CHAPTER 8

TWO-YEAR COLLEGE MATHEMATICS PROGRAMS ENROLLMENT, COURSE OFFERINGS, AND INSTRUCTIONAL PRACTICES

This chapter reports estimated enrollment and instructional practices in courses offered in Fall 1990 in the 1018 two-year college mathematics programs in the United States. Also included in this chapter are total enrollment in two-year colleges, average class size, trends in availability of mathematics courses, enrollment in mathematics courses offered outside mathematics programs, and services available to mathematics students. The data are compared with the results of the 1966, 1970, 1975, 1980, and 1985 CBMS surveys. A "mathematics program" includes courses taught by the group of all mathematics and computer science faculty members. For information on the sampling procedure used in this survey, see Appendix II.

Highlights

- Enrollment in two-year college mathematics programs resumed its steep climb after hesitating from 1980 to 1985. Enrollment in mathematics programs increased by 35% from 1985 to 1990, while the total number of two-year college students increased by 24%. Fewer than 1% of two-year college students are mathematics majors.

- Enrollment in remedial courses has climbed from 33% of the total mathematics enrollment in 1970 to 47% in 1985 to 52% in 1990. Remediation was classified as a major problem by 65% of department heads.

- In spite of the increase in remediation, a larger percentage of two-year colleges are able to offer at least one section of advanced courses such as differential equations and of service courses such as finite mathematics.

- Courses showing large percentage increases in enrollment were elementary algebra, intermediate algebra, college algebra, math for liberal arts, non-mainstream calculus, and elementary statistics. Pre-algebra (a course listed for the first time on the 1990 survey) debuts with an enrollment of about 45,000. (In comparison, elementary algebra has an enrollment of about 262,000 and the first semester of mainstream calculus has an enrollment of about 53,000.)

- Courses showing large percentage decreases in enrollment, both inside and outside of mathematics programs, include technical mathematics and data processing.

- Total enrollment in mathematics courses taught outside the mathematics department continues to increase, primarily in arithmetic, computer science/programming, and statistics.

- Class size remains small, averaging about 28 students per section. Standard lecture-recitation formats to classes of 40 or fewer are used by most faculty in 94% of two-year colleges. In another 5% of two-year college mathematics programs, most faculty members lecture to larger classes.

- Use of instructional innovations of the 1970s, such as PSI (personalized system of instruction), modules, and programmed instruction, continues to decline.

- Reform in calculus instruction has yet to take hold. Group projects or writing assignments are components of 5% or fewer of calculus sections.

- Most two-year colleges now have computers available for use in the classroom, for students to use in a math lab, and for the exclusive use of mathematics program faculty. Department heads estimate that, in a typical week, 24% of the full-time faculty use a computer for classroom demonstrations and 23% assign homework requiring a computer.

- Calculators are recommended for use in more than 50% of the sections of each mathematics course, except for remedial courses, analytic geometry, and mathematics for liberal arts.

- More than 86% of two-year colleges operate a math lab or tutorial center. Placement examination, available in about 60% of two-year colleges, is the only other student service offered by more than 20% of two-year colleges.

Enrollment, Class Size, and Course Offerings

Trends in the number of two-year college students, 1966–1990

Following a slight, and uncharacteristic, drop from 1980 to 1985, the number of two-year college students in the United States increased sharply between 1985 and 1990 (see Table TYR.1). Nearly 6,000,000 people are now enrolled in two-year colleges, a 24% increase since 1985.

TABLE TYR.1 Total enrollment in two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

	1966	1970	1975	1980	1985	1990
Number of students	1,464,099	2,499,837	4,069,279	4,825,931	4,730,235	5,850,803
Percent part-time	46	48	54	63	65	65

Source: Community, Junior, and Technical College Directory, 1967, 1972, 1976, 1981, 1986, and 1991, AACJC, One Dupont Circle, NW, Washington, DC 20036.

Enrollment in two-year colleges in 1988 constituted about 30% of the full-time equivalent enrollment in colleges and universities. *[1990 Digest of Educational Statistics,* National Center for Education Statistics, U.S. Department of Education, Washington, DC].

The percentage of students who attend part-time rose until 1980, when it stabilized at about 65%.

