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ABSTRACT

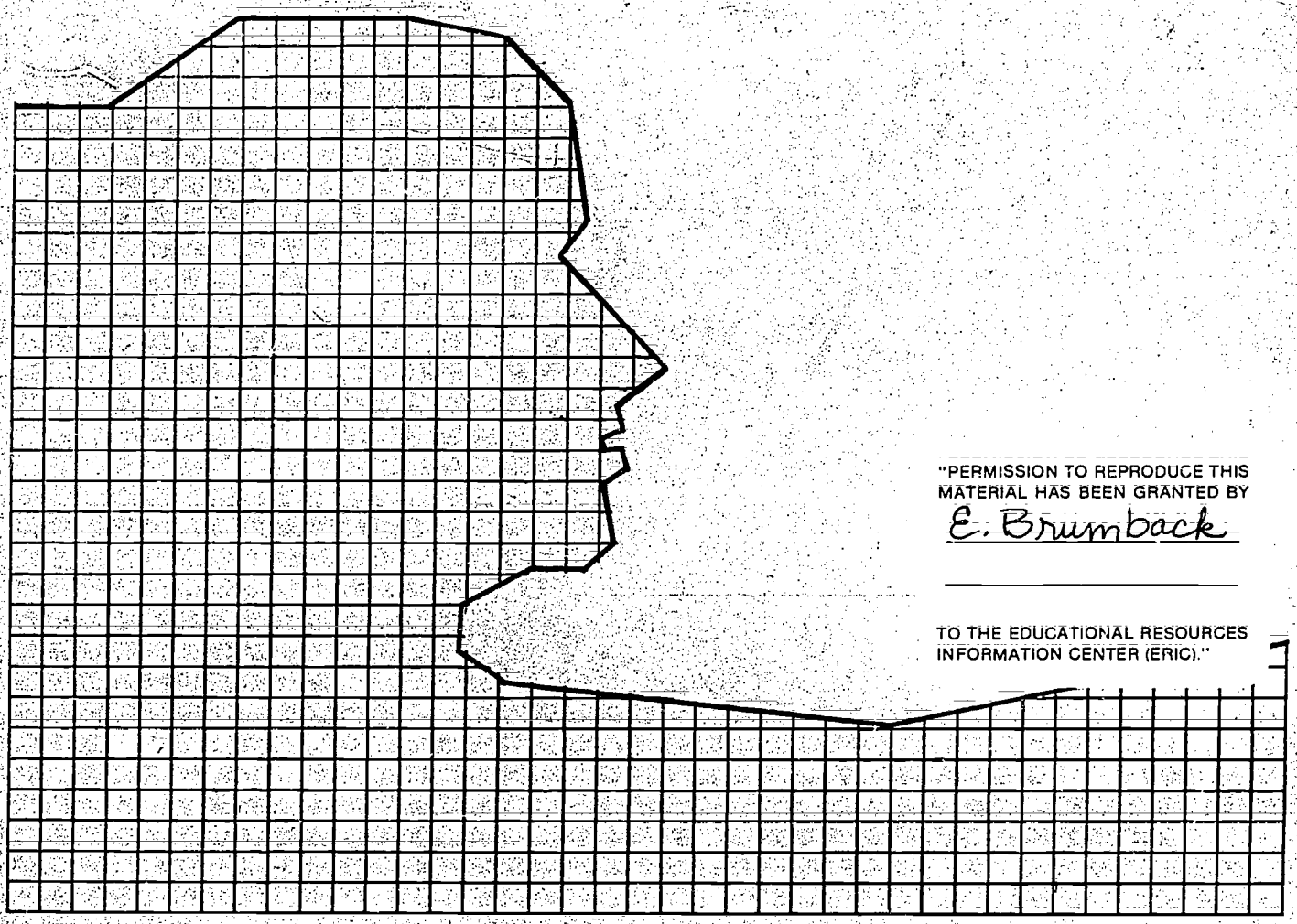
This report presents a statistical profile of secondary science teachers in grades 7-12 in North Carolina public schools. Data are provided and discussed in 9 sections under these headings: (1) basic information (teachers, subject and student membership, certification, and subject and certification areas); (2) subjects and certification; (3) subjects and certification per class; (4) subjects taught and degrees held; (5) sex distribution by subjects; (6) subjects taught by race; (7) years teaching experience; (8) teaching experience by subjects; and (9) teaching experience by sex. A brief summary is included in an appendix. Among the findings reported are: 85 percent of the high school (10-12) teachers were appropriately certified; 30 percent of teachers who taught science in grades 7-12 had no science certification; on the average, the junior high school science teacher was more likely to be younger, less experienced, female, holder of a lower degree, inappropriately certified for assignment, and assigned to larger class(es); on the average, the senior high science teacher was more likely to be older, more experienced, male, white, holder of an advanced degree, appropriately certified (although 16 percent were still inappropriately certified), and assigned to smaller classes. (JN)

