DOCUMENT RESUME

ED 341 874 CE 060 451

AUTHOR	Kaufman, Phillip
TITLE	A Comparison of Vocational and Non-Vocational Public School Teachers of Grades 9 to 12. Contractor Report. Statistical Analysis Report.
INSTITUTION	MPR Associates, Berkeley, CA.
SPONS AGENCY	National Center for Education Statistics (ED), Washington, DC.
REPORT NO	ISBN-0-16-036028-5; NCES-92-666
PUB DATE	Feb 92
NOTE	93p.
AVAILABLE FROM	U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328.
PUB TYPE	Reports - Research/Technical (143) -- Statistical Data (110)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Comparative Analysis; Degrees (Academic); High Schools; Job Satisfaction; Public Schools; *Public School Teachers; *Teacher Attitudes; Teacher Background; *Teacher Characteristics; Teacher Morale; *Teacher Persistence; Teacher Qualifications; *Vocational Education Teachers

ABSTRACT

The Public School Teachers Questionnaire from the 1987-88 Schools and Staffing Survey was analyzed to produce a descriptive portrait of vocational and nonvocational teachers of grades 9-12 in public schools. The sample consisted of 3,863 vocational and 14,315 nonvocational teachers. Almost 90 percent of each group classified themselves as white. The ages of vocational and nonvocational teachers differed significantly with vocational teachers being older. Although a slight majority of all vocational teachers were male, this was not true in all vocational subjects. Fewer than 1 percent of nonvocational teachers but over 7 percent of vocational teachers had less than a bachelor's degree. Nonvocational teachers were more likely to have majored in academic subjects, whereas vocational teachers were more likely to have majored in vocational education or occupationally specific areas. The average class size for vocational teachers was substantially smaller than that for nonvocational teachers. Few vocational teachers (9 percent) taught any nonvocational subjects. A higher percentage of vocational teachers reported a high degree of control over their own classroom environment. Vocational teachers were more likely to report plans to remain in teaching until they were eligible to retire. Agriculture teachers were more likely than other vocational teachers to report planning to leave teaching as soon as something better came along. (The report contains nine tables and nine figures. Appendixes include methodology and technical notes and standard errors for figures and tables.) (YLB)

NATIONAL CENTER FOR EDUCATION STATISTICS

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Contractor Report

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A Comparison of Vocational and Non-Vocational Public School Teachers of Grades 9 to 12

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February 1992

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Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328
ISBN 0-16-036028-5

Foreword

This report uses information about the teaching assignments and the courses taught by public school teachers of grades 9 to 12 during the 1987-88 school year. Data come from the Public School Teachers Questionnaire, which is one of seven surveys included in the 1987-88 Schools and Staffing Survey (SASS).

The Public School Teachers Questionnaire provides a rich source of information on teachers and includes information related to such topics as their qualifications, demographic characteristics, and satisfaction with teaching. The sample is large enough to report on fields taught within vocational education.

We hope that this report will inspire other researchers to use these data, as well as data from the other questionnaires included in SASS, to pursue their own interests. The National Center for Education Statistics (NCES) can make computer tapes available to those wishing to conduct their own analyses of the data.

Information about obtaining SASS computer tapes is available from the U.S. Department of Education, Office of Educational Research and Improvement, Information Technology Branch, 555 New Jersey Avenue NW, Room 215, Capitol Place Building, Washington, DC 20208-1227.

Jeanne Griffith
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Acknowledgments

This report was prepared under the direction of James Houser, Data Development Division. Many members of the NCES staff provided assistance in preparing various parts of the report. John Ralph, Jeanne Griffith, and Mary Frase reviewed drafts during initial stages of the project. Mary Frase and Susan Ahmed provided statistical advice.

The report was reviewed by Doug Wright, Mary Frase, Charles Hammer, and Kerry Gruber of NCES; Deborah Nolan of the Office of Vocational and Adult Education; and Barbra Shay, Howard Berkun, and Kathleen Eksterowicz of the New York State Education Department. Their efforts and contributions are greatly appreciated.

Executive Summary

This report describes the results of an ongoing analysis by the National Center for Education Statistics (NCES) on the characteristics of vocational and non-vocational teachers. Using the 1987-88 Schools and Staffing Survey, it provides a descriptive portrait of vocational and non-vocational teachers of grades 9 through 12 in public schools. A few of the major highlights follow:

- Approximately 20 percent of all teachers of grades 9 through 12 were vocational teachers. Roughly 33 percent of vocational instructors taught Business, while nearly 18 percent taught Industrial Arts and 16 percent taught Home Economics.

Demographic Characteristics

- Both non-vocational and vocational teachers were predominantly white; almost 90 percent of each group classified themselves as white.

- The age of vocational and non-vocational teachers differed significantly—with vocational teachers, on average, being older than non-vocational teachers.

- While a slight majority of all vocational teachers were male (53 percent of vocational teachers were male compared with only 49 percent of non-vocational teachers), this was not true within all vocational subjects. For example, Business and Home Economics teachers were more likely to be female (67 and 99 percent, respectively). Agriculture and Industrial Arts/Trade & Industry teachers, however, were overwhelmingly male (81 and 96 percent, respectively).

Educational Background

- The educational backgrounds of vocational teachers differed from those of non-vocational teachers. While less than 1 percent of non-vocational teachers did not complete a bachelor's degree, over 7 percent of vocational teachers had less than a B.A. or B.S. Furthermore, about 46 percent of vocational teachers compared to 54 percent of non-vocational teachers had a master's degree or more.

- Non-vocational teachers were more likely to have majored in academic subjects, while vocational teachers were more likely to have majored in vocational education or occupationally specific areas. However, most teachers, vocational or non-vocational, majored in Education—71 percent of vocational teachers majored in this subject area, and 55 percent of non-vocational teachers majored in Education.

- Agriculture teachers were more likely than other vocational teachers to have earned their associate's or bachelor's degree in Mathematics and Science, with about 16 percent earning their degree in these areas. In contrast, only 3 percent of all vocational teachers (including Agriculture teachers) earned their associate's or bachelor's degree in Mathematics and Science.

- Home Economics teachers were more likely to have attained an associate's or bachelor's degree in an occupationally specific subject area, while Industrial Arts teachers were more likely to hold a degree in vocational education than were other vocational teachers.

Teaching Environment

- The average class size for vocational teachers was substantially smaller than that for non-vocational teachers. About 20 percent of vocational teachers taught classes with 25 or more students, while more than 40 percent of non-vocational teachers taught classes of this size.

- Considering the recent demand for more integration of academic instruction in vocational classrooms, this report examined the proportion of vocational teachers who also teach non-vocational subjects. Few vocational teachers (9 percent) taught any non-vocational subjects.

Teacher Attitudes and Perceptions

- A higher percentage of vocational teachers reported that they had a high degree of control over their own classroom environment (e.g., choosing topics, teaching techniques) than did non-vocational teachers. While only 22 percent of non-vocational teachers indicated that they had a high degree of control over making decisions in their classrooms, 29 percent of vocational teachers reported that they had a great deal of control.

- Vocational teachers were more likely to report that they plan to remain in teaching until they are eligible to retire than were non-vocational teachers. In fact, 43 percent of vocational teachers stated that they would remain until retirement, compared to 37 percent of non-vocational teachers. One reason for this difference might be that vocational teachers were more likely to be age 50 and over than non-vocational teachers.

- There were differences among vocational teachers in when they plan to leave teaching. Agriculture teachers were more likely than other vocational teachers to report that they planned to leave teaching as soon as something better came along. Over 25 percent of Agriculture teachers said they would leave as soon as a better opportunity presented itself, while less than 15 percent of all vocational teachers (including Agriculture teachers) reported they would leave as soon as a better opportunity was presented. This might be due to the relatively low level of satisfaction of teaching reported by Agriculture teachers.

Table of Contents

List of Tables

List of Figures

Introduction

Vocational teachers have traditionally followed varied routes into the classroom. S. ıe have made a career change after working for a number of years in a trade, the military, homemaking, business, or medicine. Many, however, follow the customary path that leads to teaching by obtaining a college degree. However, little is known about how vocational education teachers presently differ on average from their non-vocational peers. Earlier studies, which have generally shown few overall differences between vocational and non-vocational teachers, were based on surveys with limited data on vocational teachers. Because of a lack of data, these studies could only examine overall distinctions between vocational and non-vocational teachers and could not look at the characteristics of teachers in different vocational subjects.[1] Now that data have been collected from the Schools and Staffing Surveys (SASS), statistics are availab for the first time on persons teaching a variety of vocational subjects. Furthermore, with ac tional SASS data collections planned for 1991 and for every subsequent two years, a time series can soon serve as a foundation for educational indicators on vocational teachers.

This report describes the results of an analysis by the National Center for Education Statistics (NCES) on the characteristics of vocational and non-vocational teachers. Because few teachers in private schools teach vocational education, this report is limited to a discussion of public school vocational and non-vocational teachers.[2] It consists of four main sections. This section briefly discusses the data source used. The next section compares the characteristics of vocational teachers with those of non-vocational teachers. The third section describes the characteristics of teachers of different vocational subjects (e.g., Business, Agriculture, and Home Economics). Finally, the report concludes with a summary of the study's findings and emphasizes the need for future multivariate analyses of these data. Throughout this report, tables present the data on vocational and non-vocational teachers, thereby facilitating comparisons between the two groups. To accompany these tables, figures highlight key trends or patterns found in this analysis.

Data Source

The data in this publication is based on a sample of 18,178 public school teachers in grades 9 to 12, which is only part of the data available in the Schools and Staffing Survey (SASS). SASS consists of seven sets of questionnaires: 1) the Teacher Demand and Shortage Questionnaire for Public School Districts (LEAs); 2) the Teacher Demand and Shortage Questionnaire for Public Schools; 3) the Public School Questionnaire; 4) the Private School Questionnaire; 5) the School Administrator Questionnaire; 6) the Public School Teachers Questionnaire; and 7) the Private School Teachers Questionnaire. The sample includes 9,300 public and 3,500 private schools, within which three to eight teachers were selected. The total teacher sample contains approximately 56,250 public and 11,500 private school teachers. Consequently, SASS has the largest sample size of any survey of teachers, including such

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[1]Little has been published on vocational teachers using nationally representative databases. The latest work used the Public School Survey of 1985 to look at differences between vocational and non-vocational teachers in public schools (Janice Ancarrow, *Teachers of Secondary Vocational and Non-vocational Classes in Public Schools* (National Center for Education Statistics:Washington, DC, June, 1990)). However, the Public School Survey data could only be broken out by vocational, business, and non-vocational teachers. As a result, comparisons are not made between the data presented in this publication and data from the Public School Survey.

[2]Because almost all private school teachers teach non-vocational subjects, keeping private school teachers in the analysis would confound differences between vocational and non-vocational teachers with differences between public and private school teachers.

surveys as the Public School Survey of 1985 and the Consortium for the Study of Effective Schools. As a result, analysts can categorize vocational teachers by their vocational subject areas (e.g., Business, Industrial Arts) with SASS. The data included in this report come from the Public School Teachers Questionnaire.

SASS contains several types of data that can be used to classify a teacher's subject area. These types of data include school administrators' reports of teachers' primary teaching assignment and teachers' self-reports of primary teaching assignment and courses taught. The teachers were supposed to report their primary assignment as the subject field in which they taught most of their courses. The teachers' reports were not always consistent with the count of the actual courses that they reported teaching. This analysis used data on the courses taught by teachers rather than the administrators' or teachers' report of the teachers' primary assignment to classify them as either vocational or non-vocational. The details of this classification scheme are provided in Appendix A at the end of this report.

The comparisons in the text have all been tested for statistical significance to ensure that the differences are larger than those that might be expected due to sampling variation. An overall significance level of 0.05 was used. A correction for multiple comparisons was made using the Bonferonni adjustment. The details of the methodology used in this report are also provided in Appendix A at the end of this report. The standard errors and unweighted n's that were used to calculate statistical significance appear in Appendix B at the end of this report.

Vocational and Non-Vocational Teachers

In the 1987-88 school year, there were an estimated 829,000 public school teachers of grades 9 to 12 in the United States (table 1 and figure 1). Approximately 20 percent of them (or 163,000) were vocational teachers. Roughly 33 percent of vocational instructors taught Business, while nearly 18 percent taught Industrial Arts and 16 percent taught Home Economics.[3] About 24 percent of the respondents reported that they either taught other vocational subjects or did not provide their vocational teaching assignment. Few vocational teachers taught Career Education.[4]

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[3]These percentages are somewhat different than the percentages found by Ancarrow in her study using the 1985 Public School Survey. Specifically, a larger percentage of vocational teachers were identified as teaching business in the 1987-88 SASS than in the earlier survey. In this analysis 33 percent of vocational teachers were identified as teaching business, while in the analysis of the Public School Survey 24 percent were identified as business teachers (19 percent business and office and 5 percent marketing and distributive education). These differences may reflect real change between 1985 and 1987-88 or may reflect differences in the way in which vocational teachers were defined in the separate analyses. For example, in the Ancarrow analysis vocational teachers were defined as any teacher who taught at least one course in vocational education while the present analysis defined vocational teachers as those who taught at least 50 percent of their courses in vocational education.

[4]Career education consists of a group of related courses such as work exploration, career guidance, work experience, cooperative education, and career development.

