

Chapter 7

Faculty, Administration, and Special Topics in Mathematics Programs at Two-Year Colleges

This chapter continues the presentation of data and analysis about mathematics faculty and programs in public two-year colleges. It reports the number, teaching conditions, education, professional activities, age, gender, and ethnicity of the faculty in these mathematics programs in fall 2010. Also included is information on mobility into, within, and out of two-year college mathematics program teaching positions. Additional analysis of the items discussed in this chapter can be found in Chapters 1 and 2, where they are discussed from a comprehensive point of view in comparison to similar data for four-year colleges and universities. In particular, Chapter 2 discusses issues related to dual enrollment, distance-learning courses, and pre-service teacher training.

CBMS survey data has been collected since 1965. However, unlike surveys prior to 1995, the mathematics faculty surveyed in 1995, 2000, 2005, and 2010 did not include faculty who taught in computer science programs that were separate from mathematics programs. Also, CBMS2005 and CBMS2010 include only public two-year colleges. A more detailed statement on this issue occurs at the start of Chapter 6. Information on the sampling procedure used in the 2010 survey is in Appendix II. A copy of the two-year college survey questionnaire for CBMS2010 can be found in Appendix V.

The term “full-time permanent” is used frequently in this chapter. Two-year college faculty members in this category have an ongoing stable relationship with the mathematics program similar to that of tenured and tenure-track faculty at four-year institutions. They occupy a recurring position in the college’s budget and are subject to the college’s long-term evaluation and reappointment policy. They are the group of faculty primarily responsible for teaching, curriculum development, student advising, committee appointments, and other forms of college service. Full-time faculty who are not permanent are called “temporary full-time faculty.”

The term “tenure” is not used because many two-year colleges do not have traditional tenure systems, and the use of the word “tenure” in the survey questionnaire would have been inappropriate for some respondents. At two-year colleges, faculty stability is often embodied in a sequence of recurring contracts or appointments typically running from three to five

years. Full-time permanent faculty members teach full course assignments, distinguishing them from part-time or adjunct faculty. Full-time permanent faculty are distinguished from “temporary” full-time faculty who are meeting a short-term institutional need, usually employed with a one-year contract.

The Table display code in this chapter is TYF, for “two-year faculty,” since the chapter discusses issues related to faculty.

Highlights of Chapter 7

- There were 9,790 full-time permanent faculty in public two-year college mathematics programs in the United States in fall 2010. This 11% increase in faculty experienced between 2005 and 2010 is less than the 19-21% increase in student enrollment during the same period (see Chapter 6) and less than the 26% increase in student enrollment between 2000 and 2005. Addressing the disparity between full-time permanent faculty and student enrollment numbers, temporary full-time faculty increased 78% from 2005 to a total of 1083 individuals in 2010. This increase is additionally notable considering the 63% decrease in temporary full-time faculty that occurred between 2000 and 2005. See Table TYF.1.
- In fall 2010, the number of part-time faculty (23,453) in two-year college mathematics programs was more than twice the number of full-time faculty. Part-time faculty represented 70% of the total number of faculty when those paid by third parties such as school districts are included (2323). When third party payees are omitted, part-time faculty represented 68% of the total number of faculty. See Table TYF.1.
- Forty-six percent (46%) of all sections were taught by part-time faculty members, a two-point drop from 2005. See Table S.5 in Chapter 1.
- The average teaching assignment for full-time permanent faculty decreased slightly to 15 classroom contact hours in fall 2010 in comparison to 15.3 in fall 2005. See Table TYF.2.
- Table TYF.2 shows that 65% of full-time permanent faculty taught extra hours for extra pay at their own college in fall 2010, up from 53% in 2005. Of

- those faculty who taught for extra pay, 47% taught 1-3 extra hours, 39% taught 4-6 hours, and 14% taught 7 or more extra hours. See Table TYF.2.
- In fall 2010, a masters degree was the terminal degree for 83% of the full-time permanent mathematics faculty members at two-year colleges, up one point from 2005. An additional 14% of full-time faculty held doctorates and 3% held bachelors degrees. Of the total full-time permanent faculty, 68% held degrees in mathematics, and 21% held degrees in mathematics education. See Tables TYF.4 and TYF.5.
 - Among part-time faculty in fall 2010, 73% held a masters degree and 22% had a bachelors degree as their highest degree. A bachelors degree is generally allowed by accrediting agencies for those who teach precollege (remedial) courses or highly specialized technical courses. The percentage of part-time faculty holding a doctorate has been steady at 5% to 6% since 2000. See Table TYF.6.
 - Of the total part-time faculty, 48% held degrees in mathematics, 26% in mathematics education, and 2% in statistics. See Table TYF.7.
 - For the second time in a CBMS survey, the proportion of men and women among the full-time permanent faculty was evenly divided in 2005 and 2010. In 2010, women made up 49% of the part-time faculty. See Tables TYF.8, TYF.9, and TYF.17.
 - In fall 2010, sixteen percent (16%) of full-time permanent faculty members in mathematics programs were ethnic minorities totaling 1566 faculty, up from 14% in 2005. The majority of faculty represented in the ethnic groups were Asian/Pacific Islander or Black (non-Hispanic). See Tables TYF.10, TYF.11, and TYF.12.
 - Ethnic minorities accounted for 16% of full-time permanent faculty and 18% of full-time permanent faculty under age 40. This is lower than the percentage of masters degrees awarded to ethnic minorities in 2008-2009 (22%). See Table TYF.13.
 - Among newly-hired full-time permanent faculty in fall 2010, 18% were ethnic minorities (Asian/Pacific Islander, Black, Hispanic) and 47% were women. See Table TYF.20.
 - Among part-time faculty, 17% were ethnic minorities (Asian/Pacific Islander, Black, Hispanic) in fall 2010. See Tables TYF.14 and TYF.15.
 - The number of full-time permanent faculty in mathematics programs at two-year colleges increased 11% from 2005 to 2010 to a total of 9,790 faculty. This was an increase of 997 new permanent faculty hires for 2010, compared to 1,833 new hires in 2005. See Table TYF.16.
 - Distribution of faculty by age fluctuated in the last decade. The percentage of faculty 50-54 years of age decreased from 20% in 2000 to 11% in 2010. In contrast, the percentage increase in the number of full-time permanent faculty in the age group greater than 59 years was 11% in 2005 and 17% in 2010. The average age was 46.8 in 2010 compared with 47.8 in 2005. See Table S.18 in Chapter 1 and Table TYF.17.
 - The source of 777 newly hired full-time permanent faculty in fall 2010 differed slightly from the source in 2005. A lower percentage of new full-time permanent faculty came from four-year institutions (3% in 2010 and 18% in 2005), and a larger percentage came from secondary schools (25% in 2010 and 13% in 2005). Eight-two percent (82%) of newly hired full-time faculty held masters degrees in 2010. See Tables TYF.18 and TYF.19.
 - The percentage of two-year colleges requiring periodic teaching evaluations for all full-time faculty members increased from 89% in 2005 to 96% in 2010 and remained about the same for part-time faculty (88%, down from 89%). Changes in the percentages of methods used for evaluating teaching were observed with increases in observations by an administrator, written peer evaluations, and the use of self-evaluation with tools such as teaching portfolios (52% in 2010, up from 19% in 2005). See Tables TYF.21, TYF.22, and TYF.26.
 - The percentage of two-year colleges requiring annual continuing education or professional development for full-time permanent faculty rose to 67%, up from 55% in 2005. The percentages of specific activities used to meet professional development requirements in 2010 were similar to those in 2005. See Table TYF.23.
 - The three items reported by the highest percentage of mathematics program heads as being a major problem in 2010 were the same as in 2005:
 - i. too many students needing remediation (67%),
 - ii. students not understanding the demands of college work (64%), and
 - iii. low student motivation (50%).

When considering issues reported as “somewhat of a problem,” the percentages for the three items above (in the same order) were 90%, 93%, and 91% of colleges. Too many students needing remediation and low student motivation were also at the top of the problems list in 2000 and near the top in 2005. See Tables TYF.24 and TYF.25.
 - In fall 2010, a traditional mathematics department was found in close to half (46%) of the two-year colleges, up 7 points when compared with 2005. A combined mathematics/science department or

division was the management structure at 14% of institutions, down from 35% in 2005, while “other” department or division structures were reported at 31% of responding institutions, compared with 15% in 2005. See Table TYF.26.

- Continuing the expanded role for two-year colleges in teacher preparation, especially at the elementary school level, 36% of institutions assigned a mathematics faculty member to coordinate K-8 teacher education in mathematics. Pre-service elementary teachers could complete their entire mathematics course requirement or licensure requirements at the two-year college in 41% of institutions, up from 30% in 2005. Table SP.2 in Chapter 4 reflects increases in all percentages of organized programs for pre- and in-service teachers. See Special Topics in Chapter 2, Table SP.4.
- As reported in Chapter 6, 80,805 students were dually enrolled in fall 2010 in a two-year college mathematics course that gave credit at both the high school and at the college, almost doubling 2005 numbers. The academic control of such courses resided primarily with the two-year colleges. Ninety-six percent (96%) of two-year college mathematics programs reported that they always approved the syllabus, and 71% reported that they always chose the textbook. Forty-seven percent (47%) of the colleges reported that they controlled the choice of instructor, and 41% reported control over the design of the final exam. The majority of dual-enrollment courses were taught on a high school campus by a high school faculty member. Twenty-two percent (22%) of two-year colleges participating in dual enrollment assigned their own faculty members, teaching 8% of the dually enrolled students. See Tables SP.18 and SP.19 in Chapter 2.
- As noted in Chapter 6, twenty-nine percent (29%) of two-year colleges reported that some of their precollege (remedial) mathematics courses were

administered separately from the mathematics program in fall 2010, often in a developmental studies department. This percentage was two points lower than the 31% in 2005 for precollege courses. Within precollege courses, Arithmetic/Pre-algebra taught outside the mathematics program increased four percentage points, Elementary Algebra was down two points, and Intermediate Algebra remained the same. See Table TYE.17 in Chapter 6.