NORTH CAROLINA SCIENCE TEACHER PROFILE

GRADES 7-12

Division of Science/North Carolina Department of Public Instruction

1982-83

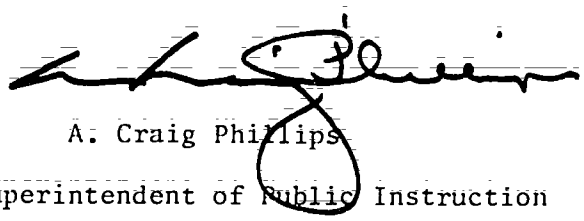


FOREWORD

This publication represents a fifth attempt to provide a statistical profile of secondary science teachers in grades 7-12 in North Carolina public schools. Although the information presents many concerns, it can also serve as a basis from which to strive for improvement in teacher qualifications.

This information should stimulate discussion and interaction among the many individuals and groups who are concerned with the improvement of science instruction in the schools of North Carolina and elsewhere. It provides a view of the present and offers a challenge for the future. This should serve in future planning of ways to accomplish excellence in science instruction for our boys and girls.

The data presented should be of special interest and assistance to at least three groups: (1) State Department of Public Instruction personnel, especially those in teacher certification and science education; (2) Higher Education personnel, especially those in teacher education and science education; and (3) Local Education Agency (LEA) personnel, especially those in charge of personnel and the science curriculum. Hopefully, these groups will be able to use this "profile" in many constructive ways.



A. Craig Phillips
State Superintendent of Public Instruction

December 1983

PREFACE

This publication is a fifth annual report on the statistical profile of science teachers in North Carolina public schools in grades 7-12. The data used are those which are collected annually from the Professional Personnel Activity Report (PPAR). At the end of the first month of each school year, a PPAR form is filled out by each professional employee working at the school level in one or more schools and those administrative unit staff members who have specific teaching assignments. The forms then are sent to the Division of Planning and Research, Controller's Office, Department of Public Education. The PPAR plays a significant role in the administration of the class-size bill (G.S. 115-59) mandated by the General Assembly in 1973. The data displayed in this publication are relevant to school year 1982-83.

The information is as accurate as that which is placed on the PPAR forms by local personnel at the beginning of school. Interpretation of the data has been vital in the preparation of this publication. *For a clear understanding of the data, careful study is essential.*

Special recognition and appreciation are extended to the Division of Management Information Systems for providing the information contained in this publication. Appreciation is also extended to the Division of Science's secretarial staff, Ruth Lawson and Patricia Smith, for their editorial work, typing, and patience with the preparation and distribution of this report. William E. Spooner, Science Consultant, coordinated the preparation of this publication.

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CONTENTS

BASIC INFORMATION

The information in this section is the basis for all the remaining data in this report.

The Teacher

The data presented in Table I represent all science teachers (3,647[1]) who taught one or more science classes in grades 7-12 during 1982-83. The certification data address individuals only and are not concerned with whether the individual is appropriately certified for the specific assignment(s) held during 1982-83.

Table I: Basic Teacher Information

Teacher Information			Number	Percentage
Sex	Male		1,645	45.1
	Female		2,002	54.9
		Total	3,647	
Race	Black		687	18.8
	White		2,921	80.1
	Hispanic		2	0.1
	American Indian		27	0.7
	Asian		9	0.2
		Total	3,647	
Certification	Certified in Any Science		2,556	70.01
	Not Certified in Any Science		1,091	29.99
		Total	3,647	
Degrees	Bachelor's		2,715	74.4
	Master's		883	24.2
	Advanced Degree		18	0.5
	Doctor's		5	0.1
	Below Bachelor's		2	0.1
	Unknown		24	0.7
		Total	3,647	

[1] There were 52 more secondary science teachers in 1982-83 than in 1981-82. There were no significant changes in teacher certification or degrees held.

Subject and Student Membership Summary[1]

Table II gives a breakdown of classes, student membership, and average class size per subject. Eighty-six percent of the students were enrolled in the first four courses (Life Science, Earth Science, Physical Science, Biology). Life Science, Earth Science, and Biology are required (state requirement) courses for all students. Physical Science is required by many local school administrative units. Two units of science (Life Science [Biology] included) in grades 9-12 are required for graduation.