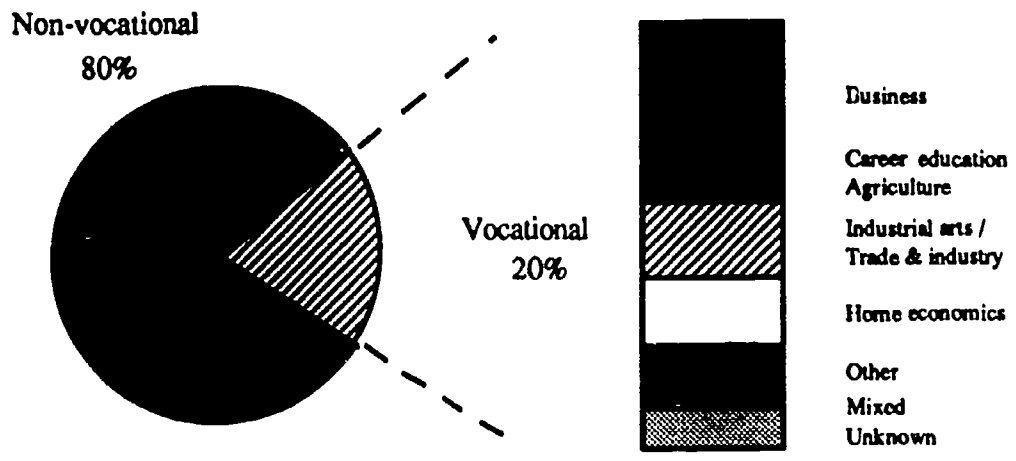
Table 1—Percentage distribution and number of public school teachers of grades 9 to 12, by vocational and non-vocational teaching assignment and by vocational field: 1987-88

Teaching assignment and vocational field	Percentage	Number
Total	100.0	828,764
Non-vocational	80.3	665,564
Vocational	19.7	163,200
Vocational field	100.0	163,200
Business	33.0	53,924
Career education	2.1	3,497
Agriculture	6.5	10,598
Industrial arts/Trade and industry	17.5	28,574
Home economics	15.6	25,534
Other[1]	13.3	21,683
Mixed[2]	0.9	1,398
Unknown[3]	11.0	17,993

[1]Other vocational, trade, and industrial education.
[2]"Mixed" indicates that the teacher taught equal proportions in two or more subject areas.
[3]"Unknown" indicates that the instructor taught vocational education but did not indicate in the survey the specific subject area taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Figure 1—Percentage distribution of public school teachers of grades 9 to 12, by vocational and non-vocational teaching assignment and by vocational field: 1987-88



SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

There were 502 survey respondents (or about 11 percent of the weighted sample of 3,863 vocational teachers) who indicated that they taught vocational education, but did not supply information on the courses that they taught. (See table B1, page B-1.) These teachers were classified as "subject area unknown" in table 1 and all subsequent tables in this report. One reason why so many teachers failed to report course-level data may lie in the wording of the course-level items on the questionnaire. In the 1987-88 SASS, there was no separate subject area category for trade and industry, technical, or allied health teachers. Therefore, it may have been difficult for teachers of these subjects to respond to the course-level items. Many teachers in trade and industry may have classified themselves in the industrial arts subject area, while technical and allied health teachers may have classified themselves into the "other" category.[5] In the 1990-91 SASS a more detailed classification scheme was employed, using 12 categories of vocational education rather than the 9 categories in the 1987-88 SASS. This should result in a higher response rate for these items in the future. A comparison of the categories used by the two surveys is included in Appendix A.

Characteristics of Vocational and Non-Vocational Teachers

Demographic Characteristics

Table 2 presents data that can be used to compare teachers on several demographic variables. Figure 2 graphically highlights several of these key comparisons. Vocational and non-vocational teachers tend to be demographically similar. Vocational teachers, however, were slightly more likely to be male than were non-vocational teachers. More than 53 percent of vocational teachers were male, compared with only 49 percent of non-vocational teachers. Vocational teachers were just as likely to be from a minority group as non-vocational teachers.[6] Both non-vocational and vocational teachers were predominantly white; almost 90 percent of each group classified themselves as white. There were significant differences in age between vocational and non-vocational teachers—about 27 percent of all vocational teachers were 50 and over while only about 19 percent of all non-vocational teachers were 50 and over.

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[5]Because many trade and industry teachers may have classified themselves as industrial arts teachers, in this report industrial arts teachers are referred to as industrial arts/trade and industry teachers.

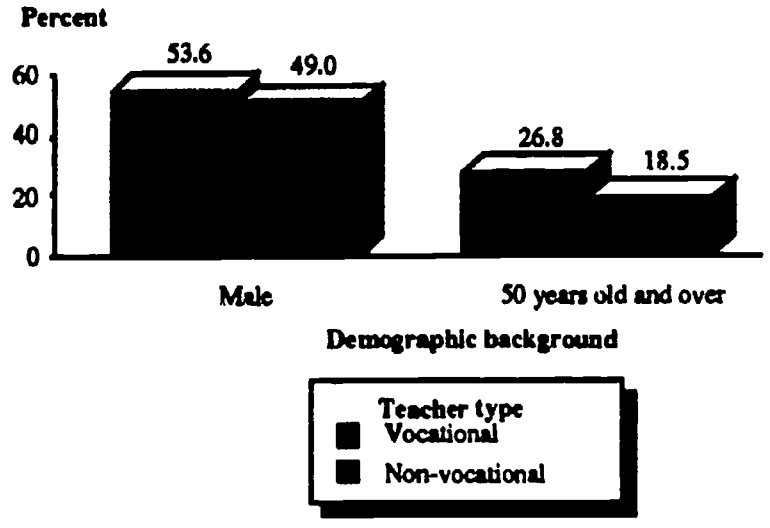
[6]The racial and ethnic categories reported here were constructed to be mutually exclusive. That is, teachers classified as white are actually white, non-Hispanic, and teachers classified as black are actually black, non-Hispanic, etc.

Table 2—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics: 1987-88

Demographic characteristic	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Sex			
Male	49.9	53.6	49.0
Female	50.1	46.5	51.0
Race–ethnicity			
American Indian or Alaskan Native	1.1	1.4	1.0
Asian or Pacific Islander	0.8	0.7	0.8
Black, non-Hispanic	7.1	8.2	6.8
White, non-Hispanic	88.6	87.5	88.9
Hispanic	2.5	2.2	2.5
Age			
Under 30	10.7	8.6	11.2
30 to 39	31.8	29.0	32.5
40 to 49	37.4	35.7	37.9
50 and over	20.1	26.8	18.5

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Figure 2—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics: 1987-88



SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Educational Background

For decades, vocational education has employed specialists from the private sector to serve as vocational teachers for job skill classes. In fact, the Smith-Hughes Vocational Education Act of 1917 specifically stated that instructors teaching in federally funded vocational education programs must have had work experience in the specific occupational area in which they were hired to teach. Many states, therefore, have enacted policies and offered classes that enable skilled workers to be employed and credentialed as vocational education teachers without the educational requirements that most teachers must meet.

Table 3 and figure 3 compare the educational backgrounds of vocational and non-vocational teachers. The educational backgrounds of vocational teachers differed somewhat from those of non-vocational teachers. While less than 1 percent of non-vocational teachers did not complete a bachelor's degree, over 7 percent of vocational teachers had less than a B.A. or B.S. Furthermore, about 46 percent of vocational teachers compared to 54 percent of non-vocational teachers had a master's degree or more.

The college majors of vocational and non-vocational teachers differed significantly. As one might expect, non-vocational teachers were more likely to have majored in academic subjects, while vocational teachers were more likely to have majored in vocational education or race–ethnicity areas. Non-vocational teachers would be expected to be more likely to have majored in an academic subject since they might be teaching an academic subject. However, most teachers, vocational or non-vocational, majored in Education—71 percent of vocational teachers majored in this subject area, and 55 percent of non-vocational teachers majored in Education.

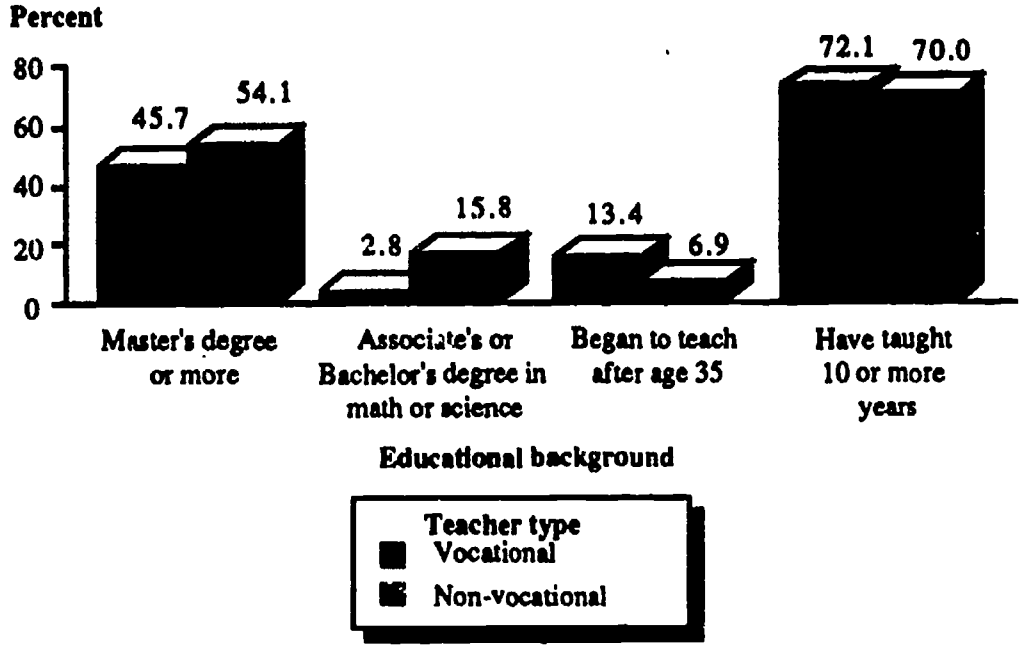
Table 3—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and teaching experience: 1987-88

Educational background and teaching experience	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Highest college degree			
Less than a bachelor's degree	1.7	7.4	0.3
Bachelor's degree	45.9	46.9	45.6
Master's degree	44.1	39.3	45.3
Education specialist[1]	7.0	5.8	7.3
Doctorate or first professional	1.4	0.6	1.5
Major field of study (associate's or bachelor's degree)[2]			
Mathematics and science	13.3	2.8	15.8
Social sciences	9.5	3.6	10.9
Letters and humanities	8.5	1.4	10.3
Education			
General education	41.7	11.1	49.0
Special education	3.6	0.6	4.3
Vocational education	12.8	59.0	1.8
Occupationally specific[3]	6.6	19.3	3.6
Other	3.9	2.3	4.2
Age at which first began to teach full-time			
25 or under	68.4	61.8	70.1
26-35	23.4	24.9	23.0
36-45	6.3	9.8	5.5
45-55	1.5	3.1	1.1
Over 55	0.4	0.5	0.3
Number of years of teaching experience			
Less than 3	6.2	5.4	6.4
3-9	23.4	22.5	23.6
10-20	45.5	46.6	45.3
Over 20	24.9	25.6	24.7
Type of credential in primary assignment field			
None	3.0	2.1	3.2
Standard state certificate	89.7	91.3	89.3
Probationary certificate	3.1	2.9	3.2
Temporary, provisional, or emergency certificate	4.0	3.4	4.1
Other	0.1	0.2	0.1

[1]Education specialist degrees or certificates are generally awarded for one year's work beyond the master's level.
[2]The base of this percentage was all teachers who had at least an associate's degree.
[3]Occupationally specific degrees include health occupations, agriculture, home economics, etc. See the technical notes at the end of the tables for a full description of this variable.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Figure 3—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and teaching experience: 1987-88



NOTE: "Master's degree or more" indicates the percentage of teachers with a master's degree, an educational specialist degree, a doctorate or first professional degree.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Vocational teachers, were more likely to have 10 or more years of teaching experience than were non-vocational teachers. Moreover, vocational teachers were more likely to have started teaching after age 35 than non-vocational teachers. However, these differences, while statistically significant, were quite small. Most non-vocational and vocational teachers started teaching before the age of 26, and most non-vocational and vocational teachers had at least 10 years of teaching experience. Seventy percent of non-vocational teachers and 62 percent of vocational teachers started teaching before they were 26, and 70 percent of non-vocational teachers and 72 percent of vocational teachers had 10 or more years of teaching experience.

In recent decades, some parts of the country have reported a shortage of instructors who are qualified to teach in certain subject areas, including vocational education. Because of teacher shortages in specific areas, many states have established provisional certification for teachers in critically needed fields. As demonstrated in table 3, vocational teachers and non-vocational teachers held standard teaching credentials in their primary assignment fields at similar but statistically different rates. Approximately 91 percent of all vocational teachers held standard state credentials in their field, while 89 percent of all non-vocational teachers held standard credentials.

Teaching Environment

Table 4 shows several variables that describe the teaching environment in which vocational and non-vocational instructors work, and figure 4 highlights several of these variables. Vocational and non-vocational teachers do not differ in terms of the likelihood of holding regular (full- or part-time) assignments as opposed to itinerant or long-term substitute assignments. That is, 98 percent of vocational and 96 percent of non-vocational teachers filled regular full- or part-time teaching positions. Vocational and non-vocational teachers also spent a similar amount of time teaching at their present school.

However, the average class size for vocational teachers was substantially lower than that for non-vocational teachers. Non-vocational teachers were more likely to have large classes compared with vocational teachers. About 20 percent of vocational teachers taught classes with 25 or more students, while more than 40 percent of non-vocational teachers taught classes of this size. Vocational teachers were also more likely to have small classes; approximately 10 percent had classes with 10 or fewer students enrolled, compared to approximately 6 percent of non-vocational teachers.

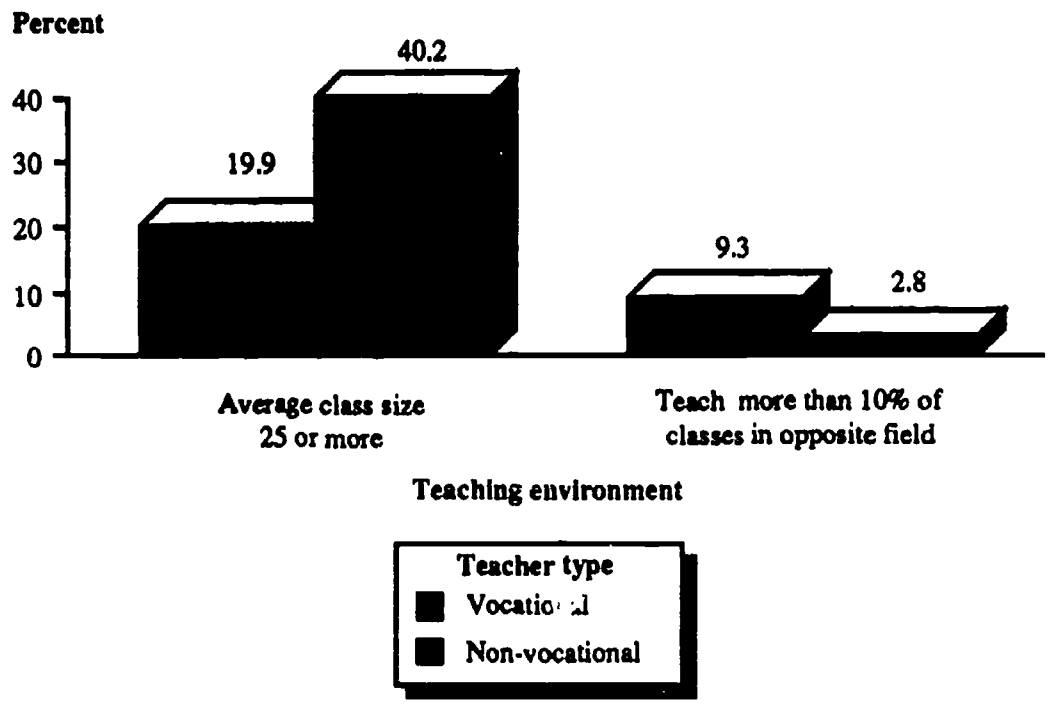
Table 4—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics: 1987-88

Teaching environment	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Primary assignment at present school			
Regular full- or part-time teacher	96.4	98.0	96.0
Itinerant teacher	3.2	1.7	3.5
Long-term substitute	0.5	0.3	0.5
Teaching assignment at present school			
Full-time	93.5	93.7	93.4
3/4 time or more, but less than full-time	2.0	1.9	2.0
1/2 time or more, but less than 3/4 time	3.0	3.1	3.0
1/4 time or more, but less than 1/2 time	1.0	1.0	1.0
Less than 1/4 time	0.5	0.4	0.5
Average class size			
1-10	6.9	10.3	6.1
11-15	12.6	24.4	9.7
16-24	44.3	45.5	44.1
25 or more	36.2	19.9	40.2
Percent of classes taught in opposite field*			
0 to 10%	96.0	90.7	97.2
11 to 20%	1.4	2.4	1.2
21 to 30%	0.4	1.3	0.2
31 to 40%	1.5	2.6	1.3
41 to 50%	0.6	3.0	0.0

*Opposite field for vocational teachers is any non-vocational subject and for non-vocational teachers any vocational subject.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics,Schools and Staffing Survey, 1987-88.

