

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 estimated number, teaching conditions, education, professional activities, age, gender, and ethnicity of the faculty in these mathematics programs in fall 2015. Additional analysis of some 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 and distance learning courses. CBMS survey data has been collected since 1965. However, unlike surveys prior to 1995, the mathematics faculty surveyed in 1995, 2000, 2005, 2010, and 2015 do not include faculty who taught in computer science programs that were separate from mathematics programs. Also, CBMS2005, CBMS2010 and CBMS2015 include data regarding public two-year colleges only. A more detailed statement on this issue occurs at the beginning of Chapter 6. The estimated data in this chapter have not been rounded. Information on the sampling procedure used in the 2015 survey can be found in Appendix II. A copy of the CBMS2015 two-year college survey questionnaire can be found in Appendix VI.

The term “full-time permanent” faculty is used frequently in this document. Two-year college faculty members in this category have an on-going stable relationship with the college’s mathematics programs, are tenured and tenure-eligible faculty, including those on leave or on sabbatical. They occupy a recurring position in the college’s budget and are subject to the college’s long-term evaluation and re-appointment policy. These faculty are responsible for teaching, curriculum development, student advising, committee appointments, and other forms of college service.

Full-time faculty who are employed on a non-tenure track, sometimes continuing, are called “full-time continuing” faculty in this document. Two-year colleges often have their own individual classification for other non-tenure track full-time faculty. Data about this third classification of positions was collected for the first time in CBMS2015. This group is referred to as “other full-time” faculty in this document. Full-time “permanent” faculty are distinguished from “continuing” or “other” full-time faculty who are

often meeting a short-term institutional need. Full-time faculty members teach full course assignments, distinguishing them from part-time or adjunct faculty.

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

In the text that follows, the standard error (SE) in many of the estimates is provided along with the estimate (e.g. estimate 4,596 (SE 58)). The standard errors for all CBMS2015 tables can be found in Appendix VIII. The change in an estimate from the estimate in a previous survey is often expressed both as percentage change, and as the number of SEs that change represents (e.g. “increased 22% (1.2 SEs”).

Highlights of Chapter 7

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

- In fall 2015, the total estimated number of full-time faculty (permanent, continuing and other) in two-year colleges was 9,801 (SE 894). This number is a 10% (2 SEs) decrease of full-time faculty from 2010 to 2015. The decrease in faculty can be viewed in light of the 14% decrease in institutional enrollment in two-year colleges and the 4% (1 SE) decrease in mathematics and statistics enrollment (5%, 1 SE, decrease when dual enrollment is excluded) discussed in Chapter 6. See Table S.13 in Chapter 1, Table TYE.2 in Chapter 6, and Table TYF.1 in this chapter.
- It was estimated that there were 8314 (SE 840) full-time permanent faculty in public two-year college mathematics programs in the United States in fall 2015, compared with 9,790 in 2010. This 15% (2 SEs) decrease of 1476 persons can be compared to 11% increase in full-time permanent faculty experienced between 2005 and 2010, but with caution. As mentioned above, for the first time, CBMS2015 collected data on full-time faculty in three categories (permanent, continuing and other), instead of two (permanent and temporary) in CBMS2010. Full-time continuing and other faculty together totaled 1487 (SE 273) in fall 2015, compared with 1083 full-time continuing faculty in fall 2010 and

represented an increase of 37% (1 SE). See Table S.14 in Chapter 1 and Table TYF.1 in this chapter.

- In fall 2015, the estimated number of part-time faculty in two-year college mathematics programs was 20,247 (17,888, SE 1909, paid by two-year colleges and 2,359, SE 528, paid by third parties such as school districts). Part-time faculty represented 67% of the total number of faculty. This percentage was 70% from 2005 to 2010. When third party payees are omitted, part-time faculty represented 65% of the total number of faculty, also down three points from 2010. See Table TYF.1.
- In fall 2015, sixty-eight percent (68%; 5 SEs) of responding colleges reported the average teaching assignment to be 13-15 hours, compared to 76% in 2010. This decrease is accompanied by an increase in the percentage of two-year colleges reporting teaching assignments greater than or equal to 19 contact hours. The average weekly contact hours for full-time permanent faculty increased to 18 (SE 2) hours in fall 2015 in comparison to 15 hours in fall 2010. Sixty-four percent (64%; 2 SEs) of part-time faculty taught six or more hours in 2015, up ten points from 2010. See Table TYF.2. Thirty-six percent (36%; 4 SEs) of all sections were taught by part-time faculty in fall 2015, a ten-point drop from 2010. See Table S.5 in Chapter 1 and Table TYE.9 in Chapter 6.
- Table TYF.2 shows that 74% (3 SEs) of full-time permanent faculty taught extra hours for extra pay at their own college in fall 2015, up from 65% in 2010. Of those faculty who taught for extra pay, 38% (3 SEs) taught 1-3 extra hours and 39% (2 SEs) taught 4-6 hours. A notable change from 2010 to 2015 was the increase to 23% (2 SEs) from 14% in 2010 in the percentage of faculty teaching 7 or more hours for extra pay. See Table TYF.2.
- There were 612 (SE 132) faculty who were no longer part of the faculty in 2015-2016, compared to 459 who were no longer part of the faculty in 2010-2011. Reasons for these departures were not surveyed in 2015. See Table TYF.3.

Educational Credentials of Faculty in Mathematics Programs

- In fall 2015, a masters degree was the terminal degree for 80% (3 SEs) of the full-time permanent mathematics faculty members at two-year colleges, down three points from 2010. An additional 15% (2 SEs) full-time faculty held doctorates and 5% (3 SEs) held bachelors degrees. Of the total full-time permanent faculty, 73% (2 SEs) held degrees in an academic major in mathematics, 13% (2SEs) in mathematics education and 3% (1 SE) in statistics. See Tables TYF.4 and TYF.5.

- Among part-time faculty in fall 2015, seven percent (7%; 1 SE) held a doctorate (up two points from 2010), 76% (3 SEs) held a masters degree (up three points from 2010) and 17% (3 SEs) held a bachelors degree as their highest degree (down five points from 2010). A bachelors degree may be considered an appropriate or terminal degree for those teaching precollege courses or by accrediting agencies for faculty teaching highly specialized technical courses. See Table TYF.6.
- In fall 2015, fifty-eight percent (58%; 4 SEs) of part-time faculty held degrees in an academic major in mathematics, 19% (2 SEs) in mathematics education, and 3% (1 SE) in statistics. See Table TYF.7.

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

- After the proportion of men and women among the full-time permanent faculty was evenly divided in 2005 and 2010, women comprised 52% (2 SEs) of full-time faculty and 53% (2 SEs) of part-time faculty in 2015. See Tables TYF.8, TYF.9, and TYF.17.
- In fall 2015, the percentage of ethnic minorities among full-time permanent faculty members in mathematics programs in two-year colleges was 23% (2 SEs), compared to 16% in 2010. The total number of ethnic minority faculty was 1876 (SE 289) faculty, up 310 persons from 2010. The majority of faculty represented in the ethnic groups was Asian/Pacific Islander (734 persons; SE 111), up three percentage points to 9% (1 SE). The percentage of women in each ethnic group is displayed in Table TYF.12. See Tables TYF.10, TYF.11, and TYF.12.
- The number of full-time permanent faculty under the age of 40 was 2045 (SE 292), 25% of the total 8314 in 2015, down eight percentage points from 2010, and represented a decrease of 1199 faculty. Ethnic minorities accounted for 26% (3 SEs) of full-time permanent faculty under age 40, 532 persons. The percentage of masters degrees awarded in the U.S. in 2014-15 to ethnic minorities increased to 29%, up seven percentage points from 2008-2009. See Tables TYE.10 and TYF.13.
- Among part-time faculty paid by two-year colleges, twenty-two percent (22%; 2 SEs) or 3935 faculty were ethnic minorities (Asian/Pacific Islander, Black or African American, Mexican American, Puerto Rican, or other Hispanic). Asian/Pacific Islanders represented the largest group of part-time faculty, seven percent (7%; 1 SE), and 1341 (SE 284) faculty. Fifty-three percent (53%; 2 SEs) of all part-time faculty were women in fall 2015. See Tables TYF.14 and TYF.15.
- Distribution of faculty by age is displayed in Table TYF.16. The percentage of faculty, 50-54 years of

age, increased to 16% (2 SEs) in 2015 from 11% in 2010 to a total of 1,357 (SE 220) persons. The percentage decrease in the number of full-time permanent faculty in the age group greater than 59 years was two points to 15% (1 SE) in 2015 and represented 1,219 (SE 153) persons. The average age was 47.7 (SE 0.5) in 2015 compared with 46.8 in 2010. See Table S.16 in Chapter 1 and Tables TYF.16 and TYF.17.