Table II: Subject and Student Membership

Subjects	Number of Classes	Student Membership	Average Class[2]
0092 Life Science	2,458	67,640	27
0092 Earth Science	2,402	65,950	27
3010 Physical Science	2,984	78,675	26
3111 Biology	3,555	91,253	25
3120 Advanced Biology	332	5,976	18
3210 Chemistry	997	23,226	23
3220 Advanced Chemistry	103	1,514	14
3310 Physics	370	6,790	18
3320 Advanced Physics	13	177	13
3600 Applied Science	126	2,931	23
3700 Marine Science	42	849	20
3990 Special Interest Science	127	2,731	21
3991 Environmental (Ecology)	89	2,135	23
3992 Anatomy & Physiology	84	1,894	22
3993 Aviation Science	5	83	16
	13,687	351,824	25.7[3]

[1]The figures in this summary were collected at the end of the first month of the school year and reported on the PPAR forms.

[2]Rounded to nearest whole number.

[3]Represents student membership (351,824) divided by classes (13,687).

- *3,647 teachers taught one or more science classes in grades 7-12 during 1982-83.*
- *13,687 classes of science were taught in grades 7-12 during 1982-83.*
- *Student membership in science classes in grades 7-12 at the end of the first month in 1982-83 was 351,824. This represents 2,357 more students than the previous year.*
- *26 was the average science class size in grades 7-12 at the end of the first month of the school year 1982-83.*
- *27 was the average science class size in grades 7-9.*
- *24 was the average science class size in grades 10-12.*

CHANGES SINCE THE 1981-82 PROFILE

There were 58 more classes of science during the 1982-83 school year. This represents an increase of 2,357 students which represents a gain in science enrollment but does not account for the sudden drop of 11,540 students between the 1979-80 and 1980-81 school year.

The data for Applied Science indicates a gain of 1,128 students from the previous year. This represents a 62% increase in enrollment. It is believed this increase does not represent any significant increase in the number of students electing science. Special Interest Science enrollment decreased by 1,245 for the same period. These variations are probably due to changes in emphasis on how courses are reported on the PPAR forms.

Certification

Certification is a legal prerequisite (G.S. 115-155) for employment in the North Carolina public schools in all professional positions. Certification is issued to individuals by the Division of Certification, North Carolina Department of Public Instruction, upon the recommendation of a college or university after the individual has successfully completed an approved teacher education program.

To retrieve data from the computer in desired categories, a decision was made regarding what courses may be taught under each type certificate which a teacher must hold to be considered appropriately certified for an assignment. That decision was based on what seems practical in regard to what academic background is needed to be qualified to teach the various science courses. The result of that decision is displayed in Table III. For example: A teacher holding a 300 Science certificate is considered qualified to teach any of the courses in the extreme left column; while a teacher holding a 302 Earth Science certificate is considered qualified to teach only earth science, applied science, or special interest science.

The criteria used to establish Table III *are not correlated totally with state standards which govern who may teach what and be considered appropriately certified. For example: A teacher with any type secondary certification (not just Science) or with elementary (intermediate--Science) certification may teach science in grades 7-9 and be considered appropriately certified according to state standards.*

Listed as follows are types and descriptions of science areas for which certificates are awarded under the current Competency-Based Program:

300 Science

This is the broadest and most comprehensive certification issued. A teacher with this certification is considered qualified to teach any of the science courses. Teacher training institutions generally require approximately one-third of the students' course work in the area of science and at least two courses in mathematics. This is equated to about 48-51 semester hours under the old traditional program. One-half of the science course work must be concentrated in one science area. Course work in three other science areas is also required. Approximately 37% of those holding Science certification are in this category.

303 Physical Science

This certification is not very common. Teachers with this certification have a concentration in chemistry, physics, and advanced math. This certification requires about 25% of the students' course work to be in science. Only 5% of the teachers hold this certification.

302 Earth Science, 310 Biology, 330 Chemistry, 320 Physics

Individuals with these areas of certification have a major in a specific area which constitutes about 25% of the students' course work. In addition to the area of specialization, course work in other sciences is normally a part of these teacher education programs. The approximate percentages of teachers holding science certification in Earth Science, Biology, Chemistry, and Physics are .8%, 35.4%, 8.1%, and 1.9%, respectively.

- *Secondary science certification may be obtained in six areas: Science, Earth Science, Physical Science, Biology, Physics, and Chemistry.*
- *Approximately 70% of the North Carolina teachers who hold the 300 Science certification have a concentration in biology.*
- *301 General Science certification is no longer issued. It was issued during the 1950s and early 1960s. Teachers with this certification have a minor (24 semester hours) in science. A minor constitutes about 20% of the students' course work.*

Subject and Certification Areas

Table III portrays certification criteria used in defining appropriate certification in regard to the science subjects assigned to a teacher to teach. The designations in this Table were used in retrieving information from the computer.