Figure 4—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics: 1987-88



SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Table 4 also includes a measure of the amount of vocational education taught by non-vocational teachers and the amount of non-vocational courses taught by vocational teachers. Considering the recent demand to integrate more instruction of academic subjects in vocational classrooms, it is worthwhile to examine the proportion of vocational teachers who also currently teach non-vocational subjects. For example, the Carl D. Perkins Vocational Education Act states that program improvement funds be used to train both vocational and academic instructors in methods for integrating academics into their two programs. As table 4 shows, few vocational teachers (9 percent) taught non-vocational subjects and only 3 percent of non-vocational teachers taught vocational subjects.

Teacher Attitudes and Perceptions

This section explores differences between vocational and non-vocational teachers in their perceptions and opinions about their schools and their plans for the future. Table 5 and figure 5 present data on the perceptions of individual teachers about school problems, their influence on school policy, their control over classroom policy, and teacher satisfaction.[7] School problems include such features of the school environment as student absenteeism, vandalism, and student drug use. Vocational teachers reported about the same amount of problems in their school's environment as did non-vocational teachers.

[7]These variables are composites created for this analysis. Please see Appendix A for a discussion of how these variables were created.

Table 5—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes: 1987-88

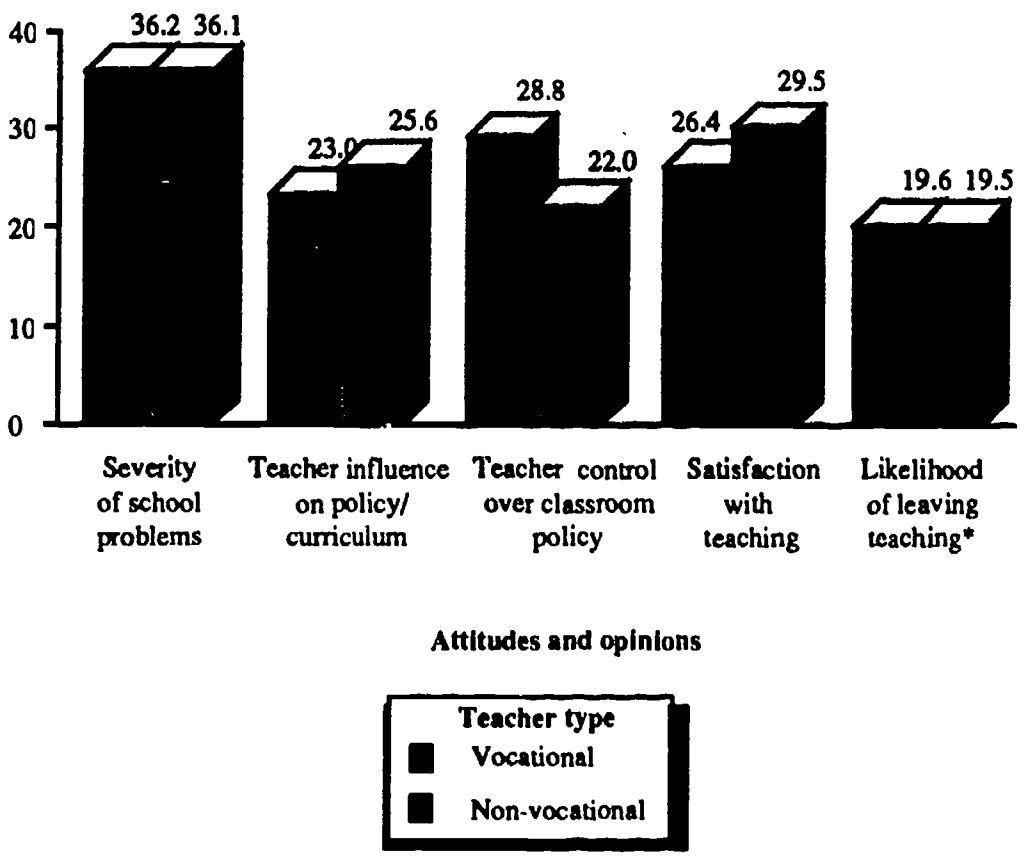
Teacher perception and attitude	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Severity of school problems			
Low	9.7	9.5	9.8
Moderate	54.1	54.3	54.1
High	36.1	36.2	36.1
Teacher influence on policy/curriculum			
Low	23.2	22.5	23.3
Moderate	51.7	54.4	51.1
High	25.1	23.0	25.6
Teacher control over classroom policy			
Low	23.1	17.0	24.5
Moderate	53.6	54.2	53.4
High	23.4	28.8	22.0
Satisfaction with teaching			
Low	18.7	19.5	18.6
Moderate	52.4	54.1	52.0
High	28.9	26.4	29.5
Plans to remain in teaching			
As long as I am able	27.6	24.0	28.5
Until I am eligible for retirement	37.8	42.5	36.7
Will probably continue unless something better comes along	14.8	14.5	14.8
Definitely plan to leave teaching as soon as possible	4.7	5.1	4.7
Undecided at this time	15.1	13.9	15.3

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Vocational teachers, on average, believed they had more control over classroom policy (e.g., choosing topics, teaching techniques) than did non-vocational teachers. While only 22 percent of non-vocational teachers reported that they had a high degree of control over making decisions in their classrooms, 29 percent of vocational teachers said that they had a great deal of control. The differences between the two types of teachers in whether they perceived they had a high amount of influence over classroom policy, while statistically significant, were small. There were also essentially no differences in the satisfaction of vocational and non-vocational teachers. The difference in the proportion of teachers who are highly satisfied with teaching between the two types of teachers, while significant, was small.

Vocational teachers were more likely to report they will remain teaching until eligible for retirement. In fact, 43 percent of vocational teachers stated that they would remain teaching only until they were eligible for retirement, compared to 37 percent of non-vocational teachers. As previously mentioned, one reason for this difference might be that vocational teachers were more likely to be age 50 or over than non-vocational teachers. However, vocational teachers were just as likely as non-vocational teachers to report that they plan to remain in teaching until something better comes along or plan to leave as soon as possible. Almost 20 percent of non-vocational and vocational teachers might leave if something better comes along or plan to leave as soon as possible (figure 5).

Figure 5—Percentage of vocational and non-vocational public school teachers of grades 9 to 12 giving "high" ratings on selected teacher perception and attitude scales: 1987-88



* "Likelihood of leaving teaching" combines the categories "Will probably continue unless something better comes along" and "Definitely plan to leave teaching as soon as possible" from table 5.

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Characteristics of Teachers of Different Vocational Subjects

A great variety of subjects are taught within the vocational education curriculum. While the previous section described the differences between all vocational and non-vocational teachers generally, there was much greater variation when all vocational teachers were analyzed by the type of courses they taught. This section looks at the characteristics of vocational instructors who taught in different vocational areas and compares their characteristics with each other and with non-vocational teachers.

Demographic Characteristics

While the majority of all vocational teachers were male, this was not true within all vocational subjects (table 6 and figure 6). For example, Business and Home Economics teachers were more likely to be female (67 and 99 percent, respectively). Agriculture and Industrial Arts/Trade & Industry teachers, however, were overwhelmingly male (81 and 96 percent, respectively). Within vocational subject areas, almost all teachers were white. Furthermore, Agriculture teachers were more likely to be below age 50 than teachers in other vocational areas, with the exception of teachers classified as mixed.

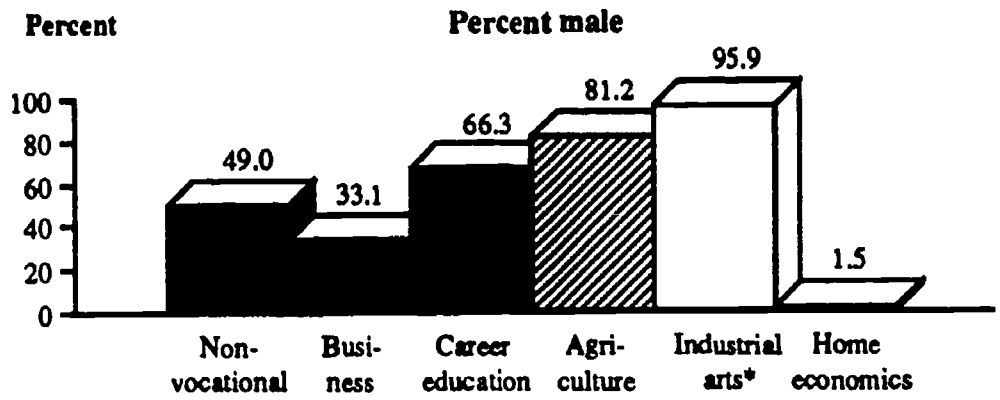
Table 6—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics and by subject taught: 1987-88

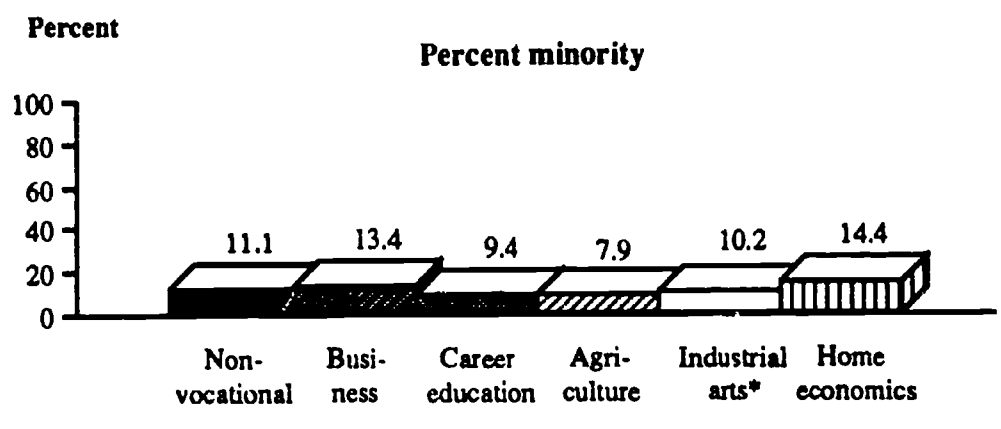
Demographic characteristic	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sex									
Male	49.0	33.1	66.3	81.2	95.9	1.5	73.7	66.8	77.3
Female	51.0	66.9	33.7	18.8	4.1	98.5	26.3	33.2	22.7
Race–ethnicity									
American Indian or Alaskan Native	1.0	1.4	0.0	1.0	1.5	1.7	1.5	0.0	1.4
Asian or Pacific Islander	0.8	0.8	1.4	0.8	0.7	1.1	0.3	2.3	0.0
Black, non-Hispanic	6.8	9.5	5.9	5.1	5.5	8.9	8.3	18.7	8.9
White, non-Hispanic	88.9	86.6	90.6	92.1	89.8	85.6	87.4	71.4	87.3
Hispanic	2.5	1.7	2.1	1.1	2.5	2.7	2.5	7.6	2.4
Age									
Under 30	11.2	8.6	6.0	20.6	9.1	8.6	3.6	20.5	6.4
30 to 39	32.5	26.3	24.9	37.4	27.4	36.5	29.8	25.7	23.7
40 to 49	37.9	38.4	38.5	30.8	39.0	31.5	38.2	25.6	28.2
50 and over	18.5	26.7	30.7	11.3	24.6	23.4	28.4	28.3	41.6

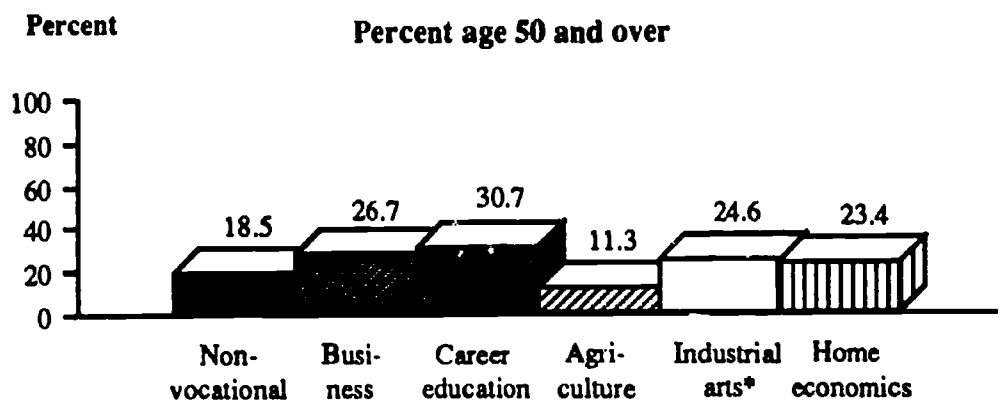
[1] Other vocational, trade and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Figure 6—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics and by subject taught: 1987-88







*"Industrial arts" includes "trade and industry."

