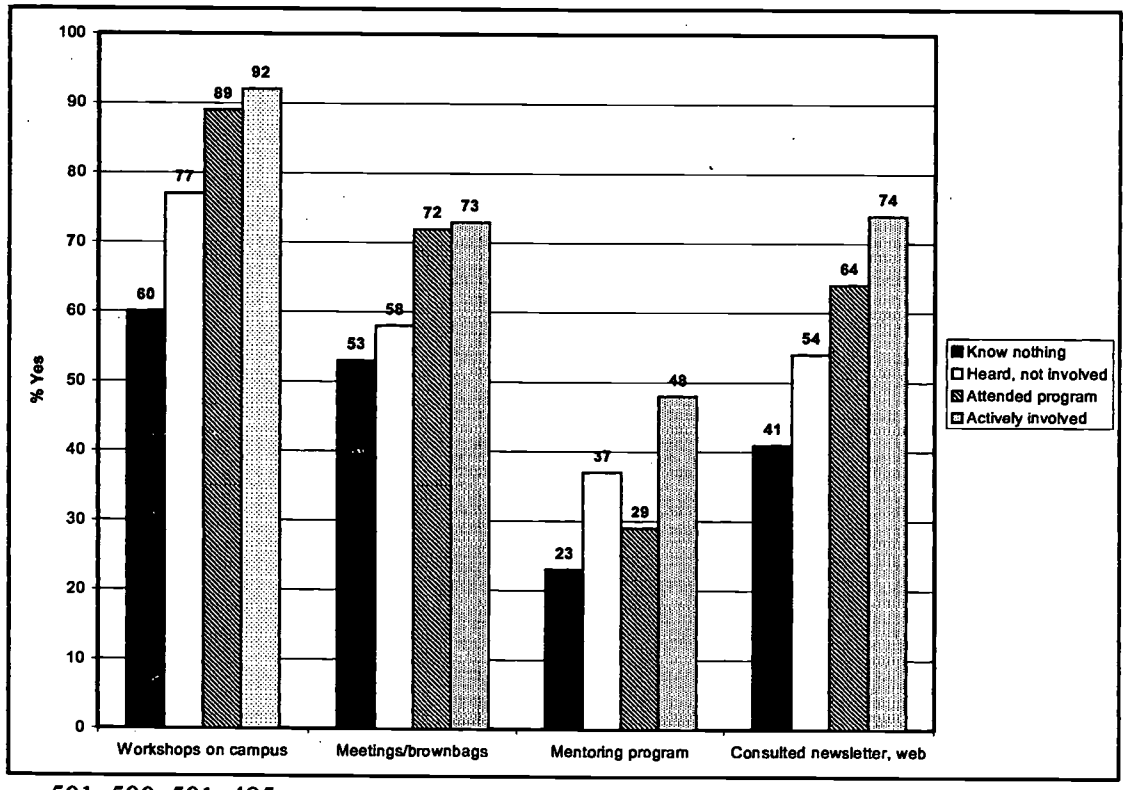
  We note the anomaly that 25% of people who reported attending no career teaching workshops nonetheless report having attended a workshop on campus. We can only assume that either they did not consider the workshop on campus to be a workshop "specifically related to teaching" or that they simply forgot about it when responding to the question about attending teaching workshops.

- Faculty members who were more involved with SUCCEED were more likely to attend workshops or seminars on campus, χ^2 (3, N = 501) = 26.41, p ≤ .0005; attend meetings to discuss professional development, χ^2 (3, N = 500) = 12.90, p = .005; participate in a formal mentoring program, χ^2 (3, N = 501) = 11.38, p = .01); and consult a newsletter or web site on faculty development χ^2 (3, N = 495) = 17.07, p = .001. (See Figure 3.)



n = 506, 502, 505, 506, 502, 500, 503

Figure 2. Use of faculty development services by career teaching seminars attended



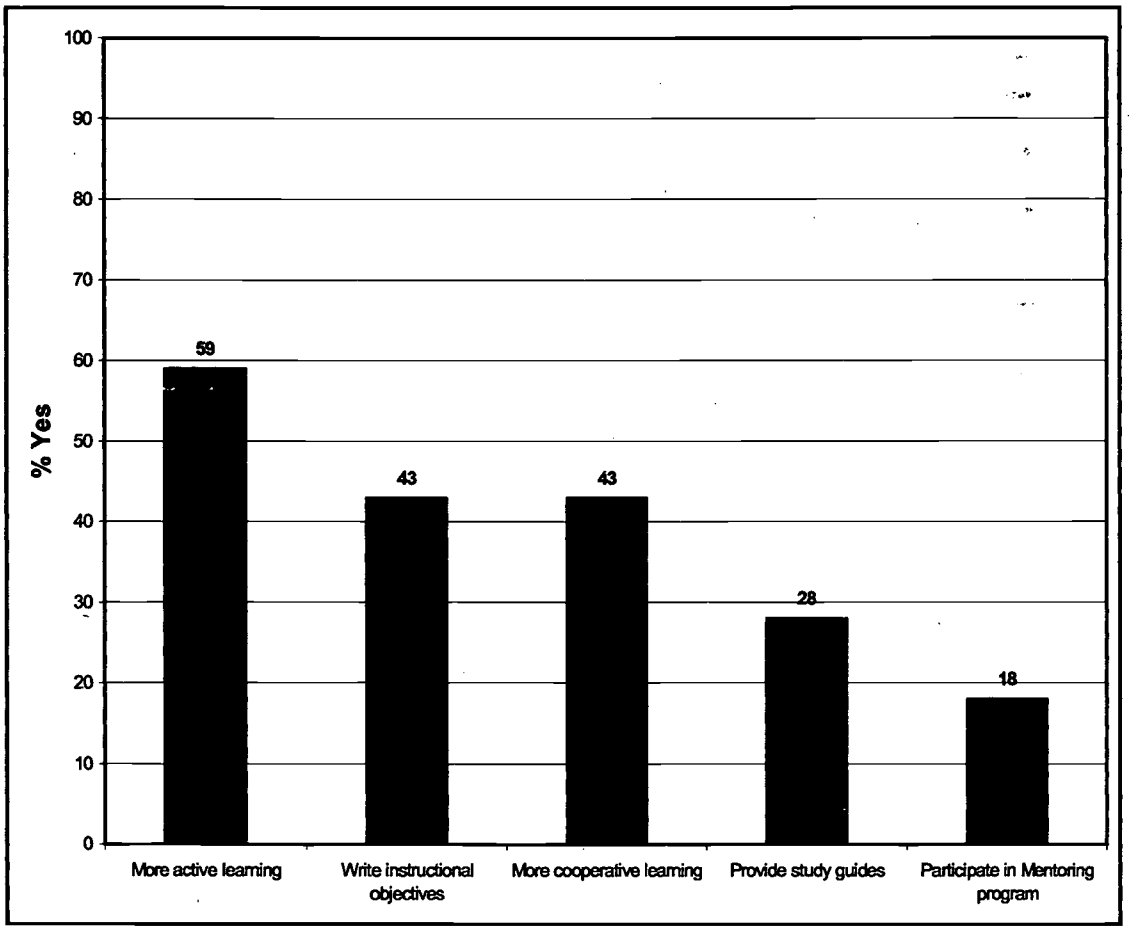
n = 501, 500, 501, 495

Figure 3. Use of faculty development services by level of involvement in SUCCEED

Respondents were also asked if they had changed their teaching behavior in the following areas *as a result of* attending education-related seminars/workshops/conferences in the three years prior.

- Write formal instructional objectives
- Use more active learning in class
- Use more cooperative (team-based) learning for assignments
- Provide study guides to students before tests
- Participate in a mentoring program
- Other

The results—which are shown in Figure 4—may provide the most definitive indication of all the survey data that the SUCCEED faculty development effort has induced many faculty members to make substantial changes in their instructional practices.



n = 495, 492, 492, 493, 490

Figure 4. Changes as a result of attending teaching workshops

Nearly 60% of the respondents indicated that the changes they made improved their students' learning slightly or moderately, and small percentages indicated that their students' learning did not improve (6%) or improved greatly (9%). One-fourth indicated that they did not change their activities at all.

There were a number of significant differences among the subpopulations.[7] Women (95%) were much more likely than men (72%) to try some of the alternative teaching methods with their students and more likely to report that the changes improved the students' learning greatly or moderately (56%) compared with the men (38%), $t(56.1) = 4.05$, $p \leq .0005$. Similarly, 90% of the faculty members at masters institutions reported that they changed their teaching behavior compared with 71% at research institutions. The masters faculty were also more likely to report that their students' learning improved moderately or greatly (51%) than were the research faculty (37%), $t(110.1) = 4.13$, $p \leq .0005$.

As can be seen in Table 65, faculty members who were actively involved in SUCCEED or who attended a coalition program were more likely to change their behavior and report an increase in student learning because of it than those who didn't know anything about the coalition. Those who were actively involved were also significantly more likely to change their behavior and report an increase in student learning than those who had heard of the coalition but weren't active in it.

Table 65
How teaching methods improved student learning by involvement in SUCCEED

% reporting level of improvement	Don't know anything$_a$	Heard, not involved$_{ab}$	Attended coalition program$_{bc}$	Actively involved$_c$
n =	32	206	122	72
Did not change my activities	43.8	32.5	18.0	12.5
Did not improve	9.4	5.3	5.7	5.6
Improved slightly	21.9	27.2	32.0	33.3
Improved moderately	25.0	25.2	36.1	37.5
Improved greatly	0.0	9.7	8.2	11.1
	$F(3, 428) = 6.672$, $p \leq .0005$			

Assistant professors (to whom many faculty development programs have been targeted) were also significantly more likely to report that they changed their behavior and that students' learning improved than were full professors, as can be seen in Table 66. Associate professors were statistically indistinguishable from both groups.

[7] Statistical note: For the tests of statistical significance in this section, the following scale was used: Did not change my activities – 0, did not improve – 1, improved slightly – 2, improved moderately – 3, improved greatly – 4.

Table 66

How teaching methods improved student learning by rank

% reporting level of improvement n =	Assistant$_a$ 100	Associate$_{ab}$ 129	Professor$_b$ 185
Did not change my activities	18.0	27.9	29.7
Did not improve	3.0	7.0	6.5
Improved slightly	29.0	26.4	31.4
Improved moderately	42.0	29.5	23.8
Improved greatly	8.0	9.3	8.6
	$F(2, 411) = 3.685, p = .026$		

Faculty members who attended teaching seminars during the 1998-99 school year were more likely to report that they had changed their teaching behavior and that it impacted their students' learning than were those who attended none. Similarly, faculty members who attended at least three teaching seminars in the course of their careers were more likely to report that they had changed their teaching behavior and that it improved their students' learning than those who never attended any. (See Tables 67 and 68.)