The Number and Teaching Assignments of Full-time and Part-time Two-Year-College Mathematics Program Faculty

Number of full-time permanent faculty and part-time faculty

In the last decade, the number of full-time permanent mathematics faculty at two-year colleges resumed the growth trend that had characterized the period from 1980 to 1995. There was a one-time 8% decline in full-time permanent faculty between 1995 and 2000. The growth from 2005 to 2010 was 11%, following the 26% increase from 2000 to 2005. The number of full-time permanent faculty in 2010 was a record 9,790. While the increase in full-time faculty is a positive trend, the 11% increase in full-time mathematics faculty falls short of the 19% increase (excluding dual enrollment) in mathematics students from 2005 to 2010. See Table TYF.1. Dual enrollment is discussed at the end of Chapter 6, later in this chapter, and comprehensively in Chapter 2.

Another 1083 faculty were reported as “full-time temporary” in 2010, a 76% increase from 2005. The increase in mathematics faculty, both full-time permanent and full-time temporary, is attributable to the growth in enrollment. However, the larger growth in temporary faculty may be an indication of the stressed financial conditions in colleges, particularly in the last half of the decade. See Chapter 6 for two-year

TABLE TYF.1 Number of full-time permanent, full-time temporary faculty, and part-time faculty paid by two-year colleges (TYC) and by a third party (e.g. dual-enrollment instructors) in mathematics programs at two-year colleges in fall 1995, 2000, 2005, and 2010.

| Two-Year Colleges | 1995 | 2000 | 2005 | 2010 |
|--------------------------------|-------|-------|-------|-------|
| Full-time permanent faculty | 7578 | 6960 | 8793 | 9790 |
| Full-time temporary faculty | 164 | 961 | 610 | 1083 |
| Part-time faculty paid by TYC | 14266 | 14887 | 18227 | 23453 |
| Part-time, paid by third party | na | 776 | 1915 | 2323 |

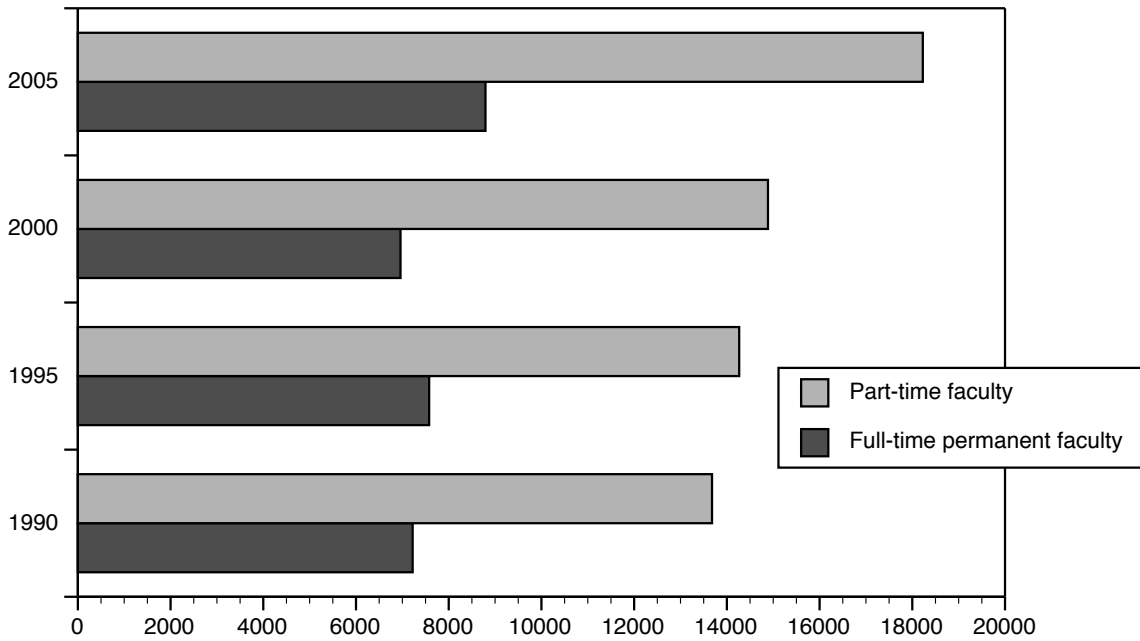


FIGURE TYF.1.1 Number of full-time permanent faculty and part-time faculty in mathematics programs in two-year colleges in fall 1990, 1995, 2000, and 2005. (Data for 2005 include public two-year colleges only.)

college enrollment data and the overall enrollment data summary in Chapter 1.

Part-time faculty members fell into two categories, those paid by two-year colleges and others paid by a third party. The latter most often were high school teachers in a school with which the college had a dual-enrollment agreement. When both categories are included, part-time faculty numbered 25,776 or 70% of the total two-year college teaching staff. When third party payees are excluded, part-time faculty members were 68% of total faculty, up two percentage points from 2005. See Table TYF.1.

Teaching assignment of full-time permanent and part-time faculty

The average required teaching assignment in weekly classroom contact hours for a full-time permanent mathematics faculty member at a public two-year college was 15 weekly contact hours in 2010. This continued a twenty-year period of oscillation. In 2005 the average was 15.3, in 2000 the average weekly contact hour assignment had been 14.8, and in 1995 it was reported as 15.8. In 1990 the number was 14.7 hours and in 1985 it had been 16.1 hours. See Tables TYF.2 and TYF.2.1.

TABLE TYF.2 Teaching assignment for full-time permanent faculty, and teaching and other duties of part-time faculty, in mathematics programs at two-year colleges in fall 2010, with 2005 data in parentheses.

| | Teaching assignment in weekly contact hours | | | | | |
|--|---|----------|------------|----------|----------|----------|
| | <10 | 10 to 12 | 13 to 15 | 16 to 18 | 19 to 21 | >21 |
| Percentage of two-year colleges | 3 (0) | 7 (6) | 76 (79) | 8 (8) | 3 (4) | 3 (3) |
| Full-time Permanent Faculty | | | | | | |
| A. Average weekly contact hours: 15 (15.3) | | | | | | |
| B. Percentage who teach extra hours for extra pay at their own two-year college: 65% (53%) | | | | | | |
| C. Percentage teaching 1-3 extra hours for extra pay: 47% | | | | | | |
| D. Percentage teaching 4-6 extra hours for extra pay: 39% | | | | | | |
| E. Percentage teaching 7 or more extra hours for extra pay: 14% | | | | | | |
| Part-time Faculty | | | | | | |
| F. Percentage who teach 6 or more hours weekly: 54% | | | | | | |
| G. Percentage of two-year colleges requiring part-time faculty to hold office hours: 28% | | | | | | |

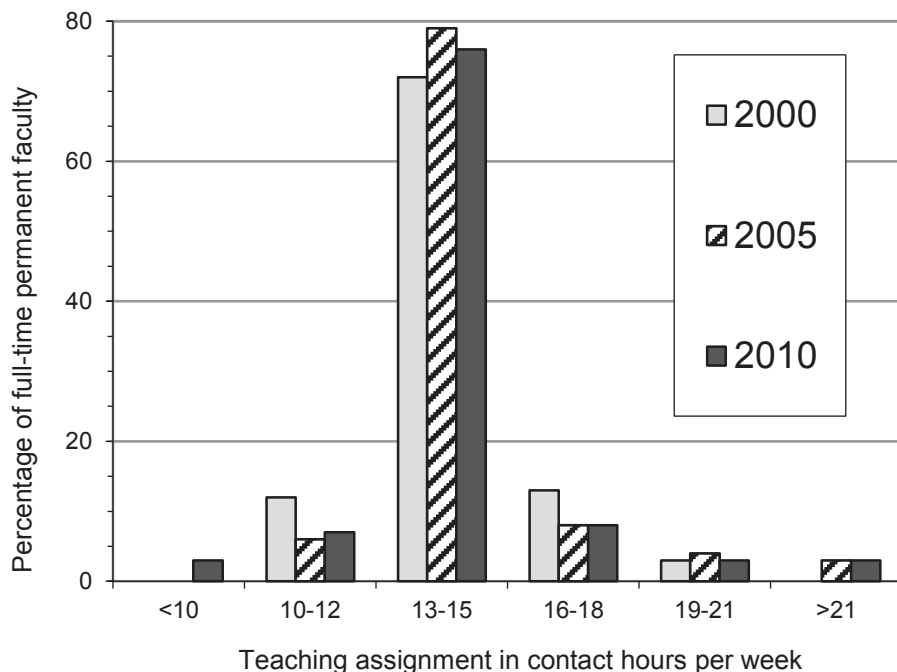


FIGURE TYF.2.1 Percentage of full-time permanent faculty with various teaching assignments in mathematics programs at two-year colleges in fall 2000, 2005, and 2010.