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Educational Background

In general, most vocational teachers had achieved similar educational levels (table 7 and figure 7). More than 50 percent of Career and Business teachers had completed a master's, educational specialist, or doctorate degree while slightly less than 50 percent of Industrial Arts, Agriculture, and Home Economics teachers had done so. Only about 37 percent of vocational teachers classified as "other" in this analysis and about 30 percent of "subject area unknown" teachers had achieved this level of education. As presented previously, about 55 percent of non-vocational teachers had attained this level of education. Agriculture teachers were most likely to have earned their bachelor's or associate's degree in Mathematics and Sciences, with over 16 percent earning their degree in these areas. Home Economics teachers generally were most likely to have attained their degree in an occupationally specific subject area. On the other hand, Industrial Arts teachers were most likely to hold a degree in vocational education. Vocational teachers whose subject area was classified as "other" or "unknown" were much more likely to have less than a bachelor's degree than were other vocational teachers. About one in four "other" teachers and about one in three "unknown" teachers had less than a bachelor's degree.

Table 7—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Highest college degree									
Less than a bachelor's degree	0.3	0.2	2.7	0.0	1.3	0.1	25.4	3.1	33.0
Bachelor's degree	45.6	44.7	45.3	53.4	49.7	59.9	37.8	47.9	38.0
Master's degree	45.3	49.0	38.3	36.4	42.2	35.7	30.0	42.1	23.4
Education specialist[4]	7.3	5.6	12.7	8.8	6.3	4.3	5.7	6.9	5.1
Doctorate or first professional	1.5	0.5	1.1	1.4	0.6	0.1	1.0	0.0	0.5
Major field of study (associate's or bachelor's degree)[5]									
Mathematics and sciences	15.8	2.1	1.2	16.2	1.4	1.0	3.0	0.0	1.9
Social sciences	10.9	2.7	4.4	3.5	2.6	1.8	7.7	0.0	6.2
Letters and humanities	10.3	0.6	3.1	1.0	1.7	0.5	2.8	2.6	2.5
Education									
General education	49.0	13.6	18.3	10.4	9.6	4.5	12.2	15.5	12.9
Special education	4.3	0.0	6.1	0.3	0.2	0.0	2.2	0.0	1.4
Vocational education	1.8	57.3	45.1	42.4	80.7	56.0	53.8	70.7	50.9
Occupationally specific[6]	3.6	20.2	20.7	26.1	3.1	36.2	14.4	11.3	19.9
Other	4.2	3.6	1.2	0.1	0.8	0.0	3.9	0.0	4.2
Age at which first began to teach full-time									
25 or under	70.1	70.3	68.1	76.0	60.9	78.4	40.3	50.0	30.9
26-35	23.0	20.2	25.1	20.4	31.8	15.0	35.8	43.3	29.8
36-45	5.5	7.4	5.6	2.8	5.8	5.4	16.7	2.5	26.5
46-55	1.1	1.4	1.2	0.8	1.6	1.0	6.3	4.3	11.3
Over 55	0.3	0.7	0.0	0.0	0.0	0.1	0.9	0.0	1.5

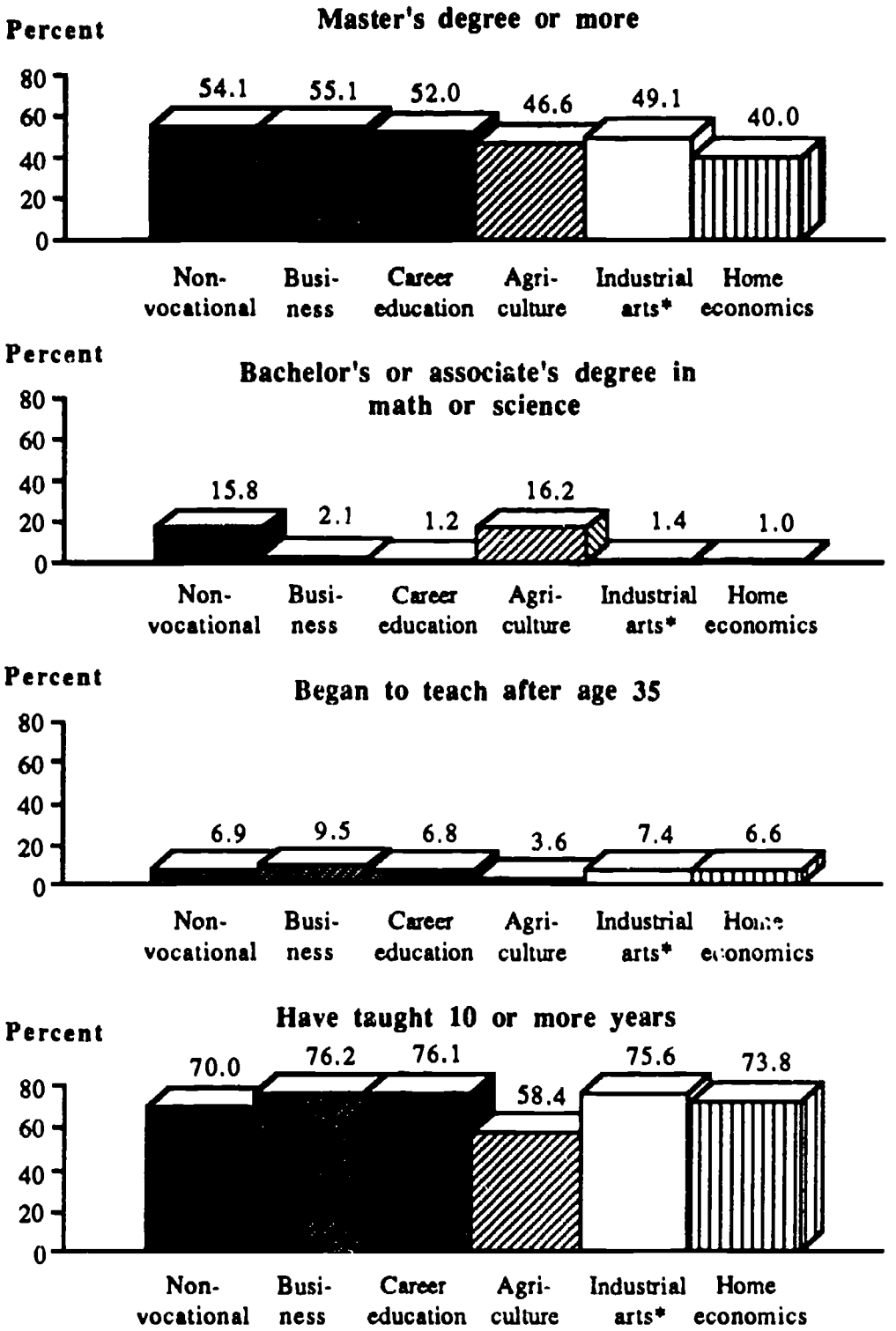
Table 7—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88—Continued

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of years of teaching experience									
Less than 3	6.4	4.6	4.9	5.7	3.9	5.8	5.8	9.0	9.0
3-9	23.6	19.2	19.0	35.9	20.5	20.4	25.9	27.3	26.6
10-20	45.3	45.1	43.7	40.0	44.4	52.0	49.7	40.7	47.7
Over 20	24.7	31.1	32.4	18.4	31.2	21.8	18.6	23.0	16.7
Type of credential in primary assignment field									
None	3.2	2.2	6.2	7.1	1.2	0.9	1.5	0.0	2.5
Standard state certificate	89.3	93.5	86.3	82.7	93.5	94.1	88.4	96.0	85.4
Probationary certificate	3.2	2.5	4.1	5.0	3.0	1.8	3.1	4.1	4.4
Temporary, provisional, or emergency certificate	4.1	1.6	3.3	4.9	2.2	2.3	7.1	0.0	7.8
Other	0.1	0.2	0.0	0.3	0.1	0.9	0.0	0.0	0.0

[1] Other vocational, trade, and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.
[4] Education specialist degrees or certificates are generally awarded for one year's work beyond the master's level.
[5] The base of this percentage was all teachers who had at least an associate's degree.
[6] Occupationally specific degrees include health occupations, agriculture, home economics, etc. See the technical notes at the end of the tables for a full description of this variable.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Figure 7—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88



*"Industrial arts" includes "trade and industry."

NOTE: "Master's degree or more" indicates the percentage of teachers with a master's degree, an educational specialist, or a doctorate or first professional degree.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

In general, Agriculture and Home Economics teachers were more likely to have started teaching before age 26 and Business teachers were more likely to have started teaching after age 35. Agriculture and Career Education teachers were more likely not to be certified in their field than were other vocational teachers. In fact, approximately 7 percent of Agriculture teachers did not have a teaching credential in their primary assignment field.

Teaching Environment

While Industrial Arts/Trade & Industry and Home Economics teachers appear to be more likely to be itinerant teachers than were Business or Agriculture teachers (table 8 and figure 8), these differences were not statistically significant. Career Education teachers were more likely to teach less than full-time at their present school than were Agriculture teachers. Furthermore, while vocational teachers overall had fewer students in their classrooms, Business teachers had class sizes more similar to non-vocational classes than to other vocational classes. Approximately one-quarter of all Business teachers had classes with 25 or more students, while about 40 percent of all non-vocational teachers had classes this large.

Table 8—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88

Teaching environment	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Primary assignment at present school									
Regular full- or part-time teacher	96.0	98.3	98.0	98.7	96.3	97.7	98.9	100.0	98.4
Itinerant teacher	3.5	1.1	1.6	1.3	3.6	2.0	1.1	0.0	1.3
Long-term substitute	0.5	0.6	0.4	0.0	0.1	0.3	0.0	0.0	0.3
Time spent teaching at present school									
Full-time	93.4	93.7	89.5	96.7	94.4	90.9	97.0	79.8	92.6
3/4 time or more, but less than full-time	2.0	2.3	4.4	0.6	1.4	1.9	1.1	18.3	1.2
1/2 time or more, but less than 3/4 time	3.0	2.4	5.7	2.8	2.1	6.1	1.1	1.9	4.4
1/4 time or more, but less than 1/2 time	1.0	1.3	0.0	0.0	1.5	1.1	0.5	0.0	0.8
Less than 1/4 time	0.5	0.3	0.5	0.0	0.7	0.0	0.2	0.0	1.0
Average class size									
1-10	6.1	6.5	14.4	17.9	12.7	8.8	13.1	14.5	–
11-15	9.7	18.1	14.8	22.5	31.6	27.9	30.2	18.2	–
16-24	44.1	48.2	52.8	41.6	40.3	47.5	43.6	41.7	–
25 or more	40.2	27.2	18.0	18.1	15.5	15.8	13.1	25.6	–

Table 8—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88—Continued

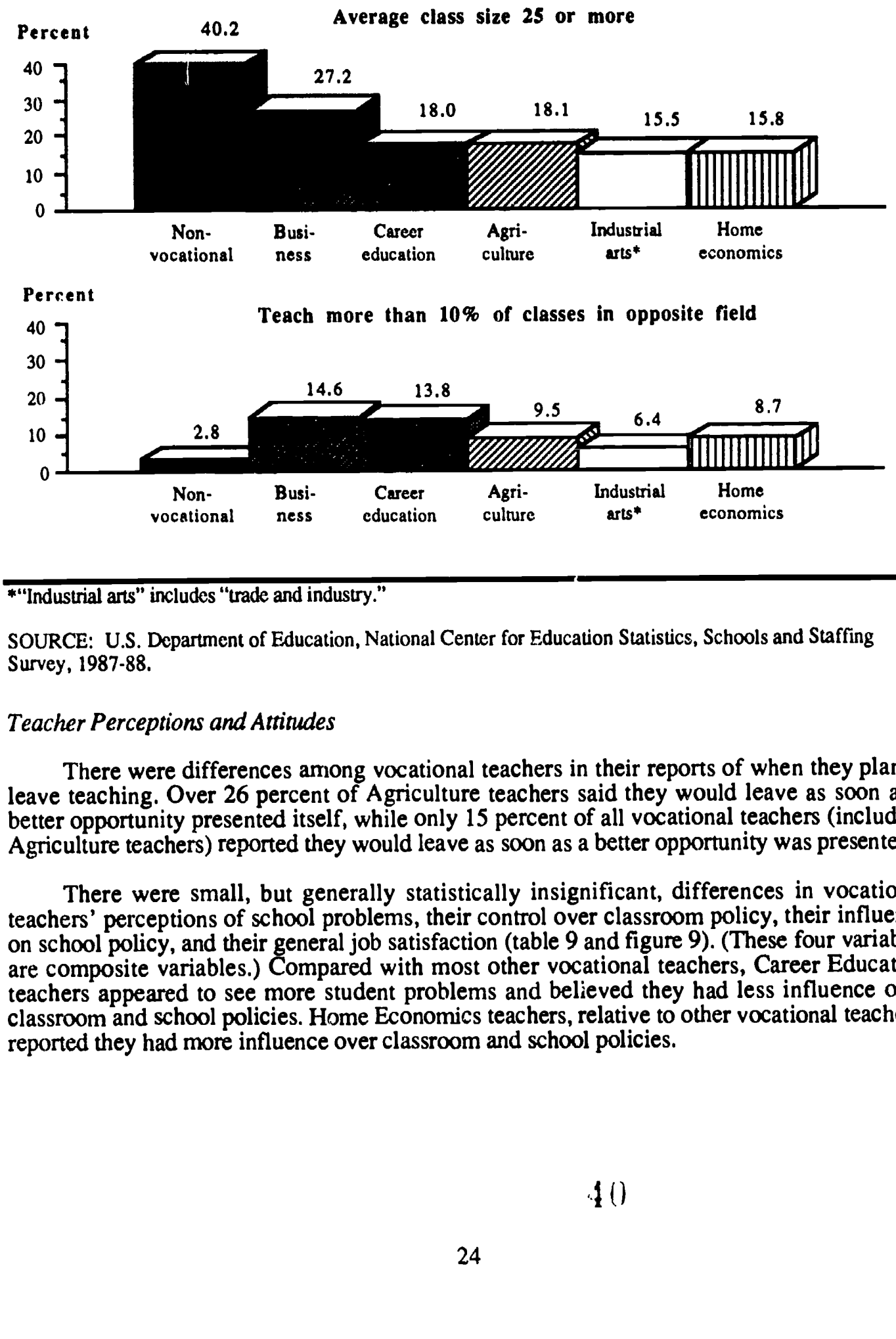
Teaching environment	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Percent of classes taught in opposite field[4]									
0 to 10%	97.2	85.4	86.2	90.5	93.6	91.3	93.5	55.9	–
11 to 20%	1.2	3.0	0.0	3.4	3.3	3.2	1.0	1.3	–
21 to 30%	0.2	2.0	2.1	0.4	0.7	1.6	1.3	0.0	–
31 to 40%	1.3	4.3	5.6	2.2	0.9	1.4	2.6	27.9	–
41 to 50%	0.0	5.3	6.1	3.5	1.5	2.4	1.5	14.9	–

-- Unknown.