Table 67

How teaching methods improved student learning by 98-99 teaching seminars

% reporting level of improvement n =	0_a 163	1_b 106	2_b 87	3 or more$_b$ 76
Did not change my activities	42.3	20.8	17.2	9.2
Did not improve	6.1	4.7	6.9	3.9
Improved slightly	19.6	29.2	39.1	38.2
Improved moderately	23.9	35.8	29.9	38.2
Improved greatly	8.0	9.4	6.9	10.5
	$F(3, 428) = 9.931, p \leq .0005$			

Table 68

How teaching methods improved student learning by career teaching seminars

% reporting level of improvement n =	0_a 36	$1\text{-}2_{ab}$ 88	$3\text{-}5_{bc}$ 136	$6\text{-}10_{because}$ 68	$> 10_c$ 108
Did not change my activities	61.1	37.5	25.0	14.7	12.0
Did not improve	0.0	6.8	4.4	5.9	8.3
Improved slightly	11.1	21.6	27.9	38.2	37.0
Improved moderately	22.2	26.1	33.1	32.4	31.5
Improved greatly	5.6	8.0	9.6	8.8	11.1
	$F(4, 431) = 11.415, p \leq .0005$				

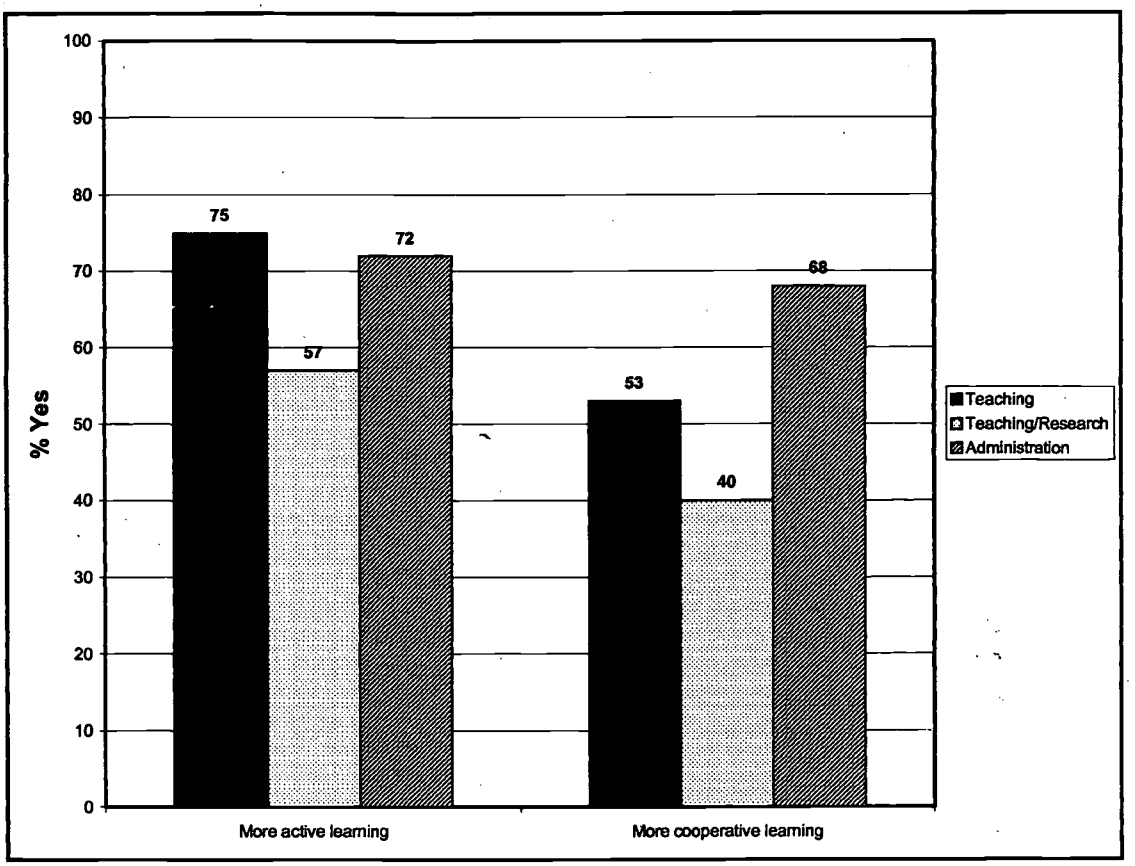
Table 68 shows the anomalous result that about 40% of the respondents who reported never having attended a teaching seminar also reported changing their instructional methods as a consequence of having attended teaching seminars. Some of these individuals may have changed their behavior after consulting a colleague, book, or web site and ignored the specification that the changes they made had to result from teaching seminars; others may have forgotten about attending a program when they were initially

asked about their participation but then thought of one when they were asked about changes in their teaching. In any case, only 18 out of 436 respondents in Table 68 fell into this category, so too much significance should not be attached to the anomaly.

The various demographic categories were also tested for significant differences in their use of teaching techniques they had learned in a teaching seminar during the prior three years.

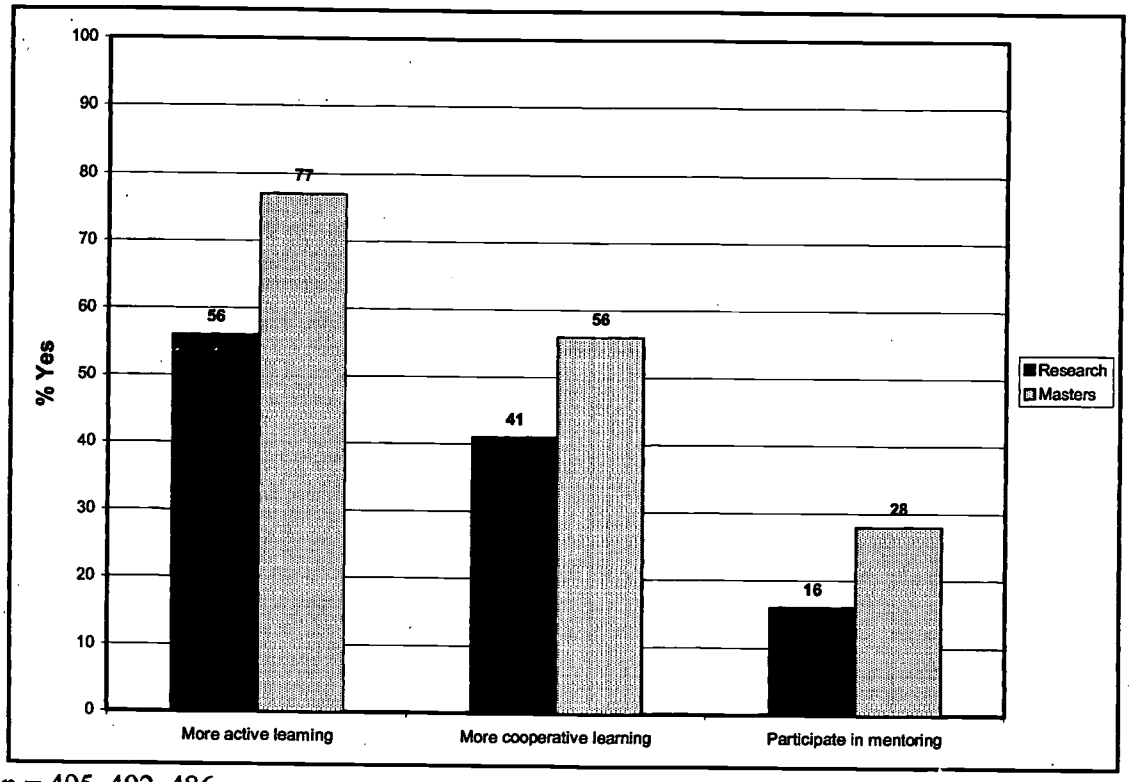
- 80% of the women indicated that they used more active learning compared with 57% of the men, χ^2 (1, N = 492) = 8.76, p = .003;
- Assistant professors (73%) were more likely than associate professors (62%) or full professors (51%) to use active learning χ^2 (2, N = 469) = 16.11, p ≤ .0005;
- Teaching faculty (75%) and administrators (72%) reported using active learning more than teaching/research faculty (57%), χ^2 (2, N = 475) = 7.80, p = .02 (see Figure 5);
- Administrators (68%) reported using more cooperative learning than either teaching faculty (53%) or teaching/research faculty (40%), χ^2 (2, N = 472) = 10.46, p = .005 (see Figure 5);
- Faculty members at masters institutions reported using more active learning, more cooperative learning, and participating in a mentoring program more than did faculty members at research institutions, as shown in Figure 6:
  - More active learning, χ^2 (1, N = 495) = 11.80, p = .001;
  - More cooperative learning, χ^2 (1, N = 492) = 6.02, p = .014;
  - Participate in a mentoring program, χ^2 (1, N = 490) = 6.74, p = .009;
- As faculty members attended more career teaching seminars, they were more likely to report that they:
  - wrote instructional objectives, χ^2 (4, N = 491) = 19.86, p = .001;
  - used active learning, χ^2 (4, N = 494) = 37.94, p ≤ .0005;
  - used cooperative learning, χ^2 (4, N = 491) = 24.94, p ≤ .0005;
  - participated in mentoring programs, χ^2 (4, N = 489) = 23.38, p ≤ .0005 (see Figure 7).

There were no significant differences among groups in the percentage of respondents who gave study guides as a result of attending teaching seminars.