In 2010, the teaching requirement for full-time faculty was between 13 and 15 weekly contact hours in 76% of colleges. Fourteen percent (14%) had weekly contact hour teaching assignments greater than 15 hours, including 3% teaching more than 21 hours. Ten percent (10%) had teaching assignments below 13 weekly contact hours.

Fifty-four percent (54%) of part-time faculty members in two-year college mathematics programs taught six credit hours or more, down three percentage points from 2005. Office hours were required of part-time faculty in 28% of two-year colleges, down 9 points from 2005. See Table TYF.2.

Table TYF.2 also shows that 65% of full-time permanent mathematics faculty members at two-year colleges taught extra hours for extra pay at their own colleges, compared with 53% in 2005. Data was collected regarding the specific number of hours taught for extra pay for the first time in 2010: 47% of full-time permanent faculty taught 1-3 hours for

extra pay, 39% taught 4-6 hours, and 14% taught 7 or more extra hours for extra pay.

Outflow of full-time permanent mathematics faculty

Data about outflow of permanent faculty were collected in detail prior to CBMS2010, including specific information about faculty retiring, faculty taking positions at four-year institutions, other two-year institutions, high schools, or graduate school. In CBMS2005, the number of deaths or retirements were reported as 292 persons. Because this information is difficult to obtain, CBMS2010 collected only the total number of outflow of faculty of 459 persons. The authors acknowledge that this data is difficult to collect and may not represent a true picture in the change in faculty numbers over time.

Other occupations of part-time faculty

CBMS2010 did not collect information about other occupations of part-time faculty.

TABLE TYF.3 Number of full-time permanent faculty in 2009-2010 who were no longer part of the faculty in 2010-2011.

| | |
|--|------|
| Number no longer part of 2010-2011 faculty | 459 |
| Total full-time permanent faculty, fall 2010 | 9790 |

Educational Credentials of Faculty in Mathematics Programs

Highest degree of full-time permanent faculty

A masters degree was the terminal degree for 83% of full-time permanent mathematics faculty at two-year colleges, a percentage that has increased from 79% over the last 20 years. See Table TYF.4 and Figure TYF.4.1. The percentage of faculty with a doctorate decreased to 14% in 2010, a three-point decrease over two decades. The percentage of full-time faculty whose terminal degree was a bachelors was 3% in 2010, down 1 point from 1990 and up one point

from 2005. Data regarding the previous employment and degrees of *new hires* in fall 2010 can be found in Tables TYF.18 and TYF.19, along with additional discussion there.

The academic major of the highest degree of full-time permanent two-year college mathematics faculty is shown in Table TYF.5. Compared to 2005 data, the proportion of the faculty with a masters or doctorate with major field mathematics dropped two points to 68%. The percentage of faculty whose most advanced degree was in mathematics education increased three points to 21%. The percentage of degrees with majors in statistics or other fields decreased slightly.

TABLE TYF.4 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by highest degree in fall 1990, 1995, 2000, 2005, and 2010.

| Highest degree | Percentage of full-time permanent faculty | | | | |
|---------------------------------------|---|------|------|------|------|
| | 1990 | 1995 | 2000 | 2005 | 2010 |
| Doctorate | 17 | 17 | 16 | 16 | 14 |
| Masters | 79 | 82 | 81 | 82 | 83 |
| Bachelors | 4 | 1 | 3 | 2 | 3 |
| Number of full-time permanent faculty | 7222 | 7578 | 6960 | 8793 | 9790 |

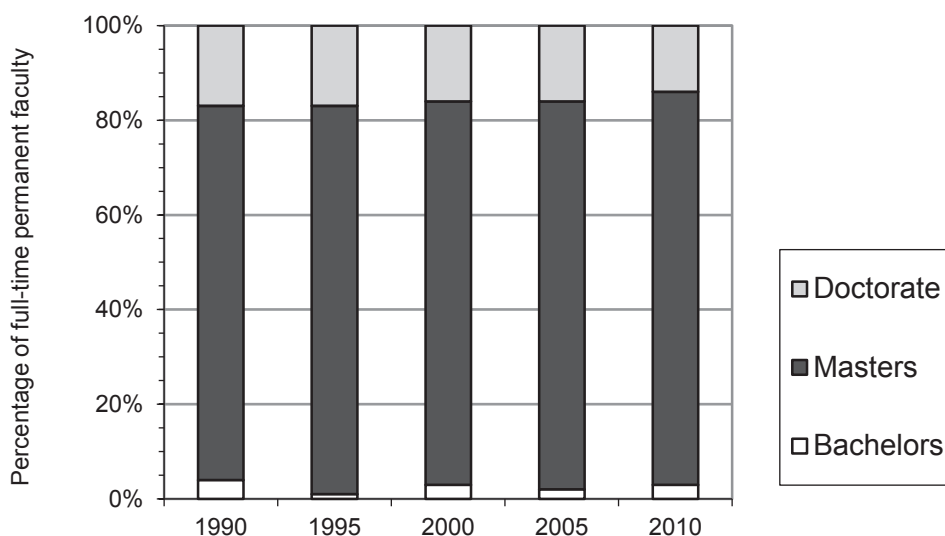


FIGURE TYE.4.1 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by highest degree in fall 1990, 1995, 2000, 2005, and 2010.

TABLE TYF.5 Percentage of full-time permanent faculty in mathematics programs at public two-year colleges by field and highest degree in fall 2010.

| Field of degree | Percentage with highest degree | | | Total Percent in Field |
|------------------------------------|--------------------------------|---------|-----------|------------------------|
| | Doctorate | Masters | Bachelors | |
| Mathematics | 8 | 60 | 1 | 68 |
| Statistics | 0 | 2 | 0 | 3 |
| Mathematics Education | 3 | 17 | 1 | 21 |
| Other fields | 2 | 5 | 0 | 7 |
| Total percentage by highest degree | 14 | 83 | 3 | 100 |

Note: 0 means less than half of 1% and round-off may make column sums seem inaccurate.

TABLE TYF.6 Percentage of part-time faculty in mathematics programs at two-year colleges (including those paid by a third party, as in dual-enrollment courses) by highest degree in fall 1990, 1995, 2000, 2005, and 2010.

| Highest degree | Percentage of part-time faculty | | | | |
|-----------------------------|---------------------------------|-------|-------|-------|-------|
| | 1990 | 1995 | 2000 | 2005 | 2010 |
| Doctorate | 8 | 7 | 6 | 6 | 5 |
| Masters | 65 | 76 | 70 | 72 | 73 |
| Bachelors | 27 | 18 | 24 | 22 | 22 |
| Total | 100% | 100% | 100% | 100% | 100% |
| Number of part-time faculty | 13680 | 14266 | 14887 | 20142 | 25775 |

Highest degree of part-time faculty

Tables TYF.6 and TYF.7 as well as Figure TYF 6.1 summarize data on the highest degrees held by part-time faculty members and their fields of specialization. In fall 2010, a doctoral degree was the highest degree held by 5% of part-time faculty, down one point from fall 2005 and 2000. A masters degree was the highest degree for 73% of part-time faculty, compared to 72% in 2005. A bachelors was the highest degree for 22% of part-time faculty in 2010 and 2005.

The percentage of part-time faculty whose most advanced degree had mathematics or mathematics education as the major field of study was 74% in 2010, compared to the combined total of 76% in 2005. Two percent (2%) of part-time faculty held degrees in statistics, down one point from 2005. A three point increase was reported in "other fields." See Table TYF.7.

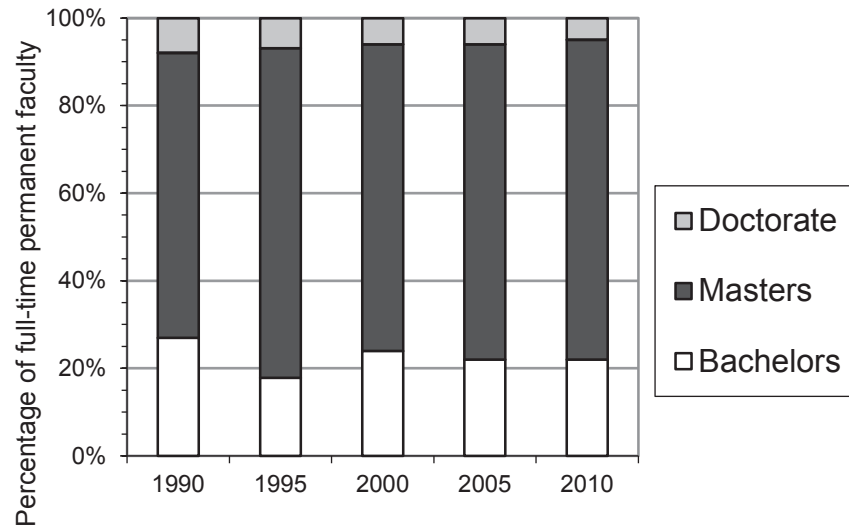


FIGURE TYF.6.1 Percentage of part-time faculty in mathematics programs at two-year colleges (including those paid by a third party, as in dual-enrollment courses) by highest degree in fall 1990, 1995, 2000, 2005, and 2010.