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

- The 451 (SE 83) newly-hired full-time permanent faculty in fall 2015 represented a decrease of 326 faculty from 2010. Thirty-seven percent (37%; 7 SEs) were hired from graduate school (23% in 2010). Four percent (4%; 2 SEs) of the new full-time permanent faculty had been teaching in four-year institutions (3% in 2010) and one percent (1%; 1 SE) had been teaching in secondary schools (25% in 2010). Twenty-six percent (26%; 6 SEs) had taught part-time or on a full-time faculty contract at the same college of the hire. Eight-seven percent (87%; 4 SEs) of newly hired full-time faculty held masters degrees in 2015, compared to 82% in 2010. Nine percent (9%; 3 SEs) held doctorate degrees, compared to 11% in 2010. See Tables TYF.18 and TYF.19.
- Nine percent (9%), 41 persons, of the 451 newly-hired full-time permanent faculty in fall 2015 were ethnic minorities (Asian/Pacific Islander, Black or African American, Mexican American, Puerto Rican, or other Hispanic), down nine percentage points from 2010. In 2015, fifty-five percent (55%; 7 SEs) of all new hires were women, up eight points from 2010. See Tables TYF.18 and TYF.20.

Teaching Evaluations and Professional Development of Mathematics Program Faculty

- The percentage of two-year colleges requiring periodic teaching evaluations for all full-time faculty members increased to 100% (0 SE) in 2015 from 96% in 2010. Percentages of colleges requiring evaluation of part-time faculty increased to 98% (1 SE) in 2015 from 88% in 2010. Increases in the percentages of methods for evaluating full-time faculty were reported in observation of classes by other faculty (75%; 5 SEs) and evaluation forms completed by students (95%; 3 SEs). Decreases in the percentages of methods used for evaluating teaching of full-time were reported in observations by an administrator (45%; 5 SEs) and self-evaluation, such as teaching portfolios (23%; 4 SEs), and written peer evaluations (21%; 5 SEs). Table TYF.22 also reports evaluation methods for part-time faculty, where 94% (3 SEs) of colleges used evaluation forms completed by students and 64% (5

SEs) used observation by other faculty. See Tables TYF.21 and TYF.22.

- The percentage of two-year colleges requiring annual continuing education or professional development for full-time permanent faculty rose to 82% (4 SEs), up 15 points from 2010. The percentages of specific activities used to meet the professional development requirements in 2015 were similar to those in 2010, with an increase of nine percentage points to 62% (2 SEs) of activities provided by the employer. See Table TYF.23.
- The three items reported by mathematics program heads with the highest percentage as being a “major problem” in 2015 were:
 - i. too many students needing remediation (64%; 5 SEs),
 - ii. students not understanding the demands of college work (62%; 5 SEs), and
 - iii. low student motivation (57%; 8 SEs).

When considering issues reported as “somewhat of a problem,” the top three items and their percentages were:

- i. low success rate in transfer-level courses (54%; 5 SEs),
- ii. coordinating mathematics courses with high schools (52%; 4 SEs), and
- iii. lack of curricular flexibility because of transfer rules (46%; 5 SEs).

See Tables TYF.24 and TYF.25.

- In fall 2015, a traditional mathematics department was found in more than half (52%; 5 SEs) of the two-year colleges, up six points compared to 2010. A combined mathematics/science department or division was the management structure at 28% (5 SEs) of institutions and 10% (3 SEs) in mathematics and computer science programs. “Other” department or division structures were reported at 6% (2 SEs) of responding institutions. See Table TYF.26.

Topics of Special Interest for Mathematics Programs

- Issues related to faculty involvement and instructional strategies in distance learning courses are discussed in Chapters 2 and 6. Eighty-seven percent (87%; 4 SEs) of two-year colleges reported that distance learning courses were offered in fall 2015. Instructional materials for distance courses were created by a combination of commercially produced materials and faculty in 67% (5 SEs) of the colleges. Ninety-seven percent (97%; 3 SEs) of responding colleges reported that the same course outlines were used in distance learning and face-to-face courses. Instructors participated in evaluation in the same way in both non-distance and distance learning formats in 93% (3 SEs)

of responding colleges. Thirty-two percent (32%; 7 SEs) of two-year colleges reported that faculty whose entire teaching load was in distance learning had a specific number of office hours per week. See Tables TYE.12.1 and TYE.12.2 in Chapter 6 and Tables SP.8-SP.10 in Chapter 2.

- Two-year colleges' focus on teacher preparation in 2015 included 35% (6 SEs) of reporting institutions assigning 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 28% (5 SEs) of institutions, down from 41% in 2010. Table SP.2 presents decreases in all percentages of organized programs for pre- and in-service teachers. While teacher education is still a focus at two-year colleges, the decreases presented in SP.2, together with the decrease in enrollment in the courses Mathematics for Elementary Teachers I and II presented in Chapter 6, may indicate a lessening of the priority. See Table TYE.3.2 in Chapter 6 and Tables SP.2 and SP.3 in Chapter 2.
- As reported in Chapter 6, ninety-four thousand (94,000; SE 23,000) students were dual enrolled in fall 2015 in a two-year college mathematics course that awarded credit at both the high school and at the college, an increase of 16% (1 SE) since 2010. The academic control of such courses resided primarily with the two-year colleges. Departmental teaching evaluations were required in 72% (5 SEs) of dual enrollment courses in 2015, up from 48% in 2010. Forty-four percent (44%; 6 SEs) of two-year colleges participating in dual enrollment assigned their own faculty members, compared to 22% in 2010 to teach off-campus. See Tables SP.16 and SP.17 in Chapter 2.
- As noted in Chapter 6, thirty-two percent (32%; 5 SEs) of two-year colleges reported that some of their precollege mathematics courses were administered outside of the control of the mathematics department in fall 2015. This percentage was three points higher than in 2010 for precollege courses. Within precollege courses, Arithmetic/Pre-algebra taught outside the mathematics program decreased one percentage point, and Elementary Algebra and Intermediate Algebra both increased nine points. See Tables TYE.14-TYE.16 in Chapter 6.

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

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

In fall 2015, the total estimated number of full-time faculty (permanent, continuing and other) in two-year colleges was 9801 (SE 894) and represented a decrease of 10% (2 SEs) of all full-time faculty (permanent, continuing, and other) from 2010 to 2015, the second decrease since 1980. This decrease is consistent with the 14% decrease in institutional enrollment in two-year colleges and is likely related to the 4% (1 SE) decrease in mathematics and statistics enrollment discussed in Chapter 6 (5 % when dual enrollment is excluded). The decrease in faculty follows an increase of 26% from 2000 to 2005 and an increase of 11% from 2005 to 2010.

In fall 2015, the total estimated number of faculty reported as "full-time permanent" faculty was 8314 (SE 840), a 15% (2 SEs) decrease of 1476 persons from 2010. This data should be considered by examining data of categories of full-time faculty. For the first time, CBMS2015 collected data on full-time faculty in the three categories of permanent, continuing and other faculty, instead of the two categories, permanent and temporary, in CBMS2010. Full-time continuing and other faculty together totaled 1487 (SE 273) persons in fall 2015, compared with 1083 full-time continuing faculty in fall 2010 and represented an increase of 37% (1 SE). Refer to page 1 in this chapter for a more detailed description of the faculty titles used in this document. The growth in non-tenure track continuing and other faculty may be an indication of the stressed financial conditions in two-year colleges, mathematics program changes and redesign, and shifting enrollment trends. See Chapter 6 for two-year college enrollment data and the overall enrollment data summary in Chapter 1 and Table TYF.1.

The total estimated number of all full-time faculty in four-year institutions, full-time (tenure-eligible), other full-time and postdocs, was approximately 24,000 (SE 317) in fall 2015, a 2% increase. Four-year institutions experienced 6% (4 SEs) decrease in full-time permanent (tenure-eligible) faculty in 2015 and an estimated total decrease of 768 faculty. Two-year colleges, a 22% (6 SEs) increase was evident in "other" full-time faculty at four-year institutions. See Tables S.13 and S.14 in Chapter 1.

TABLE TYF.1 Number of full-time permanent, full-time temporary faculty, other full-time 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 2000, 2005, 2010, and 2015.