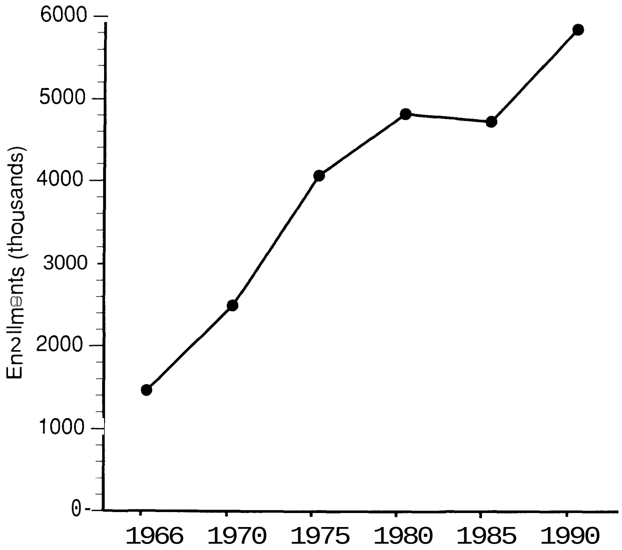

FIGURE TYR.1.1 Total enrollment in two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

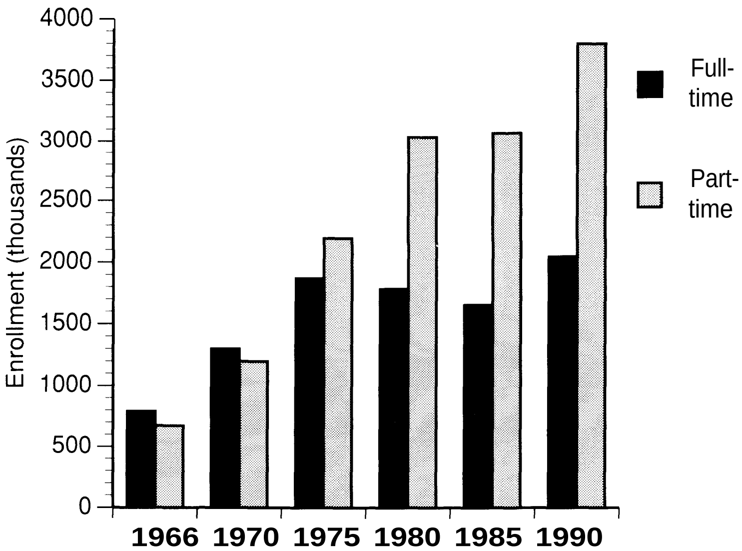

FIGURE TYR.1.2 Total full-time and part-time enrollment in two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990

Trends in enrollment in two-year college mathematics programs, 1966–1990

Enrollment in two-year college mathematics programs resumes its steep climb after hesitating from 1980 to 1985 (see Table TYR.2). While the total number of students in two-year colleges increased by 24% from 1985 to 1990, the enrollment in mathematics programs increased by 35%.

About 38% of all post-secondary mathematics, statistics, and computer science enrollment is in two-year colleges, up from 30% in 1985 (see Table S.1 and Figure S.1.2).

This study found that fewer than 1% of two-year college students are mathematics majors.

TABLE TYR.2 Enrollment in mathematics programs at two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

	1966	1970	1975	1980	1985	1990
Enrollment	348,000	584,000	874,000	1,048,000	1,034,000	1,392,000

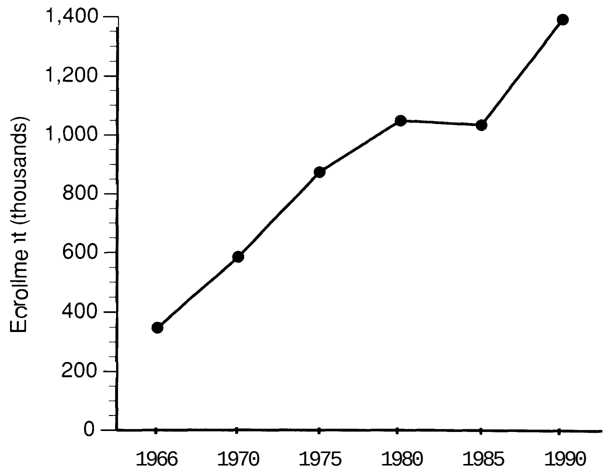

FIGURE TYR.2.1 Enrollment (in thousands) in mathematics programs at two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