[1] Other vocational, trade, and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.
[4] Opposite field for vocational teachers is any non-vocational subject and for non-vocational teachers any vocational subject.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Figure 8—Percentage of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88



*"Industrial arts" includes "trade and industry."

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Teacher Perceptions and Attitudes

There were differences among vocational teachers in their reports of when they plan to leave teaching. Over 26 percent of Agriculture teachers said they would leave as soon as a better opportunity presented itself, while only 15 percent of all vocational teachers (including Agriculture teachers) reported they would leave as soon as a better opportunity was presented.

There were small, but generally statistically insignificant, differences in vocational teachers' perceptions of school problems, their control over classroom policy, their influence on school policy, and their general job satisfaction (table 9 and figure 9). (These four variables are composite variables.) Compared with most other vocational teachers, Career Education teachers appeared to see more student problems and believed they had less influence over classroom and school policies. Home Economics teachers, relative to other vocational teachers, reported they had more influence over classroom and school policies.

Table 9—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes and by subject taught: 1987-88

Teacher perception and attitude	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Severity of school problems									
Low	9.8	8.8	7.3	10.2	10.7	7.6	8.5	7.9	14.1
Moderate	54.1	52.4	45.9	57.5	57.3	54.9	52.7	56.8	55.9
High	36.1	38.8	46.8	32.3	32.1	37.6	38.8	35.3	30.0
Teacher influence on policy/curriculum									
Low	23.3	23.4	24.8	17.0	23.3	21.8	23.7	18.3	21.7
Moderate	51.1	56.2	54.2	59.6	53.3	50.7	55.6	54.5	51.9
High	25.6	20.5	21.1	23.4	23.3	27.5	20.7	27.2	26.5
Teacher control over classroom policy									
Low	24.5	18.4	31.1	21.1	19.1	12.2	16.2	6.7	13.4
Moderate	53.4	52.6	49.5	55.8	53.6	53.8	58.4	72.2	54.3
High	22.0	29.0	19.5	23.2	27.3	34.1	25.4	21.1	32.3
Satisfaction with teaching									
Low	18.6	17.7	16.1	20.7	16.3	19.0	20.4	26.3	28.7
Moderate	52.0	54.3	50.9	54.8	52.7	60.1	52.0	54.1	50.4
High	29.5	28.1	33.0	24.5	31.0	20.9	27.6	19.6	20.9

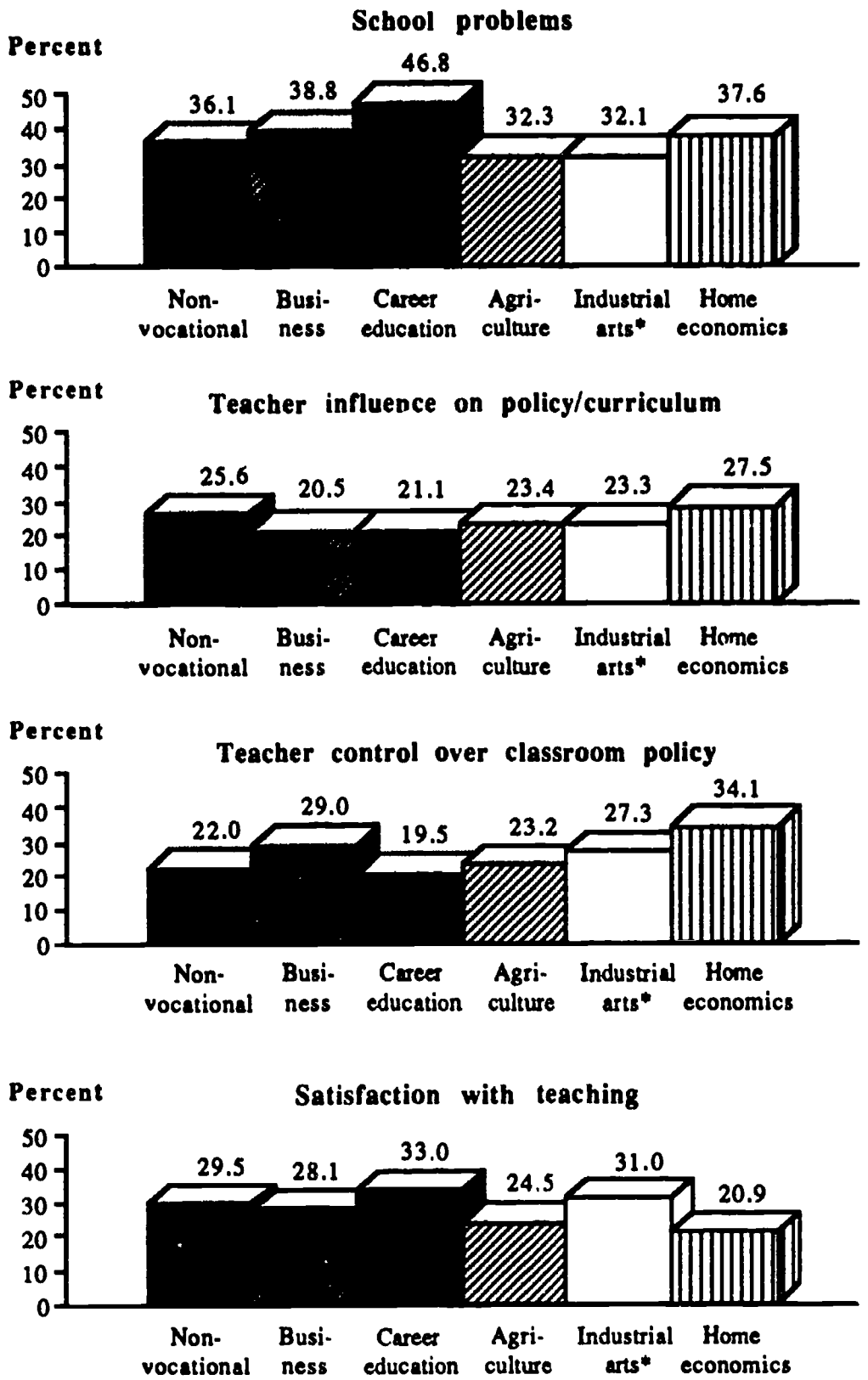
Table 9—Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes and by subject taught: 1987-88—Continued

Teacher perception and attitude	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Plans to remain in teaching									
As long as I am able	28.5	23.9	22.8	21.7	20.7	22.8	26.2	20.4	30.7
Until I am eligible for retirement	36.7	45.0	44.5	29.4	45.1	41.5	42.8	39.1	39.6
Will probably continue unless something better comes along	14.8	12.8	11.0	25.2	15.3	15.8	14.0	16.2	11.4
Definitely plan to leave teaching as soon as possible	4.7	3.8	8.9	7.2	8.5	3.5	4.4	7.7	4.3
Undecided at this time	15.3	14.6	12.8	16.5	10.3	16.4	12.6	16.7	14.1

[1] Other vocational, trade, and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Figure 9—Percentage of vocational and non-vocational public school teachers of grades 9 to 12 rating their schools "high" on selected teacher perception and attitude scales, by subject taught: 1987-88



*"Industrial arts" includes "trade and industry."

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Summary

This publication reports findings from an exploration of the characteristics of vocational and non-vocational secondary teachers being conducted at NCES. From the data presented in this report, it appears that the common perceptions about vocational teachers may be exaggerated. If they mirrored the stereotype, vocational teachers would more likely have been older, would have had more teaching experience, and would have been more likely to have started teaching at a later age than non-vocational teachers. While these trends were present, the data indicated that these differences were not very great. Generally, vocational teachers in secondary schools were, in fact, quite similar to their non-vocational counterparts in their demographic characteristics.

However, the educational attainment of vocational teachers did not match that of non-vocational teachers. Vocational teachers were more likely to have less than a bachelor's degree than non-vocational teachers and vocational teachers were less likely to have attained an advanced degree.

There were other areas in which vocational and non-vocational teachers differed. For instance, there were significant differences between vocational and non-vocational teachers in their perceptions about the amount of control they had over classroom policy. Vocational teachers reported that they had more control over policies in their own classrooms than did non-vocational teachers. Also, vocational teachers were more likely to report that they plan to remain in teaching until they are eligible to retire.

Beyond describing the differences in the characteristics of vocational and non-vocational teachers, this report also presented data on the differences among teachers of various vocational subjects. Indeed, there was a greater variety among vocational teachers of different subject areas than between vocational and non-vocational teachers in general. Many of the differences among vocational teachers conformed to well-known stereotypes. For example, almost all Home Economics teachers were female, while most Agriculture and almost all Industrial Arts/ Trade & Industry teachers were male. However, some of the findings presented here are perhaps contrary to common perception. For example, Industrial Arts/Trade & Industry teachers were almost as likely as non-vocational teachers and just as likely than most other vocational teachers to have earned at least a master's degree.

Among vocational teachers, Agriculture teachers were more likely to be younger, to have fewer years of teaching experience than Business or Industrial Arts teachers, and to have a degree in mathematics or science. Agriculture teachers also were more likely to report plans to leave the teaching field than Business or Home Economics teachers. Almost 32 percent of Agriculture teachers planned to leave teaching as soon as they were able or if something better came up. Industrial Arts, Career Education, and Business teachers were more likely to be older, have 20 or more years of teaching experience, and have a master's degree than were other vocational educators.

There were also some apparent differences between vocational teachers in their reported perceptions of the control they have over classroom policy, their satisfaction with teaching, and the amount of student problems in their schools. However, given the relatively small sample sizes for some groups of vocational teachers, these apparent differences were not statistically significant. The small sample sizes for some of the vocational subject areas was due, in part, to the relatively large number of teachers whose subject area was unknown. Approximately 27 percent of the vocational teachers in the sample (unweighted) were classified as subject area "unknown," or subject area "other."

The data presented here are intended to provide both an in-depth description of vocational and non-vocational teachers and to prompt more detailed analyses of the differences between vocational and non-vocational teachers in the near future. By design, this analysis has been descriptive and broad in scope and is meant to provide a profile of the teachers of vocational and non-vocational subjects in grades 9 to 12. More in-depth analyses and analyses perhaps more narrow in scope are a logical extension of the analysis reported here. For example, it was shown in this report that vocational teachers were more likely to be looking forward to retirement than were non-vocational teachers. However, if one controls for age, are vocational teachers more likely to be looking forward to retirement than non-vocational teachers? Furthermore, there appeared to be some differences in the attitudes and opinions of teachers of different vocational subjects. Would these differences remain if one controlled for the age, sex, and years of teaching experience? Further analyses in the future should examine these characteristics from a multivariate perspective with the ultimate goals of building a solid empirical framework for the study of vocational teachers and of guiding policymakers in their ongoing efforts to improve the recruitment and retention of vocational teachers.

Appendix A

Methodology and Technical Notes

Appendix A

This report is based on data collected in the 1987-88 Schools and Staffing Survey. The survey was conducted by NCES and provides comprehensive information on the nation's public and private school teachers, school administrators, and school policies and practices. There were seven questionnaires administered in this survey:

- Teacher Demand and Shortage for Public School Districts (LEAs)
- Teacher Demand and Shortage for Private Schools
- Public School
- Private School
- School Administrator
- Public School Teachers
- Private School Teachers

The data used for this report came from the public school teacher data files, a total sample of 18,178 teachers which represent the American population of public vocational and non-vocational teachers of grades 9 to 12.

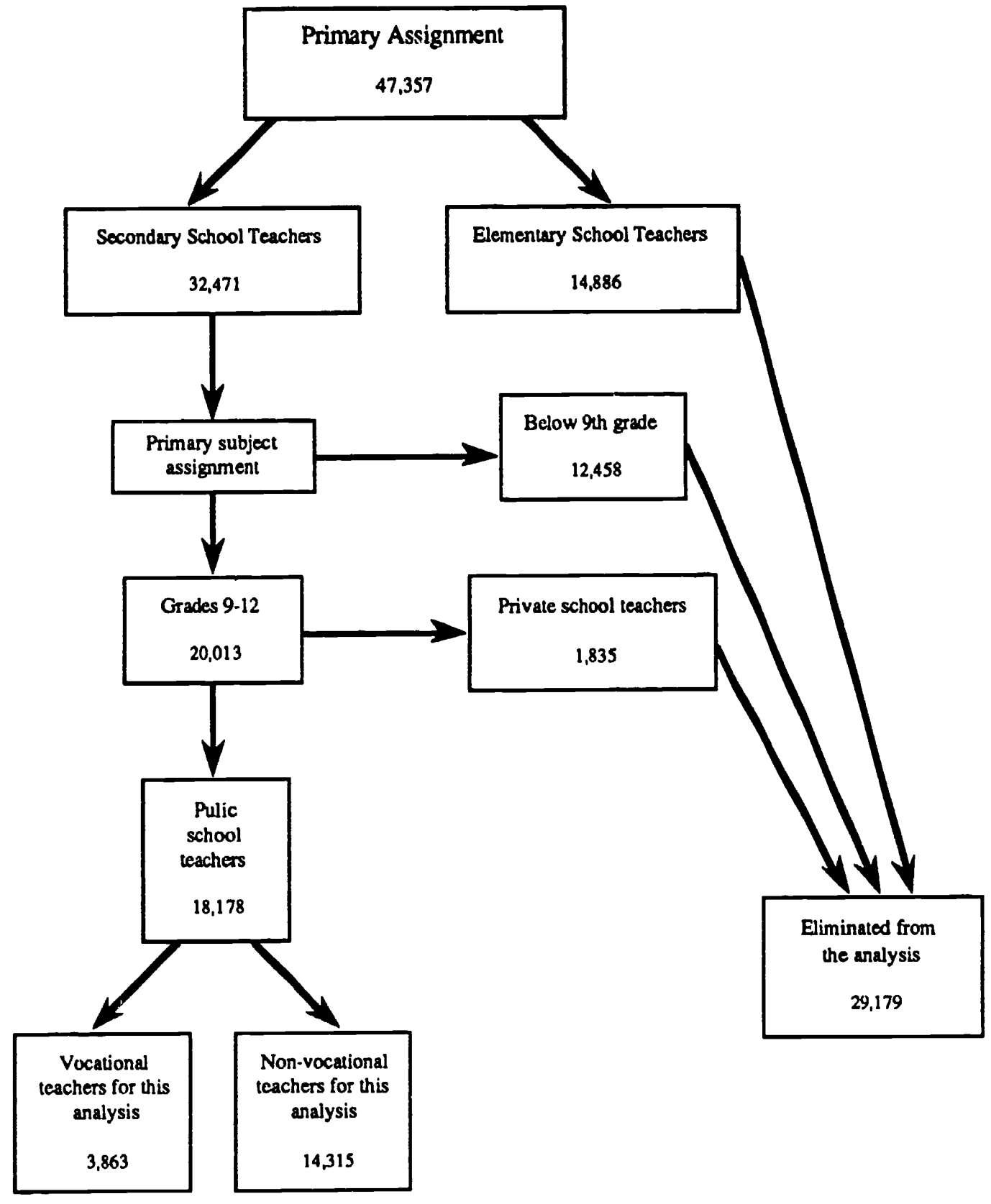
Classification of Teachers

One of the first and most important steps in this analysis was constructing a scheme to classify survey respondents into vocational teachers and non-vocational teachers. It was vital to address explicitly factors that may later confuse observed differences among vocational and non-vocational teachers. Many potential confounding factors could be handled analytically later, by either statistically removing their influence through some kind of covariance technique or by using them as independent variables in the analysis. However, there were two factors—school control and school level, whose high correlation with teacher type warranted their treatment in the design of the sample used for this analysis. For example, most vocational education below the postsecondary level is taught at the secondary level in public schools—therefore, most vocational teachers will also be public secondary teachers. Consequently, in a simple one-way contrast between vocational and non-vocational teachers, differences between vocational and non-vocational teachers will be confounded with differences between: 1) elementary and secondary teachers, and 2) private and public school teachers. That is, without somehow controlling for these factors, observed differences in teacher attitudes, experiences, and educational background between vocational and non-vocational teachers may merely reflect differences between public and private teachers, or differences between elementary and secondary teachers.