Two-Year Colleges	2000	2005	2010	2015
Full-time permanent faculty	6960	8793	9790	8314
Full-time continuing faculty	961	610	1083	1221
Other full-time faculty				266
Part-time faculty paid by TYC	14887	18227	23453	17888
Part-time, paid by third party	776	1915	2323	2359

Note: Prior to 2015, there was no differentiation between full-time continuing faculty and other full-time faculty.

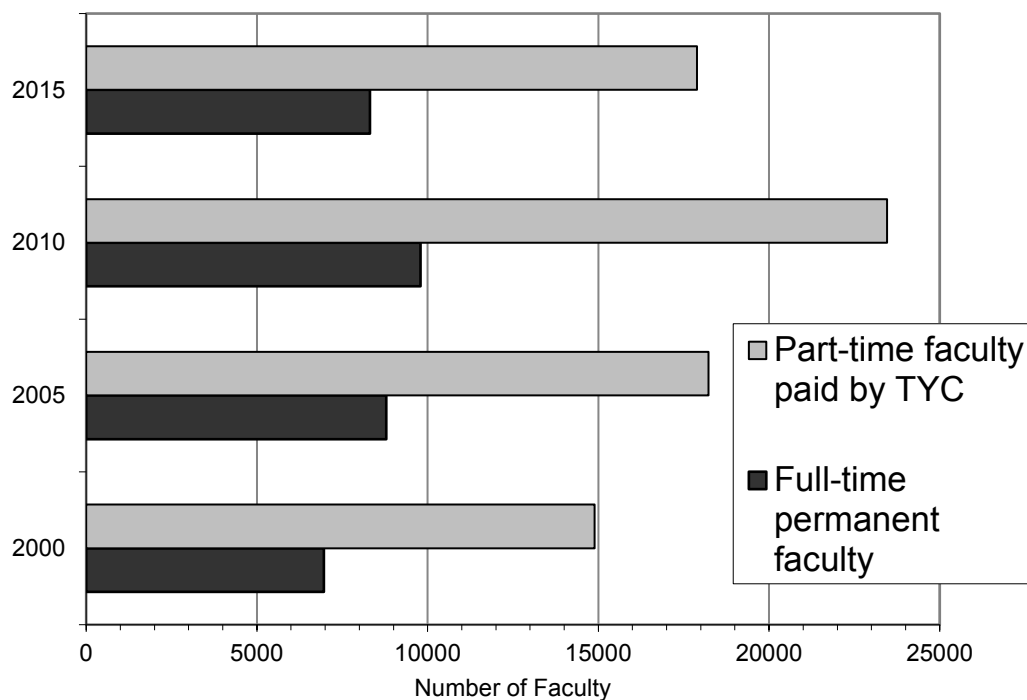


FIGURE TYF.1.1 Numbers of full-time permanent faculty and part-time faculty paid by TYC in mathematics programs in two-year colleges in fall 2000, 2005, 2010, and 2015.

Part-time faculty members in two-year colleges 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, the estimated number of part-time faculty was 20,247 or 67% of the total two-year college teaching staff, down three percentage points since 2010. When third party payees are excluded, the estimated number of part-time faculty members was 17,888 (SE 1909), a decrease of 24% (3 SEs) from 2010 to 2015, and represented 65% of total faculty, down three percentage points from 2010. Another 2,359 (SE 528) part-time faculty were paid by a third party, such as a school district. See Table TYF.1.

Demographics and discussion of newly hired full-time permanent faculty in fall 2015 are presented later in this chapter before and in Tables TYF.18, TYF.19, and TYF.20.

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

The average teaching assignment in weekly classroom contact hours for a full-time permanent mathematics faculty member at a public two-year college in fall 2015 was 18 (SE 2) weekly contact hours. This continued a long period during which this figure has oscillated. Previous CBMS surveys reported that in 2010, the average was 15 hours; in 2000, the average weekly contact hour assignment had been 14.8 hours; and in 1990, the number was 14.7 hours. See Tables TYF.2 and TYF.2.1.

In 2015, the teaching assignment for full-time faculty was between 13 and 15 weekly contact hours in 68% (5 SEs) of responding colleges. Nineteen percent (19%) of colleges reported weekly contact hour teaching assignments greater than 15 hours, up five points from 2010. This included 5% (2 SEs) of colleges reporting that teaching assignments were more than

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 2015, with 2010 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 (3)	10 (7)	68 (76)	8 (8)	6 (3)	5 (3)
Full-time Permanent Faculty						
A. Average weekly contact hours: 18 (15)						
B. Percentage who teach extra hours for extra pay at their own two-year college: 74% (65%)						
C. Percentage teaching 1-3 extra hours for extra pay: 38% (47%)						
D. Percentage teaching 4-6 extra hours for extra pay: 39% (39%)						
E. Percentage teaching 7 or more extra hours for extra pay: 23% (14%)						
Part-time Faculty						
F. Percentage who teach 6 or more hours weekly: 64% (54%)						
G. Percentage of two-year colleges requiring part-time faculty to hold office hours: 29% (28%)						

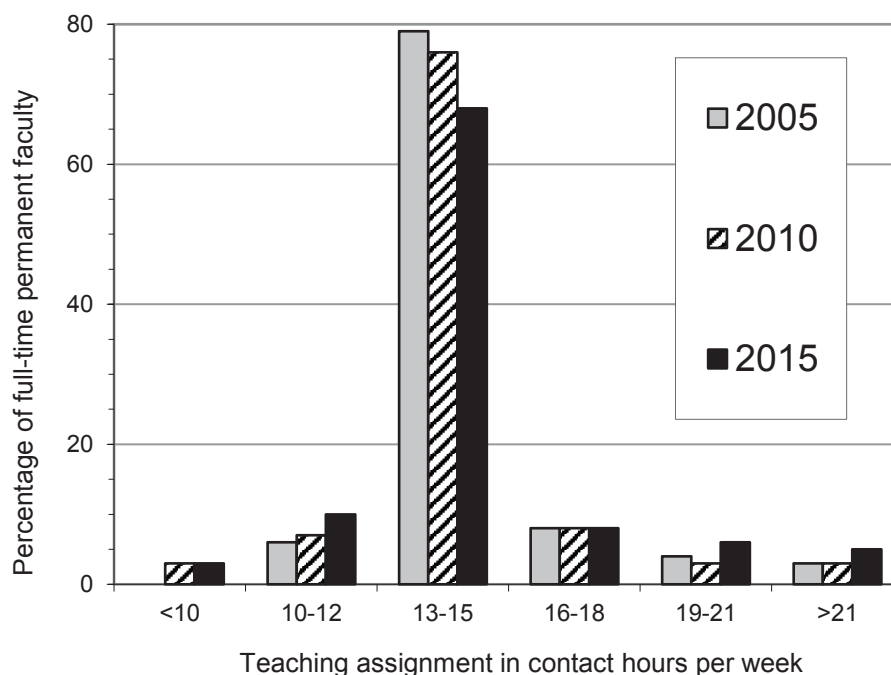


FIGURE TYF.2.1 Percentage of full-time permanent faculty with various teaching assignments in mathematics programs at two-year colleges in fall 2005, 2010, and 2015.

21 hours. Thirteen percent (13%) had teaching assignments less than 13 weekly contact hours.

Sixth-four percent (64%; 2 SEs) of part-time faculty members in two-year college mathematics programs taught six credit hours or more, up ten percentage points from 2010. Office hours were required of part-time faculty in 29% (6 SEs) of two-year colleges, up one point from 2010. See Table TYF.2.

Table TYF.2 also shows that 74% (3 SEs) of full-time permanent mathematics faculty members at two-year colleges taught extra hours for extra pay at their own colleges, compared to 65% in 2010. Of those faculty who taught for extra pay in 2015, 38% (3 SEs) of full-time permanent faculty taught 1-3 hours for extra pay, 39% (2 SEs) taught 4-6 hours, and 23% (2 SEs) taught 7 or more extra hours for extra pay. Full-time permanent faculty teaching 7 or more extra hours

increased by nine points to 23% (2 SEs) from 2010 to 2015.

Outflow of full-time permanent mathematics faculty and other occupations of part-time faculty

Data about outflow of permanent faculty was collected in detail prior to CBMS2010, including specific information about faculty deaths, faculty retiring, faculty taking positions at four-year institutions, other two-year institutions, high schools, or graduate school. Because this detailed information is difficult to obtain, CBMS2015 and CBMS2010 collected only the total number of outflow of faculty. In 2015, six hundred twelve (612; SE 132) full-time permanent faculty were no longer a part of the faculty in 2015-2016, compared to 459 persons in 2010-2011. The authors acknowledge that this data is difficult to

TABLE TYF.3 Number of full-time permanent faculty in 2014-2015 who were no longer part of the faculty in 2015-2016.