TABLE TYF.7 Percentage of part-time faculty in mathematics programs at two-year colleges (including those paid by a third party, as in dual enrollments) by field and highest degree in fall 2010, with 2005 data in parentheses.

| Field of degree | Percentage having as highest degree | | | Total Percent in Field |
|------------------------------------|-------------------------------------|---------|-----------|------------------------|
| | Doctorate | Masters | Bachelors | |
| Mathematics | 2 | 35 | 11 | 48 |
| Mathematics Education | 1 | 20 | 5 | 26 |
| Statistics | 0 | 2 | 0 | 2 |
| Other fields | 1 | 17 | 6 | 24 |
| Total percentage by highest degree | 5 | 73 | 22 | 100% |
| | (6) | (72) | (22) | |

Note: 0 means less than half of 1% and round-off may make column sums seem inaccurate.

TABLE TYF.8 Number and percentage of total full-time permanent faculty in mathematics programs at two-year colleges by gender in fall 1995, 2000, 2005, and 2010.

| | 1995 | 2000 | 2005 | 2010 |
|-------|--------------|--------------|--------------|--------------|
| Men | 4579 60% | 3537 51% | 4420 50% | 4866 50% |
| Women | 2999 40% | 3423 49% | 4373 50% | 4924 50% |
| Total | 7578 100% | 6960 100% | 8793 100% | 9790 100% |

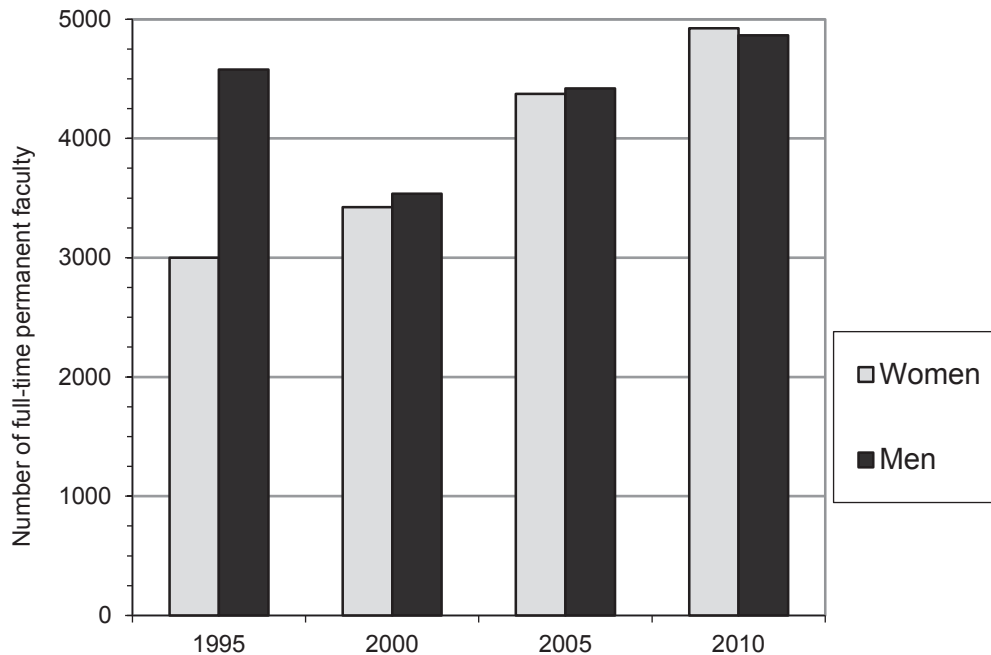


FIGURE TYF.8.1 Number of full-time permanent faculty in mathematics programs at two-year colleges by gender in fall 1995, 2000, 2005, and 2010.

Gender, Ethnic Composition, and Age of Full-time Permanent Mathematics Program Faculty

Gender of full-time permanent faculty and part-time faculty

An increase in the percentage of women among full-time permanent mathematics faculty at two-year colleges has been reported in every CBMS study since 1975. In fall 2000, the percentage of women faculty reached 49%. In fall 2005 and 2010, fifty percent

(50%) of full-time permanent mathematics faculty members at the nation's public two-year colleges were women. See Table TYF.8 and Figure TYF.8.1.

Table TYF.9 reports that in fall 2010 the percentage of women among part-time faculty was 49%. This was up from 47% in fall 2005. The percentage of women was 41% among U.S. citizen/resident alien mathematics masters degree recipients in 2008-2009, the last year for which firm data were available.

Table TYF.20 presents data on the gender and ethnicity of newly hired full-time permanent mathe-

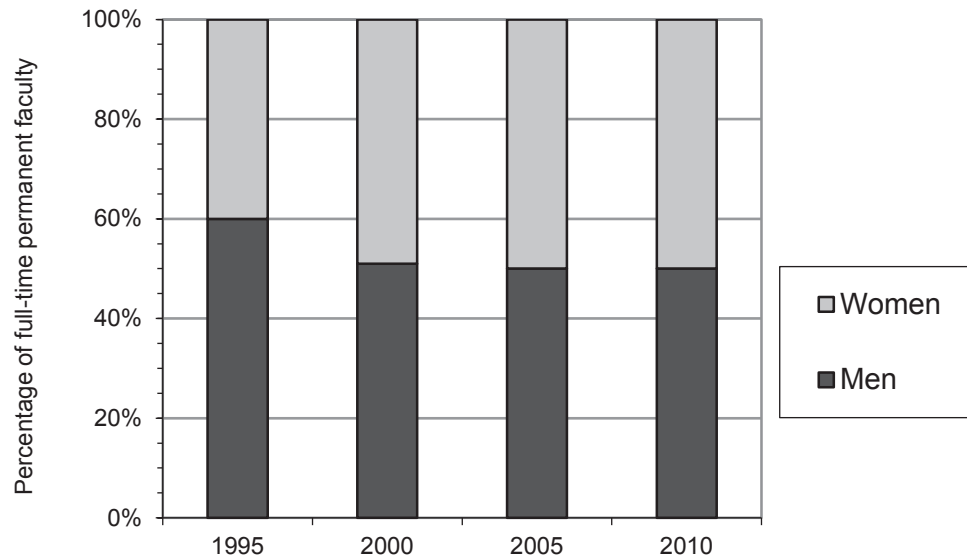


FIGURE TYF.8.2 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by gender in fall 1995, 2000, 2005, and 2010.

TABLE TYF.9 Percentage of full-time permanent faculty and part-time faculty in mathematics programs at public two-year colleges by gender in fall 2010. Also masters degrees in mathematics and statistics granted in the U.S. to citizens and resident aliens, by gender, in 2008-09. Part-time faculty paid by a third party are not included.

| | Percentage of | | |
|--------------|-----------------------------|-------------------|---|
| | Full-time permanent faculty | Part-time faculty | Masters degrees in mathematics & statistics granted in the U.S. in 2008-09 to citizens and resident aliens ¹ |
| Men | 50 | 51 | 59 |
| Women | 50 | 49 | 41 |
| Total | 100% | 100% | 100% |
| Total Number | 9790 | 23453 | 3137 |

¹ Report Table 65 from IPEDS Fall 2009 Compendium Tables, National Center for Education Statistics, nces.ed.gov/das/library/ipeds_com.asp. (These figures include resident aliens but do not include a total of 2074 nonresident aliens who also received masters degrees.)

mathematics faculty. In fall 2000, the percentage of women in this group was 42%. By fall 2005, the percentage of women among new hires had risen to 53%, but dropped to 47% in 2010.

Ethnicity among full-time permanent and part-time faculty

Demographics data about ethnic minority faculty among full-time permanent mathematics faculty members at two-year colleges are given in Tables TYF.10, TYF.11, TYF.12, TYF.13, and Figure TYF.10.1. The minority groups referenced in the survey are listed in TYF.11. Tables TYF.10 and TYF.11 provide an historical perspective, while Tables TYF.12 and TYF.13 present more detailed information on the ethnic profile of the full-time permanent mathematics faculty in fall 2010, including information about both age and gender. Tables TYF.14 and TYF.15 present data on ethnicity of part-time faculty.

The increase in the overall size of the full-time permanent mathematics faculty in the last decade (41%) was matched by growth in the number of the ethnic minority faculty (72% increase). In fall 2005, ethnic minority faculty constituted 14% of the full-time permanent faculty, numbering 1198 faculty. In fall 2010, 1566 full-time permanent ethnic minority faculty comprised 16% of total mathematics faculty. See Table TYF.10 and Figure TYF.10.1.

The relative sizes within individual ethnic groups of the full-time permanent faculty changed little between 2005 and 2010. The percentage of Black (non-Hispanic) faculty (up one point to 6%) was the same as the percentage of Asian/Pacific Islanders (6%), and both groups represented the largest ethnic minority groups in fall 2010. Mexican American/Puerto Rican/

other Hispanic also increased one point to 4%. See Table TYF.11.