Trends in enrollment in specific courses

The growth in mathematics program enrollment can be attributed largely to growth in remediation, which accounts for 67% of the enrollment increase from 1985 to 1990, and which, for the first time, comprises more than half of the combined mathematics, statistics, and computer science enrollment and 58% of the enrollment in mathematics courses (see Tables TYR.3 and TYR.4). In comparison, 16% of four-year college and university mathematics enrollment is in remedial courses (see Table S.2).

Courses showing large percentage increases in enrollment over 1985 were elementary algebra (45%), intermediate algebra (73%), college algebra (70%), math for liberal arts (218%), non-mainstream calculus (162%) and elementary statistics (62%). From a much smaller base, advanced programming also had a large percentage increase in enrollment.

Pre-algebra, listed for the first time on the 1990 survey, debuts with an enrollment of about 45,000.

Courses showing large percentage decreases in enrollment were business mathematics, technical mathematics, use of hand calculators, assembly language programming, and data processing. Business mathematics, technical mathematics, and data processing show corresponding decreases in enrollment in courses taught outside of mathematics programs (see Table TYR.8). The decrease in college algebra/trig (Course 9) enrollment appears to be a result of restructuring these courses as precalculus/elementary functions (Course 10), which showed roughly an equivalent increase.

TABLE TYR.3 Enrollment (in thousands) in mathematical sciences and computer science courses in mathematics programs at two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

	1966	1970	1975	1980	1985	1990
Remedial level						
1. Arithmetic	15	36	67	121	77	79
2. General mathematics	17	21	33	25	65	68
3. Pre-algebra	na	na	na	na	na	45
4. Elementary algebra	35	65	132	161	181	262
5. Intermediate algebra	37	60	105	122	151	261
6. High school geometry	5	9	9	12	8	9
Precalculus level						
7. College algebra	52	52	73	87	90	153
8. Trigonometry	18	25	30	33	33	39
9. Coll alg & trig(comb)	15	36	30	41	46	18
10. Precalc/elem fns	7	11	16	14	13	33
11. Analytic geometry	4	10	3	5	6	2
Calculus level						
12. Mainstream calc I						53
13. Mainstream calc II	40	58	62	73	80	23
14. Mainstream calc III						14
15. Non-mainstream calc I	na	na	8	9	13	31
16. Non-mainstream calc II	na	na				3
17. Differential equations	2	1	3	4	4	4
Services courses						
18. Linear algebra	1	1	2	1	3	3
19. Discrete mathematics	na	na	na	na	L	1
20. Finite mathematics	3	12	12	19	21	29
21. Math for liberal arts	22	57	72	19	11	35
22. Business math	17	28	70	57	33	26
23. Math for elem teachers	16	25	12	8	9	9
24. Elementary statistics	4	11	23	20	29	47
25. Probability & statistics	1	5	4	8	7	7
26. Technical mathematics	19	26	46	66	31	17
27. Tech math (calc level)	1	3	7	14	4	1
28. Use of hand calculators	na	na	4	3	6	L
Computing						
29. Computers & society	na	na	na	na	na	10
30. Data proc (elem or adv)	na	na	na	na	36	21
31. Elem prog (languages)	3	10	6	58	37	32
32. Advanced programming	na	na	na	na	5	8
33. Database management	na	na	na	na	na	4
34. Assembly lang prog	na	na	na	na	4	2
35. Data structures	na	na	na	na	2	1
36. Other comp. sci courses	2	3	4	37	14	20
37. Other math courses	8	14	32	27	14	23
TOTAL	348	584	874	1048	1034	1393

na means not available and L means some but fewer than 500.
Mainstream calc is for math, physics, sci & engr; non-mainstream for bio, soc & mgmt sci.
Prior to 1990 aggregate sums for Main Calc I, II & III were reported.
Prior to 1990, aggregate sums for Non-Main Calc I & II were reported.