Number no longer part of 2015-2016 faculty	612
Total full-time permanent faculty, fall 2015	8314

collect and may not represent a true picture in the change in faculty numbers over time.

Information about the percentage of part-time faculty in mathematics programs at two-year college with various other occupations was collected in CBMS surveys prior to 2010. CBMS2015 and CBMS2010 did not collect information about other occupations of part-time faculty.

Educational Credentials of Faculty in Mathematics Programs

Highest degree of full-time permanent faculty

In fall 2015, a masters degree was the terminal degree for 80% (3 SEs) of full-time permanent mathematics faculty at two-year colleges, down three points from 2010. The percentage of faculty with a doctorate

TABLE TYF.4 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by highest degree in fall 1995, 2000, 2005, 2010, and 2015.

Highest degree	Percentage of full-time permanent faculty				
	1995	2000	2005	2010	2015
Doctorate	17	16	16	14	15
Masters	82	81	82	83	80
Bachelors	1	3	2	3	5
Number of full-time permanent faculty	7578	6960	8793	9790	8314

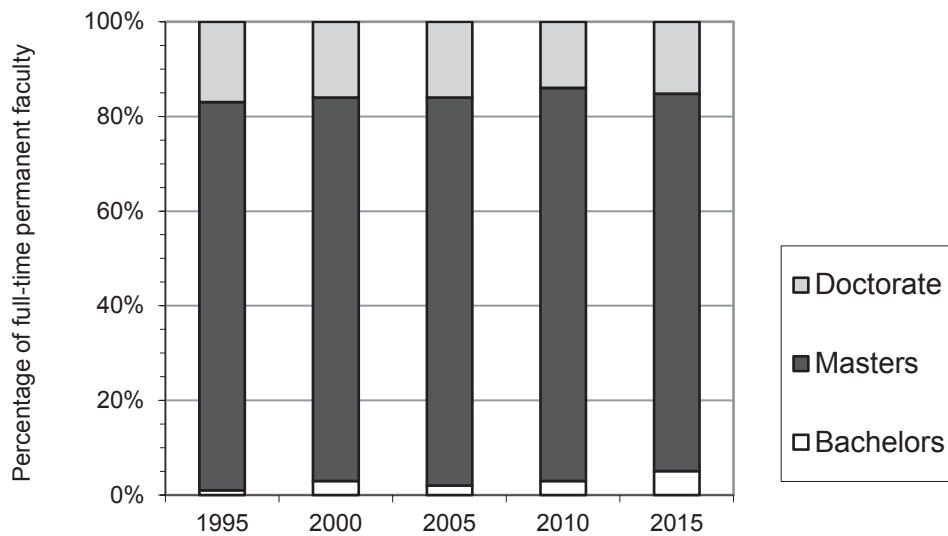


FIGURE TYE.4.1 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by highest degree in fall 1995, 2000, 2005, 2010, and 2015.

TABLE TYF.5 Percentage of full-time permanent faculty in mathematics programs at public two-year colleges by field and highest degree in fall 2015.

Field of degree	Percentage having as highest degree			Total Percent in Field
	Doctorate	Masters	Bachelors	
Mathematics	9	60	4	73
Statistics	2	3	0	5
Mathematics Education	2	11	0	13
Other fields	2	6	0	9
Total Percentage by highest degree	15	80	5	100

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

increased one point to 15% (2 SEs) in 2015. The percentage of full-time faculty whose terminal degree was a bachelors degree increased two points to 5% (3 SEs) in 2015. Tables TYF.4 and TYF.4.1 present historical data from 1995 to 2015. Data regarding the previous employment and degrees of new hires in fall 2015 can be found in Tables TYF.18 and TYF.19, along with additional discussion there.

The academic major and highest degree of full-time permanent two-year college mathematics faculty is shown in Table TYF.5. The percentage of the faculty whose most advanced degree (doctorate, masters and bachelors) was in mathematics was 73% (2 SEs), compared to 68% in 2010 data. The percentage of the faculty whose most advanced degree was in mathematics education decreased eight points to 13% (2

SEs). The percentage of degrees with majors in statistics increased two points to 5% (1 SE).

Highest degree of part-time faculty

Tables TYF.6, TYF.6.1, and TYF.7 summarize data on the highest degrees held by part-time faculty members and their fields of specialization. In fall 2015, a doctoral degree was the highest degree held by 7% (1 SE) of part-time faculty, up two points from fall 2010. A masters degree was the highest degree for 76% (3 SEs) of part-time faculty, compared to 73% in 2010. A bachelors degree was the highest degree for 17% (2 SEs) of part-time faculty in 2015, a decrease of five points from 2010 and 2005.

In 2015, the percentage of part-time faculty whose most advanced degree had mathematics or mathe-

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 1995, 2000, 2005, 2010, and 2015.

Highest degree	Percentage of part-time faculty				
	1995	2000	2005	2010	2015
Doctorate	7	6	6	5	7
Masters	76	70	72	73	76
Bachelors	18	24	22	22	17
Total	100%	100%	100%	100%	100%
Number of part-time faculty	14266	14887	20142	25775	20247

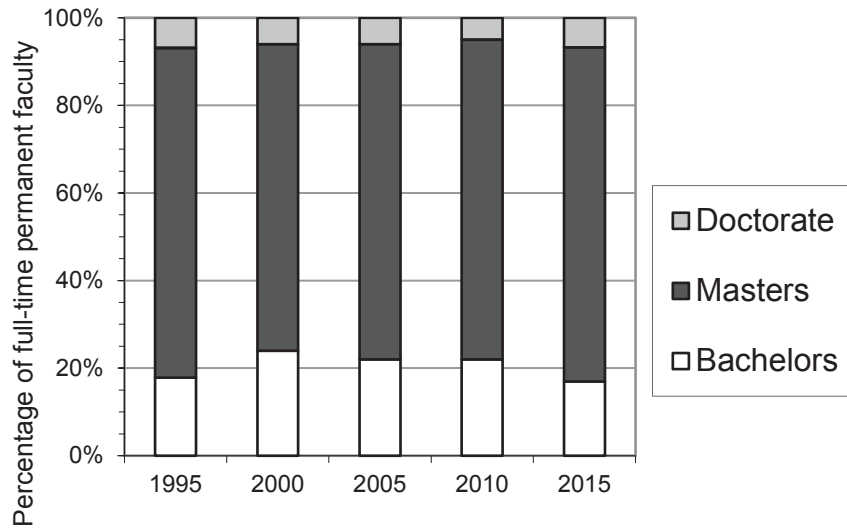


FIGURE TYF.6.1 Percentage of part-time faculty in mathematics programs at two-year colleges (including those paid by a third party, as in dual-enrollment courses) by highest degree in fall 1995, 2000, 2005, 2010, and 2015.

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 2015, with 2010 data in parentheses.

Field of degree	Percentage having as highest degree			Total Percent in Field
	Doctorate	Masters	Bachelors	
Mathematics	4	45	8	58
Mathematics Education	1	16	3	19
Statistics	0	3	0	3
Other fields	2	12	6	19
Total Percentage by highest degree	7 (5)	76 (73)	17 (22)	100%

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 2000, 2005, 2010, and 2015.