Table TYF.12 gives the percentage of women within ethnic groups of the full-time permanent faculty. After a drop in the percentage of female Black (non-Hispanic) full-time permanent faculty in fall 2000 and an increase to 47% in fall 2005 (1181 faculty), that number decreased to 37%, representing 544 faculty. The percentage of female Asian/Pacific Islander and Native Hawaiian faculty rose to 48% and 49% respectively, the highest percentage of women in any of the ethnic groups. The female Asian/Pacific Islander and Native Hawaiian faculty were slightly smaller proportionally than women within White (non-Hispanic) faculty (52%). Native Americans (American Indians/Eskimo/Aleut) faculty dropped to about 0.2% (recorded as zero in the table) or a total of 20 faculty of whom 13 were women. A word of caution is in order given that CBMS2010, CBMS2005, and CBMS2000 reported a large increase in the percentage of full-time permanent faculty whose ethnicity was unknown.

Between 1995 and 2000, the percentage of ethnic minority full-time permanent mathematics faculty under the age of 40 did not change, remaining at 20%. In fall 2005, this number rose to 23% and dropped to 18% in 2010. See Table TYF.13. Even with the drop, the 18% was higher than the percentage of ethnic faculty (16% shown in Table TYF.10) among all full-time permanent faculty members. Data on ethnicity of newly-hired faculty in fall 2005 and 2010 are in Table TYF.20.

In fall 2010, seventeen percent (17%) of part-time faculty members were ethnic minorities, up one percentage point from 2005 and up 4 points as

TABLE TYF.10 Percentage and number of ethnic minority full-time permanent faculty in mathematics programs at two-year colleges in fall 1995, 2000, 2005, and 2010.

| | 1995 | 2000 | 2005 | 2010 |
|---|------|------|------|------|
| Percentage of ethnic minorities among full-time permanent faculty | 13% | 13% | 14% | 16% |
| Number of full-time permanent ethnic minority faculty | 948 | 909 | 1198 | 1566 |
| Number of full-time permanent faculty | 7578 | 6960 | 8793 | 9790 |

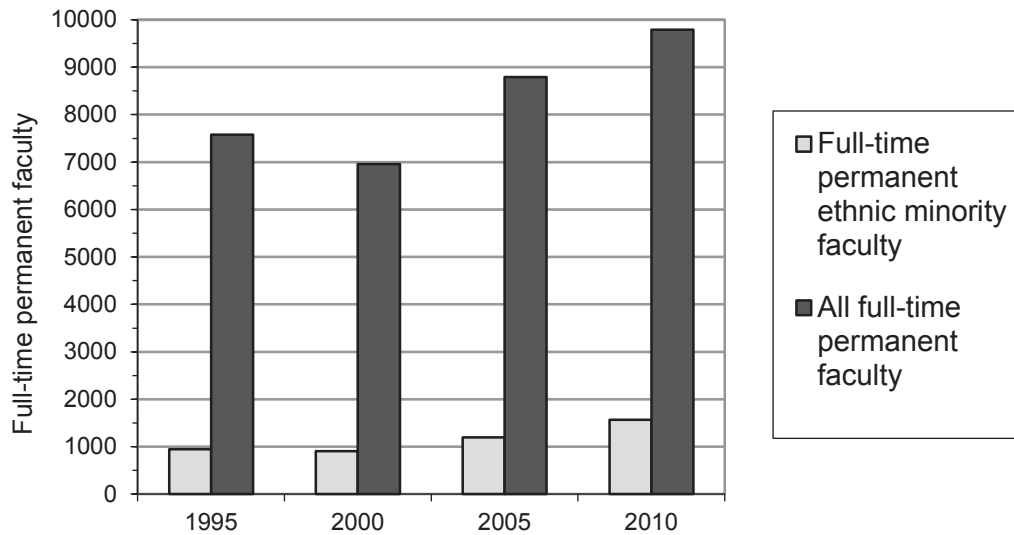


FIGURE TYF.10.1 Number of ethnic minority full-time permanent faculty and number of all full-time permanent faculty in mathematics programs at two-year colleges in fall 1995, 2000, 2005, and 2010.

TABLE TYF.11 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by ethnicity, in fall 1995, 2000, 2005, and 2010.

| Ethnic Group | Percentage of full-time permanent faculty | | | |
|---|---|------|------|------|
| | 1995 | 2000 | 2005 | 2010 |
| American Indian/Eskimo/Aleut | 0 | 1 | 0 | 0 |
| Asian/Pacific Islander | 4 | 4 | 6 | 6 |
| Black (non-Hispanic) | 5 | 5 | 5 | 6 |
| Mexican American/Puerto Rican/ other Hispanic | 3 | 3 | 3 | 4 |
| White (non-Hispanic) | 87 | 85 | 84 | 79 |
| Status unknown | 1 | 2 | 2 | 5 |
| | 100% | 100% | 100% | 100% |
| Number of full-time permanent faculty | 7578 | 6960 | 8793 | 9790 |

Note: 0 means less than half of 1%.

TABLE TYF.12 Number and percentage of full-time permanent faculty in mathematics programs at two-year colleges by ethnic group and percentage of women within each ethnic group in fall 2010.

| Ethnic Group | Number of full-time permanent faculty | Percentage of ethnic group in full-time permanent faculty | Percentage of women in ethnic group |
|--|---------------------------------------|---|-------------------------------------|
| American Indian, Alaskan Native | 20 | 0 | 63 |
| Asian | 605 | 6 | 48 |
| Native Hawaiian, Pacific Islander | 42 | 0 | 49 |
| Black or African American (non-Hispanic) | 544 | 6 | 37 |
| Mexican American, Puerto Rican or other Hispanic | 356 | 4 | 34 |
| White (non-Hispanic) | 7733 | 79 | 52 |
| Status not known or other | 490 | 5 | 50 |
| Total | 9790 | 100% | 50% |

Note: 0 means less than half of 1%.

TABLE TYF.13 Percentage of full-time permanent faculty and of full-time permanent faculty under age 40 in mathematics programs at public two-year colleges by ethnic group in fall 2010. Also U.S. masters degrees in mathematics and statistics granted in the U.S. to citizens and resident aliens by ethnic group in 2008-09.

| Ethnic Group | Percentage among | | |
|----------------------|---------------------------------|--|---|
| | All full-time permanent faculty | Full-time permanent faculty under age 40 | Masters degrees in mathematics & statistics granted in the U.S. in 2008-09 to citizens and resident aliens ¹ |
| Ethnic Minorities | 16 | 18 | 22 |
| White (non-Hispanic) | 79 | 74 | 68 |
| Unknown | 5 | 8 | 10 |
| Total | 100% | 100% | 100% |
| Number | 9790 | 3244 | 3137 |

¹ Report Table 65 from IPEDS Fall 2009 Compendium Tables, National Center for Education Statistics, nces.ed.gov/das/library/ipeds_com.asp. (These figures include resident aliens but do not include a total of 2074 nonresident aliens who also received masters degrees.)

TABLE TYF.14 Percentage of ethnic minority part-time faculty in mathematics programs at public two-year colleges in fall 2000, 2005, and 2010.

| | 2000 | 2005 | 2010 |
|---|-------|-------|-------|
| Percentage of ethnic minorities among part-time faculty | 13 | 16 | 17 |
| Number of part-time faculty | 14887 | 18227 | 23453 |

TABLE TYF.15 Number and percentage of part-time faculty in mathematics programs at public two-year colleges by ethnic group and percentage of women within each ethnic group in fall 2010.

| Ethnic Group | Number of part-time faculty | Percentage of | |
|--|-----------------------------|--|---------------------------|
| | | Ethnic group among all part-time faculty | Women within ethnic group |
| American Indian, Alaskan Native | 44 | 0 | 6 |
| Asian | 1341 | 6 | 49 |
| Native Hawaiian, Pacific Islander | 59 | 0 | 34 |
| Black or African American (non-Hispanic) | 1796 | 8 | 36 |
| Mexican American, Puerto Rican or other Hispanic | 762 | 3 | 44 |
| White (non-Hispanic) | 18105 | 77 | 51 |
| Status not known or other | 1346 | 6 | 46 |
| Total | 23453 | 100% | 49% |

compared with 2000. Similar to the ethnicity among full-time permanent faculty, Asian/Pacific Islanders and Blacks (non-Hispanic) were the two largest groups, together comprising 14% of all part-time faculty. See Tables TYF.14 and TYF.15.

Number and age distribution of full-time permanent faculty

The number of full-time permanent faculty in mathematics programs at two-year colleges increased 11% in 2010 to a total of 9,790 faculty. The total increase in faculty numbers was 997 in 2010, compared with 1,833 full-time permanent positions hired in 2005. See Table TYF.16.

During the fifteen-year period 1990 to 2005, the two-year college mathematics faculty, as a cohort, was getting older and reached an average age of 47.8 years. In fall 2010, a decrease was noted with the average faculty age being 46.8 years. Of particular interest, the percentage of full-time faculty over the

age of 59 rose from 11% in 2005 to 17% in 2010, four times the percent of faculty older than 59 in 1995. See Table TYF.16. See Table S.17 in Chapter 1 for age of mathematics faculty in two-year and four-year institutions.

In 2010, the percentage of full-time permanent faculty under age 40 rose to 29%, up from 25% in 2005. See Table TYF.16. Among ethnic minority faculty, 18% were under age 40 in fall 2005, as reported in Table TYF.13. The percentage of full-time permanent faculty between the ages of 50-59 years decreased to 24% in 2010, compared with 35% in 2005. Full-time faculty over age 59 had grown to 17% in 2010 from 11% in 2005.