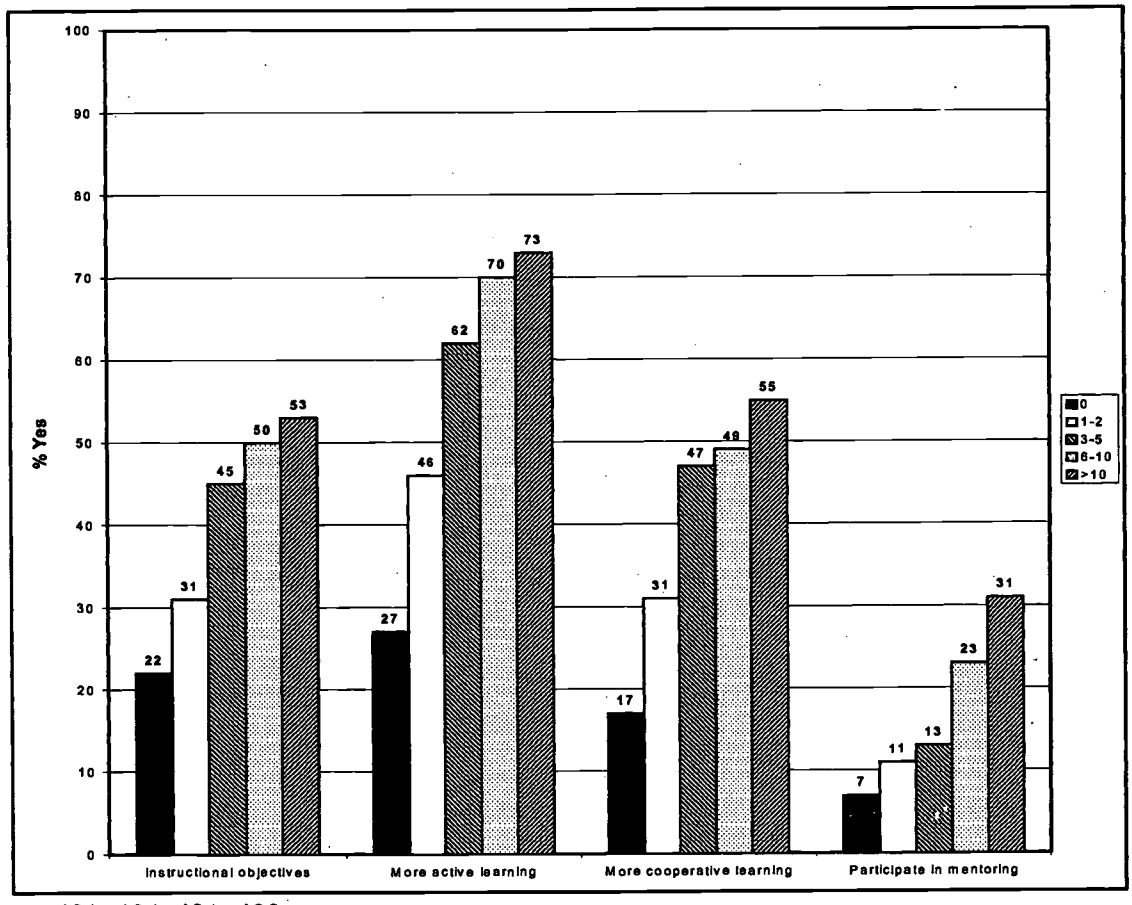
n = 475, 472

Figure 5. Changed teaching behavior by position



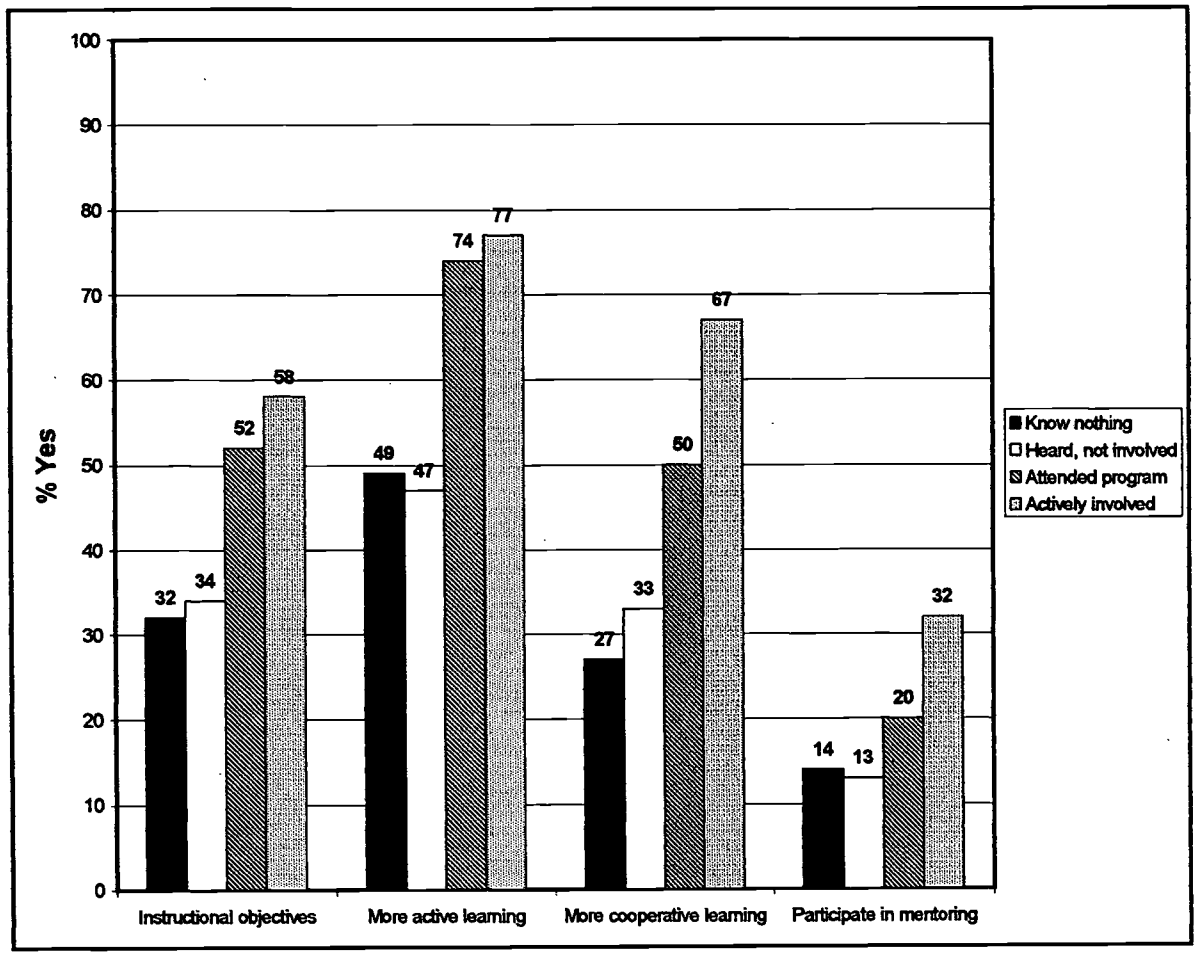
n = 495, 492, 486

Figure 6. Changed teaching behavior by Carnegie classification



n = 491, 494, 491, 489

Figure 7. Changed teaching behavior by career teaching seminars attended



n = 486, 489, 486, 484

Figure 8. Changed teaching behavior by SUCCEED involvement

As might be expected, faculty members who had been more actively involved in SUCCEED were more likely to indicate that they had changed their teaching behavior as a result of attending teaching workshops (which they were also more likely to attend) than those who did not know anything about the Coalition or had only heard of it. (See Figure 8.)

In addition to resource use and behavior change, respondents were asked how often they discussed teaching techniques with their colleagues and graduate students. As can be seen from Table 69, about half of the faculty reported discussing teaching techniques with their colleagues at least once a month and about 30% reported doing so with graduate students.

Table 69
Discussion of teaching techniques with colleagues and graduate students

	With Colleagues		With Graduate Students	
	n	%	n	%
Never	33	6.6	98	21.7
1-3 times a semester	215	42.7	218	48.2
1-3 times a month	168	33.4	104	23.0
1-3 times a week	87	17.3	32	7.1
Total	503	100	452	100

Faculty members at research institutions were more likely to discuss teaching techniques at least monthly with both their colleagues (53%) and with their graduate students (33%) than were faculty members at masters institutions (41% with colleagues and 14% with graduate students), as shown in Table 70.

Table 70
Discussion of teaching techniques with colleagues and graduate students by Carnegie classification

	With Colleagues		With Graduate Students	
	Research	Masters	Research	Masters
n =	426	76	392	59
Never	5.9	10.5	17.6	49.2
1-3 times a semester	41.5	48.7	49.7	39.0
1-3 times a month	33.8	31.6	25.0	8.5
1-3 times a week	18.8	9.2	7.7	3.4
	$t(500) = 2.48$, $p = .013$		$t(449) = 4.94$, $p \leq .0005$	

Assistant professors (56%) were significantly more likely to discuss teaching techniques with their colleagues at least once a month than were full professors (46%). Associate professors (54%) fell in-between and were statistically indistinguishable from the other two ranks. (See Table 71.)

Table 71
Discussion of teaching techniques with colleagues by rank

	$Assistant_a$	$Associate_{ab}$	$Professor_b$
n =	111	149	217
Never	2.7	7.4	8.8
1-3 times a semester	41.4	38.9	45.6
1-3 times a month	33.3	34.9	31.8
1-3 times a week	22.5	18.8	13.8
	$F(2, 474) = 3.44$, $p = .033$		

Faculty members who attended two teaching seminars in 1998-1999 (59%) were more likely to discuss teaching techniques with their colleagues at least once a month than were those who attended no teaching seminars that year (48%). Those who attended one (47%) and those who attended three or more (52%) were not statistically distinguishable from the others. (See Table 72.)

Table 72
Discussion of teaching techniques with colleagues by 98-99 teaching seminars

	0_a	1_{ab}	2_b	3 or more$_{ab}$
n =	201	116	99	82
Never	9.5	5.2	2.0	7.3
1-3 times a semester	42.8	47.4	39.4	40.2
1-3 times a month	34.8	31.0	33.3	32.9
1-3 times a week	12.9	16.4	25.3	19.5
	$F(3, 494) = 3.00, p = .03$			

There were no overall differences between the 1999 and 1997 responses in the frequency of discussing teaching techniques with colleagues or graduate students Of faculty members at masters institutions, 68% in 1997 and only 51% in 1999 reported discussing teaching with graduate students (see Table 73). There was no year-to-year difference for faculty members at research institutions.

Table 73
Discussion of teaching techniques with graduate students in 1999 and 1997 by Carnegie Classification

	Research Institutions		Masters Institutions	
	1999	1997	1999	1997
n =	392	382	59	66
Never	17.6	14.7	49.2	31.8
1-3 times a semester	49.7	52.6	39.0	45.5
1-3 times a month	25.0	25.4	8.5	13.6
1-3 times a week	7.7	7.3	3.4	9.1
	$t(772) = .461, p = .645$		$t(123) = 2.22, p = .028$	

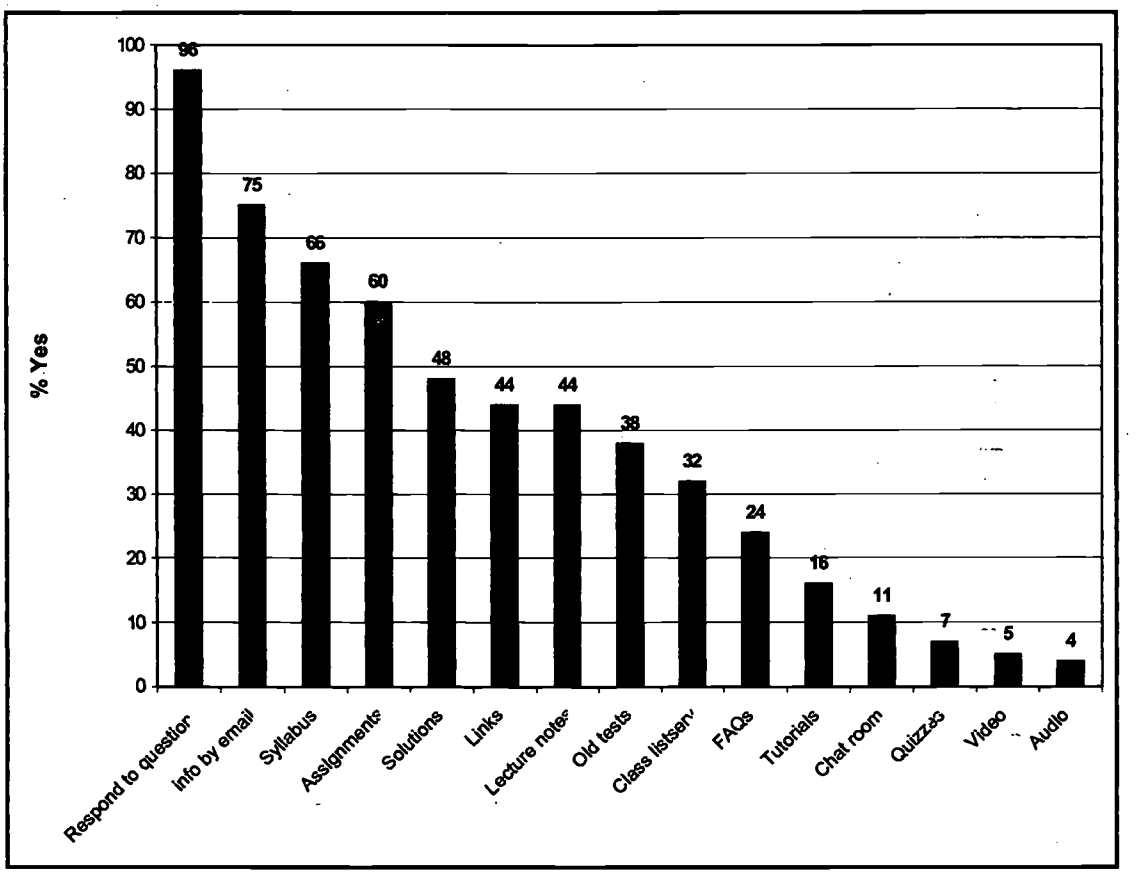
Use of on-line resources

In 1999, respondents were asked a series of yes or no questions to assess their use of email and the web within the context of undergraduate instruction. Specifically, they were asked whether they did the following:

- Send information by email to the whole class.
- Respond to student questions by email.
- Provide a class listserv or mailing lists for students to use.
- Post course syllabus on-line.
- Post student assignments on-line.
- Post links to other sites on-line.
- Provide a class chat room.
- Offer on-line tutorials.
- Post lecture notes/slides.
- Provide on-line quizzes.