	2000	2005	2010	2015
Men	3537	4420	4866	3969
	51%	50%	50%	48%
Women	3423	4373	4924	4345
	49%	50%	50%	52%
Total	6960	8793	9790	8314
	100%	100%	100%	100%

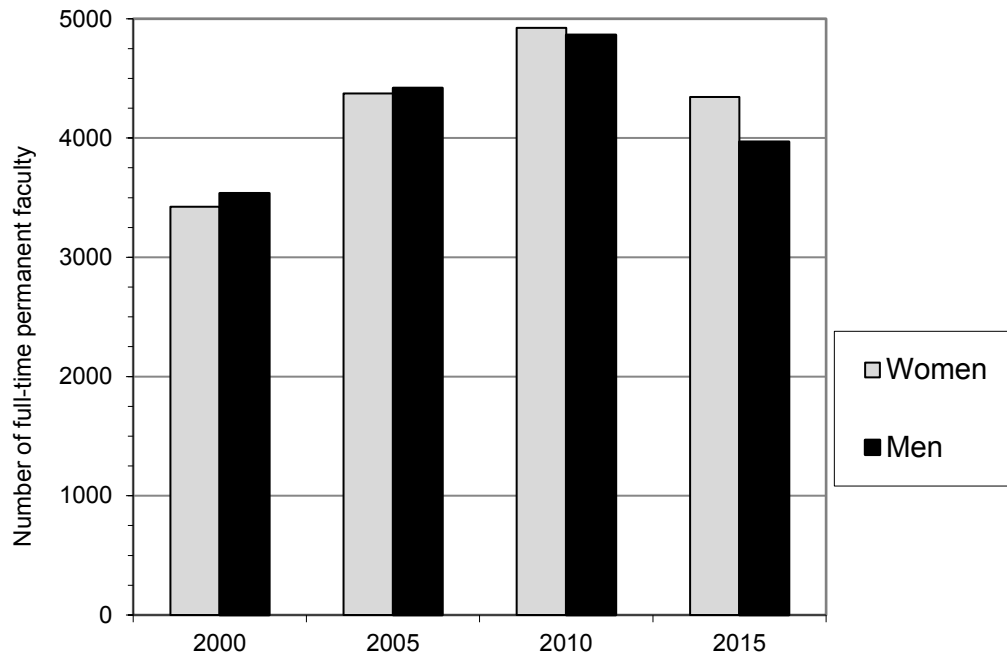


FIGURE TYF.8.1 Number of full-time permanent faculty in mathematics programs at two-year colleges by gender in fall 2000, 2005, 2010, and 2015.

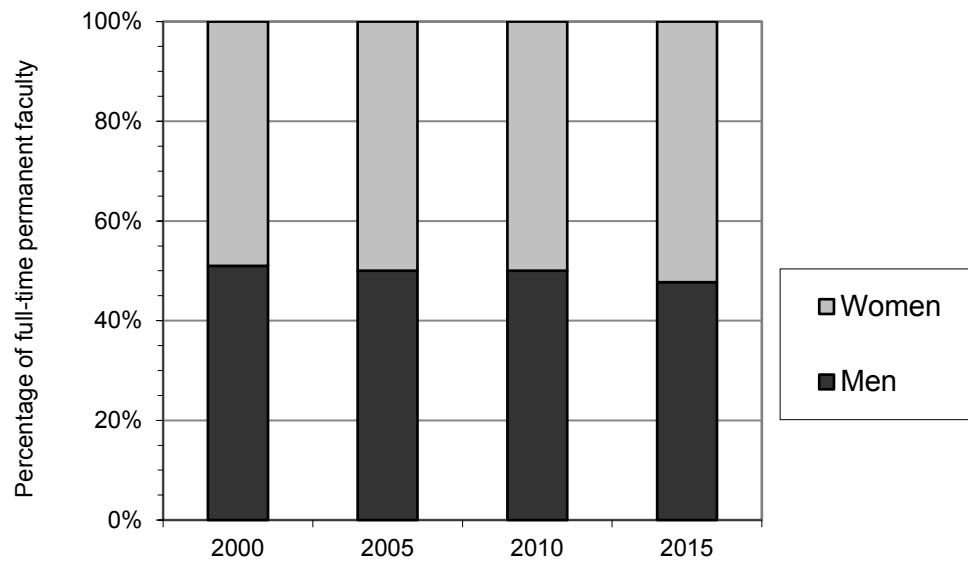


FIGURE TYF.8.2 Percentage of full-time permanent faculty in mathematics programs at two-year colleges by gender in fall 2000, 2005, 2010, and 2015.

matics education as the major field of study 77% (58%, 4 SEs and 19%, 2 SEs, respectively), compared to the combined total of 74% in 2010. Three percent (3%; 1 SE) of part-time faculty held degrees in statistics, up one point from 2010. A five-point decrease to 19% (3 SEs) was reported in “other fields.” See Table TYF.7.

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. This trend continued in fall 2015 with 52% (2 SEs) of full-time permanent faculty reported as women. In fall 2005 and 2010, the number was fifty percent (50%; 2 SEs). See Tables TYF.8 and TYF.8.1.

Table TYF.9 reports that in fall 2015 the percentage of women among part-time faculty was 53% (2 SEs). This was up from 49% in fall 2010. The percentage of women mathematics masters degree recipients among U.S. citizens/resident aliens was 36% in 2014-2015, compared with 41% in 2008-2009.

Table TYF.17 presents the percentage of full-time faculty in mathematics by age and gender and the percentage of women by age. Table TYF.20 presents data on the gender and ethnicity of newly hired full-time permanent mathematics faculty in fall 2015 and 2010. In fall 2015, the percentage of women in this

group was 55% (7 SEs), up seven points from 2010. See the discussion before TYF.17 and TYF.20.

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.10.1, TYF.11, TYF.12, and TYF.13. 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 2015, including information about both age and gender. Tables TYF.14 and TYF.15 present data on ethnicity of part-time faculty.

In fall 2015, ethnic minority faculty constituted 23% (2 SEs) of the full-time permanent faculty and 1876 (SE 289) faculty. In fall 2010, 1566 full-time permanent ethnic minority faculty comprised 16% of total mathematics faculty. In 2015, the change in the number of minority faculty was 310 more persons. See Table TYF.10 and TYF.10.1.

The relative percentage of the full-time permanent minority faculty within individual ethnic groups changed slightly between 2010 and 2015. The percentage of Black (non-Hispanic) faculty remained the same (6%; 1 SE). The percentage of Mexican American/Puerto Rican/other Hispanic faculty was 6% (1 SE), up two points from 2010. Asian/Pacific Islanders represented the largest ethnic minority

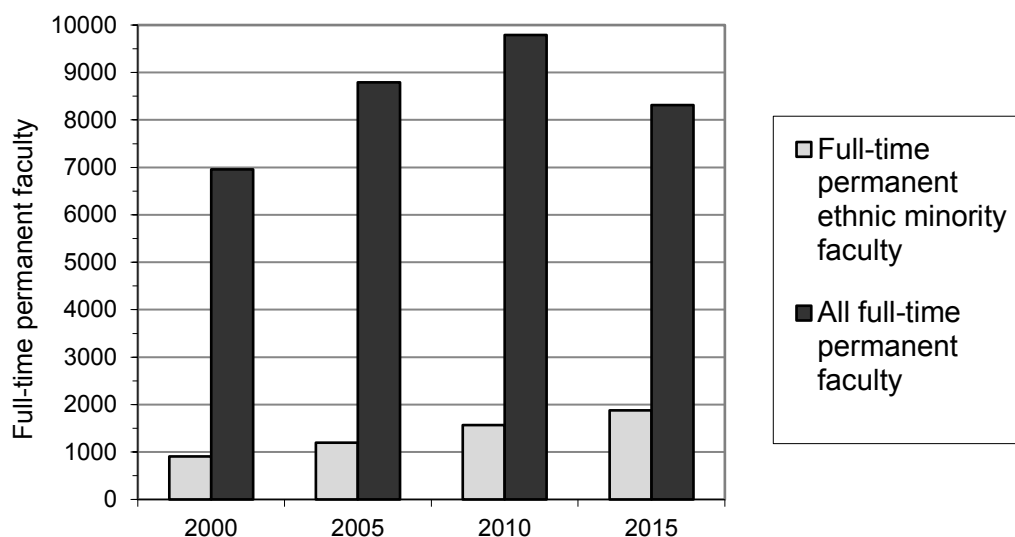
TABLE TYF.9 Percentage of full-time permanent faculty and part-time faculty in mathematics programs at public two-year colleges by gender in fall 2015. Also masters degrees in mathematics and statistics granted in the U.S. to citizens and resident aliens, by gender, in 2014-15. Part-time faculty paid 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 2014-15 to citizens and resident aliens ¹
Men	48	47	64
Women	52	53	36
Total	100%	100%	100%
Total Number	8314	17888	3909

¹ Report Tables 323.40 and 323.50 from Digest of Education Statistics 2016, National Center for Education Statistics, https://nces.ed.gov/programs/digest/current_tables.asp.

TABLE TYF.10 Percentage and number of ethnic minority full-time permanent faculty in mathematics programs at two-year colleges in fall 2000, 2005, 2010, and 2015.