In 2010, women were a majority with 57% in the age group less than 35 years, up 8 points from 2005. Forty-seven percent (47%) of the age group over-54 were women. See Table TYF.17 and Figure TYF.17.1.

TABLE TYF.16 Percentage and number of full-time permanent faculty in mathematics programs at two-year colleges by age in fall 1995, 2000, 2005, and 2010.

| Age | Percentage of full-time permanent faculty | | | | Number of full-time permanent faculty | | | |
|-------|---|------|------|------|---------------------------------------|------|------|------|
| | 1995 | 2000 | 2005 | 2010 | 1995 | 2000 | 2005 | 2010 |
| <30 | 5 | 4 | 5 | 8 | 358 | 290 | 478 | 832 |
| 30-34 | 8 | 9 | 8 | 9 | 580 | 615 | 716 | 893 |
| 35-39 | 8 | 13 | 12 | 12 | 633 | 890 | 1037 | 1189 |
| 40-44 | 14 | 11 | 13 | 14 | 1044 | 763 | 1163 | 1416 |
| 45-49 | 22 | 15 | 15 | 15 | 1672 | 1075 | 1298 | 1475 |
| 50-54 | 26 | 20 | 18 | 11 | 1933 | 1418 | 1574 | 1085 |
| 55-59 | 13 | 16 | 17 | 13 | 966 | 1146 | 1528 | 1268 |
| >59 | 5 | 11 | 11 | 17 | 391 | 763 | 999 | 1631 |
| Total | 100% | 100% | 100% | 100% | 9572 | 6960 | 8793 | 9790 |

NOTE: Rounding may make column totals seem inaccurate.

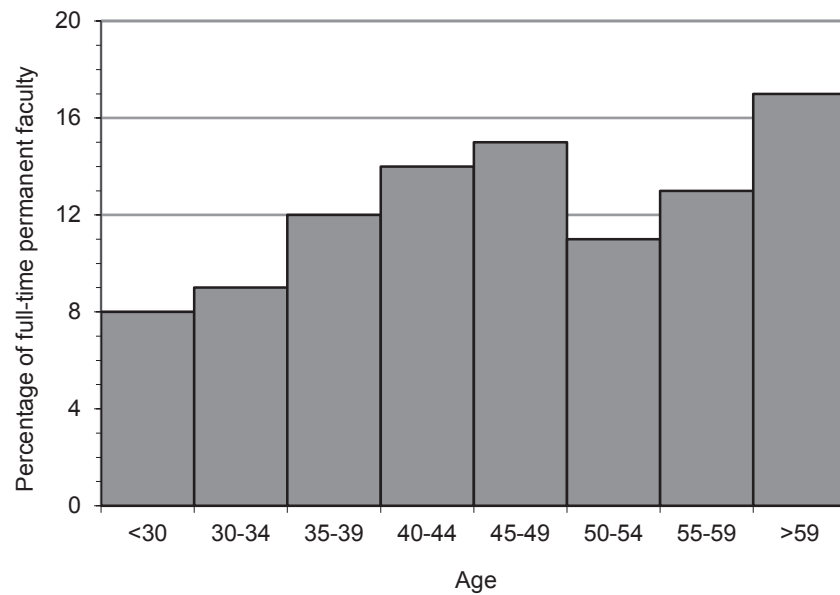


FIGURE TYF.16.1 Percentage distribution of full-time permanent faculty in mathematics programs at public two-year colleges by age in fall 2010.

TABLE TYF.17 Percentage of full-time permanent faculty in mathematics programs at public two-year colleges by age and by gender and percentage of women by age in fall 2010.

| Age | Percentage of full-time permanent faculty | | Percentage of women in age group |
|-------|---|-----|----------------------------------|
| | Women | Men | |
| <35 | 10 | 8 | 57 |
| 35-44 | 13 | 13 | 53 |
| 45-54 | 13 | 14 | 48 |
| >54 | 14 | 16 | 47 |
| Total | 50 | 50 | |

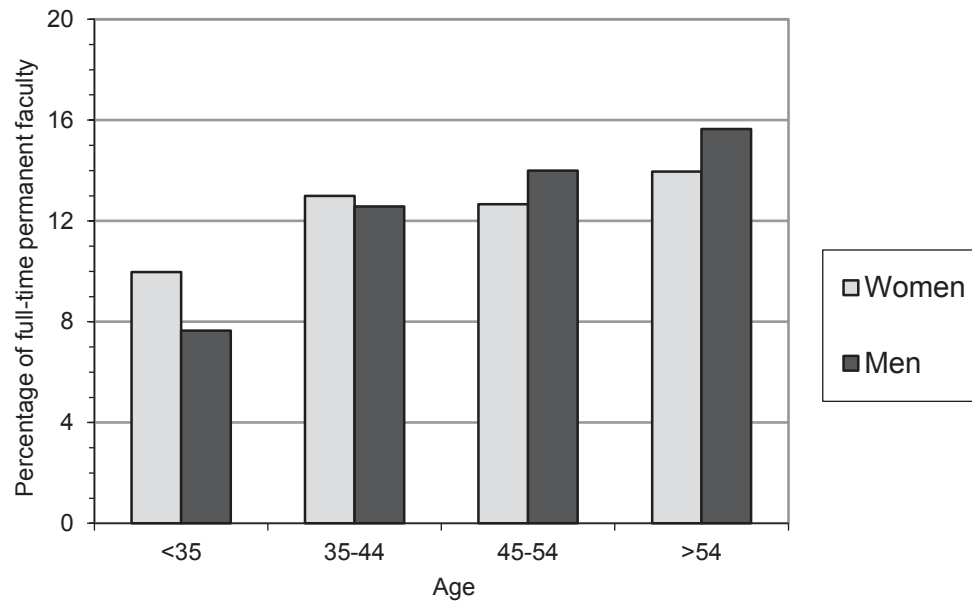


FIGURE TYF.17.1 Percentage of full-time permanent faculty in mathematics programs at public two-year colleges by age and by gender in fall 2010.

Demographics of Full-time Permanent Faculty Newly Hired by Mathematics Programs

Number and source of new full-time permanent faculty

Two-year college mathematics programs hired 777 new full-time permanent faculty members for fall 2010, up 28% over the number hired in 2005. See Table TYF.18.

Fall 2010 presented hiring pattern changes from some sources. In 2005 and 2010, graduate school as a source remained steady at 23%. In contrast, the percentage of new hires previously teaching at four-year institutions dropped to 3% in 2010 from

18% in 2005. Hiring from among part-time faculty at the same institution was down six points to 23%, while new instructors hired from a secondary school rose seven points to 25% of total new hires. See Table TYF.18.

Educational credentials of newly-hired full-time permanent faculty

The masters degree was held by 82% of newly-hired full-time permanent faculty in fall 2010, down two points from 2005, but in contrast to 2000 when the percentage was 66%. Percentage of new faculty with a doctorate degree in 2010 was 11%, close to the 12% in 2005. See Table TYF.19.

TABLE TYF.18 Percentage of newly appointed full-time permanent faculty in mathematics programs at two-year colleges coming from various sources in fall 2005 and 2010.

| Percentage of new faculty from: | 2005 | 2010 |
|--|------|------|
| A. Graduate School | 23 | 23 |
| B. Teaching in a four-year college or university | 18 | 3 |
| C. Teaching in another two-year college | 11 | 18 |
| D. Teaching in a secondary school | 13 | 25 |
| E. Part-time or full-time temporary employment at the same college | 29 | 23 |
| F. Nonacademic employment | 5 | 1 |
| G. Unemployed | 0 | 0 |
| F. Unknown | 1 | 6 |
| Total | 100% | 100% |
| Total Number Hired | 605 | 777 |

TABLE TYF.19 Percentage of full-time permanent faculty newly hired for mathematics programs at two-year colleges by highest degree in fall 2005 and 2010.

| Highest Degree | Percentage of New Hires | |
|----------------|-------------------------|-----------|
| | 2005-2006 | 2010-2011 |
| Doctorate | 12 | 11 |
| Masters | 84 | 82 |
| Bachelors | 5 | 2 |
| Unknown | 0 | 4 |
| Total | 100% | 100% |

Note: 0 means less than one-half of one percent and round-off may make column totals seem inaccurate.

TABLE TYF.20 Percentage of full-time permanent faculty newly hired for mathematics programs at two-year colleges by ethnic group in fall 2005 and 2010. Also percentage of women within each ethnic group in fall 2010.

| Ethnic Group | Percentage of new hires | | Percentage of women in ethnic group for 2010-2011 new hires |
|---|-------------------------|-----------|---|
| | 2005-2006 | 2010-2011 | |
| American Indian | na | 0 | 100 |
| Asian/Pacific Islander | 7 | 9 | 70 |
| Black (non-Hispanic) | 1 | 5 | 27 |
| Hispanic | 11 | 4 | 36 |
| White (non-Hispanic) | 80 | 78 | 49 |
| Other | na | 1 | 0 |
| Unknown | 1 | 3 | 0 |
| Percentage of women among all new hires | 53 | 47 | |

Note: 0 means less than one-half of one percent and round-off may make column totals seem inaccurate.