- Post old tests on-line.
- Post solutions to problems on-line.
- Post frequently asked questions on-line.
- Provide on-line video.
- Provide on-line audio.
- Other, specify [ ]

Figure 9 shows the percentages of respondents who reported using the various online activities.



n = 507, 508, 506, 505, 504, 505, 504, 503, 505, 503, 504, 501, 504, 503, 501

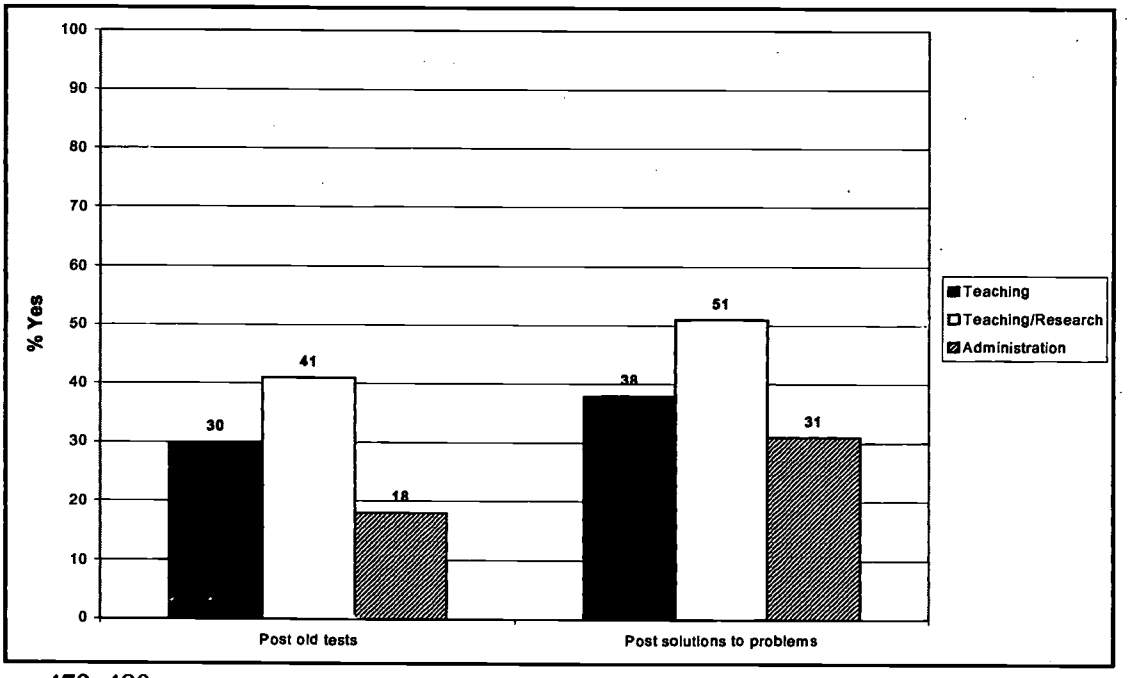
Figure 9. Use of on-line resources

Various demographic categories were tested for significant differences in the use of on-line communication tools. The following significant differences were found.

- Women (57%) were significantly more likely to post old tests on line than were men (35%), χ^2 (1, N = 499) = 8.83, p = .003;
- Associate professors (31%) were more likely to post frequently asked questions on line than were either assistant professors (23%) or full professors (20%), χ^2 (2, N = 474) = 6.37, p = .041;
- Teaching/research faculty (41%) were more likely to post old tests on line than teaching faculty (30%) or administrators (18%), χ^2 (2, N = 499) = 11.68, p = 039. Teaching/research faculty (51%) were also more likely to post solutions to problems

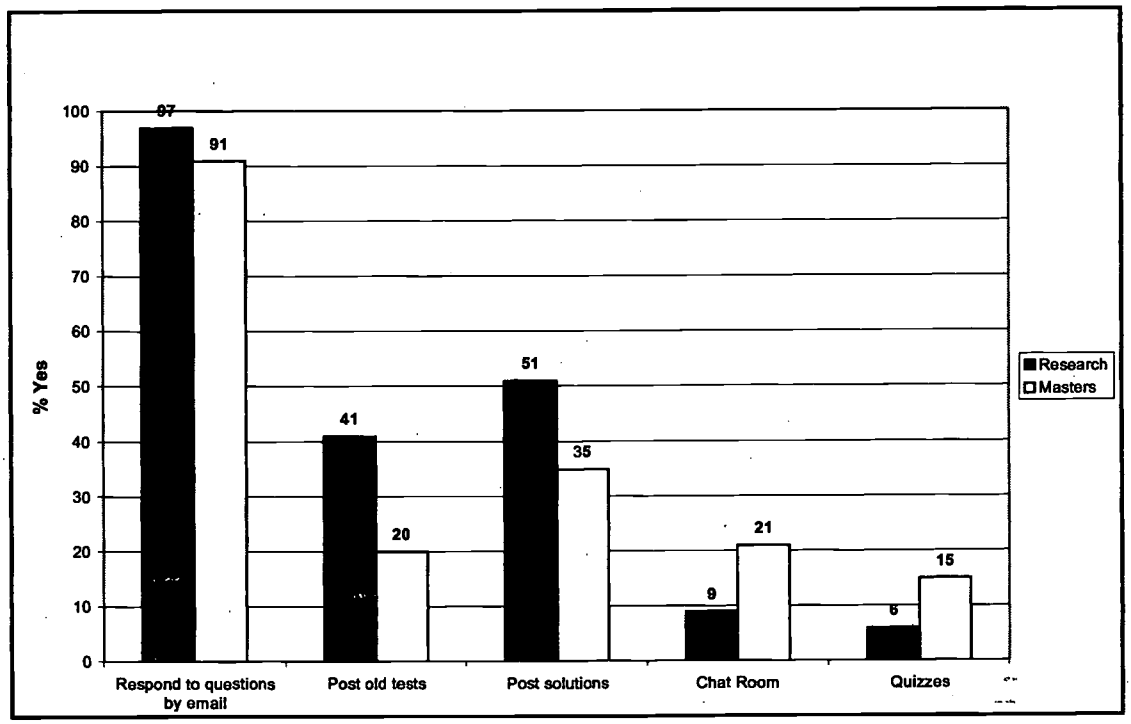
on line than were teaching faculty (38%) or administrators (31%), χ^2 (2, N = 500) = 13.23, p = .021) (see Figure 10);

- Research faculty were more likely than masters faculty to:
  - respond to student questions by email (97% vs. 91%), χ^2 (1, N = 505) = 8.30, p = .004;
  - post old tests on line (41% vs. 20%), $\chi 2$ (1, N = 503) = 12,39, p ≤ .0005; and
  - post solutions to problems on line (51% vs. 35%) χ^2 (1, N = 504), = 6.67, p = .01;
- However, masters faculty were more likely than research faculty to:
  - provide a class chat room (21% vs. 9%), χ^2 (1, N = 501) = 9.83, p = .002; and
  - give on-line quizzes (15% vs. 6%), χ^2 (1, N = 504) = 7.25, p = .007 (see Figure 11).
- Faculty members who attended more career teaching seminars were more likely to report that they send information by email to the whole class, χ^2 (4, N = 507) = 15.62, p = .004 and that they provide on-line tutorials, χ^2 (4, N = 503) = 12.13, p = .011. Faculty members who attended more than 10 teaching seminars also reported that they provided a class listserv more than those who attended 10 or fewer, χ^2 (4, N = 504) = 16.48, p = .002 (see Figure 12).



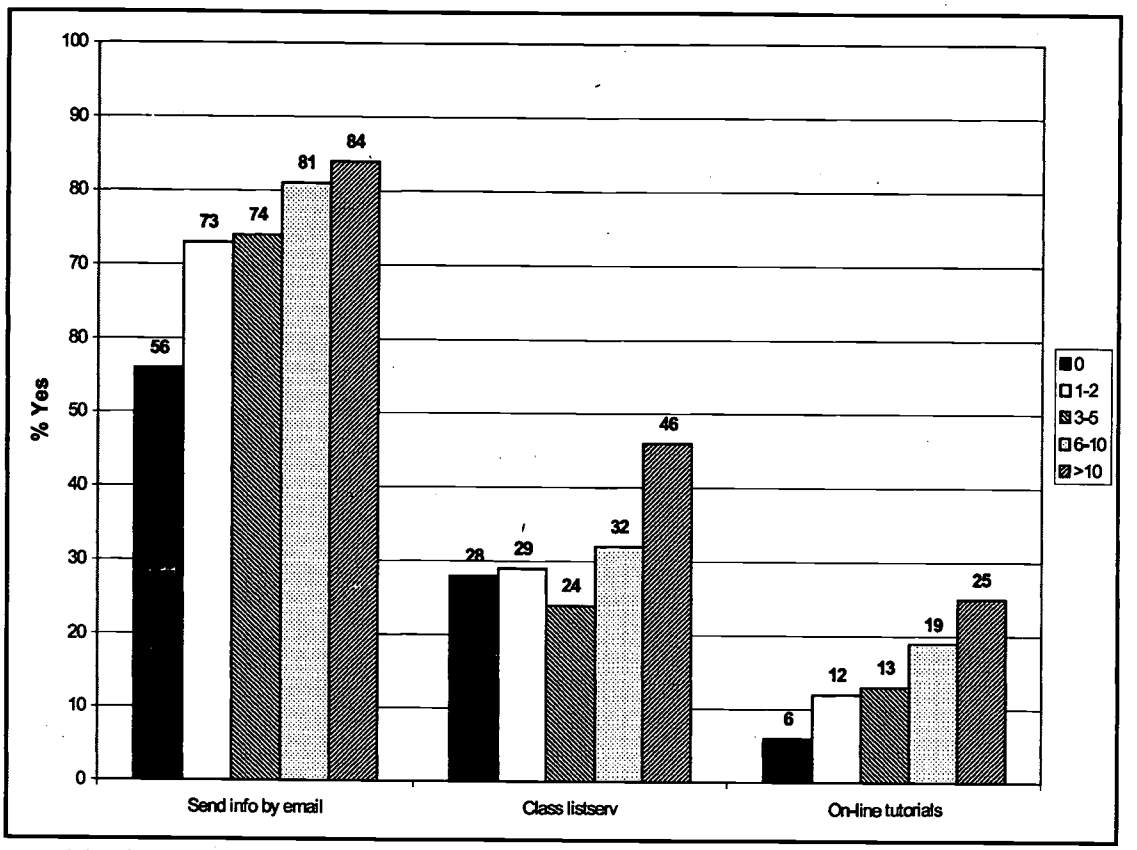
n = 479, 480

Figure 10. On-line Activities by Position



n = 505, 503, 504, 501, 504

Figure 11. On-line Activities by Carnegie Classification



n = 506, 504, 503

Figure 12. On-line Activities by Career Teaching Seminars

Differences in responses among SUCCEED campuses

As was pointed out elsewhere, SUCCEED encompasses widely varying campuses, ranging from some of the largest research universities in the country to relatively small universities that only provide graduate education through the masters level. Appendix B provides a summary of individual campus responses to the survey items, with institution names and the number of respondents from each institution obscured for reasons of confidentiality but like institutions (research and masters) are grouped together.[8]

Several noteworthy differences among the campuses are summarized below.