	2000	2005	2010	2015
Percentage of ethnic minorities among full-time permanent faculty	13%	14%	16%	23%
Number of full-time permanent ethnic minority faculty	909	1198	1566	1876
Number of full-time permanent faculty	6960	8793	9790	8314

**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 2000, 2005, 2010, and 2015.**TABLE TYF.11** Percentage of full-time permanent faculty in mathematics programs at two-year colleges by ethnicity, in fall 2000, 2005, 2010, and 2015.

Ethnic Group	Percentage of full-time permanent faculty			
	2000	2005	2010	2015
American Indian/Eskimo/Aleut	1	0	0	0
Asian/Pacific Islander	4	6	6	9
Black (non-Hispanic)	5	5	6	6
Mexican American/Puerto Rican/ other Hispanic	3	3	4	6
White (non-Hispanic)	85	84	79	75
Status unknown	2	2	5	3
	100%	100%	100%	100%
Number of full-time permanent faculty	6960	8793	9790	8314

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 2015.

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	27	0	24
Asian/Pacific Islander	734	7	36
Black or African American (non-Hispanic)	521	5	52
Mexican American, Puerto Rican or other Hispanic	595	6	37
White (non-Hispanic)	6141	58	54
Status not known or other	297	3	44
Total	8314	100%	52

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 2015. Also U.S. Masters degrees in mathematics and statistics granted in the U.S. to citizens and resident aliens by ethnic group in 2014-15.

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 2014-15 to citizens and resident aliens ¹
Ethnic Minorities	23	26	29
White (non-Hispanic)	74	72	71
Unknown	4	2	
Total	100%	100%	100%
Number	8314	2045	3909

¹ Table 323.30 from Digest of Education Statistics 2016, https://nces.ed.gov/programs/digest/d16/tables/dt16_323.30.asp?current=yes. (These figures include resident aliens but do not include a total of 3680 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 2005, 2010, and 2015.

	2005	2010	2015
Percentage of ethnic minorities among part-time faculty	16	17	22
Number of part-time faculty	18227	23453	17888

groups in fall 2015 at 9% (1 SE) of full-time permanent faculty, up three points from 2010. These changes impacted the percentage of White (non-Hispanic) full-time permanent faculty in 2015, down four points from 2010 to 75% (2 SEs). See Table TYF.11.

Table TYF.12 gives the number of full-time permanent faculty and the percentage of women within ethnic groups. The largest percentage of women within a group occurred in White (non-Hispanic) with 54%

(3 SEs) of the 6141 (SE 598) faculty in that group or 3316 women. Next, the Black or African American group of 521 (SE 80) faculty had 271 women (52%; 8 SEs). The female Asian/Pacific Islander and Native Hawaiian faculty were 36% (7 SEs) of the 734 (SE 111) faculty in that group or 264 women. Native Americans (American Indians/Eskimo/Aleut) faculty, recorded as zero in the table (0.3%), represented a total of 27 (SE 10) faculty of whom 6 were women. A

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 2015.

Ethnic Group	Number of part-time faculty	Percentage of	
		Ethnic group among all part-time faculty	Women within ethnic group
American Indian, Alaskan Native	46	0	80
Asian/Pacific Islander	1341	7	49
Black or African American (non-Hispanic)	1009	6	41
Mexican American, Puerto Rican or other Hispanic	1073	6	42
White (non-Hispanic)	12531	70	55
Status not known or other	1888	11	59
Total	17888	100%	53

TABLE TYF.16 Percentage and number of full-time permanent faculty in mathematics programs at two-year colleges by age in fall 2000, 2005, 2010, and 2015.

Age	Percentage of full-time permanent faculty				Number of full-time permanent faculty			
	2000	2005	2010	2015	2000	2005	2010	2015
<30	4	5	8	4	290	478	832	363
30-34	9	8	9	6	615	716	893	529
35-39	13	12	12	14	890	1037	1189	1153
40-44	11	13	14	14	763	1163	1416	1159
45-49	15	15	15	18	1075	1298	1475	1479
50-54	20	18	11	16	1418	1574	1085	1357
55-59	16	17	13	13	1146	1528	1268	1055
>59	11	11	17	15	763	999	1631	1219
Total	100%	100%	100%	100%	6960	8793	9790	8314

Note: Rounding may make column totals seem inaccurate.

word of caution is in order given that respondents to CBMS2015 reported the ethnicity of 297 (SE 81) full-time permanent faculty was unknown.

In fall 2015, the total number of full-time permanent faculty under the age of 40 was 2045 (SE 292), compared to a total of 3244 in 2010, a 37% (4 SEs) decrease. These faculty under the age of 40 comprised 25% of all full-time permanent faculty, compared to 33% in 2010. In fall 2015, the percentage of ethnic minority full-time permanent mathematics faculty under the age of 40 rose to 26% (3 SEs). Percentages can be misleading. The 18% of ethnic minority faculty under age 40 reported in 2010 represented 584

persons and the 26% in 2015 was 532 faculty. See Table TYF.13. Data on ethnicity of newly-hired full-time permanent faculty in fall 2015 are presented in Table TYF.20.

In fall 2015, twenty-two percent (22%; 2 SEs) of part-time faculty members or 3935 persons were ethnic minorities (Asian/Pacific Islander, Black or African American, Mexican American, Puerto Rican, or other Hispanic), up three percentage points from 2010 and up four points compared with 2005. Asian/Pacific Islanders comprised 7% (1 SE) of part-time faculty (1341 persons) and Black or African American and Mexican American, Puerto Rican or other Hispanic

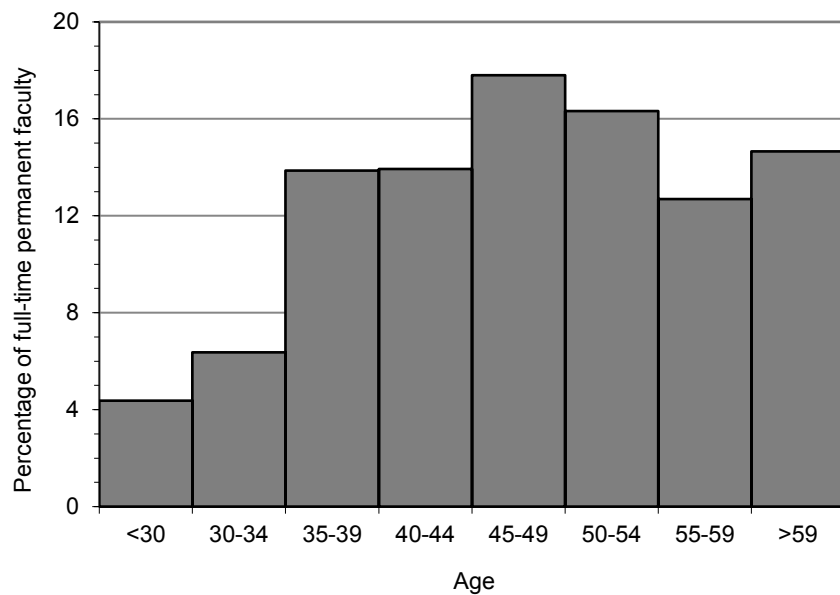


FIGURE TYF.16.1 Percentage distribution of full-time permanent faculty in mathematics programs at public two-year colleges by age in fall 2015.

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 2015.

Age	Percentage of full-time permanent faculty		Percentage of women in age group
	Women	Men	
<35	6	5	56
35-44	14	14	50
45-54	19	14	58
>54	13	15	46
Total	52	48	

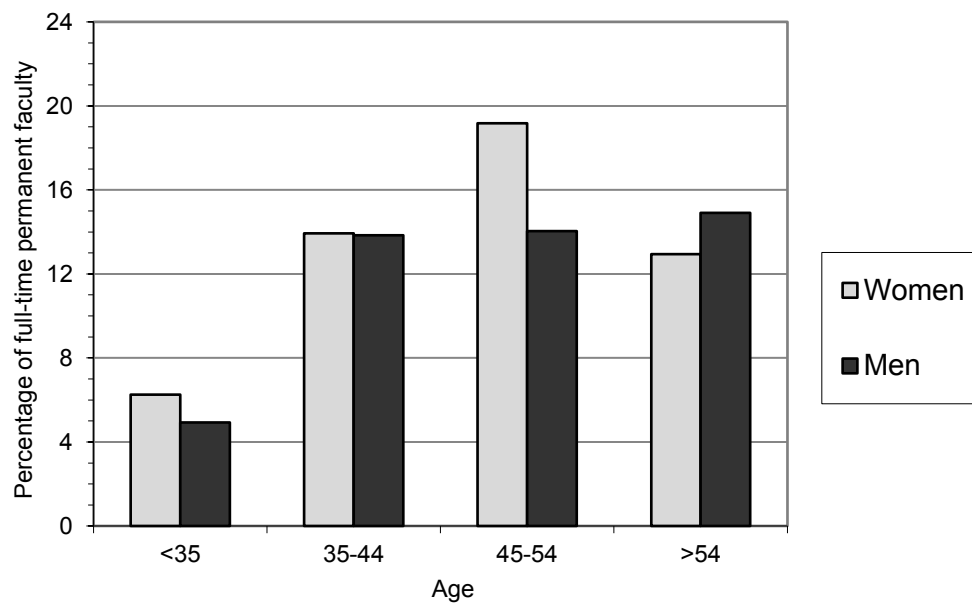


FIGURE TYF.17.1 Percentage of full-time permanent faculty in mathematics programs at public two-year colleges by age and by gender in fall 2015.