TABLE TYF.21 Percentage of two-year colleges that require periodic teaching evaluations for all full-time or all part-time faculty in fall 2005 and 2010.

| | Percentage of two-year colleges in fall 2005 | Percentage of two-year colleges in fall 2010 |
|--|--|--|
| Colleges that require teaching evaluations for all full-time faculty | 89 | 96 |
| Colleges that require teaching evaluations for all part-time faculty | 89 | 88 |

TABLE TYF.22 Percentage of mathematics programs at public two-year colleges using various methods of evaluating teaching of part-time and full-time faculty in fall 2010.

| Method of evaluating teaching | Percentage of programs using evaluation method for | |
|---|--|-------------------|
| | Part-time faculty | Full-time faculty |
| A. Observation of classes by other faculty | 69 | 64 |
| B. Observation of classes by division head (if different from chair) or other administrator | 42 | 55 |
| C. Evaluation forms completed by students | 97 | 98 |
| D. Evaluation of written course material such as lesson plans, syllabus, or exams | 53 | 58 |
| E. Self-evaluation such as teaching portfolios | 19 | 52 |
| F. Written Peer Evaluations | 11 | 27 |
| G. Other methods | 2 | 8 |

The CBMS2000 report voiced concern regarding the percentage of full-time permanent faculty being hired without a degree beyond the bachelors. The 2000, 2005, and 2010 data indicate a decrease of new hires with a bachelors degree from 19% to 5% to 2%, respectively.

Gender and ethnicity of newly-hired full-time permanent faculty

About 47% of new mathematics faculty hires in two-year colleges were women in fall 2010, down 6 percentage points from 2005. However, the 50-50 split between women and men in the full-time permanent faculty was maintained between 2005 and 2010. Table TYF.20 shows White (non-Hispanic) faculty comprised 78% of new hires for 2010, down 2 points from 2005. Overall, 18% of new hires in 2010 were ethnic minorities, down one point from 2005, but a five-percentage-point increase since 2000. Information about age of new hires was not collected in CBMS2010.

Teaching Evaluations and Professional Development of Mathematics Program Faculty

Computer and office facilities for part-time faculty

Information about computer and office facilities for part-time faculty was not collected in CBMS2010.

Teaching evaluation

In fall 2010 there was a seven-percentage-point increase to 96% in two-year colleges that required periodic evaluation of the teaching of full-time permanent mathematics faculty members. Periodic teaching evaluation was required for part-time faculty at 88% of colleges, a proportion almost identical to the 89% reported in 2005. See Table TYF.21.

Regarding methods of evaluating teaching, the percentage of colleges that used classroom visitation by a division or department chair or other administrator as a component of full-time faculty evaluation was 55%, down from 61% in 2005. In contrast, an increase of nine percentage points to 42% was reported in administrators observing part-time faculty. The percentage of colleges using classroom observation by other faculty (not administrators) increased from 2005 to 64% (up 12 points from 2005) for full-time faculty and 69% (up 5 points from 2005) for part-time faculty. See Table TYF.22.

In 2010 as well as in 2005, the most common method of evaluating teaching was the use of evaluation instruments completed by students. Student evaluations were used for full-time faculty in 98% of reporting colleges and in 97% of colleges for part-time faculty in 2010. Self-evaluation portfolios were used as a component of the evaluation of full-time faculty by 52% of colleges. For full-time faculty, evaluation of written materials—such as syllabi or course examinations—rose from 55% to 58%. The use of such

TABLE TYF.23 Percentage of two-year colleges that require some form of continuing education or professional development for full-time permanent faculty, and percentage of faculty using various methods to fulfill those requirements, in mathematics programs at two-year colleges in fall 2005 and 2010.

| Faculty Development | Fall 2005 | Fall 2010 |
|---|--|--|
| Percentage of institutions requiring continuing education or professional development for full-time permanent faculty | 55 | 67 |
| How Faculty Meet Professional Development Requirements | Percentage of permanent faculty in fall 2005 | Percentage of permanent faculty in fall 2010 |
| A. Activities provided by employer | 53 | 53 |
| B. Activities provided by professional associations | 38 | 34 |
| C. Publishing books or research or expository papers | 6 | 3 |
| D. Continuing graduate education | 7 | 4 |

written materials for part-time faculty evaluation rose four points from 2005 to 53% in 2010. In fall 2010, written peer evaluations as a category was added as a method of evaluating teaching with 27% of colleges reporting this method for full-time faculty and 11% for part-time faculty. See Table TYF.22.

Professional development obligations and activities of full-time permanent faculty

In fall 2010, as reported in Table TYF.23, some form of continuing education or professional development

was required of full-time permanent faculty members at 67% of two-year colleges, up 12% from 2005. This 15-year-long increase in required professional development for full-time permanent faculty parallels the increased faculty use of various professional development opportunities, also reported in Table TYF.23. Slightly more than half of the full-time permanent faculty met part of their professional development obligation through activities provided by their own colleges in 2010 and 2005 (53%), compared to 36% in 2000. A slight decrease of four percentage points

TABLE TYF.24 Percentage of program heads classifying various problems as "major" in mathematics programs at two-year colleges in fall 1995, 2000, 2005, and 2010.

| Problem | Percentage of program heads classifying problem as major | | | |
|---|--|------|------|------|
| | 1995 | 2000 | 2005 | 2010 |
| A. Maintaining vitality of faculty | 11 | 9 | 2 | 4 |
| B. Dual-enrollment courses | na | 8 | 5 | 11 |
| C. Staffing statistics courses | 4 | 2 | 3 | 2 |
| D. Students don't understand demands of college work | na | na | 55 | 64 |
| E. Need to use part-time faculty for too many courses | 30 | 39 | 30 | 35 |
| F. Faculty salaries too low | 31 | 36 | 22 | 21 |
| G. Class sizes too large | 11 | 10 | 5 | 3 |
| H. Low student motivation | 51 | 47 | 50 | 50 |
| I. Too many students needing remediation | 63 | 62 | 63 | 67 |
| J. Lack of student progress from developmental to advanced courses | na | na | 34 | 37 |
| K. Low success rate in transfer-level courses | 15 | 8 | 7 | 13 |
| L. Too few students who intend to transfer actually do | 7 | 2 | 4 | 11 |
| M. Inadequate travel funds for faculty | 21 | 15 | 22 | 23 |
| N. Inadequate classroom facilities for use of technology | na | na | 12 | 10 |
| O. Inadequate computer facilities for part-time faculty use | na | na | 9 | 6 |
| P. Inadequate computer facilities for student services | 23 | 3 | 1 | 5 |
| Q. Commercial outsourcing of instruction | na | 1 | 0 | 0 |
| R. Heavy classroom duties prevent personal & teaching enrichment by faculty | na | na | 14 | 11 |
| S. Coordinating mathematics courses with high schools | 8 | 6 | 7 | 14 |
| T. Lack of curricular flexibility because of transfer rules | 6 | 1 | 7 | 5 |
| U. Use of distance education | na | 10 | 6 | 6 |

Note: 0 means less than one-half of one percent.

showed 34% of professional development activities as being provided by professional societies.

Obtaining travel funds for faculty professional development has historically been a department concern. Lack of or reduced funds available for faculty travel and other professional development activities continued to challenge mathematics departments in 2010. The concern about the level of travel funding for faculty by program heads was a “major concern” or “somewhat of a problem” in 23% of reporting colleges, up slightly from 2005 and up 8 points since 2000. See Table TYF.25.

Additional information about characteristics of two-year college faculty and their professional activities can be found in the 2011 Community College Faculty Survey of Student Engagement (CCFSSE). The CCFSSE summarizes the responses of 35,000 faculty from 228 colleges. Center for Community College Student Engagement.

Community College Faculty Survey of Student Engagement, <http://www.ccsse.org/CCFSSE/CCFSSE.cfm>. Austin, TX, 2011.

TABLE TYF.25 Percentage of program heads of mathematics programs at public two-year colleges classifying various problems by severity in fall 2010.

| Problem | Percentage of program heads classifying problems as | | |
|---|---|-----------------------|---------------|
| | minor or no problem | somewhat of a problem | major problem |
| A. Maintaining vitality of faculty | 75 | 21 | 4 |
| B. Dual-enrollment courses | 61 | 16 | 11 |
| C. Staffing statistics courses | 71 | 13 | 2 |
| D. Students don't understand demands of college work | 7 | 28 | 64 |
| E. Need to use part-time faculty for too many courses | 35 | 28 | 35 |
| F. Faculty salaries too low | 49 | 30 | 21 |
| G. Class sizes too large | 80 | 17 | 3 |
| H. Low student motivation | 9 | 41 | 50 |
| I. Too many students needing remediation | 10 | 23 | 67 |
| J. Lack of student progress from developmental to advanced courses | 32 | 31 | 37 |
| K. Low success rate in transfer-level courses | 64 | 23 | 13 |
| L. Too few students who intend to transfer actually do | 66 | 23 | 11 |
| M. Inadequate travel funds for faculty | 53 | 23 | 23 |
| N. Inadequate classroom facilities for use of technology | 77 | 13 | 10 |
| O. Inadequate computer facilities for part-time faculty use | 79 | 15 | 6 |
| P. Inadequate computer facilities for student services | 83 | 12 | 5 |
| Q. Commercial outsourcing of instruction | 66 | 1 | 0 |
| R. Heavy classroom duties prevent personal & teaching enrichment by faculty | 58 | 31 | 11 |
| S. Coordinating mathematics courses with high schools | 47 | 39 | 14 |
| T. Lack of curricular flexibility because of transfer rules | 84 | 12 | 5 |
| U. Use of distance education | 68 | 15 | 6 |

Note: 0 means less than one-half of 1%.