Table III: Subject and Certification Areas

Subjects	Science 300	General Science 301	Earth Science 302	Physical Science 303	Biology 310	Physics 320	Chemistry 330
Life Science (7th)	X	X			X		
Earth Science (8th)	X		X				
Physical Science (9th)	X	X		X		X	
Biology (10th)	X				X		
Advanced Biology	X				X		
Chemistry	X			X			X
Advanced Chemistry	X			X			X
Physics	X			X		X	
Advanced Physics	X			X		X	
Applied Science	X	X	X	X	X	X	X
Marine Science	X				X		
Special Interest Science	X	X	X	X	X	X	X
Environ-mental (Ecology)	X	X			X		
Anatomy & Physiology	X				X		
Aviation Science	X			X		X	

SUBJECTS AND CERTIFICATION

Table IV shows a relationship between courses taught and certification of teachers who taught them. When compared to upper level teachers, a larger percentage of Life, Earth, and Physical Science teachers were inappropriately certified for their assignments. Only 44% of those who taught Earth Science were appropriately certified for the assignment. Fifty-four percent of the teacher count was at the junior high levels--grades 7-9.[1]

Only 51% of the teachers who taught science in grades 7-9 were appropriately certified for their assignments. (It is interesting to note that 60% of the student science enrollment [see Table II] was in grades 7-9.) Eighty-five percent of the teachers who taught science in grades 10-12 were appropriately certified. Approximately 98% of those who taught Advanced Biology were appropriately certified. Physics and Aviation Science had the highest percentage of inappropriately certified teachers in grades 10-12. In summary, 98,379 (46%) students in grades 7-9 and 21,722 (16%) students in grades 10-12 were instructed by teachers uncertified or inappropriately certified in science.

- *A greater percentage of appropriately certified teachers taught the upper level science courses.*
- *A smaller percentage of appropriately certified teachers taught the lower level courses.*
- *Only 51% of the teachers at the junior high levels (7-9) were appropriately certified.*
- *60% of the science enrollment was at the junior high levels.*
- *85% of the teachers who taught in grades 10-12 were appropriately certified.*

[1] Considerable duplication exists in the 5,414 teacher count. In fact, 1,767 (5,414 - 3,647 = 1,767) of that number represent duplicated counts. This occurs when a teacher teaches more than one science course. For example, if a teacher teaches Earth Science and Physical Science, that person represents two of the 5,414 count--one for each course taught, regardless of the number of classes taught.

Table IV: Subjects and Certification

Subjects	Teacher Count	Percentage	
		Appropriately Certified	Inappropriately Certified
0092 Life Science	955	54.7	45.3
0092 Earth Science	847	43.9	56.1
3010 Physical Science	1,100	60.2	39.8
3111 Biology	1,170	85.0	15.0
3120 Advanced Biology	262	98.1	1.9
3210 Chemistry	398	85.4	14.6
3220 Advanced Chemistry	95	91.6	8.4
3310 Physics	285	70.9	29.1
3320 Advanced Physics	11	72.7	27.3
3600 Applied Science	65	78.5	21.5
3700 Marine Science	24	79.2	20.8
3990 Special Interest Science	87	79.3	20.7
3991 Environmental (Ecology)	58	77.6	22.4
3992 Anatomy & Physiology	53	88.7	11.3
3993 Aviation Science	4	50.0	50.0
	5,414[1]	67.9[2]	32.1[2]

[1] See footnote #1 on page 7.

[2] Represents percentages of the teacher count (5,414).

SUBJECTS AND CERTIFICATION PER CLASS

Table V lists the total number of classes per subject taught. It also gives the percentage of classes per subject taught by appropriately certified teachers and the percentage of classes per subject taught by inappropriately certified teachers. The total number of classes taught in 1982-83 in grades 7-12 was 13,687. The display of data presents a clear picture of the relationship between classes taught and the certification of the teacher on a per class basis.

A greater percentage of the upper level classes were taught by appropriately certified teachers, while a lesser percentage of the lower level classes were taught by appropriately certified teachers. Ninety-nine percent of the Advanced Biology classes were taught by appropriately certified teachers; only a little more than 52% of the 8th grade Earth Science classes were taught by appropriately certified teachers.

Fifty-seven percent (7,844) of the secondary science classes were at the junior high levels.