- *Faculty teaching undergraduate courses.* The lowest percentage of respondents on an individual campus who reported teaching undergraduate courses in the preceding three years was 79% and the highest was 96%. The percentages at masters

[8] The observant reader may note that some totals in Appendix B are slightly different from comparable figures in the main body of this report. The differences reflect the fact that some respondents did not indicate their institutional affiliations.

institutions were all 90% or greater, and the highest percentage at a research institution was 94%.

- *Use of active learning.* The percentage of respondents using active learning weekly or more often in a typical undergraduate course varied from 11% to 34%. The percentages for all three masters institutions were close to the high end of this range, while the range for research institutions was almost as broad as that for all eight campuses.
- *Use of team assignments.* The percentage of respondents assigning weekly homework that could be done by teams varied from 32% to 48%, with both the highest and lowest values being at research institutions. The percentage assigning required team homework at some time during the semester was between 49% and 54% at all but two of the campuses, where the percentages were 62% (at a research institution) and 80% (at a masters institution). The percentage doing so weekly or more often varied from 6% (at a masters institution) to 25% (at two campuses, one a masters institution and the other a research institution).
- *Writing instructional objectives.* The percentage of respondents who reported usually or always writing formal instructional objectives varied from 58% to 74%. We would speculate that the frequency of writing objectives at a school is related to the proximity of an accreditation visit under EC 2000 (which requires that objectives be written), but we have not tested this hypothesis.
- *Incorporating technology into teaching.* Not surprisingly, technology use varied considerably from one campus to another. The ranges were as follows:
  - posting course syllabi: 35% (the second lowest was 50%) – 84%
  - posting assignments: 42% – 67%
  - posting solutions to problems: 25% – 60%
  - posting lecture notes and slides: 25% – 57%
  - posting responses to frequently asked questions: 15% – 28%
  - setting up class listservs and mailing lists: 10% – 54% (the second highest was 42%)
  - posting old tests: 5% (the second lowest was 20%) – 59%
  - providing a class chat room: 3% – 33%
  - offering on-line tutorials: 5% (the second lowest was 12%) – 29% (the second highest was 18%)
  - on-line quizzes: 1% (the second lowest was 4%) – 17%
  - on-line video: 0% – 8%
  - on-line audio: 0% – 8%
- *Class preparation and student contact time.* The average time spent preparing lectures, assignments, and tests for a single course varied from 8 hours to 11 hours with both the greatest (11.4 hours) and least (7.6 hours) time spent at masters institutions. The time spent with undergraduates outside of office hours varied from 3 hours to 6 hours, with the times being generally greater at masters institutions.

- *Discussing teaching techniques.* The percentage of respondents reporting discussions about teaching with colleagues once a week or more often varied from 0% to 30%, and the percentage reporting discussions with graduate students at research institutions once a month or more often varied from 24% to 44% (the second highest being 29%).
- *Soliciting feedback on teaching other than through end-of-semester evaluations.* The percentage of respondents reporting doing so varied from 66% to 90%.
- *Rated importance of teaching quality and innovation.* The noteworthy feature of the respondents' ratings of the importance of teaching quality to themselves and their colleagues and administrators and the importance of teaching quality and innovation in the faculty reward system is the absence of major intercampus differences. For example, the ratings of the importance of teaching quality to the dean of the engineering school only varied from 4.8 to 5.4, despite the fact that some of the campuses are highly research-intensive while at others research receives less emphasis. The variation in ratings of the importance of teaching quality in the reward system was somewhat greater (3.5 to 4.2), but still not as great as might have been expected given the substantially different missions of different SUCCEED campuses.
- *Attendance at teaching seminars, workshops, and conferences.* The percentages of respondents who reported attending three or more events in their careers varied from 59% to 88%, and the percentages attending six or more varied from 21% to 50%. The ranges were similar for masters and research institutions.
- *Use of faculty development services.* The variations in availability and promotion of faculty development facilities on the different campuses were reflected in substantial variations in use of faculty development services. The ranges were as follows:
  - attended workshops: 60% (the second lowest was 77%) – 96%.
  - attended meetings (discussion groups, brown-bag lunches): 45% – 85%
  - participated in a formal mentoring program (as mentor or mentee): 27% – 44%
  - consulted or borrowed books, tapes, etc.: 50% – 78% (the second highest was 69%)
  - consulted a newsletter or web site: 42% – 75%
  - had teaching videotaped: 15% – 59% (the second highest was 48%)
  - worked individually with a teaching consultant: 2% – 26% (the second highest was 16%)

Discussion and Conclusions

The data collected in the 1999 survey provide a snapshot of the SUCCEED faculty's use of various instructional practices, the level of their participation in faculty development programs, and their attitudes regarding the importance of teaching to themselves and their colleagues and in their campus's faculty incentive and reward system. Comparison of the results with the data from the 1997 administration of the survey provides an indication of changes in practices and attitudes that may have occurred between 1997 and 1999.

The paragraphs that follow summarize the principal survey results in terms of responses to several focus questions. In some cases, percentages of all the respondents replying in specified ways are followed by the minimum and maximum percentages for individual SUCCEED campuses. The latter figures come from tables in Appendix B.

To what extent did respondents report using nontraditional instructional methods advocated in faculty development programs?

Extensive evidence from cognitive science and empirical classroom research supports the effectiveness of active learning, team-based learning, writing formal instructional objectives, and assigning writing exercises at promoting acquisition of knowledge and skills.[9,10] Our experience in teaching workshops given when SUCCEED began in 1992 suggests that at that time very few engineering faculty members at that time used these methods or even knew of their existence. Workshops given on all of the SUCCEED campuses have vigorously promoted the use of the first three methods and provided guidance on effective ways to implement them, and several of the campuses have had programs on writing to learn.

By 1999 a substantial portion of the faculty had begun to use active learning. Sixty percent of the survey respondents (48%–95%) reported assigning small group exercises for brief intervals, with 22% (11%–34%) doing so once a week or more, and 37% (29%–75%) reported that they sometimes used active learning for most of a class period, with 8% (3%–21%) doing so once a week or more (*Table 25*). All of these percentages represent slight increases from the 1997 values (*Table 33*). The percentage of the respondents who lectured for most of every class period declined from 66% in 1997 to 59% in 1999 (*Table 20*).

Similarly, in 1999 73% (62%–88%) of the respondents reported giving assignments on which students had the option of working in teams, with 35% (32%–48%) doing so weekly or more often; 54% (49%–80%) of the respondents reported giving assignments on which teams were required, with 16% (13%–25%) doing so weekly or more often; and 82% (80%-95%) reported assigning a major team project in some or all of the courses they taught (*Table 34*). The percentages of respondents using optional or mandatory team assignments each rose by about 7% from 1997 to 1999, as did the percentages doing so weekly or more often (*Table 36*).

Writing instructional objectives (or in ABET terminology, course learning objectives), is an instructional method strongly encouraged by SUCCEED teaching workshops and mandated by Engineering Criteria 2000, and the workshops encourage participants to give their objectives to their students in the form of study guides for examinations. The number of respondents who reported usually or always writing instructional objectives was 65% (58%–74%) in 1999, a 5% increase from 1997 (*Table 58*). Assistant professors

[9] W. McKeachie, *Teaching Tips: Strategies, Research, and Theory for College and University Teachers*, 10th Edition. Boston, Houghton Mifflin, 1999.

[10] R.M. Felder, D.R. Woods, J.E. Stice, and A. Rugarcia, "The Future of Engineering Education: 2. Teaching Methods that Work," *Chem. Engr. Education, 34*(1), 26–39 (2000).

were much more likely to write them at all and to write them frequently than were associate and full professors (*Table 59*). Similar results were obtained regarding the provision of study guides for tests. In 1999, 60% (52%–65%) reported usually or always providing them, a percentage not much different from the 1997 values (*Table 60*).

A movement to increase writing content in engineering courses has followed the adoption by ABET of EC 2000 as the engineering program accreditation standard. The percentage of the respondents who reported ever giving writing assignments increased from 84% in 1997 to 88% (79%–100%) in 1999, and the percentage doing so weekly or more often increased from 8% to 21% (16%–30%) (*Table 36*).

While we have no data on the frequency of use of these methods in 1992 when SUCCEED began, we feel confident in saying that they were known to relatively few engineering faculty members and practiced by even fewer. Their use in 1999 by over half of the faculty and in some cases considerably more than half, and the relatively high percentages using them on all of the SUCCEED campuses, suggest that the combined effects of faculty development programs, education-related articles in professional journals, EC 2000, word-of-mouth from colleagues, and pressure from students have had significant effects on faculty teaching practices. While there is no definitive way to identify the extent to which each of those factors contributed to the observed changes, evidence to be discussed shortly indicates that the contribution of faculty development on the SUCCEED campuses was an important one. We anticipate that the observed trend toward adoption of the new methods will continue as faculty members who have used the traditional ones for decades retire, and their replacements are given training and mentoring in more effective methods starting as soon as they arrive on campus.

In what ways and to what extent did respondents report using computer technology in their course instruction?

The reported use of technology for course instruction in 1999 varied considerably by the nature of the application (*Figure 9*) and also showed the greatest variation from campus to campus of any of the variables examined in the survey (Appendix B). The most common category involved communications between instructors and students: 96% (75%–100%) of the respondents reported using e-mail to respond to questions from their students, 75% (58%–84%) to give information to their entire class, and 24% (15%–28%) to post responses to frequently asked questions. Another category involved posting course materials: 66% (35%–84%) reported posting syllabi, 60% (42%–67%) assignments, 48% (25%–60%) problem solutions, 44% (25%–57%) lecture notes, 44% (15%–51%) links to other web sites, and 38% (5%–59%) old tests. Smaller but still sizeable percentages set up on-line communications among the students—32% (10%–54%) with class listservs and 11% (5%–33%) with chat rooms. Relatively small percentages used technology for actual course material delivery other than posting lecture notes—16% (5%–29%) used on-line tutorials, 7% (1%–17%) on-line tests, 5% (0%–8%) on-line video, and 4% (0%–8%) on-line audio. Similar questions were not asked in 1997, so we cannot determine the extent to which technology use changed in the two years between survey administrations.

Engineering education is in a transitional state regarding the use of instructional technology, and the variations observed on the SUCCEED campuses undoubtedly reflect the situation throughout the country. Some of the SUCCEED campuses have a fully networked computing environment, make extensive use of instructional delivery tools such as Web-CT and Blackboard, and require all engineering students to purchase laptops. These are the schools that make the greatest use of technology for communication and instruction—where over 80% of the instructors post their syllabi on the Web, for example, and over 70% set up listservs for their classes. At other schools with fewer resources and/or more traditional and technology-resistant faculties, most professors have not progressed much beyond e-mail, programming, and word-processing in their computer usage. The full use of instructional technology for course delivery with such tools as on-line test administration and multimedia courseware is still in its early stages on all of the campuses. We anticipate dramatic changes in this situation in the coming years.

To what extent had respondents taken part in teaching improvement activities, and to what extent did they credit their participation with changing their teaching practices and improving their teaching?

In 1992, none of the eight SUCCEED campuses had a faculty development program that involved more than a handful of engineers, and most had no faculty development programs at all. One of the Coalition's principal objectives was to change this situation.

In 1999, 82% (60%–96%) of the survey respondents reported having attended one or more teaching workshops on their campuses, 64% (44%–73%) attended discussion groups or brown-bag lunches dealing with teaching, 62% (50%–78%) consulted books and/or tapes, 59% (42%–75%) consulted a newsletter or a web site, 40% (15%–59%) had their teaching videotaped, 35% (27%–44%) participated in a mentoring program, and 13% (2%–26%) worked with a teaching consultant (*Figure 1*). Assistant professors (87%) and associate professors (86%) were more likely to attend teaching workshops on campus than were full professors (77%), and women (27%) were much more likely than men (11%) to work with a teaching consultant.