TABLE TYR.4 Enrollment (in thousands) in mathematical sciences and computer science courses by level of courses in mathematics programs at two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

Level	1966	1970	1975	1980	1985	1990
Remedial (Courses 1-6)	109 (32%)	191 (33%)	346 (40%)	441 (42%)	482 (47%)	724 (52%)
Precalculus (7-11)	96 (28%)	134 (23%)	152 (17%)	180 (17%)	188 (18%)	245 (18%)
Calculus (12-17)	42 (12%)	59 (10%)	73 (8%)	86 (8%)	97 (9%)	128 (9%)
Computing (29-36)	5 (1%)	13 (2%)	10 (1%)	95 (9%)	98 (10%)	98 (7%)
Statistics (24-25)	5 (1%)	16 (3%)	27 (3%)	28 (3%)	36 (3%)	54 (4%)
Other (18-28,37)	91 (26%)	171 (29%)	266 (31%)	218 (21%)	133 (13%)	144 (10%)
TOTAL	348	584	874	1048	1034	1393

Note: This table was constructed using TABLE TYR.3. Course numbers used in the groupings are also found in TABLE TYR.3. Note that the breakdown into type of course is different from that in Table S.2 and Appendix I for four-year colleges and universities.

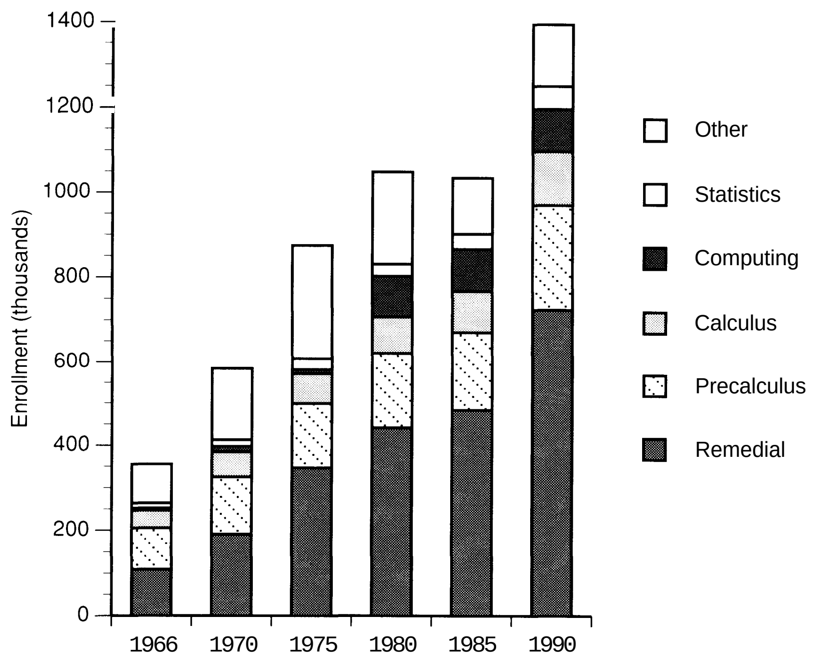

FIGURE TYR.4.1 Enrollment in mathematical sciences and computer science courses by level in mathematics programs at two-year colleges: Fall 1966, 1970, 1975, 1980, 1985, 1990.

Enrollment in statistics (Courses 24 and 25) is now about the same as enrollment in first semester mainstream calculus (Course 12). In fact, counting courses both inside and outside mathematics programs, for every 100 two-year college students who begin a calculus sequence (mainstream, non-mainstream, or outside mathematics programs), there are 78 who enroll in introductory statistics (see also Table TYR.8).

Mainstream calculus includes the calculus courses taught to mathematics, physics, and engineering majors. Non-mainstream calculus includes the "soft" calculus courses most often taught to biology, behavioral science, and business majors.

Average number of students per section

In Fall 1990, the average number of students per section for all mathematics and statistics courses in mathematics programs was 27.8. The average number of students per section in computer science courses was 18.5. Table TYR.5 gives the average number of students per section for selected mathematics courses.

TABLE TYR.5 Average section size for selected two-year college mathematics courses: Fall 1990.