- *A greater percentage of the upper level science classes were taught by appropriately certified teachers.*
- *A lesser percentage of the lower level science classes were taught by appropriately certified teachers.*
- *57% of the secondary science classes were at the junior high levels.*
- *73% of the science classes (7-12) were taught by appropriately certified teachers.*

Table V: Subjects and Certification per Class

Subjects	Classes	Percentages of Classes Taught by:	
		Appropriately Certified Teachers[1]	Inappropriately Certified Teachers
0092 Life Science	2,458	64.6	35.4
0092 Earth Science	2,402	48.5	51.5
3010 Physical Science	2,984	66.7	33.3
3111 Biology	3,555	90.9	9.1
3120 Advanced Biology	332	98.5	1.5
3210 Chemistry	997	89.6	10.4
3220 Advanced Chemistry	103	92.2	7.8
3310 Physics	370	73.5	26.5
3320 Advanced Physics	13	76.9	23.1
3600 Applied Science	126	83.3	16.7
3700 Marine Science	42	81.0	19.0
3990 Special Interest Science	127	81.9	18.1
3991 Environmental (Ecology)	89	74.2	25.8
3992 Anatomy & Physiology	84	90.5	9.5
3993 Aviation Science	5	60.0	40.0
	13,687	72.8[2]	27.2[2]

[1]The percentage of classes in 1982-83 being taught by appropriately certified teachers increased by two-tenths of 1%.

[2]Represents percentages of the classes (13,687).

SUBJECTS TAUGHT AND DEGREES HELD

Table VI shows relationships between subjects taught and degrees held by teachers who taught the various science courses. It is evident from the data that a greater number of teachers with the master's degree and above taught the upper level courses, while a larger number of teachers holding the bachelor's degree taught the junior high courses--Life, Earth, and Physical Science. Recall that 60% of the students (see Table II) enrolled in secondary science courses were enrolled in the junior high classes. In the teacher count of 5,414, 73% of the teachers held a bachelor's degree or below, while approximately 26% held a master's degree or above. At the national level, better than 50% of the science teachers in grades 7-12 have earned a master's or doctor's degree.[1]

Table VI: Subjects Taught and Degrees Held

Subjects	Teacher Count	Percentage					
		Bachelor's	Master's	Advanced	Doctor's	Below Bachelor's	Unknown
0092 Life Science	955	80.1	18.8	0.5	0.1	0.0	0.4
0092 Earth Science	847	81.1	17.9	0.6	0.0	0.0	0.4
3010 Physical Science	1,100	72.7	25.9	0.4	0.0	0.1	0.9
3111 Biology	1,170	70.5	27.9	0.6	0.2	0.0	0.8
3120 Advanced Biology	262	61.5	37.4	1.1	0.0	0.0	0.0
3210 Chemistry	398	62.3	35.4	0.8	0.5	0.0	0.0
3220 Advanced Chemistry	95	57.9	40.0	0.0	1.1	0.0	1.1
3310 Physics	285	64.2	34.4	0.7	0.0	0.0	0.7
3320 Advanced Physics	11	45.5	45.5	0.0	0.0	0.0	9.1
3600 Applied Science	65	76.9	23.1	0.0	0.0	0.0	0.0
3700 Marine Science	24	50.0	50.0	0.0	0.0	0.0	0.0
3990 Special Interest Science	87	65.5	33.3	0.0	0.0	0.0	1.1
3991 Environmental (Ecology)	58	69.0	31.0	0.0	0.0	0.0	0.0
3992 Anatomy & Physiology	53	60.4	34.0	0.0	3.8	1.9	0.0
3993 Aviation Science	4	75.0	25.0	0.0	0.0	0.0	0.0
	5,414[2]	72.5[3]	26.2[3]	0.5[3]	0.1[3]	0.1[3]	0.6[3]

[1] American Association of School Administrators, Summary of the Findings of Three NSF-Sponsored Studies on the Status of Precollege Science Education (Arlington, VA: American Association of School Administrators, 1979), p. 7.

[2] See footnote #1 on page 7.

[3] Represents percentages of the teacher count (5,414).

Few junior high school teachers of the Life, Earth, and Physical Sciences have master's degrees (22%) when compared to science teachers instructing upper level courses (32%).

SEX DISTRIBUTION BY SUBJECTS

The data in Table VII indicate that a majority of the Life Science teachers were female. With the exception of Earth Science teachers, a majority of the teachers of the Physical Sciences[1] were male. Seventh grade Life Science had the greatest percentage of female teachers. Aviation Science, Physics, and Advanced Physics had the greatest percentage of male teachers.

Table VII: Sex Distribution by Subjects

Subjects	Teacher Count	Percentage	
		Female	Male
0092 Life Science	955	64.1	35.9
0092 Earth Science	847	56.8	43.2
3010 Physical Science	1,100	48.9	51.1
3111 Biology	1,170	53.6	46.4
3120 Advanced Biology	262	55.3	44.7
3210 Chemistry	398	50.8	49.2
3220 Advanced Chemistry	95	52.6	47.4
3310 Physics	285	35.4	64.6
3320 Advanced Physics	11	27.3	72.7
3600 Applied Science	65	44.6	55.4
3700 Marine Science	24	58.3	41.7
3990 Special Interest Science	87	43.7	56.3
3991 Environmental (Ecology)	58	46.6	53.4
3992 Anatomy & Physiology	53	43.4	56.6
3993 Aviation Science	4	25.0	75.0
	5,414[2]	53.4[3]	46.6[3]

[1] From 1978-79 to 1982-83, there was a slight increase of 2.2% in the percentage of female teachers instructing the science courses. This represents a male/female ratio change from .95 to .88.