There are several ways to include these variables in the design of the sample for this study. To control for differences in public and private school teachers we eliminated private school teachers and elementary school teachers from the analysis. Private school teachers were eliminated from this study because they comprised only 3 percent (135 respondents) of the vocational teachers included in the survey. Furthermore, only 7 percent of all private secondary school teachers in the survey were vocational. Because little vocational education

Figure A1

Classification Scheme for Vocational and Non-Vocational Teachers*



*See page 41 for Algorithm.

is taught in lower elementary grades, simply eliminating elementary teachers posed no particular problem for this analysis in either bias or generalizability. Also, because the vocational curriculum in middle schools or junior high schools is different than the vocational curriculum in high schools, teachers in 7th and 8th grades were eliminated from the sample.

Figure A-1 displays the procedure we used for classifying teachers (see page 41 for algorithm). In the first step we separated elementary teachers from junior and senior high school teachers using the variable TSC075 (TEACHER'S PRIMARY TEACHING ASSIGNMENT). If it was pre-kindergarten, Kindergarten, or general elementary (codes 1-3), the teachers were eliminated from the sample. The other options for TSC075 were "special areas," science, special education, vocational education and "other." If the teacher chose one of these options, then the variables representing the specific classes taught on the 9th-12th grade levels were examined (TSC150-TSC155). If the teachers did not teach any classes at this level, then they were eliminated from the sample. Using this algorithm, there were a total of 20,013 teachers (62 percent) accepted into the analysis sample. Among these, approximately 9 percent (1835) of the teachers taught in private schools and were eliminated from the analysis, thus leaving 18,178 public secondary teachers.

Teachers were defined as vocational and non-vocational based on the courses they reported teaching. The reason for classifying teachers in this way and not with their primary teaching assignment, was because the codes for primary teaching assignment only identified vocational teachers as teaching in business education (code=07), home economics (code=14), industrial arts (code=15) or vocational education (code=31). Other specific areas of vocational education were not identified. Therefore, in order to identify vocational teachers in a more specific field, the the following algorithm was used to classify teachers as vocational or non-vocational.

The teacher file contained 9 variables (TSC166, TSC173, TSC180, TSC187, TSC194, TSC201, TSC208, TSC215, and TSC222) that defined the subjects taught for up to 9 classes by each teacher. Subjects considered vocational were accounting/bookkeeping, (11), shorthand (12), typing (13), other business (14), career education (15), agriculture (16), industrial arts (17), home economics (18), other vocational, trade, and industrial education (19), and business math (42).[8] The rest of the courses were in academic or general areas including English (21-25), foreign language (31-36), math (41-51), computer science (52-54), natural science (61-67), social science (70-78), art (81-87), and miscellaneous areas such as physical education and psychology (91-95). Courses that did not fall into any of these categories were coded as 96 "other courses not elsewhere classified."

Approximately 27 percent of the vocational teachers in the sample (unweighted) had an unclassified subject area (code=96), or were classified as subject area "other vocational, trade, and industrial education" (code=19). Fortunately, with the changes in the questionnaire instituted for the 1990-91 Schools and Staffing Survey (see table A1), subject area classifications may now be known for a greater proportion of teachers. Larger numbers of teachers successfully classified into vocational subject areas will make differences between vocational teachers easier to detect.

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[8]In the teacher questionnaire business math is listed under mathematics. For this study, we have included it as a vocational course.

Table A1—Changes in vocational subject matter code numbers for SASS Public School Teacher Questionnaires: 1987-88 to 1990-91

1987-88	1990-91
Business/vocational	Vocational education
11 Accounting/bookkeeping	01 Agriculture
12 Shorthand	02 Business, marketing
13 Typing	03 Industrial arts
14 Other business education courses	04 Health occupations
15 Career education	05 Vocational home economics
16 Agriculture	06 Trade and industry
17 Industrial arts	07 Technical
18 Home economics	08 Accounting/bookkeeping
19 Other vocational, trade, and industrial education	09 Shorthand
	10 Typing
	11 Career education
	12 Other vocational education

SOURCE: U.S. Department of Education, Center for Education Statistics, "Schools and Staffing Surveys," Public School Teachers Questionnaires, 1987-1988, p. 11, and 1990-1991, p. 15.

The total number of courses taught in each area was tallied. There appeared to be a clear delineation between vocational and non-vocational teachers. For example, approximately 96 percent of non-vocational teachers taught no vocational courses and approximately 80 percent of vocational teachers taught only vocational courses. The non-vocational subjects taught by the 20 percent of the vocational teachers who taught non-vocational courses ranged over all the academic areas, especially English and computer science.

Teachers who taught 50 percent or more of their courses in vocational subjects were considered vocational. Approximately 23 percent of the teachers in the survey, however, had no course-level data. Therefore, these teachers were classified vocational by the primary teaching assignment variable (TSC075) if the assignment was in a vocational area (codes 7,14,15, or 31). In the final sample of selected teachers, there were 3,863 (21 percent) who were identified as vocational.

Defining vocational teachers by the actual courses they taught was highly consistent with what teachers reported as their primary teaching assignment (TSC075). Table A2 shows that among those teachers who indicated a vocational field as their primary assignment and reported data on the courses they taught, over 87 percent were also classified as vocational by the number and types of courses they taught.

Table A2—Percentage of matches between classifying teachers of grades 9 to 12 by their reported primary assignment and by the courses they reported teaching

Course data	Primary assignment as reported by the teacher: Vocational	Non-vocational	Total
Missing Unweighted N Row percent	887 21.6%	3,220 78.4%	4,107 22.6%
Vocational Unweighted N Row percent	2,604 87.5%	372 12.5%	2,976 21.1% (of non-missing)
Non-vocational Unweighted N Row percent	171 1.5%	10,924 98.5%	11,095 78.9% (of non-missing)
	3,662 20.2%	14,516 79.8%	18,178

SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1987-88.

Variables

Most of the variables used in this analysis were selected directly from the variables in the SASS dataset. Some of these variables have been recoded into a smaller number of categories for this tabulation. Most of these recodes are self-explanatory. The exception is the variable representing the teacher's college major. This variable was recoded from SASS item TSC044 (in the case of bachelor's degree) or TSC040 (in the case of associate's degrees) in the following manner:

Mathematics/Science	Biological/life sciences
	Mathematics
	Chemistry
	Physics
	Geology/earth sciences
	Other physical science
Social Science	Economics
	History
	Political science
	Sociology

	Psychology
	Other social science
Letters and Humanities	Philosophy
	Religion
	Area and ethnic studies
	Fine arts
	Letters (English, literature, speech, classics)
	Foreign languages
General education	Elementary education
	Pre-elementary education
	Secondary education
	Art education
	Bilingual education
	ESL
	Foreign language education
	Mathematics education
	Physical education
	Reading
	Science education
	Social studies education
Special education	Special education
	Education for the emotionally disturbed
	Education for the mentally retarded
	Education for the speech impaired
	Special learning disabilities
	Other special education
Vocational education	Agricultural education
	Business education
	Home economics education
	Vocational and technical education
Occupationally specific	Agriculture and natural resources
	Architecture and environmental design
	Business and management
	Communications
	Computer and information science

Engineering
Health professions
Home economics
Law
Library science
Military science

The teachers' average class size and the percent of courses taught in the opposite field were constructed from several items from the SASS teacher questionnaire. The categories for these variables were constructed after the variable was rounded to the nearest whole number. For example, the first category for average class size was 1 to 10. In actuality this category included everyone with an average class size greater than .5 and less than 10.5.

The variables for the sections on teacher opinions and attitudes were created from several attitudinal variables in the SASS dataset. Four composite variables were constructed:

School problems: This composite consisted of the teacher's opinion about the severity of problems in their school. Component items included, for example, ratings of the severity of vandalism, student absenteeism, drug use, and physical abuse.

Teacher influence: This composite reflected the teacher's opinion concerning the amount of influence they had over school policy. Component items included, for example, teacher influence in determining discipline policies, establishing curriculum, and ability grouping.

Teacher control: This variable described the amount of perceived control over teacher's own classroom policies. Items included, for example, amount of teacher control over classroom content and topics, teaching techniques, and amount of homework assigned.

Teacher satisfaction: This composite measured the amount of satisfaction of teachers. Typical items included, for example, ratings of the fairness of teacher evaluation, satisfaction with salary, ratings of cooperation among staff, and ratings of administration support.

These variables were constructed in the following manner. First, items were selected which seemed on face value to represent aspects of the desired concept. Second, the dimensionality of these scales was examined by principal components analysis. Third, each component of the scale was analyzed to determine if the Cronbach's alpha for the scale would increase or decrease if the component was deleted from the scale. Since the deletion of any of the components from any of the scales did not increase the scales' overall alpha, no components were deleted (table A3 displays the reliabilities for the composite variables constructed for this study). Finally, after all the items were standardized (i.e. coded in the same way), the items in each of the four scales were averaged for each teacher.

More details on the items that went into the construction of these composite variables (along with the SAS code used to construct them) can be obtained by writing or calling:

James Houser, National Center for Education Statistics,
555 New Jersey Ave. NW, Room 517A, Washington, DC 20208

Table A3—Reliability of scales used in this analysis

Scale	Number # of items	Cronbach's alpha
School problems	13	.91
Teacher influence	4	.75
Teacher control	5	.75
Teacher satisfaction	23	.88

Accuracy of Estimates

The estimates in this report are derived from samples and are subject to two broad classes of error—sampling and nonsampling error. Sampling errors occur because the data are collected from a sample of a population rather than from the entire population. Estimates based on a sample will differ somewhat from the values that would have been obtained from a universe survey using the same instruments, instructions, and procedures. Nonsampling errors come from a variety of sources and affect all types of surveys, universe as well as sample surveys. Examples of sources of nonsampling error include design, reporting, and processing errors and errors due to nonresponse. The effects of nonsampling errors are more difficult to evaluate than those that result from sampling variability.

The standard error is a measure of the variability due to sampling when estimating a parameter. It indicates how much variance there is in the population of possible estimates of a parameter for a given sample size. Standard errors can be used as a measure of the precision expected from a particular sample. The probability that a complete census would differ from the sample by less than the standard error are about 68 out of 100. The chances that the difference would be less than 1.65 times the standard error are about 90 out of 100; that the difference would be less than 1.96 the standard error, about 95 out of 100.

Standard errors for the estimates in this report were calculated using the method of balanced repeated replication using MPR's REPTAB program. This method of calculating standard errors takes into account the complex sampling design used for SASS.

Standard errors for many of the estimates in the tables appear in Appendix B.

Methodology and Statistical Procedures

The comparisons in the text have all been tested for statistical significance to ensure that the differences are larger than those that might be expected due to sampling variation.

Differences in Two Estimated Percentages

The Student's t statistic was used to test the likelihood that the differences between two percentages were larger than would be expected by sampling error.

$$t = \frac{P_1 - P_2}{\sqrt{se_1^2 + se_2^2}}$$

where P_1 and P_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors.

As the number of comparisons on the same set of data increases, the likelihood that the t value for at least one of the comparisons will exceed 1.96 simply due to sampling error increases. For a single comparison, there is a five percent chance that the t value will exceed 1.96 due to sampling error. For five tests, the risk of getting at least one t value that high increases to 23 percent and for 20 comparisons, 64 percent.

One way to compensate for this danger when making multiple comparisons is to adjust the alpha level to take into account the number of comparisons being made using a Bonferroni adjustment. For example, rather than establishing an alpha level of 0.05 for a single comparison, the alpha level is set to ensure that the likelihood is less than 0.05 that the t value for any of the comparisons exceeds the critical value by chance alone when there are truly no differences for any of the comparisons. This is calculated by taking the desired alpha level and dividing by the number of possible comparisons, based on the variable(s) being compared. The t value corresponding to the revised, lower alpha level must be exceeded in order for any of the comparisons to be considered significant.