Course	Average section size
Remedial	
Arithmetic	28.3
General mathematics	26.2
Pre-algebra	28.8
Elementary algebra	30.5
Intermediate algebra	29.9
Precalculus Level	
College algebra	28.3
Precalculus/elem. functions	27.3
Calculus Level and Above	
Non-mainstream Calculus I	27.0
Mainstream Calculus I	25.7
Mainstream Calculus II	22.9
Mainstream Calculus III	17.9
Linear algebra	16.5
Differential equations	21.2
Discrete mathematics	11.9
Other	
Elementary statistics (Course 24)	29.5
Technical math (Course 26)	19.8

Table TYR.6 shows that the average number of students per section is quite a bit smaller in two-year colleges than in four-year colleges and universities. In both two-year colleges and in four-year colleges and universities, the most advanced courses have the smallest average class sizes (see also Table E.3).

TABLE TYR.6 Average section size by level of course in two-year colleges and four-year colleges and universities: Fall 1990.

	Two-Year Colleges	Four-Year Colleges and Universities
Remedial (Courses 1-6)	29	31
Precalculus (Courses 7-11)	27	35
Calculus (Courses 12-17)	24	35
Computer science (Courses 29-36)	18	29
Statistics (Courses 24-25)	29	37

Course numbers are for two-year college courses. See Table TYR.3.

Twenty year trends in availability of mathematics courses

Two-year college mathematics departments have traditionally had difficulty offering the full range of lower division mathematics courses. Table TYR.7 shows that from 1970 to 1990, there was an encouraging improvement in the availability of baccalaureate level courses. For example, the percentage of two-year colleges that offer a linear algebra course at least once in two years has doubled from 17% to 34% and the percentage offering finite mathematics has jumped from 19% to 46%. Discrete mathematics, now offered by 21% of two-year colleges, has arrived as a significant course.

However, many students will still have difficulty completing the first two years of baccalaureate-level mathematics. Linear algebra, discrete mathematics, finite mathematics, mathematics for liberal arts, mathematics for elementary school teachers, elementary programming, and many other computer science courses are offered at fewer than half of all two-year colleges. A further indication of the precarious position of some of the more advanced courses is the average section size shown in Table TYR.5.

The decrease in the availability of technical mathematics courses does not mean that technical mathematics is increasingly being taught outside of mathematics programs. Enrollment in technical mathematics taught outside of mathematics programs decreased from 25,000 in 1980 to 10,000 in 1990 (see Table TYR.8).

TABLE TYR.7 Percentage of two-year college mathematics programs teaching selected mathematical sciences and computer science courses: Fall 1970, 1985, 1990.

	1970	1985	1990
Mathematics			
Differential equations	49%	40%	53%
Linear algebra	17%	24%	34%
Discrete mathematics	na	3%	21%
Finite mathematics	19%	27%	46%
Math for liberal arts	na	25%	35%
Mathematics of finance	13%	5%	na
Business mathematics	38%	34%	42%
Math for elem teachers	48%	31%	32%
Elementary statistics	41%	61%	69%
Probability & statistics	16%	15%	22%
Technical mathematics	41%	42%	36%
Technical math (calc level)	19%	18%	6%
Use of hand calculators	na	4%	6%
Computing			
Data processing (elem or adv)	na	28%	16%
Elem programming (languages)	27%	46%	48%
Advanced programming	na	19%	31%
Assembly lang programming	na	12%	17%
Data structures	na	5%	11%
Other computer sci courses	16%	16%	21%

Mathematics and Computer Science Courses Taught Outside of Mathematics Programs

Trends in enrollment in mathematics and computer science courses taught outside of mathematics programs

Many associate of arts degree programs and technical/occupational programs in two-year colleges teach their own mathematics. The growth in enrollment in these mathematics courses has traditionally outstripped the growth in enrollment in mathematics programs. Comparing Tables TYR.3 and TYR.8, we see that from 1970 to 1985, these courses increased in enrollment by 292%, while growth in mathematics program enrollment increased by 77%. However, from 1985 to 1990, the growth in enrollment in mathematics programs increased by 35%, while the growth in enrollment in mathematics/computer science courses outside mathematics programs increased by only 12%.

Enrollment in these courses is now about 29% as large as enrollment in mathematics programs (compared to 35% in 1985, but only 16% in 1970). The majority of the enrollment in business math, computer science and programming, and data processing is outside of mathematics programs.