[2] See footnote #1 on page 7.

[3] Represents percentages of the teacher count (5,414).

- *Female teachers were in the majority in the Life Sciences.*
- *Male teachers were in the majority in the Physical Sciences.*
- *There were 6.8% more female than male teachers when teachers of all courses were considered.*

SUBJECTS TAUGHT BY RACE

The data in Table VIII indicate that the upper level courses had the highest percentage of white teachers. The highest percentage of black teachers taught lower level science courses. The subjects with the highest percentage of black teachers were Earth Science and Applied Science. Approximately 99% of the secondary science teachers were either black or white.

Table VIII: Subjects Taught by Race

Subjects	Teacher Count	Percentage				
		White	Black	Hispanic	American Indian	Asian
0092 Life Science	955	78.7	20.2	0.1	0.4	0.4
0092 Earth Science	847	78.2	20.5	0.1	0.7	0.4
3010 Physical Science	1,100	79.6	19.2	0.1	0.1	0.1
3111 Biology	1,170	79.1	20.4	0.0	0.3	0.2
3120 Advanced Biology	262	85.5	14.1	0.0	0.4	0.0
3210 Chemistry	338	85.9	12.6	0.0	1.3	0.3
3220 Advanced Chemistry	95	87.4	11.6	0.0	1.1	0.0
3310 Physics	285	91.9	6.0	0.0	1.8	0.4
3320 Advanced Physics	11	100.0	0.0	0.0	0.0	0.0
3600 Applied Science	65	73.8	26.2	0.0	0.0	0.0
3700 Marine Science	24	79.2	16.7	0.0	0.0	4.2
3990 Special Interest Science	87	79.3	20.7	0.0	0.0	0.0
3991 Environmental (Ecology)	58	89.7	10.3	0.0	0.0	0.0
3992 Anatomy & Physiology	53	88.7	11.3	0.0	0.0	0.0
3993 Aviation Science	4	100.0	0.0	0.0	0.0	0.0
	5,414[1]	80.8[2]	18.2[2]	0.1[2]	0.7[2]	0.2[2]

[1] See footnote #1 on page 7.

[2] Represents percentages of the teacher count (5,414).

- *Approximately 99% of the secondary science teachers were either black or white.*
- *Upper level courses had the highest percentage of white teachers.*
- *The highest percentage of black teachers taught the lower level courses.*

YEARS TEACHING EXPERIENCE

Table IX portrays the teaching experience of the 3,647 teachers who taught one or more secondary science classes during 1982-83. The mean and median of the teaching experience of the total group are different. The mean is 11.0 years; the median is 9.5 years. The mean indicates that the average teaching experience of secondary science teachers during 1982-83 was 11 years. On the national level, the average secondary science teacher has been teaching for 11.65 years.[1] The median indicates that 50% of the secondary science teachers had previously taught 9.5 years or less and that 50% had previously taught more than 9.5 years. Using the median as a measure of "holding power," North Carolina science teachers are very close to the national median of 9 years.