The survey data also indicate that the frequency of participation in faculty development activities was positively associated with the use of active learning, team-based assignments, and other nontraditional instructional methods referred to in the first section. To gauge the extent to which the association might be causal and not merely correlational, the survey asked the respondents to indicate which teaching practices they had adopted as a consequence of their participation in teaching seminars. Of roughly 500 respondents, 59% reported that they either began or increased their use of active learning, 43% wrote instructional objectives, 43% began or increased their use of cooperative learning, 28% provided study guides before tests, and 18% participated in a mentoring program (*Figure 4*). Women (95%) were more likely than men (72%) to try new methods, assistant professors (82%) more likely than associate professors (72%) and full professors (70%), and faculty at masters institutions (90%) more likely than faculty at

research institutions (71%). Willingness to try new approaches generally correlated positively with the number of teaching seminars attended. When asked how the changes they made as a consequence of seminar participation affected their students' learning, 69% of the respondents reported improvements, 6% said that they could see no improvement, and 25% indicated that they had not made changes.

Our conclusion is that while faculty development cannot claim exclusive credit for the increased use of the instructional methods it has sought to promote in recent years, it clearly had a major effect in accomplishing the increase, and the faculty who adopted or increased their use of the new methods overwhelmingly believed that the effects of the changes on their teaching were positive. Considering the historic reluctance of engineering faculty to participate in campus-wide faculty development programs, engineering schools would do well to strengthen their internal faculty development efforts rather than relying primarily or entirely on campus-wide teaching centers for guidance in improving teaching. Guidelines for the design and implementation of engineering faculty development programs formulated by the SUCCEED Coalition[11] might prove useful in this regard.

How did respondents rate the importance of teaching quality and innovation to themselves and their colleagues and in the faculty reward system?

Another component of SUCCEED's mission was to improve the climate for teaching on the coalition campuses. Efforts to achieve this goal included involving a large percentage of the faculty in coalition programs and giving presentations to administrators on ways to help new faculty members become both more productive in research and more effective in teaching.

From the point of view of the survey respondents, the climate for teaching on their campuses was not particularly good in 1997 and worse in 1999. Most respondents expressed a belief that teaching quality was very important to them, with an average rating of 6.5 on a scale from 1 (not at all important) to 7 (extremely important). They considered teaching quality as being decreasingly important to their department heads (5.6), faculty colleagues (5.2), dean (5.14), and top university administrator (5.10). There was general agreement that teaching quality and teaching innovation (testing new instructional methods, writing textbooks or instructional software) were not important in the faculty incentive and reward system, with average ratings of 3.7 and 3.5 respectively (*Tables 8–12*). All significant changes from 1997 to 1999 were in the negative direction (*Tables 9 and 10*).

Women generally gave lower ratings of the importance of teaching to colleagues and administrators and in the reward system than did men (*Table 11*), and assistant professors gave lower ratings than associate professors, who in turn gave lower ratings than full professors. Administrators consistently rated the importance of teaching to themselves

[11] R. Brent, R. Felder, T. Regan, A. Walser, C. Carlson-Dakes, D. Evans, C. Malave, K. Sanders, J. McGourty, "Engineering Faculty Development: A Multicoalition Perspective," *Proceedings, 2000 Annual Meeting of the American Society for Engineering Education*, ASEE, June 2000.

and their colleagues and in the reward system higher than the rest of the faculty did (*Table 12*). Predictably, ratings of the importance of teaching quality in the reward system were higher at masters institutions (4.03) than at research institutions (3.65), but both ratings were relatively low.

We infer from these findings that professors who spend time and energy participating in faculty development programs and learning and implementing new methods do so despite their general belief that their efforts will neither be appreciated by their colleagues nor rewarded by their administrators. (There is some comfort in the fact that respondents gave department chairs the second-highest rating after themselves, indicating a belief that those who rise to that level feel that teaching is more important than it is to most rank-and-file faculty.) Nevertheless, the study shows that many of them choose to make the effort anyway, which we regard as a tribute to their dedication. The dramatic advances in the quality of American engineering education that might result from putting teaching and research on a more equal footing in the faculty reward system can only be imagined. Our hope is that the next survey administration in 2002 will reveal movement in this direction.

Acknowledgement

This work is supported by the SUCCEED Coalition (NSF Cooperative Agreement EEC-9727411). We are grateful to the representatives at each member campus for their assistance in providing e-mail lists of faculty members and other information.

Appendix A

1999-2000 SUCCEED Coalition Faculty Survey

To: __EMAIL__
From: Catherine E. Brawner <brawnerc@bellsouth.net>
Subject: 1999 SUCCEED Survey-R

1999 SUCCEED FACULTY SURVEY

This faculty survey has been e-mailed to your university engineering faculty by Dr. Catherine Brawner of Research Triangle Educational Consultants for SUCCEED. The purpose is to evaluate faculty teaching methods and instructional climate. Your individual responses will be held in strict confidence, will only be reported in the aggregate, and will not be seen by anyone on your campus. Your response is very important to SUCCEED and your college. If you have already replied to this survey, thank you. If not, please take the time to do so now. It should take approximately 15 minutes to complete.

INSTRUCTIONS

Click Reply in your email program to respond to this survey. For all questions enter your answers within the brackets to the left of the question. In some cases you will be asked for a number (e.g., How many years have you been teaching?); In others, you will be asked to choose an answer from a list of alternatives, entering the letter that corresponds with your choice in the brackets. Only responses within brackets will be captured by the analysis program.

[a] Correct
[a Incorrect
a] Incorrect
a Incorrect

If your answer to a question is "other", please put the corresponding letter in the brackets to the left of the question and your specific response in the brackets to the right of "other", for example:

e. Other, specify [this is my other response]

Further instructions are at the end of this survey. Thank you for your help.

[ ] 1. If you currently teach undergraduates or have done so in the past 3 years, please put an Y in the brackets and proceed to Question 2. If you do not teach undergraduates and have not done so in the past 3 years, put an N in the brackets and skip to Question 60.

[ ] 2. From August 1998 through July 1999 how many seminars, workshops, conferences, etc., did you attend that were specifically related to teaching?

[ ] 3. Since you began teaching, about how many seminars, workshops, conferences, etc., have you attended that were specifically related to teaching? Enter the letter from the following list that corresponds with your answer. a=0, b=1-2, c=3-5, d=6-10, e=more than 10.

[ ] 4. What level of involvement have you had in SUCCEED Coalition programs? Choose from the list below.

a. I don't know anything about the SUCCEED Coalition.
b. I've heard of the Coalition but haven't been involved with it.
c. I've attended a Coalition program (e.g., a workshop or conference), but haven't actively participated.
d. I have been involved as a principal investigator, campus implementation team member, or coalition focus team member.
e. Other, specify [ ]

****

Questions 5-10 refer to "teaching quality." By this we mean teaching that sets high but attainable standards for learning, enables most students being taught to meet or exceed those standards, and produces high levels of satisfaction and self-confidence in the students.

In Questions 5-11, please rate the importance of teaching quality and innovation on a scale from 1-7 with 1 meaning "not at all important" and 7 meaning "extremely important." Please use whole numbers.

[ ] 5. How important is teaching quality to you?
[ ] 6. How important do you feel teaching quality is to most of your department faculty colleagues?
[ ] 7. How important do you feel teaching quality is to your department head?
[ ] 8. How important do you feel teaching quality is to your dean?
[ ] 9. How important do you feel teaching quality is to the top administrator at your university?
[ ] 10. How important is teaching quality in your institution's faculty incentive and reward system (recognition, raises, tenure, promotion)?
[ ] 11. How important is teaching innovation (testing new methods, writing textbooks or instructional software) in your institution's faculty incentive and reward system (recognition, raises, tenure, promotion)?

****

In Questions 12-27, please think of a typical undergraduate course that you teach. We would like to know how frequently you use certain teaching techniques. Select the letter that corresponds with the first response that applies to you and type it in the brackets.

Questions 12-20 use the following scale: a=Every class, b=One or more times a week, c=One or more times a month, d=One or more times a semester, e=Never

How often do you:

[ ] 12. Lecture for most of the class period?
[ ] 13. Use demonstrations (live or multimedia)?
[ ] 14. Address questions to the class as a whole?

[ ] 15. Put students into pairs or small groups for brief intervals during class to answer questions or solve problems?
[ ] 16. Put students into pairs or small groups for most of a class period to answer questions or solve problems?
[ ] 17. Assign homework to individuals (as opposed to teams)?
[ ] 18. Give students the option of working in teams (2 or more) to complete homework?
[ ] 19. REQUIRE students to work in teams (2 or more) to complete homework?
[ ] 20. Give a writing assignment (any exercise that requires verbal explanations and not just calculations)?

****

[ ] 21. How often do you assign at least one major team project? a=In every course I teach, b=In some but not all courses I teach, c=Never

****

[ ] 22. On average, how many hours do you spend per week preparing lectures, assignments, and tests for a typical undergraduate course?

[ ] 23. On average, how many hours, EXCLUSIVE OF OFFICE HOURS, do you spend outside of class each week with undergraduate students for advising, study sessions, or other individual or group help?

****

Questions 24 and 25 use the following scale: a=Always, b=Usually, c=Sometimes, d=Never

[ ] 24. How often do you write formal instructional objectives for your courses (detailed statements of what you expect your students to be able to do to demonstrate their mastery of the course content)?

[ ] 25. How often do you give students study guides before tests?

****

Below is a list of many possible ways that one might use email or the web within the context of undergraduate instruction. Please put a Y in the brackets next to those that you use when teaching undergraduate classes and an N in the brackets next to those that you do not use.

[ ] 26. Send information by email to the whole class.
[ ] 27. Respond to student questions by email.
[ ] 28. Provide a class listserv or mailing lists for students to use.
[ ] 29. Post course syllabus on-line.
[ ] 30. Post student assignments on-line.
[ ] 31. Post old tests on-line.
[ ] 32. Post solutions to problems on-line.
[ ] 33. Post frequently asked questions on-line.

[ ] 34. Post links to other sites on-line.
[ ] 35. Provide a class chat room.
[ ] 36. Offer on-line tutorials.
[ ] 37. Post lecture notes/slides.
[ ] 38. Provide on-line quizzes.
[ ] 39. Provide on-line video.
[ ] 40. Provide on-line audio.
[ ] 41. Other, specify [ ]

****

Please enter a Y in the brackets next to all faculty development services that you have used on your campus. Please enter an N next to those that you have not used.

[ ] 42. Attended workshops or seminars.
[ ] 43. Worked individually with a teaching consultant.
[ ] 44. Attended meetings (e.g., discussion groups, brown bag lunches) to discuss professional development.
[ ] 45. Participated in a formal mentoring program (as a mentor or mentee).
[ ] 46. Consulted or borrowed books, tapes, etc.
[ ] 47. Consulted newsletter or web site.
[ ] 48. Had your teaching videotaped.
[ ] 49. Other, specify [ ]

****

Please enter a Y in the brackets next to any activity that you are doing differently in your teaching as a result of education related seminars/workshops/conferences that you have attended in the last three years. Otherwise enter an N.

[ ] 50. Writing formal instructional objectives.
[ ] 51. Using more active learning in class.
[ ] 52. Using more cooperative (team based) learning for assignments.
[ ] 53. Providing study guides to students before tests.
[ ] 54. Participating in a mentoring program.
[ ] 55. Other, describe [ ]

[ ] 56. How have the methods in questions 50-55 impacted your students' learning? a=Improved greatly, b=Improved moderately, c=Improved slightly, d=Did not improve, e=I did not change my activities.