Algorithm for Choosing Vocational Teachers

I. Determine secondary (9th to 12th grade) teachers

1. Primary Assignment is not elementary (TSC075 > 3) **[32,471]**

2. Determine if they teach at or above 9th grade in one of two ways:
   a. Course-level information (TSC150-TSC155) indicates 9th grade or above (19,756)
   b. If no course-level information, the variable TSUBJ indicates high school level (code > 2) (257)

[20,013]

II. Eliminate private school teachers (1835)

[18,178]

III. Identify teacher as vocational in one of two ways:

1. If 50 percent or more of the courses taught are in a vocational area (TSC166, TSC173, TSC180, TSC187, TSC194,TSC201, TSC208, TSC215, TSC222--codes 11-19 or 42) (2,976)

2. If no course subject information then primary assignment is in a vocational area (TSC075 = 7,14,15,31) (887)

[3,863]

Appendix B

Standard Errors for Figures and Tables

Table B1—Standard errors for table 1: Percentage distribution and number of public school teachers of grades 9 to 12, by vocational and non-vocational teaching assignment and by vocational field: 1987-88

Teacher assignment and vocational field	Unweighted n	Percentage	Number
Total			
n, % or number	18,178	100.0	828,764
SE		n/a	9,014
Non-vocational			
n, % or number	14,315	80.3	665,554
SE		0.33	8,221
Vocational			
n, % or number	3,863	19.7	163,200
SE		0.33	2,922
Vocational field total			
n, % or number	3,863	100.0	163,200
SE		n/a	2,922
Business			
n, % or number	1,201	33.0	53,924
SE		0.92	1,714
Career education			
n, % or number	84	2.1	3,497
SE		0.23	389
Agriculture			
n, % or number	261	6.5	10,598
SE		0.35	621
Industrial arts/Trade & industry			
n, % or number	631	17.5	28,574
SE		0.71	1,234
Home economics			
n, % or number	606	15.7	25,534
SE		0.69	1,123
Other			
n, % or number	544	13.3	21,683
SE		0.62	1,127
Mixed			
n, % or number	34	0.9	1,398
SE		0.18	303
Unknown			
n, % or number	502	11.0	17,993
SE		0.71	1,241

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B2—Standard errors for table 2: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics: 1987-88

Demographic characteristic	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Unweighted n	18,178	3,863	14,315
Sex			
Unweighted n	18,108	3,854	14,254
Male			
%	49.9	53.6	49.0
SE	0.43	0.83	0.48
Female			
%	50.1	46.5	51.0
SE	0.43	0.83	0.48
Race–ethnicity			
Unweighted n	17,940	3,825	14,115
American Indian or Alaskan Native			
%	1.1	1.4	1.0
SE	0.09	0.20	0.11
Asian or Pacific Islander			
%	0.8	0.7	0.8
SE	0.07	0.14	0.09
Black, non-Hispanic			
%	7.1	8.2	6.8
SE	0.28	0.56	0.31
White, non-Hispanic			
%	88.6	87.5	88.9
SE	0.28	0.76	0.34
Hispanic			
%	2.5	2.2	2.5
SE	0.13	0.22	0.17
Age			
Unweighted n	17,986	3,832	14,154
Under 30			
%	10.7	8.6	11.2
SE	0.23	0.45	0.28
30 to 39			
%	31.8	29.0	32.5
SE	0.38	0.75	0.38
40 to 49			
%	37.4	35.7	37.9
SE	0.34	1.00	0.40
50 and over			
%	20.1	26.8	18.5
SE	0.32	1.05	0.28

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B3—Standard errors for table 3: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and teaching experience: 1987-88

Educational background and teaching experience	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Unweighted n	18,178	3,863	14,315
Highest college degree			
Unweighted n	18,178	3,863	14,315
Less than a bachelor's degree			
%	1.7	7.4	0.3
SE	0.12	0.50	0.05
Bachelor's			
%	45.9	46.9	45.6
SE	0.39	0.84	0.43
Master's			
%	44.1	39.3	45.3
SE	0.40	0.78	0.42
Education specialist			
%	7.0	5.8	7.3
SE	0.19	0.48	0.19
Doctorate or first professional			
%	1.4	0.6	1.5
SE	0.09	0.13	0.11
Major field of study (associate's or bachelor's degree)			
Unweighted n	17,511	3,607	13,904
Mathematics and sciences			
%	13.3	2.8	15.8
SE	0.23	0.32	0.29
Social sciences			
%	9.5	3.6	10.9
SE	0.26	0.40	0.33
Letters and humanities			
%	8.5	1.4	10.3
SE	0.22	0.15	0.28
General education			
%	41.7	11.1	49.0
SE	0.46	0.63	0.50
Special education			
%	3.6	0.6	4.3
SE	0.16	0.15	0.20
Vocational education			
%	12.8	59.0	1.8
SE	0.25	0.88	0.15
Occupationally specific			
%	6.6	19.3	3.6
SE	0.23	0.85	0.18
Other			
%	3.9	2.3	4.2
SE	0.17	0.26	0.20

Table B3—Standard errors for table 3: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and teaching experience: 1987-88—Continued

Educational background and teaching experience	Total	Teacher type	
		Vocational	Non-vocational
Age at which first began to teach full-time			
Unweighted n	17,880	3,796	14,084
25 or under			
%	68.4	61.8	70.1
SE	0.38	0.86	0.43
26-35			
%	23.4	24.9	23.0
SE	0.39	0.71	0.39
36-45			
%	6.3	9.8	5.5
SE	0.19	0.60	0.17
46-55			
%	1.5	3.1	1.1
SE	0.09	0.26	0.09
Over 55			
%	0.4	0.5	0.3
SE	0.05	0.14	0.06
Number of years of teaching experience			
Unweighted n	18,178	3,863	14,315
Less than 3			
%	6.2	5.4	6.4
SE	0.15	0.39	0.21
3-9			
%	23.4	22.5	23.6
SE	0.32	0.63	0.40
10-20			
%	45.5	46.6	45.3
SE	0.36	0.91	0.44
Over 20			
%	24.9	25.6	24.7
SE	0.30	0.83	0.32
Type of credential in primary assignment field			
Unweighted n	14,521	2,970	11,551
None			
%	3.0	2.1	3.2
SE	0.13	0.27	0.15
Standard state certificate			
%	89.7	91.3	89.3
SE	0.27	0.49	0.30
Probationary certificate			
%	3.1	2.9	3.2
SE	0.15	0.36	0.17
Temporary, provisional, or emergency certificate			
%	4.0	3.4	4.1
SE	0.19	0.33	0.21
Other			
%	0.1	0.2	0.1
SE	0.03	0.07	0.03

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B4—Standard errors for table 4: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics: 1987-88

Teaching environment	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Unweighted n	18,178	3,863	14,315
Primary assignment at present school			
Unweighted n	18,178	3,863	14,315
Regular full- or part-time teacher			
%	96.4	98.0	96.0
SE	0.16	0.22	0.20
Itinerant teacher			
%	3.2	1.7	3.5
SE	0.15	0.22	0.18
Long-term substitute			
%	0.5	0.3	0.5
SE	0.07	0.1	0.07
Time spent teaching at present school			
Unweighted n	18,178	3,863	14,315
Full-time			
%	93.5	93.7	93.4
SE	0.24	0.47	0.29
3/4 time or more, but less than full-time			
%	2.0	1.9	2.0
SE	0.13	0.27	0.16
1/2 time or more, but less than 3/4 time			
%	3.0	3.1	3.0
SE	0.14	0.26	0.18
1/4 time or more, but less than 1/2 time			
%	1.0	1.0	1.0
SE	0.08	0.16	0.08
Less than 1/4 time			
%	0.5	0.4	0.5
SE	0.06	0.09	0.07
Average class size			
Unweighted n	14,045	2,952	11,093
1-10			
%	6.9	10.3	6.1
SE	0.21	0.49	0.21
11-15			
%	12.6	24.4	9.7
SE	0.37	0.89	0.36
16-24			
%	44.3	45.5	44.1
SE	0.52	1.05	0.55
25 or more			
%	36.2	19.9	40.2
SE	0.57	0.72	0.61

Table B4—Standard errors for table 4: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics: 1987-88—Continued

Teaching environment	Total	Teacher type	
		Vocational	Non-vocational
Percent of classes taught in opposite field			
Unweighted n	17,944	3,629	14,315
0 to 10%			
%	96.0	90.7	97.2
SE	0.15	0.59	0.14
11 to 20%			
%	1.4	2.4	1.2
SE	0.11	0.35	0.11
21 to 30%			
%	0.4	1.3	0.2
SE	0.05	0.20	0.04
31 to 40%			
%	1.5	2.6	1.3
SE	0.10	0.34	0.09
41 to 50%			
%	0.6	3.0	0.0
SE	0.08	0.40	0.01

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, School and Staffing Survey, 1989.

Table B5—Standard errors for table 5: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes: 1987-88

Teacher perceptions and attitudes	Total	Teacher type	
		Vocational	Non-vocational
Total	100.0	100.0	100.0
Unweighted n	18,178	3,863	14,315
School problems			
Unweighted n	18,160	3,861	14,299
Low			
%	9.7	9.5	9.8
SE	0.27	0.58	0.27
Moderate			
%	54.1	54.3	54.1
SE	0.51	1.04	0.54
High			
%	36.1	36.2	36.1
SE	0.54	0.90	0.57
Teacher influence on policy/curriculum			
Unweighted n	18,111	3,849	14,262
Low			
%	23.2	22.5	23.3
SE	0.43	0.76	0.48
Moderate			
%	51.7	54.4	51.1
SE	0.42	0.83	0.46
High			
%	25.1	23.0	25.6
SE	0.47	0.75	0.51
Teacher control over classroom policy			
Unweighted n	18,132	3,856	14,276
Low			
%	23.1	17.0	24.5
SE	0.34	0.70	0.38
Moderate			
%	53.6	54.2	53.4
SE	0.54	1.04	0.56
High			
%	23.4	28.8	22.0
SE	0.46	0.80	0.43
Satisfaction with teaching			
Unweighted n	18,132	3,855	14,277
Low			
%	18.7	19.5	18.6
SE	0.36	0.79	0.42
Moderate			
%	52.4	54.1	52.0
SE	0.46	1.06	0.51
High			
%	28.9	26.4	29.5
SE	0.44	0.84	0.47

Table B5—Standard errors for table 5: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes: 1987-88—Continued

Teacher perception and attitude	Total	Teacher type	
		Vocational	Non-vocational
Plans to remain in teaching			
Unweighted n	18,065	3,831	14,234
As long as I am able			
%	27.6	24.0	28.5
SE	0.35	0.80	0.39
Until I am eligible for retirement			
%	37.8	42.5	36.7
SE	0.42	0.79	0.41
Will probably continue unless something better comes along			
%	14.8	14.5	14.8
SE	0.36	0.83	0.38
Definitely plan to leave teaching as soon as possible			
%	4.7	5.1	4.7
SE	0.17	0.42	0.19
Undecided at this time			
%	15.1	13.9	15.3
SE	0.31	0.62	0.35

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B6—Standard errors for table 6: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics and by subject taught: 1987-88

Demographic characteristic	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Sex									
Unweighted n	14,254	1,198	84	260	631	605	541	34	501
Male									
%	49.0	33.1	66.3	81.2	95.9	1.5	73.7	66.8	77.3
SE	0.48	1.42	6.64	2.53	0.93	0.60	1.86	12.16	2.37
Female									
%	51.0	66.9	33.7	18.8	4.1	98.5	26.3	33.2	22.7
SE	0.48	1.42	6.64	2.53	0.93	0.60	1.86	12.16	2.37
Race–ethnicity									
Unweighted n	14,115	1,184	83	257	626	603	539	34	499
American Indian or Alaskan Native									
%	1.0	1.4	0.0	1.0	1.5	1.7	1.5	0.0	1.4
SE	0.11	0.38	0.00	0.58	0.54	0.48	0.63	0.00	0.50
Asian or Pacific Islander									
%	0.8	0.8	1.4	0.8	0.7	1.1	0.3	2.3	0.0
SE	0.09	0.27	1.48	0.24	0.32	0.35	0.27	2.44	0.00
Black, non-Hispanic									
%	6.8	9.5	5.9	5.1	5.5	8.9	8.3	18.7	8.9
SE	0.31	0.99	2.94	1.92	1.18	1.33	1.42	11.84	1.14
White, non-Hispanic									
%	88.9	86.6	90.6	92.1	89.8	85.6	87.4	71.4	87.3
SE	0.34	1.26	3.03	2.15	1.54	1.77	1.76	11.36	1.51
Hispanic									
%	2.5	1.7	2.1	1.1	2.5	2.7	2.5	7.6	2.4
SE	0.17	0.51	1.50	0.65	0.72	0.92	0.59	5.38	1.11

Table B6—Standard errors for table 6: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected demographic characteristics and by subject taught: 1987-88—Continued

Demographic characteristic	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Age									
Unweighted n	14,154	1,189	84	258	629	602	539	34	497
Under 30									
%	11.2	8.6	6.0	20.6	9.1	8.6	3.6	20.5	6.4
SE	0.28	0.69	2.83	3.05	1.04	1.57	0.66	9.22	0.82
30 to 39									
%	32.5	26.3	24.9	37.4	27.4	36.5	29.8	25.7	23.7
SE	0.38	1.22	6.05	2.96	2.11	2.18	1.94	9.63	2.19
40 to 49									
%	37.9	38.4	38.5	30.8	39.0	31.5	38.2	25.6	28.2
SE	0.40	1.72	5.53	3.22	2.07	2.61	2.49	8.07	2.22
50 or over									
%	18.5	26.7	30.7	11.3	24.6	23.4	28.4	28.3	41.6
SE	0.28	1.71	5.36	1.64	2.04	2.26	2.17	9.61	2.44

[1] Other vocational, trade and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B7—Standard errors for table 7: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Highest college degree									
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Less than a bachelor's degree									
%	0.3	0.2	2.7	0.0	1.3	0.1	25.4	3.1	33.0
SE	0.05	0.11	2.03	0.00	0.35	0.08	1.88	3.67	2.83
Bachelor's									
%	45.6	44.7	45.3	53.4	49.7	59.9	37.8	47.9	38.0
SE	0.43	1.71	6.02	2.78	2.21	1.91	2.56	9.29	2.43
Master's									
%	45.3	49.0	38.3	36.4	42.2	35.7	30.0	42.1	23.4
SE	0.42	1.72	5.18	2.66	2.17	1.96	2.18	10.55	22.8
Education specialist[4]									
%	7.3	5.6	12.7	8.8	6.3	4.3	5.7	6.9	5.1
SE	0.19	0.74	4.03	1.89	0.97	0.81	1.54	3.83	1.08
Doctorate or first professional									
%	1.5	0.5	1.1	1.4	0.6	0.1	1.0	0.0	0.5
SE	0.11	0.20	1.17	0.69	0.29	0.09	0.51	0.00	0.29
Major field of study									
Unweighted n	13,904	1,166	80	257	604	589	478	33	400
Mathematics and sciences									
%	15.8	2.1	1.2	16.2	1.4	1.0	3.0	0.0	1.9
SE	0.29	0.53	1.20	2.07	0.58	0.48	0.87	0.00	0.79
Social sciences									
%	10.9	2.7	4.4	3.5	2.6	1.8	7.7	0.0	6.2
SE	0.33	0.65	2.52	1.16	0.75	0.83	1.32	0.00	1.43