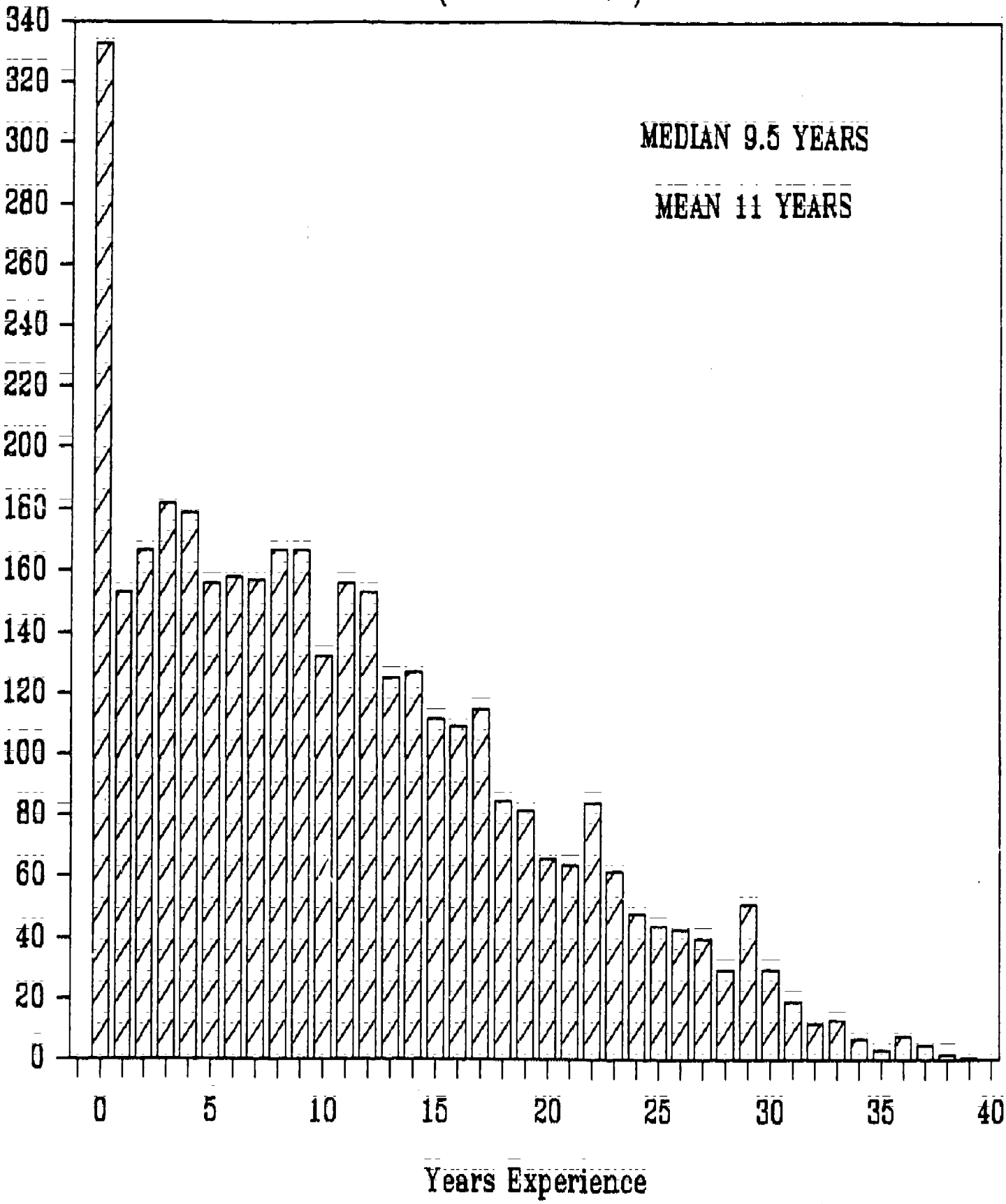
It is interesting to note that the largest category (by experience) of teachers is the beginning group. For the 1982-83 school year, the number of first-year science teachers (333) represents the highest number for a 5-year period. It is also of interest and concern to note that the biggest drop-out period is between the first and second year of teaching.

- *The mean teaching experience of secondary science teachers in North Carolina in 1982-83 was 11 years, while the national mean was 11.65 years.*
- *The median teaching experience of secondary science teachers in North Carolina in 1982-83 was 9.5 years, while the national median was 9 years.*
- *One teacher has been teaching for 39 years.*

[1] Iris R. Weiss, 1977 National Survey of Science, Mathematics, and Social Studies Education, prepared for the National Science Foundation (Research Triangle Park, NC: Research Triangle Institute, 1978), p. 11.

TEACHING EXPERIENCE

(Teachers 3647)



TEACHING EXPERIENCE BY SUBJECTS

Table X displays a distribution of the secondary science teachers by experience and subjects. A concentration of teachers with two years or less of teaching experience was in the subjects of Earth, Physical, Environmental (Ecology), and Special Interest Science.

Table X: Teaching Experience by Subjects

Subjects	Teacher Count	Years/Percentages[1]								
		0-2	3-5	6-8	9-11	12-15	16-20	21-25	26-30	31-53
0092 Life Science	955	17.8	16.4	15.1	12.9	12.1	12.3	7.6	3.9	1.9
0092 Earth Science	847	20.2	14.4	12.0	11.8	15.3	11.5	8.0	5.2	1.5
3010 Physical Science	1,100	20.1	15.5	13.0	11.2	14.5	10.2	7.5	5.8	2.1
3111 Biology	1,170	16.9	12.9	13.1	11.5	14.8	14.6	8.7	5.8	1.7
3120 Advanced Biology	262	9.5	10.3	11.8	12.6	19.8	17.2	9.5	6.1	3.1
3210 Chemistry	398	15.8	10.1	11.1	13.3	14.6	14.6	10.6	7.3	2.8
3220 Advanced Chemistry	95	14.7	7.4	14.7	16.8	13.7	13.7	12.6	5.3	1.1
3310 Physics	285	15.8	13.0	11.9	14.0	13.3	14.4	7.7	7.4	2.5
3320 Advanced Physics	11	18.2	9.1	18.2	0.0	18.2	18.2	18.2	0.0	0.0
3600 Applied Science	65	13.8	10.8	9.2	21.5	16.9	15.4	10.8	1.5	0.0
3700 Marine Science	24	8.3	20.8	16.7	4.2	0.0	20.8	8.3	16.7	4.2
3990 Special Interest Science	87	19.5	18.4	6.9	8.0	14.9	21.8	8.0	2.3	0.0
3991 Environmental (Ecology)	58	20.7	17.2	20.7	13.8	10.3	8.6	6.9	1.7	0.0
3992 Anatomy & Physiology	53	9.4	11.3	9.4	15.1	15.1	20.8	11.3	5.7	1.9
3993 Aviation Science	4	0.0	0.0	25.0	25.0	50.0	0.0	0.0	0.0	0.0
	5,414[2]	17.6[3]	14.0[3]	12.9[3]	12.2[3]	14.4[3]	13.0[3]	8.4[3]	5.4[3]	1.9[3]