****

Questions 57 and 58 use the following scale: a=1-3 times a week, b=1-3 times a month, c=1-3 times a semester, d=Never, e=Don't work with graduate students

[ ] 57. How often do you discuss teaching techniques with your colleagues?
[ ] 58. How often do you discuss teaching techniques with your graduate students?

****

[ ] 59. Do you solicit student feedback toward improving your teaching during the semester (other than through the end-of-course evaluation)? Y=yes, N=no

****

Please tell us a little about yourself.

[ ] 60. What is your University?
- a. Clemson
- b. FAMU-FSU
- c. Georgia Tech
- d. NC A&T
- e. NC State
- f. University of Florida
- g. University of North Carolina at Charlotte
- h. Virginia Tech

[ ] 61. Choose the response that best represents your department/discipline.
- a. Agricultural
- b. Aerospace
- c. Architectural
- d. Chemical
- e. Civil
- f. College of Engineering (no department)
- g. Computer Science
- h. Electrical or Electrical and Computer
- i. Engineering Technology
- j. Environmental
- k. Industrial
- l. Materials
- m. Mechanical
- n. Nuclear
- o. Dual appointment, list both [ ]
- p. Other, specify [ ]

[ ] 62. How many years have you been a faculty member at this institution?

[ ] 63. How many total years have you been a faculty member at this or any other institution?

[ ] 64. Sex (F = Female, M = Male)

[ ] 65. Current Rank
- a. Assistant Professor
- b. Associate Professor
- c. Professor
- d. Instructor/Lecturer
- e. Adjunct/Visiting (any rank)
- f. Emeritus (any rank)
- g. Other, specify [ ]

[ ] 66. Which category best describes your primary position?

a. Teaching Faculty
b. Teaching/Research Faculty
c. Research Faculty
d. Department Chair
e. Dean's office or other administration
f. Other, specify [ ]

67. Please provide any comments you may have about the quality or importance of teaching on your campus within the brackets below.
[ ]

****

Thank you for your time. Please click "Send" or equivalent to return the survey to Dr. Brawner. If you prefer, you may print the survey and mail your response to:

Research Triangle Educational Consultants
6316 Lakeland Drive
Raleigh, NC 27612

Appendix B

Survey Summary by Institution

Notes to the Appendix

These tables show the answers to each question by institution. The number of respondents and the percent of respondents are shown for the coalition as a whole. Only the percent of respondents at each institution is shown. The sample sizes range from 59 to 158 at research institutions and 21 to 35 at masters institutions. The number of people answering an individual question may vary.

1. Have you taught undergraduate courses in the last three years (% yes)?

Total		Research %					Masters %		
N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
508	87.3	94.3	86.4	82.0	78.6	85.3	96.0	91.4	90.9

2. From August 1998 through July 1999, how many seminars, workshops, conferences, etc., did you attend that were specifically related to teaching?

	Total	Research					Masters		
		Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
N	506								
M	1.41	1.4	1.8	1.1	.95	1.8	1.4	1.4	2.0
SD	1.86	2.12	1.69	1.56	1.54	2.02	1.41	1.32	2.34

3. Since you began teaching, how many seminars, workshops, conferences, etc., have you attended that were specifically related to teaching?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
0	48	9.5	9.4	2.0	9.6	16.9	6.2	20.8	6.3	5.0
1-2	106	20.9	20.8	9.8	28.8	24.7	21	16.7	18.8	15.0
3-5	159	31.4	26.8	41.2	34.2	37.7	27.2	33.3	25.0	30.0
6-10	79	15.6	18.1	17.6	17.8	7.8	17.3	8.3	12.5	20.0
More than 10	115	22.7	24.8	29.4	9.6	13.0	28.4	20.8	37.5	30.0

4. What level of involvement have you had in SUCCEED Coalition programs?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Don't know anything about SUCCEED	39	7.7	12.8	7.8	4.1	6.7	3.7	8.3	6.3	5.0
Heard of Coalition, not involved in it	245	48.5	66.4	39.2	60.3	38.7	42	29.2	31.3	10.0
Attended a Coalition program, but haven't actively participated	130	25.7	11.4	29.4	16.4	32	29.6	50	43.8	60.0
Been involved as a PI, CIT member, or CFT member	72	14.3	6.0	15.7	15.1	20	22.2	12.5	12.5	20.0
Other	19	3.8	3.4	7.8	4.1	2.7	2.5	-----	6.3	5.0

Questions 5-11. How do you rate the importance of teaching quality and innovation? Use a rating scale of 1 (low) to 7 (high) to rate your responses. "Teaching quality" refers to teaching that sets high but attainable standards for learning, enables most students being taught to meet or exceed those standards, and produces high levels of satisfaction and self-confidence in the students. In Question 11, rate the importance of teaching quality and innovation on a scale from 1-7, with 1 meaning "not at all important" and 7 meaning "extremely important".

Importance of Teaching:		Total	Research					Masters		
			Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Quality to You	N	508								
	M	6.5	6.4	6.7	6.5	6.6	6.6	6.5	6.7	6.4
	SD	.71	.73	.58	.78	.70	.65	.72	.60	.82
Quality to Colleagues	N	504								
	M	5.21	4.9	5.7	5.2	5.3	5.3	5.2	5.6	4.8
	SD	1.24	1.21	1.10	1.2	1.14	1.19	1.37	1.26	1.71
Quality to Dept. Head	N	503								
	M	5.57	5.4	6.0	5.7	5.6	5.6	5.6	5.8	4.8
	SD	1.31	1.34	1.05	1.18	1.24	1.32	1.53	1.14	1.94
Quality to Dean	N	494								
	M	5.15	5.2	5.3	4.9	4.8	5.4	5.1	5.6	5.2
	SD	1.49	1.43	1.62	1.55	1.38	1.45	1.62	1.63	1.28
Quality to President	N	485								
	M	5.11	5.2	5.4	5.0	4.6	5.3	4.7	5.3	5.1
	SD	1.52	1.44	1.52	1.57	1.49	1.48	1.74	1.56	1.65
Quality in reward system	N	501								
	M	3.71	3.5	4.2	3.4	3.7	3.7	3.8	4.3	3.7
	SD	1.49	1.54	1.53	1.46	1.34	1.45	1.8	1.33	1.05
Innovation in Rewards system	N	498								
	M	3.5	3.5	3.9	3.2	3.3	3.7	3.5	3.8	3.2
	SD	1.42	1.46	1.49	1.29	1.27	1.47	1.5	1.46	1.18

Questions 12-25. Respondents were asked to: "Think of a typical undergraduate course that you teach. We would like to know how frequently you use certain teaching techniques. How often do you_____?"

12. Lecture for most of the class period

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	301	59.5	65.3	54.9	59.7	61	56.8	58.3	54.8	40.0
One or more times a week	166	32.8	32.7	39.2	30.6	31.2	30.9	37.5	32.3	35.0
One or more times a month	24	4.7	1.3	3.9	8.3	5.2	4.9	------	6.5	20.0
One or more times a semester	4	.8	------	------	1.4	1.3	2.5	------	------	------
Never	11	2.2	.7	2.0	------	1.3	4.9	4.2	6.5	5.0

13. Use demonstrations (live or multimedia)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	30	5.9	1.3	3.9	4.2	14.3	8.6	12.5	6.3	------
One or more times a week	125	24.7	18.1	39.2	25.0	29.9	18.5	16.7	40.6	25.0
One or more times a month	163	32.2	31.5	17.6	38.9	27.3	38.3	33.3	31.3	45.0
One or more times a semester	146	28.9	34.9	25.5	27.8	24.7	27.2	37.5	18.8	25.0
Never	42	8.3	14.1	13.7	4.2	3.9	7.4	-----	3.1	5.0

14. Address questions to the class as a whole

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	398	78.8	79.3	76.5	73.6	83.1	82.5	70.8	78.1	78.9
One or more times a week	86	17	18.7	17.6	15.3	14.3	16.3	20.8	15.6	21.1
One or more times a month	14	2.8	1.3	3.9	9.7	1.3	1.3	4.2	------	-----
One or more times a semester	4	.8	-----	2.0	1.4	1.3	------	-----	3.1	-----
Never	3	.6	.7	-----	------	-----	------	4.2	3.1	-----

15. Put students into pairs or small groups for brief intervals during class to answer questions or solve problems

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	30	5.9	1.3	7.8	5.6	9.1	8.8	12.5	9.4	-----
One or more times a week	80	15.8	10	25.5	20.8	9.1	13.8	20.8	25.0	30
One or more times a month	92	18.2	15.3	17.6	22.2	20.8	15	12.5	12.5	45
One or more times a semester	104	20.6	21.3	15.7	23.6	18.2	26.3	25	6.3	20
Never	200	39.5	52	33.3	27.8	42.9	36.3	29.2	46.9	5

16. Put students into pairs or small groups for most of the class period to answer questions or solve problems

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	10	2.0	-----	2.0	------	4.0	4.9	4.2	------	5.0
One or more times a week	30	6.0	2.7	9.8	11.4	4.0	1.2	16.7	9.4	10.0
One or more times a month	59	11.8	8.1	11.8	11.4	6.7	13.6	16.7	21.9	30.0
One or more times a semester	87	17.3	18.1	17.6	15.7	13.3	18.5	20.8	12.5	30.0
Never	316	62.9	71.1	58.8	61.4	72.0	61.7	41.7	56.3	25.0

17. Assign homework to individuals (as opposed to teams)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	115	22.7	22.0	25.5	11.3	16.9	33.3	33.3	25.0	25.0
One or more times a week	226	44.7	47.3	54.9	42.3	45.5	34.6	29.2	46.9	60.0
One or more times a month	92	18.2	20.0	9.8	28.2	18.2	14.8	16.7	15.6	10.0
One or more times a semester	33	6.5	5.3	3.9	11.3	6.5	4.9	12.5	6.3	5.0
Never	40	7.9	5.3	5.9	7.0	13	12.3	8.3	6.3	------

18. Give students the option of working in teams (2 or more) to complete homework

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	89	17.7	14.2	22.0	21.1	18.2	15.0	25.0	25.0	10.0
One or more times a week	91	18.1	20.3	26.0	18.3	14.3	11.3	20.8	12.5	30.0
One or more times a month	99	19.7	25.0	18.0	22.5	11.7	18.8	------	15.6	40.0
One or more times a semester	89	17.7	17.6	14.0	12.7	19.5	23.8	16.7	25	5.0
Never	134	26.7	23.0	20.0	25.4	36.4	31.3	37.5	21.9	15.0

19. REQUIRE students to work in teams (2 or more) to complete homework

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	29	5.7	4.0	4.0	8.3	6.5	6.2	8.3	3.1	10.0
One or more times a week	52	10.3	8.7	12.0	16.7	15.6	3.7	16.7	3.1	5.0
One or more times a month	64	12.7	10.1	24.0	11.1	6.5	12.3	8.3	18.8	30.0
One or more times a semester	126	25	28.9	22.0	18.1	23.4	27.2	16.7	25.0	35.0
Never	234	46.3	48.3	38.0	45.8	48.1	50.6	50.0	50.0	20.0

20. Give a writing assignment (any exercise that requires verbal explanations and not just calculations)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Every Class	29	5.8	6.0	4.1	7.0	2.6	8.6	8.3	3.2	5.0
One or more times a week	78	15.5	15.4	12.2	15.5	22.1	9.9	12.5	16.1	25.0
One or more times a month	160	31.9	28.2	38.8	29.6	24.7	43.2	20.8	32.3	45.0
One or more times a semester	174	34.7	36.2	36.7	35.2	39.0	29.6	37.5	29.0	25.0
Never	61	12.2	14.1	8.2	12.7	11.7	8.6	20.8	19.4	-----

21. Assign at least one major team project

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
In every course I teach	129	25.6	20.1	25.5	30.0	27.6	22.2	50.0	25.0	30.0
In some but not all courses I teach	286	56.9	61.1	56.9	51.4	52.6	59.3	37.5	62.5	65.0
Never	88	17.5	18.8	17.6	18.6	19.7	18.5	12.5	12.5	5.0

22. On average, how many hours do you spend per week preparing lectures, assignments, and tests for a typical undergraduate course?