TABLE TYR.8 Estimated enrollment (in thousands) in mathematical sciences and computer science courses taught at two-year colleges but outside of mathematics programs at two-year colleges: Fall 1970, 1975, 1980, 1985, 1990.

	1970	1975	1980	1985	1990
Arithmetic	14	27	18	18	42
Elem algebra (high sch)	na	na	na	na	38
Int algebra (high sch)	na	na	na	na	27
College algebra	na	na	na	na	6
Trig or precalc (college)	6	17	29	3	3
Calculus or Diff eqs	L	4	8	L	4
Business math	36	53	70	50	32
Statistics & prob	6	14	12	7	15
Comp science & prog	21	51	92	97	128
Data processing	na	na	na	159	96
Technical math	na	na	25	23	10
Other	9	12	10	4	4
TOTAL	92	178	264	361	405

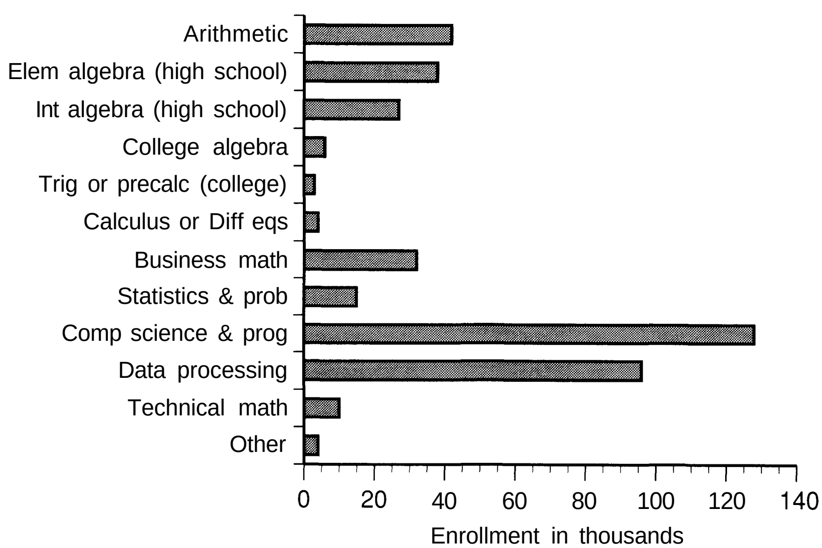

FIGURE TYR.8.1 Estimated enrollment (in thousands) in mathematical sciences and computer science courses taught outside of mathematics programs at two-year colleges: Fall 1990.

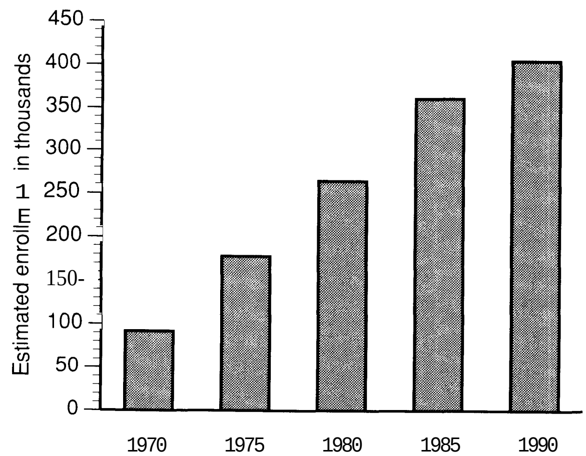

FIGURE TYR.8.2 Estimated enrollment (in thousands) in mathematical sciences and computer science courses taught outside of mathematics programs at two-year colleges: Fall 1970, 1975, 1980, 1985, 1990.

Other divisions that teach mathematics and computer science courses

Table TYR.9 is a further breakdown of the 1990 data in Table TYR.8 by division where the mathematics and computer science courses are taught. Three-fourths of outside enrollment is in business departments and in "other" departments.

Presumably the "other," which now teach arithmetic, elementary algebra, and intermediate algebra to 88,000 students, include learning centers that offer coursework in remedial mathematics.

The enrollment in mathematics and computer science courses outside mathematics programs given in Table TYR.8 and Table TYR.9 is based on estimates provided by the heads of mathematics programs. Consequently, this enrollment is probably not as accurate as that for courses taught inside the mathematics program.