TABLE TYF.18 Percentage of newly appointed full-time permanent faculty in mathematics programs at two-year colleges coming from various sources in fall 2010 and 2015.

Percentage of new faculty from:	2010	2015
A. Graduate School	23	37
B. Teaching in a four-year college or university	3	4
C. Teaching in another two-year college	18	19
D. Teaching in a secondary school	25	1
E. Part-time or full-time temporary employment at the same college	23	26
F. Nonacademic employment	1	1
G. Unemployed	0	4
F. Unknown	6	9
Total	100%	100%
Total Number Hired	777	451

together represented 6% each (1 SE) of all part-time faculty (2082 persons). Women comprised 53% (2 SEs) of all part-time faculty. See Tables TYF.14 and TYF.15.

Number and age distribution of full-time permanent faculty

As mentioned above, the number of full-time permanent faculty in mathematics programs at two-year

colleges decreased by 15% in 2015 to a total of 8314, compared to 9790 faculty in 2010. When the 1487 continuing and other full-time faculty are included, the total was 9800 persons and represented a decrease of 10% compared to 2010. See Table TYF.1.

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

TABLE TYF.19 Percentage of full-time permanent faculty newly hired for mathematics programs at two-year colleges by highest degree in fall 2010 and 2015.

Highest Degree	Percentage of New Hires	
	2010-2011	2015-2016
Doctorate	11	9
Masters	82	87
Bachelors	2	0
Unknown	4	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 2010 and 2015. Also percentage of women within each ethnic group in fall 2015.

Ethnic Group	Percentage of new hires		Percentage of women in ethnic group for 2015-2016 new hires
	2010-2011	2015-2016	
American Indian	0	0	na
Asian/Pacific Islander	9	4	11
Black or Arican American (non-Hispanic)	5	2	54
Mexican American, Puerto Rican, or other Hispanic	4	3	33
White (non-Hispanic)	78	82	63
Other	1	3	33
Unknown	3	5	0
Percentage of women among all new hires	47	55	

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

na = Not applicable

years. In fall 2010, a decrease was noted with the average faculty age of 46.8 years. Fall 2015 data showed a slight increase of the average age to 47.7 (SE 0.5) years. Of particular interest and due to possible influence of sample error, the percentage of full-time faculty over the age of 59 rose from 11% (999 persons) in 2005 to 17% (1631 persons) in 2010 and then down 15% (1 SE) in 2015 (1219 persons; SE 153). See Table S.16 in Chapter 1 for data on age of mathematics faculty in both two-year and four-year institutions and Table TYF.16 for specific age groups and historical data for two-year colleges.

In 2015, the percentage of full-time permanent faculty under age 40 years dropped seven points to 25% compared to 2010, similar the 25% collected in 2005. Again, percentages do not tell the entire story. The number of full-time permanent faculty under the age of 40 in 2015, 2010, and 2005 was 2045, 2914, and 2231, respectively. Among ethnic minority faculty, 26% (3 SEs; 532 persons) were under age 40 in fall 2015, as reported in Table TYF.13. The percentage of full-time permanent faculty between the ages of 50-59 years increased five points to 29% in 2015 (total increase of 59 persons), compared to 2010. The percentage of full-time faculty over age 59 was down two points from 2010 to 15% (1 SE) in 2015 (a decrease of 412 persons). The total number of full-time permanent faculty over the age of 49 decreased by 353 persons from 2010 to 2015. See Table TYF.16.

In 2015, women were a majority with 56% (2 SEs) in the age group less than 35 years, down one point from 2010. Fifty-eight percent (58%; 2 SEs) of the age group 45-54 were women, up 10 points from 2010. Forty-six percent (46%; 2 SEs) of the age group over age 54 were women, down one point from 2010. See Table TYF.17 and TYF.17.1.

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

Two-year college mathematics programs hired 451 (SE 83) new full-time permanent faculty members in fall 2015, down 326 persons and 42% (4 SEs) from those hired in 2010. See Table TYF.18.

Fall 2015 and earlier surveys presented sources of new hires at two-year colleges. In 2005 and 2010, graduate school as a source remained steady at 23%. In fall 2015, that percentage increased to 37% (7 SEs) in 2015 (166 persons). In contrast, the percentage of new hires who had been teaching at four-year institutions was 4% (2 SEs) in 2015 (18 persons), compared to 3% in 2010 and 18% in 2005. Hiring from among part-time faculty at the same institution was up three points to 26% (6 SEs; 116 persons), while new faculty hired from a secondary school decreased to 1% (1 SE; 4 persons) of total new hires, down 24 points from 2010. See Table TYF.18.

The masters degree was held by 87% (4 SEs) of newly-hired full-time permanent faculty in fall 2015, up five points from 2010, and in contrast to 2000 when the percentage was 66%. Percentage of new faculty with a doctorate degree in 2015 was 9% (3 SEs), compared with 11% in 2010. See Table TYF.19.

The 2000, 2005, 2010, and 2015 data indicate a decrease of new hires with a bachelors degree from 19% to 5% to 2% to 0% (less than one percent and/or round-off may make 0% totals inaccurate), respectively.

In 2015, fifty-five percent (55%; 7 SEs) of new mathematics faculty hires were women, compared to 47% in fall 2010. Table TYF.20 shows White (non-Hispanic) faculty comprised 82% (5 SEs) of new hires for 2015, up 4 points from 2010. Overall, 9% of the 451

TABLE TYF.21 Percentage of two-year colleges that require periodic teaching evaluations for all full-time or all part-time faculty in fall 2010 and 2015.

	Percentage of two-year colleges in fall 2010	Percentage of two-year colleges in fall 2015
Colleges that require teaching evaluations for all full-time faculty	96	100
Colleges that require teaching evaluations for all part-time faculty	88	98

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 2015.

Method of evaluating teaching	Percentage of programs using evaluation method for	
	Part-time faculty	Full-time faculty
A. Observation of classes by other faculty	64	75
B. Observation of classes by division head (if different from chair) or other administrator	62	45
C. Evaluation forms completed by students	94	95
D. Evaluation of written course material such as lesson plans, syllabus, or exams	57	53
E. Self-evaluation such as teaching portfolios	62	23
F. Written Peer Evaluations	34	21
G. Other methods	18	9

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 2010 and 2015.

Faculty Development	Fall 2010	Fall 2015
Percentage of institutions requiring continuing education or professional development for full-time permanent faculty	67	82
How Faculty Meet Professional Development Requirements	Percentage of permanent faculty in fall 2010	Percentage of permanent faculty in fall 2015
A. Activities provided by employer	53	62
B. Activities provided by professional associations	34	33
C. Publishing books or research or expository papers	3	3
D. Continuing graduate education	4	3

TABLE TYF.24 Percentage of program heads classifying various problems as "major" in mathematics programs at two-year colleges in fall 2000, 2005, 2010, and 2015.