Table B7—Standard errors for table 7: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88—Continued

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Letters and humanities									
%	10.3	0.6	3.1	1.0	1.7	0.5	2.8	2.6	2.5
SE	0.28	0.18	1.59	0.75	0.52	0.28	0.85	2.68	0.75
General education									
%	49.0	13.6	18.3	10.4	9.6	4.5	12.2	15.5	12.9
SE	0.50	1.26	3.79	2.30	1.14	1.02	1.53	10.06	1.84
Special education									
%	4.3	0.0	6.1	0.3	0.2	0.0	2.2	0.0	1.4
SE	0.20	0.00	2.80	0.31	0.20	0.00	0.66	0.00	0.75
Vocational education									
%	1.8	57.3	45.1	42.4	80.7	56.0	53.8	70.7	50.9
SE	0.15	1.50	5.65	3.10	1.52	2.04	2.48	9.99	2.20
Occupationally specific[5]									
%	3.6	20.2	20.7	26.1	3.1	36.2	14.4	11.3	19.9
SE	0.18	1.65	5.71	3.18	0.83	1.92	2.17	6.00	2.23
Other									
%	4.2	3.6	1.2	0.1	0.8	0.0	3.9	0.0	4.2
SE	0.20	0.60	1.24	0.13	0.39	0.00	1.05	0.00	1.16
Age at which first began to teach full-time									
Unweighted n	14,084	1,180	83	257	627	592	537	33	487
25 or under									
%	70.1	70.3	68.1	76.0	60.9	78.4	40.3	50.0	30.9
SE	0.43	1.63	5.32	3.53	1.96	1.86	2.21	11.95	2.37
26-35									
%	23.0	20.2	25.1	20.4	31.8	15.0	35.8	43.3	29.8
SE	0.39	1.35	5.14	3.46	1.96	1.68	2.10	12.42	2.47
36-45									
%	5.5	7.4	5.6	2.8	5.8	5.4	16.7	2.5	26.5
SE	0.17	0.84	1.71	1.29	1.05	1.29	1.92	1.81	2.60

Table B7—Standard errors for table 7: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88—Continued

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
46-55									
%	1.1	1.4	1.2	0.8	1.6	1.0	6.3	4.3	11.3
SE	0.09	0.49	1.20	0.69	0.58	0.47	1.12	3.80	1.36
Over 55									
%	0.3	0.7	0.0	0.0	0.0	0.1	0.9	0.0	1.5
SE	0.26	0.52	0.00	0.00	0.00	0.10	0.38	0.00	1.36
Number of years of teaching experience									
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Less than 3									
%	6.4	4.6	4.9	5.7	3.9	5.8	5.8	9.0	9.0
SE	0.21	0.59	2.63	1.31	1.02	1.16	1.00	8.76	1.49
3-9									
%	23.6	19.2	19.0	35.9	20.5	20.4	25.9	27.3	26.6
SE	0.40	1.24	4.73	3.79	1.46	1.57	2.30	8.47	2.34
10-20									
%	45.3	45.1	43.7	40.0	44.4	52.0	49.7	40.7	47.7
SE	0.44	1.54	5.52	3.30	2.44	1.91	2.29	11.17	2.75
Over 20									
%	24.7	31.1	32.4	18.4	31.2	21.8	18.6	23.0	16.7
SE	0.32	1.34	6.61	2.59	2.03	1.89	2.06	7.98	2.01

Table B7—Standard errors for table 7: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected educational background characteristics and by subject taught: 1987-88—Continued

Educational background	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Type of credential in primary assignment field									
Unweighted n	11,551	953	61	200	445	500	436	27	348
None									
%	3.2	2.2	6.2	7.1	1.2	0.9	1.5	–	2.5
SE	0.15	0.46	3.56	2.86	0.47	0.47	0.48	–	0.96
Standard state certificate									
%	89.3	93.5	86.3	82.7	93.5	94.1	88.4	–	85.4
SE	0.30	0.83	5.28	3.93	1.21	1.07	1.82	–	1.51
Probationary certificate									
%	3.2	2.5	4.1	5.0	3.0	1.8	3.1	–	4.4
SE	0.17	0.55	3.22	2.06	0.96	0.69	0.93	–	1.15
Temporary, provisional, or emergency certificate									
%	4.1	1.6	3.3	4.9	2.2	2.3	7.1	–	7.8
SE	0.21	0.34	2.00	1.42	0.65	0.85	1.36	–	1.38
Other									
%	0.1	0.2	0.0	0.3	0.1	0.9	0.0	–	0.0
SE	0.03	0.11	0.00	0.25	0.07	0.39	0.00	–	0.00

-- Sample size too small for reliable estimate.

[1] Other vocational, trade and industrial education.

[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.

[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

[4] Education specialist degrees or certificates are generally awarded for one year's postgraduate work in education leading to a state teaching credential.

[5] Occupationally specific degrees include health occupations, agriculture, home economics, etc. See the technical notes at the end of the tables for a full description of this variable.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

79

Table B8—Standard errors for table 8: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88

Teaching environment	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Primary assignment at present school									
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Regular full- or part-time teacher									
%	96.0	98.3	98.0	98.7	96.3	97.7	98.9	100.0	98.4
SE	0.20	0.39	1.60	0.74	0.86	0.63	0.42	0.00	0.67
Itinerant teacher									
%	3.5	1.1	1.6	1.3	3.6	2.0	1.1	0.0	1.3
SE	0.18	0.29	1.58	0.74	0.86	0.58	0.42	0.00	0.62
Long-term substitute									
%	0.5	0.6	0.4	0.0	0.1	0.3	0.0	0.0	0.3
SE	0.07	0.26	0.22	0.00	0.11	0.29	0.00	0.00	0.30
Time spent teaching at present school									
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
Full-time									
%	93.4	93.7	89.5	96.7	94.4	90.9	97.0	79.8	92.6
SE	0.29	0.71	3.68	1.36	0.96	1.26	0.75	10.8	1.50
3/4 time or more, but less than full-time									
%	2.0	2.3	4.4	0.6	1.4	1.9	1.1	18.3	1.2
SE	0.16	0.50	2.20	0.48	0.51	0.64	0.46	10.62	0.66
1/2 time or more, but less than 3/4 time									
%	3.0	2.4	5.7	2.8	2.1	6.1	1.1	1.9	4.4
SE	0.18	0.51	3.04	1.26	0.63	1.01	0.37	1.98	0.99

Table B8—Standard errors for table 8: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88—Continued

Teaching environment	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
1/4 time or more, but less than 1/2 time									
%	1.0	1.3	0.0	0.0	1.5	1.1	0.5	0.0	0.8
SE	0.08	0.36	0.00	0.00	0.60	0.45	0.41	0.00	0.38
Less than 1/4 time									
%	0.5	0.3	0.5	0.0	0.7	0.0	0.2	0.0	1.0
SE	0.08	0.36	0.47	0.00	0.36	0.16	0.23	0.00	0.38
Average class size									
Unweighted n	11,093	1,042	84	254	496	504	533	34	
1-10									
%	6.1	6.5	14.4	17.9	12.7	8.8	13.1	14.5	-
SE	0.21	0.66	4.69	3.10	1.42	1.24	1.50	6.04	
11-15									
%	9.7	18.1	14.8	22.5	31.6	27.9	30.2	18.2	-
SE	0.36	1.55	4.39	2.51	2.24	1.98	2.95	7.23	
16-24									
%	44.1	48.2	52.8	41.6	40.3	47.5	43.6	41.7	-
SE	0.55	1.72	7.63	3.75	2.24	2.30	2.92	9.70	
25 or more									
%	40.2	27.2	18.0	18.1	15.5	15.8	13.1	25.6	-
SE	0.61	1.42	4.64	3.47	1.39	1.67	1.88	11.8	

Table B8—Standard errors for table 8: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teaching environment characteristics and by subject taught: 1987-88—Continued

Teaching environment	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Percent of classes taught in opposite field									
Unweighted n	14,315	1,084	78	252	594	562	526	31	
0 to 10%									
%	97.2	85.4	86.2	90.5	93.6	91.3	93.5	55.9	–
SE	0.14	1.31	3.70	1.81	1.14	1.29	1.27	11.62	
>10 to 20%									
%	1.2	3.0	0.0	3.4	3.3	3.2	1.0	1.3	–
SE	0.11	0.67	0.00	1.35	0.88	0.66	0.46	1.49	
>20 to 30%									
%	0.2	2.0	2.1	0.4	0.7	1.6	1.3	0.0	–
SE	0.04	0.42	0.25	0.35	0.41	0.48	0.70	0.00	
>30 to 40--									
%	1.3	4.3	5.6	2.2	0.9	1.4	2.6	27.9	–
SE	0.09	0.83	3.25	1.03	0.39	0.47	0.80	11.86	
>40 to 50%									
%	0.0	5.3	6.1	3.5	1.5	2.4	1.5	14.9	–
SE	0.01	1.08	2.15	1.51	0.70	0.84	0.55	10.63	

-- Not available.

[1] Other vocational, trade and industrial education.

[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.

[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

Table B9—Standard errors for table 9: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes and by subject taught: 1987-88

Teacher perception and attitude	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Unweighted n	14,315	1,201	84	261	631	606	544	34	502
School problems									
Unweighted n	14,299	1,201	84	261	630	606	544	34	501
Low									
%	9.8	8.8	7.3	10.2	10.7	7.6	8.5	7.9	14.1
SE	0.27	0.91	3.14	2.24	1.48	1.06	1.34	4.78	1.53
Moderate									
%	54.1	52.4	45.9	57.5	57.3	54.9	52.7	56.8	55.9
SE	0.54	1.60	6.96	3.59	1.78	2.50	1.93	12.80	2.23
High									
%	36.1	38.8	46.8	32.3	32.1	37.6	38.8	35.3	30.0
SE	0.57	1.30	7.25	2.83	1.59	2.64	1.92	11.71	2.19
Teacher influence on policy/curriculum									
Unweighted n	14,262	1,196	84	261	629	603	542	34	500
Low									
%	23.3	23.4	24.8	17.0	23.3	21.8	23.7	18.3	21.7
SE	0.48	1.33	5.49	2.40	1.88	1.76	1.93	7.99	2.20
Moderate									
%	51.1	56.2	54.2	59.6	53.3	50.7	55.6	54.5	51.9
SE	0.46	1.31	6.84	3.36	2.07	1.92	2.69	12.03	2.45
High									
%	25.6	20.5	21.1	23.4	23.3	27.5	20.7	27.2	26.5
SE	0.51	1.42	5.26	3.30	1.95	2.05	2.05	11.26	2.22

Table B9—Standard errors for table 9: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes and by subject taught: 1987-88—Continued

Teacher perception and attitude	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Teacher control over classroom policy									
Unweighted n	14,276	1,200	84	261	629	604	543	34	501
Low									
%	24.5	18.4	31.1	21.1	19.1	12.2	16.2	6.7	13.4
SE	0.38	1.47	5.73	2.96	1.69	1.39	1.96	4.59	1.83
Moderate									
%	53.4	52.6	49.5	55.8	53.6	53.8	58.4	72.2	54.3
SE	0.56	1.53	6.32	3.97	2.10	2.42	1.93	8.58	3.01
High									
%	22.0	29.0	19.5	23.2	27.3	34.1	25.4	21.1	32.3
SE	0.43	1.60	4.13	2.91	1.51	2.49	1.85	7.70	2.47
Satisfaction with teaching									
Unweighted n	14,277	1,199	84	261	629	605	543	33	501
Low									
%	18.6	17.7	16.1	20.7	16.3	19.0	20.4	26.3	28.7
SE	0.42	1.12	5.32	2.60	1.86	2.27	1.73	10.55	2.60
Moderate									
%	52.0	54.3	50.9	54.8	52.7	60.1	52.0	54.1	50.4
SE	0.51	2.01	5.55	3.29	2.43	2.27	2.35	11.76	2.22
High									
%	29.5	28.1	33.0	24.5	31.0	20.9	27.6	19.6	20.9
SE	0.47	1.81	5.62	3.31	1.76	2.04	2.24	8.38	2.36

Table B9—Standard errors for table 9: Percentage distribution of vocational and non-vocational public school teachers of grades 9 to 12, by selected teacher perceptions and attitudes and by subject taught: 1987-88—Continued

Teacher perception and attitude	Non-vocational	Vocational subject taught							
		Business	Career education	Agriculture	Industrial arts/ Trade and industry	Home economics	Other[1]	Mixed[2]	Unknown[3]
Plans to remain in teaching									
Unweighted n	14,234	1,192	82	258	627	601	539	34	498
As long as I am able									
%	28.5	23.9	22.8	21.7	20.7	22.8	26.2	20.4	30.7
SE	0.39	1.51	5.78	3.12	2.32	2.14	1.61	9.25	1.93
Until I am eligible for retirement									
%	36.7	45.0	44.5	29.4	45.1	41.5	42.8	39.1	39.6
SE	0.41	1.50	5.72	3.72	1.96	2.21	2.03	12.15	2.01
Will probably continue unless something better comes along									
%	14.8	12.8	11.0	25.2	15.3	15.8	14.0	16.2	11.4
SE	0.38	1.12	3.70	2.98	1.32	1.99	1.70	7.81	1.54
Definitely plan to leave teaching as soon as possible									
%	4.7	3.8	8.9	7.2	8.5	3.5	4.4	7.7	4.3
SE	0.19	0.65	3.27	1.85	1.18	0.72	1.18	4.13	0.88
Undecided at this time									
%	15.3	14.6	12.8	16.5	10.3	16.4	12.6	16.7	14.1
SE	0.35	0.96	4.43	2.32	1.05	1.36	1.61	9.39	1.84

[1] Other vocational, trade and industrial education.
[2] "Mixed" indicated that the teacher taught equal proportions in two or more vocational subject areas.
[3] "Unknown" indicates that the instructor teaches vocational education but did not indicate in the survey the specific subject area in which they taught.

NOTE: Estimates may not sum to 100 percent due to rounding.
SOURCE: US Department of Education, National Center for Education Statistics, Schools and Staffing Survey, 1989.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1992 311-987/62976

ISBN 0-16-036028-5

United States
Department of Education
Washington, D.C. 20208–5650

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