TABLE TYR.9 Estimated enrollment (in thousands) in mathematical sciences or computer science courses taught outside of mathematics programs by division where taught at two-year colleges: Fall 1990.

	Natural Sciences	Occupat programs	Business	Social Sciences	Other	TOTAL
Arithmetic	L	1	4	0	37	42
Elem algebra (high sch)	9	1	L	0	28	38
Int algebra (high sch)	3	1	L	0	23	27
College algebra	4	0	0	0	2	6
Trig or precalc (college)	1	1	0	0	1	3
Calculus or Diff eqs	1	L	2	0	1	4
Business math	1	L	31	0	0	32
Statistics & prob	L	L	10	5	L	15
Comp science & prog	2	45	45	0	36	128
Data processing	L	15	60	0	21	96
Technical math	0	6	2	1	1	10
Other	0	2	2	L	0	4
TOTAL	21	72	156	6	150	405

L: fewer than 500.

Instructional Practices

Instructional formats

In Fall 1990, the standard lecture-recitation system with classes of 40 or fewer was used by most faculty in 94% of two-year college mathematics programs. Table TYR.10 also shows that the instructional innovations of the 1970s that allowed students to pace their learning—personalized system of instruction, audio-tutorial, modules, computer-assisted instruction, programmed instruction—continued to decline in popularity. None of these is used today by a significant percentage of the two-year college mathematics faculty.

Innovations in calculus courses

Table TYR.11 shows that innovations in calculus instruction of the late 1980s had not gained much of a toehold in Fall 1990. The corresponding percentages in Mainstream Calculus I and II for four-year colleges and universities were about double for the writing component but slightly lower for group projects (compare Table TYR.ll with Table C.3).

TABLE TYR.10 Instructional formats used by faculty in mathematics programs at two-year colleges: Fall 1980, 1985, 1990.

	Not being used			Used by some faculty			Used by most faculty		
Instructional Method	1980	1985	1990	1980	1985	1990	1980	1985	1990
Standard lecture-recitation system (class size < 41)	1%	1%	0%	2%	14%	6%	97%	85%	94%
Large lecture classes (>40) with recitation sections	63%	77%	89%	16%	19%	7%	21%	4%	4%
Large lecture classes (>40) with no recitation sections	76%	82%	89%	12%	17%	10%	12%	1%	1%
Organized program of independent study	37%	60%	64%	62%	38%	36%	1%	2%	0%
Courses by television (closed circuit or broadcast)	73%	92%	87%	27%	9%	13%	0%	0%	0%
Courses by film	75%	96%	87%	24%	4%	13%	1%	0%	0%
Courses by programmed instruction	40%	69%	81%	56%	27%	19%	4%	4%	0%
Courses by computer-assisted instruction (CAI)	68%	74%	79%	31%	24%	21%	1%	2%	0%
Modules	42%	69%	82%	54%	25%	17%	4%	6%	1%
Audio-tutorial	55%	74%	86%	43%	24%	14%	2%	2%	0%
PSI (Personalized system of instruction)	51%	76%	85%	46%	20%	15%	3%	4%	0%

TABLE TYR.11 Percent of calculus sections in two-year colleges that assign group projects and that have a writing component: Fall 1990.

Course	% of sections that assign group projects	% of sections that have a writing component
Main. Calculus I	4%	5%
Main. Calculus II	3%	4%
Main. Calculus III	0%	4%
Non-Main. Calc. I	5%	4%
Non-Main. Calc. II	2%	2%

Computer and calculator use by students

The computer has arrived in two-year college mathematics classes, especially in advanced classes. Department heads report that in a typical week 23% of the faculty assign homework requiring use of the computer. Computer assignments are regularly given in 9% of all sections of mathematics (excluding computer science), up from fewer than 7% in 1985. Table TYR.12 gives the percentage of sections of selected courses in which computer assignments are regularly given. The percentages for Mainstream Calculus I and II are quite a bit higher than those in four-year colleges and universities (compare Table TYR.12 with Table C.3).