Problem	Percentage of program heads classifying problem as major			
	2000	2005	2010	2015
A. Maintaining vitality of faculty	9	2	4	7
B. Dual-enrollment courses	8	5	11	7
C. Staffing statistics courses	2	3	2	5
D. Students don't understand demands of college work	na	55	64	62
E. Need to use part-time faculty for too many courses	39	30	35	15
F. Faculty salaries too low	36	22	21	39
G. Class sizes too large	10	5	3	5
H. Low student motivation	47	50	50	57
I. Too many students needing remediation	62	63	67	64
J. Lack of student progress from developmental to advanced courses	na	34	37	36
K. Low success rate in transfer-level courses	8	7	13	14
L. Too few students who intend to transfer actually do	2	4	11	8
M. Inadequate travel funds for faculty	15	22	23	25
N. Inadequate classroom facilities for use of technology	na	12	10	4
O. Inadequate computer facilities for part-time faculty use	na	9	6	7
P. Inadequate computer facilities for student services	3	1	5	6
Q. Heavy classroom duties prevent personal & teaching enrichment by faculty	na	14	11	13
R. Coordinating mathematics courses with high schools	6	7	14	21
S. Lack of curricular flexibility because of transfer rules	1	7	5	2
T. Other barriers than inhibit curricular changes ¹	na	na	na	7
U. Maintaining high and consistent expectations across sections ¹	na	na	na	8
V. High cost of textbooks ¹	na	na	na	54
W. Lack of flexibility in curricular redesign ¹	na	na	na	4
X. Maintaining common standards between distance learning and related courses ¹	na	na	na	2
Y. Use of distance education ¹	10	6	6	4

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

¹Data not collected before 2015.

TABLE TYF.25 Percentage of program heads of mathematics programs at public two-year colleges classifying various problems by severity in fall 2015.

Problem	Percentage of program heads classifying problems as		
	minor or no problem	somewhat of a problem	major problem
A. Maintaining vitality of faculty	60	33	7
B. Dual-enrollment courses	57	36	7
C. Staffing statistics courses	63	31	5
D. Students don't understand demands of college work	7	31	62
E. Need to use part-time faculty for too many courses	47	38	15
F. Faculty salaries too low	22	39	39
G. Class sizes too large	70	24	5
H. Low student motivation	9	34	57
I. Too many students needing remediation	2	33	64
J. Lack of student progress from developmental to advanced courses	15	48	36
K. Low success rate in transfer-level courses	32	54	14
L. Too few students who intend to transfer actually do	47	45	8
M. Inadequate travel funds for faculty	44	31	25
N. Inadequate classroom facilities for use of technology	70	26	4
O. Inadequate computer facilities for part-time faculty use	63	31	7
P. Inadequate computer facilities for student services	70	24	6
Q. Heavy classroom duties prevent personal & teaching enrichment by faculty	43	43	13
R. Coordinating mathematics courses with high schools	28	52	21
S. Lack of curricular flexibility because of transfer rules	52	46	2
T. Other barriers than inhibit curricular changes	61	32	7
U. Maintaining high and consistent expectations across sections	48	44	8
V. High cost of textbooks	11	35	54
W. Lack of flexibility in curricular redesign	55	41	4
X. Maintaining common standards between distance learning and related courses	57	41	2
Y. Use of distance education	53	43	4

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

new hires in 2015 were ethnic minorities (41 persons), down nine points from 2010. New hires for Asian/Pacific Islander, Mexican American, Puerto Rican or other Hispanic and the group “others,” tended to be males. Information about age of new hires was not collected in CBMS2015 and CBMS2010.

Teaching Evaluations and Professional Development of Mathematics Program Faculty and Concerns and Issues in Mathematics Programs

In fall 2015, one hundred percent (100%; 0 SE) of two-year colleges responding to the survey required periodic evaluation of the teaching of full-time permanent mathematics faculty members, compared with 96% in 2010. Periodic teaching evaluation was required for part-time faculty at 98% (1 SE) of colleges, compared to 88% reported in 2010. See Table TYF.21.

Regarding methods of evaluating teaching, the percentage of colleges using classroom observation by other faculty (not administrators) increased eleven points to 75% (5 SEs) for full-time faculty and down five points in 2015 to 64% (5 SEs) for part-time faculty. 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 45% (5 SEs), down ten points compared to 2010. In contrast, an increase of twenty percentage points to 62% (6 SEs) was reported in administrators observing part-time faculty in 2015. See Table TYF.22.

In 2015, 2010 and 2005, the most common method of evaluating full- and part-time teaching was the use of evaluation instruments completed by students. Student evaluations were used for full-time faculty in 95% (3 SEs) of reporting colleges and 94% (3 SEs) of colleges for part-time faculty in 2015. Self-evaluation, such as teaching portfolios, were used as a component of the evaluation of full-time faculty by 23% (4 SEs) of colleges in 2015, down twenty-nine points from 2010. In contrast, 62% (6 SEs) of responding colleges in 2015 used self-evaluation, such as teaching portfolios, for part-time faculty, compared to 19% in 2010.

For full-time faculty, evaluation of written materials, such as lesson plans, syllabi or course examinations, dipped to 53% (7 SEs) in 2015 from 58% in 2010. The use of such written materials for part-time faculty evaluation rose four points from 2015 to 57% (6 SEs) in 2015. In 2015, written peer evaluations, as a method of evaluating teaching, occurred in 21% (5 SEs) of colleges (down six points from 2010) reporting this method for full-time faculty and 34% (5 SEs; up 23 points from 2010) for part-time faculty. See Table TYF.22.

Professional development obligations and activities of full-time permanent faculty

In fall 2015, some form of continuing education or professional development was required of full-time permanent faculty members at 82% (4 SEs) of two-year colleges, up 15% from 2010. This represents a 20-year long increase in required professional development for full-time permanent faculty. Sixty-two percent (62%; 2 SEs) of the full-time permanent faculty met part of their professional development obligation through activities provided by their own colleges in 2015, compared to 53% in 2010. A slight decrease of one percentage point showed 33% (2 SEs) of permanent faculty met professional development requirements provided by professional societies. See Table TYF.23.

Concerns and issues in mathematics programs

Obtaining travel funds for faculty professional development has historically been a department concern. Lack of or reduced funds available for faculty professional travel and other professional development activities continued to challenge mathematics departments in 2015. The concern about the level of travel funding for mathematics faculty by program heads was a “major concern” in 25% (4 SEs) of reporting colleges and “somewhat of a problem” by 31% (3 SEs) of reporting colleges, both increased from 2010. See Tables TYF.24 and TYF.25.

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 2015, this figure was 64% (5 SEs). In fall 2010, this figure was 67%. This was the number one major problem in 2015, 2010, 2005, 2000 and 1995. 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 2015, 2010 and 2005, reported by 62% (5 SEs), 64% and 55% respectively of mathematics program heads. “Low student motivation” ranked third in 2015 and 2010 (50%), as reported by 57% (8 SEs) of mathematics program heads. Other notable major problems in 2015 were “high cost of textbooks” (54%; 4 SEs) and “lack of student progress from developmental to advanced courses” (36%; 6 SEs). The “need to use too many part-time faculty” decreased as a major problem by twenty points to 15% (3 SEs) in 2015. See Tables TYF.24 and TYF.25.

When considering issues reported as “somewhat of a problem,” the top three items and their percentages were “low success rate in transfer-level courses” (54%; 5 SEs), “coordinating mathematics courses with high schools” (52%; 4 SEs) and “lack of curricular flexibility because of transfer rules” (46%; 5 SEs).

Table TYF.25 includes additional data on the extent to which program heads thought items listed were a “major” problem, “somewhat” of a problem, or a “minor or no” problem.

Administration of Mathematics Programs

In 2015, fifty-two (52%; 5 SEs) reported that two-year college mathematics programs were administered within a mathematics departmental structure, up six points from 2010. A division structure, where mathematics is combined with science department was found in 28% (5 SEs) of colleges and another 10% of the college reported a mathematics and computer science department structure. Six percent (6%; 2 SEs) of mathematics programs were administered by other departments or division structures (down 25 points), leaving 4% unreported or unknown. See Table TYF.26.

Historically, mathematics courses at two-year colleges have been taught in different administra-

tive 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 2015, as shown in Table TYE.16 in Chapter 6. In fall 2015, about 32% (5 SEs) of colleges reported that some precollege mathematics courses were taught outside of the mathematics program. This was up three points from 2010 and up one point compared to 2005. Table TYE.16 in Chapter 6 reports specific courses percentages of two-year colleges administering mathematics course offering separately from the mathematics program: Arithmetic & Basic Math and Prealgebra (23%; 5 SEs), Elementary Algebra (22%; 5 SEs) and Intermediate Algebra (16%; 5 SEs), with nine percentage point increases in Elementary and Intermediate Algebra.

TABLE TYF.26 Percentage of mathematics programs at public two-year colleges by type of administrative structure on their own campus in fall 2010 and 2015.

Administrative structure	Percentage of Mathematics Programs	
	2010	2015
Mathematics Department	46	52
Mathematics and computer science ¹	na	10
Mathematics and science	14	28
Other department or division structure	31	6
None of the above or unknown	9	4

¹Data not collected before 2015.