Concerns and Issues in Mathematics Programs

In every CBMS survey since 1985, sixty percent or more of mathematics program heads classified “too many students needing remediation” as a *major* problem for their programs. In fall 2010, this figure was 67%. In fall 2005, the figure was 63%. See Tables TYF.24 and TYF.25.

In 2005, a new category, “students’ lack of understanding of the demands of college work,” was introduced. This ranked second in the list of major problems in both 2010 and 2005, as reported by 64% and 55% respectively of mathematics program heads. “Low student motivation” ranked third, as reported by 50% of mathematics program heads in 2010. Rounding out the top five major problems in 2010 were “lack of student progress from developmental to advanced courses” (37%) and “need to use too many part-time faculty” (35%). The same five topics ranked in the top five in 2000 and 2005. See Tables TYF.24 and TYF.25.

All other major issues listed showed a much lower percentage of mathematics programs reporting them than the five issues above. See Table TYF.28 for the historical perspective on these issues and the fall 1995-2010 ratings. Table TYF.29 includes data on the extent to which program heads thought these matters were somewhat of a problem, a minor problem, or no problem.

Administration of Mathematics Programs

In the last fifteen years, two-year colleges (like four-year institutions) made a major shift to the semester system. In fall 2000, 93% of two-year colleges operated under the semester structure. The use of the

semester system had become so widespread after 2000 that CBMS2005 elected to omit this question from future surveys.

In 2010, 46% reported that two-year college mathematics programs were administered within a mathematics departmental structure, up seven points from 2005. A division structure, where mathematics is combined with a science department, was found in 14% of colleges, and another 31% of mathematics programs were administered by other departments or division structures, leaving 9% unreported or unknown. The shifts between 2005 and 2010 included a decrease to 14% from 35% in mathematics programs within mathematics and science departments and an increase up to 31% from 16% in 2005 of mathematics programs administered in other departments or divisions. See Table TYF.26.

Historically, mathematics courses at two-year colleges have been taught in different administrative units other than in mathematics programs/departments. The location of precollege (remedial) mathematics courses within a college’s academic structure always has been of special interest. This practice continued in fall 2010, as shown in Table TYE.17 in Chapter 6. In fall 2010, about 29% of colleges reported that some precollege mathematics courses were taught outside of the mathematics program. This was down two points from the 31% reported in 2005 and the same (29%) as reported in 2000.

Topics of Special Interest for Two-Year-College Mathematics Programs

In each CBMS survey cycle, certain topics of special interest are chosen for data collection and compre-

TABLE TYF.26 Percentage of mathematics programs at public two-year colleges by type of administrative structure on their own campus in fall 2005 and 2010.

| Administrative structure | Percentage of Mathematics Programs | |
|--|------------------------------------|------|
| | 2005 ¹ | 2010 |
| Mathematics Department | 41 | 46 |
| Mathematics and science department or division | 36 | 14 |
| Other department or division structure | 17 | 31 |
| None of the above or unknown | 6 | 9 |

¹ The numbers reported for 2005 come from Table TYF.30 in the 2005 CBMS report with the numbers in the two columns added.

hensive analysis across both two-year and four-year colleges. Special topics for two-year and four-year institutions are discussed in Chapter 2 of this report. Additional questions were added in 2010 regarding the various options available in precollege instruction, technology permitted by mathematics departments in precollege courses, and focus of courses titled “College Algebra” and distance-learning courses. Tables and discussion of these questions are included in Chapter 6 (Tables TYE.11, TYE.11.1, and TYE.11.2). Distance learning is discussed in Chapters 2 (Tables SP.10-SP.13) and 6 (Table TYE.12). For two-year colleges, pre-service education of K-8 teachers and faculty who teach dual-enrollment courses are relevant to the current chapter (Chapter 7) and are also discussed in Chapter 2.

Scope and organization of pre-service mathematics education for K-8 teachers

CBMS2010 continued an inquiry begun in 2000 about the level of involvement of two-year college mathematics programs in the mathematical education of future mathematics teachers. These data are reported primarily among the special topics in Chapter 2, Table SP.4.

In the last two decades, involvement in teacher education at two-year colleges has been active as more students turned to them to take required mathematics and education courses. Enrollment in the Mathematics for Elementary Teachers course fall 2010 and 2005 survey data confirm this involvement, reporting 29,000 students enrolled each year. This number was an attention-getting 61% increase from the 18,000 reported in 2000. See Table TYE.3 in Chapter 6.

Table TYE.5 shows that 55% of two-year colleges offered the course Mathematics for Elementary School Teachers in fall 2010, compared with 59% of two-year colleges in fall 2005. See Table TYE.5 in Chapter 6. The percentages of two-year colleges teaching the Mathematics for Elementary School Teachers course are successively 32%, 43%, 49%, 59% and 55% for the five-year CBMS intervals beginning in 1990 through 2010. The historical growth in offerings for this course and other selected courses at two-year colleges, beginning in 1990 for five-year CBMS intervals, is reported in Table TYE.6.

Table SP.4 in Chapter 2 reports on *organized* programs at two-year colleges in which students can obtain their entire mathematics course requirement for teacher licensure. These data confirm that two-year colleges are involved in teacher education primarily at the K-8 level, though future secondary school teachers often take their lower-division mathematics courses at two-year colleges. The single largest component is the program for pre-service elementary school teachers reported by 41% of two-year colleges

in 2010. Pre-service middle school licensure-oriented programs were reported at 24% of colleges. Between 12% and 30% of two-year colleges reported programs at the elementary or middle school levels for retraining by career switchers moving into teaching. Compared with 2005, all categories of Table SP.2 except one (in-service for middle school teachers) showed increases of 3 to 11 percentage points.

Table SP.4 reports on other involvement two-year college mathematics programs have with K-8 teacher education. Thirty-six (36) percent report that a faculty member is assigned to coordinate mathematics education for future K-8 teachers. About 7% of the reporting colleges designate special sections of courses other than Mathematics for Elementary School Teachers for attendance by future teachers. Among mathematics departments, 5% offer mathematics pedagogy courses for future K-8 teachers, and 9% of colleges offer such pedagogy courses outside the mathematics department. Each category in Table SP.4 shows a slight decrease in 2010 as compared with 2005.

The conclusion in Chapter 2 is that, given the large number of two-year colleges in the United States, even when the percentage of colleges involved in the education of future K-8 teachers is small, the cumulative impact of two-year colleges on the next generation of K-8 teachers is significant. Demonstrating the national interest in the importance of two-year colleges in teacher training, a national professional organization, the National Association of Community College Teacher Education Programs (NACCTEP), was formed in 2003.

Credentials and supervision of dual-enrollment faculty

Dual enrollment in CBMS2010 is defined as a credit structure that allows high school students to receive simultaneous high school and college credit for courses that were taught at a high school by a high school teacher. Data in Chapter 2 (Tables SP.16 and SP.17) show how that by fall 2010, 80,804 students were dually enrolled, a 92% increase from 2005. Of special note in fall 2010 is the almost doubling of dual enrollment in College Algebra from 2005 to 2010 and a 66% increase in Precalculus dual enrollments from 2005 to 2010. Dual enrollments in Calculus decreased almost 2%, in contrast to dual enrollments in Statistics that increased 74%, and dual enrollment in other courses almost tripled.

In some cases, a faculty member teaching a dual-enrollment course was classified as a part-time faculty member at the two-year college that awarded college credit for the course, even though the salary was paid completely by a third party, e.g., the local school district. Table SP.17 presents data for two-year (22%) and four-year institutions (20%) that assign and pay their own faculty to teach courses in a high school that

awards both high school and college credit. These direct-pay faculty members taught 6,570 of the total 80,804 (8%) dual-enrolled students. See Tables SP.18 and SP.19 in Chapter 2.

In the 2000 survey, CBMS first investigated the extent to which two-year college mathematics programs retained control of various aspects of these dual-enrollment courses. This exploration was expanded in the 2005 and 2010 surveys. While textbook choice by two-year college mathematics departments for dual-enrolled courses taught by high school teachers decreased in 2010 by 3 points to 71%, design and approval of syllabi increased to 96% of reporting colleges. See Tables SP.18 and SP.19 in Chapter 2.

As presented in SP.18, 47% of two-year college mathematics programs reported they had full control over the selection of instructors for dual-enrollment courses, down five points from the 2005 report and

down 14 points from 2000. Forty-one percent (41%) of two-year college mathematics programs reported controlling the final examinations in their dual-enrollment courses.

In spite of some of the issues raised in the preceding paragraph, as reported in Tables TYF.24 and TYF.25, among all survey respondents (including respondents from colleges that do not have dual-enrollment arrangements), only 11% of mathematics program heads in two-year colleges saw dual-enrollment courses as a major problem, up seven points from 2005. Another 16% found dual-enrollment arrangements somewhat of a problem, down 5 points from 2005.