Calculators are recommended for use in 48% of all mathematics sections (excluding computer science courses), up from 43% in 1985 and from 29% in 1980. More than half of the sections of each course, except for remedial courses, analytic geometry, and mathematics for liberal arts, recommend use of the calculator. Table TYR.12 gives the percentage of sections in selected courses that recommend use of the calculator.

TABLE TYR.12 The percent of sections of selected two-year college courses in which computer assignments are regularly given and in which calculators are recommended: Fall 1990.

Course	% of sections in which computer assignments are regularly given	% of sections in which calculators are recommended
Arithmetic	6%	12%
Elementary algebra	7%	30%
Intermediate algebra	4%	39%
College algebra	5%	54%
Trigonometry	7%	71%
Precalculus	11%	70%
Mainstream Calculus I	13%	72%
Mainstream Calculus II	18%	70%
Mainstream Calculus III	13%	76%
Non-mainstream Calculus I	10%	68%
Differential equations	13%	88%
Linear algebra	40%	76%
Math for liberal arts	5%	39%
Elementary statistics	29%	86%

Use of computers by faculty

Use of computers by faculty, as estimated by mathematics program heads, is now substantial for constructing tests or assignments, but only 10% of the mathematics program faculty use a computer algebra system in a typical week (see Table TYR.13).

TABLE TYR.13 Use of computers by faculty in mathematics programs at two-year colleges (a typical week): Fall 1990.

Activity	Percent of full-time faculty engaged in activity (est. by dept heads)
Use computer for classroom demos	24%
Assign homework requiring computer	23%
Use computer to construct tests or assignments	55%
Use a computer algebra system	10%

Availability of computers

Computers are available in moderate numbers for use by mathematics students and mathematics faculty, but the percentage of two-year colleges with no computers for use in mathematics classrooms is still quite large (see Table TYR.14.B). In fact, "computer facilities for classroom use" is listed as a major problem by 28% of department heads (see Table TYR.41).

TABLE TYR.14.A Average number per college of personal computers, terminals and workstations available to mathematics faculty and students for various uses by size of two-year college: Fall 1990.

	Public Two-Year Colleges				Private
Enrollment	0-1999	2000-7999	8000-14999	15000-	
Number of two-year colleges	298	419	120	54	127
For use of math students in a math lab	14.2	6.5	17.1	18	0
For use of math students at other location	7.7	46	73.1	58.5	31.3
For exclusive use of math faculty	2.6	3.5	8	8.7	0
For use in math classrooms	3.6	1.3	3.4	16.2	0

TABLE TYR.14.B Percent of two-year colleges reporting no computers for each category below concerning the availability of personal computers, terminals and workstations for faculty and students for various uses by size of the two-year college: Fall 1990.

	Public Two-Year Colleges				Private
Enrollment	0-1999	2000-7999	8000-14999	15000-	
Number of two-year colleges	298	419	120	54	127
For use of math students in a math lab	27%	46%	18%	13%	100%
For use of math students at other location	48%	4%	3%	4%	0%
For exclusive use of math faculty	9%	19%	11%	0%	100%
For use in math classrooms	44%	52%	22%	17%	100%

Student Services

Math labs or tutorial centers can be found in 86% of all two-year colleges.

They may contain tutors, computers, audio-visual aids, learning modules, etc. These labs have become a source of employment for students (see Table TYR.15).

TABLE TYR.15 Sources of personnel for mathematics laboratories in mathematics programs at two-year colleges: Fall 1985, 1990.

	Percent of two-year colleges using source	
	1985	1990
Students	48%	73%
Full-time members of mathematics staff	38%	46%
Paraprofessionals	34%	51%
Part-time members of mathematics staff	30%	32%
Members of other departments	19%	18%
Other	3%	5%

Table TYR.16 shows that few services other than math labs and placements tests are available to students taking mathematics classes in two-year colleges. Compare Table TYR.16 with Table D.1 for four-year colleges and universities.

TABLE TYR.16 Percent of two-year colleges offering various services to students: Fall 1990.

Service	% of two-year colleges offering
Math lab or tutorial center	86%
Advisory placement examinations	60%
Mandatory placement examinations	58%
Honors sections	17%
Regular participation in math contests	17%
Lectures/colloquia for students	15%
Active math club	12%
Social activities for majors and faculty	7%