	Total	Research					Masters		
		Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
N	499								
M	9.2	8.5	8.6	9.7	10.0	8.9	9.4	11.4	7.6
SD	5.35	4.39	3.89	5.29	5.22	4.84	4.94	10.6	5.02

23. On average, how many hours, EXCLUSIVE OF OFFICE HOURS, do you spend outside of class each week with undergraduate students for advising, study sessions, or other individual or group help?

	Total	Research					Masters		
		Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
N	500								
M	3.9	3.3	4.7	3.5	4.2	3.4	4.3	5.7	4.8
SD	3.77	3.36	4.39	3.31	3.49	3.8	3.92	4.83	4.38

24. Write formal instructional objectives for your courses (detailed statements of what you expect your students to be able to do to demonstrate their mastery of the course content)?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Always	214	42.5	43.3	48.0	31.0	50.0	39.5	50.0	40.6	42.1
Usually	114	22.7	24.0	16.0	26.8	23.7	21.0	16.7	21.9	26.3
Sometimes	114	22.7	22.7	22.0	22.5	19.7	25.9	29.2	21.9	15.8
Never	61	12.1	10.0	14.0	19.7	6.6	13.6	4.2	15.6	15.8

25. Give students study guides before tests

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Always	178	35.7	35.6	31.3	34.3	38.2	38.8	41.7	21.9	45.0
Usually	124	24.8	27.5	20.8	28.6	21.1	25.0	12.5	31.3	20.0
Sometimes	98	19.6	20.1	20.8	21.4	25.0	13.8	16.7	18.8	15.0
Never	99	19.8	16.8	27.1	15.7	15.8	22.5	29.2	28.1	20.0

Questions 26-41. Which of the following forms of email or web communications have you used as an instructor within the context of an undergraduate course? (Percent answering yes is reported)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Send information by email to the whole class	381	75.3	80.5	82.4	73.7	58.4	84.0	79.2	68.8	60.0
Respond to student questions by email.	487	96.4	97.3	98.0	97.2	94.8	100.0	95.8	96.9	75.0
Provide a class listserv or mailing lists for students to use.	157	31.2	30.9	75.0	16.7	27.3	54.3	41.7	31.3	10.0
Post course syllabus on line	333	65.9	60.4	50.0	68.1	84.4	75.3	83.3	50.0	35.0

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Post student assignments on line	302	59.8	59.7	49.0	61.1	66.2	65.4	66.7	50.0	42.1
Post old tests on line	190	37.8	58.5	20.0	29.2	46.8	27.2	25.0	25.0	5.0
Post solutions to problems on line	244	48.4	59.5	35.3	50.0	58.4	38.3	52.2	28.1	25.0
Post frequently asked questions on line	122	24.3	27.0	22.0	18.1	23.7	27.2	25.0	28.1	15.0
Post links to other sites on line	222	44	45.9	37.3	40.3	50.6	50.6	41.7	40.6	15.0
Provide a class chat room	54	10.8	13.5	6.1	2.8	10.7	6.2	33.3	21.9	5.0
Offer on line tutorials	81	16.1	16.1	14.0	18.1	14.3	17.5	29.2	12.5	5.0
Post lecture notes/slides	222	44	38.3	28.0	47.2	56.6	55.6	50	37.5	25.0
Provide on line quizzes	36	7.1	8.1	11.8	4.2	3.9	1.3	16.7	12.5	15.0
Provide on line video	22	4.4	7.4	2.0	4.2	4.0	2.5	8.3	------	------
Provide on line audio	19	3.8	5.4	------	4.2	2.6	2.5	8.3	6.3	------
Other	57	23.1	22.7	30.8	22.6	16.3	31.7	14.3	14.3	25.0

Questions 42-49. Which of the following faculty development services have you used on campus? (Percent answering yes is reported)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Attended workshops or seminars	413	81.6	80.0	96.0	76.7	60.5	95.1	79.2	87.5	95.0
Worked individually with a teaching consultant	63	12.5	26.2	2.0	2.8	6.7	7.4	8.3	15.6	15.0
Attended meetings (e.g., discussion groups, brown bag lunches) to discuss professional development.	324	64.2	72.7	55.1	54.8	44.7	72.8	54.2	78.1	85.0
Participated in a formal mentoring program (as a mentor or mentee)	179	35.4	38.7	44	27.4	28.9	34.6	29.2	43.8	40.0
Consulted or borrowed books, tapes, etc.	312	62.2	61.3	65.3	50.7	68.9	63.0	50.0	78.1	63.2

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Consulted a newsletter or web site	295	59	48.3	69.4	63.9	64.9	61.7	41.7	75.0	57.9
Had your teaching videotaped	196	39	47.7	16.3	38.4	58.7	28.4	41.7	28.1	15.0
Other	25	11.8	13.2	13	20	8.3	8.1	12.5	8.3	10.0

Questions 50-55. Are you doing any of the following activities differently as a result of education related seminars/workshops/conferences you attended in the last 3 years? (Percent answering yes is reported)

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Write formal instructional objectives	210	42.7	31.1	47.9	37.7	54.2	45.7	56.5	41.9	65.0
Use more active learning in class	294	59.4	47.7	67.3	62.3	55.6	60.5	73.9	75.0	85.0
Use more cooperative (team based) learning for assignments	212	43.1	29.9	52.1	53.6	43.1	40.7	52.2	50.0	70.0
Provide study guides to students before tests	139	28.2	20.3	24.5	31.9	33.8	29.6	39.1	31.3	40.0

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Participate in a mentoring program	87	17.8	18.2	25.5	13.2	11.1	12.3	8.7	37.5	36.8
Other	33	14.9	11.7	27.3	20.0	12.5	8.1	14.3	21.4	20.0

56. How have the methods in questions 50-55 impacted your students' learning?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Improved greatly	40	9.2	9.1	8.7	1.6	12.7	2.7	18.2	25	11.1
Improved moderately	132	30.2	29.8	39.1	31.1	30.2	23.0	22.7	28.1	50.0
Improved slightly	127	29.1	24	28.3	36.1	17.5	39.2	18.2	37.5	38.9
Did not improve	25	5.7	5.0	6.5	6.6	4.8	5.4	18.2	3.1	-----
I did not change my activities	113	25.9	32.2	17.4	24.6	34.9	29.7	22.7	6.3	----

57. How often do you discuss teaching techniques with your colleagues?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
1-3 times a week	87	17.3	16.7	25.5	7.1	17.3	29.6	12.5	12.5	------
1-3 times a month	168	33.4	30.7	29.4	34.3	41.3	34.6	20.8	31.3	45
1-3 times a semester	214	42.5	44.7	37.3	52.9	37.3	32.1	54.2	53.1	35
Never	34	6.8	8.0	7.8	5.7	4.0	3.7	12.5	3.1	20

58. How often do you discuss teaching techniques with your graduate students?

	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
1-3 times a week	32	6.4	7.4	4.0	7.2	10.7	4.9	8.3	-------	------
1-3 times a month	103	20.6	21.5	20.0	20.3	33.3	21.0	4.2	12.5	------
1-3 times a semester	218	43.7	51	40	44.9	48	39.5	33.3	34.4	21.1
Never	98	19.6	17.4	20	23.2	4.0	17.3	45.8	18.8	63.2
Do not work with graduate students	48	9.6	2.7	16	4.3	4.0	17.3	8.3	34.4	15.8

59. Do you solicit feedback toward improving your teaching during the semester (other than through the end-of-course evaluation)?

Total		Research %					Masters %		
N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
386	78	80.3	78.4	66.2	86.7	72.2	82.6	75.0	90.0

Questions 60-64. Demographic Information

Department/Discipline	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Agricultural	7	1.2	------	-------	------	7.2	-------	-------	-------	------
Aerospace	34	5.9	10.1	-------	1.1	10.3	7.6	------	-------	-------
Architectural	3	.5	1.3	-------	------	------	-------	------	-------	4.8
Chemical	39	6.8	8.2	10.2	9	3.1	3.3	16	-------	9.5
Civil	83	14.4	11.9	16.9	18	14.4	14.1	4.0	14.3	23.8
College of Engineering (no department)	29	5.0	3.1	5.1	1.1	6.2	9.8	------	5.7	14.3
Computer Science	22	3.8	------	------	10.1	7.2	-------	------	11.4	9.5
Electrical or Electrical and Computer	108	18.7	22.0	16.9	21.3	14.4	15.2	32.0	20.0	4.8
Engineering Technology	11	1.9	0.6	------	------	2.1	-------	4.0	20.0	-------
Environmental	28	4.9	3.8	8.5	1.1	9.3	5.4	8	-------	-------
Industrial	61	10.6	12.6	6.8	12.4	7.2	10.9	16.0	-------	23.8
Materials	26	4.5	3.8	1.7	7.9	8.2	3.3	------	2.9	-------
Mechanical	94	16.3	18.9	25.4	13.5	7.2	15.2	20.0	25.7	9.5
Nuclear	6	1.0	1.3	------	4.5	------	-------	------	-------	-------
Other	26	4.5	2.5	8.5	------	3.1	15.2	-------	-------	-------

Gender	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Female	54	9.3	10.8	5.1	10.1	9.4	10.5	4.0	8.6	9.1
Male	524	90.7	89.2	94.9	89.9	90.6	89.5	96.0	91.4	90.9

Current Rank	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Assistant Professor	122	21.2	21.5	25.4	11.4	29.2	17.2	24.0	25.7	19.0
Associate Professor	157	27.3	27.8	28.8	26.1	22.9	28.0	32.0	28.6	33.3
Professor	248	43.1	50.0	39	45.5	38.5	41.9	40.0	28.6	47.6
All other ranks (instructor/lecturer, emeritus, adjunct/visiting, other)	48	8.3	0.6	6.8	17.0	9.3	13.0	4.0	17.3	------

Primary Position	Total		Research %					Masters %		
	N	%	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
Teaching Faculty	50	8.7	7.0	12.1	7.9	4.1	10.6	4.0	22.9	9.1
Teaching/Research Faculty	437	75.6	81.6	79.3	76.4	77.3	70.2	76.0	48.6	77.3
Research Faculty	28	4.8	4.4	------	5.6	4.1	7.4	8.0	8.6	-------
Department Chair or Dean's office	43	7.4	4.4	8.6	5.6	8.3	4.3	12.0	14.3	13.6
Other	20	3.5	2.5	------	4.9	6.2	7.5	------	5.7	------

Years as a faculty member			Research					Masters		
		Total	Beta	Theta	Eta	Zeta	Omega	Pi	Psi	Phi
At this institution	M	12.3	11.8	11.5	14.8	11.9	13.8	9.1	9.3	11.5
	SD	9.4	8.3	9.7	10.3	9.9	10.0	8.3	9.1	7.4
	N	579								
Total at all institutions	M	14.8	14.2	13.9	17.4	14.3	16.1	14.2	11.9	15.1
	SD	10.8	9.5	11.6	11.3	11.5	10.9	12.4	10.6	7.6
	N	570								

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