- *Lower level courses had a noticeable concentration of teachers with two or less years of teaching experience.*
- *Upper level basic courses generally had a lower percentage of teachers with two or less years teaching experience.*

[1] Intervals are not equal.

[2] See footnote #1 on page 7.

[3] Represents percentages of the teacher count (5,414).

TEACHING EXPERIENCE BY SEX

The most obvious trend in regard to sex displayed in Table XI is that of "holding power" of the teaching profession. It is much greater for females than for males. As beginning teachers, males and females are about equal in number. Females are in the majority and remain so throughout the teaching career. By the time 31 years of experience is realized, females are in the majority by 61% to 39%, respectively. The gap between female and male teachers continues to widen.

Table XI: Teaching Experience by Sex

Years	Teachers	Percentage	
		Female	Male
0-2	653	50.8	49.2
3-5	517	55.9	44.1
6-8	482	56.2	43.8
9-11	455	56.9	43.1
12-15	517	54.7	45.3
16-20	457	53.6	46.2
21-25	302	56.3	43.7
26-30	194	56.7	43.3
31-99	70	61.4	38.6
	3,647[1]	54.9[2]	45.1[2]

- *"Holding power" of the teaching profession (in science) is greater for females than for males.*
- *As beginning science teachers, males and females are about equal in number.*
- *Females are in the majority among the more experienced science teachers.*

[1] Actual number of teachers who taught one or more classes in grades 7-12.

[2] Represents percentages of actual number of teachers (3,647).

REFERENCES

1. Statistical Profile 1979-North Carolina Public Schools, Division of Statistical Services, Department of Public Education, Raleigh, NC.

2. Summary of the Findings of Three NSF-Sponsored Studies on the Status of Precollege Science Education, American Association of School Administrators, 1801 North Moore Street, Arlington, VA 22209, 1979.

3. 1977 National Survey of Science, Mathematics, and Social Studies Education, prepared for the National Science Foundation by Iris R. Weiss, Research Triangle Institute, Research Triangle Park, NC, 1978.

4. North Carolina Science Teacher Profile 1978-1979, Grades 7-12, Division of Science, North Carolina Department of Public Instruction, November 1979.

5. North Carolina Science Teacher Profile 1979-1980, Grades 7-12, Division of Science, North Carolina Department of Public Instruction, November 1980.

6. North Carolina Science Teacher Profile 1980-81, Grades 7-12, Division of Science, North Carolina Department of Public Instruction, November 1981.

7. North Carolina Science Teacher Profile 1981-82, Grades 7-12, Division of Science, North Carolina Department of Public Instruction, October 1982.

Summary/Comments

The data presented in this publication should be of concern to all who have an interest in science education. The most serious weakness revealed in the profile focuses on the junior high school grades.

The majority (60%) of the students who took science were in grades 7-9, while instruction for them was provided by only about 54% of the teachers in grades 7-12. On the average, science class size (27) in grades 7-9 was larger than class size (24) in grades 10-12. Only 51% of the teachers who taught science in grades 7-9 were appropriately certified. Eighty-five percent of the high school (10-12) teachers were appropriately certified. Thirty percent of the teachers who taught science in grades 7-12 had NO science certification.

On the average, the junior high science teacher was more likely to be (1) younger, (2) less experienced, (3) female, (4) holder of a lower degree, (5) inappropriately certified for assignment, and (6) assigned to larger science class(es). There appeared to be a relationship between the percentages of teachers by race grouping and courses taught. There was a higher percentage of the white teachers and a lower percentage of the black teachers who taught the upper level courses.

On the average, the senior high science teacher was more likely to be (1) older, (2) more experienced, (3) male, (4) white, (5) holder of an advanced degree, (6) appropriately certified for assignment, and (7) assigned to smaller science class(es). The profile of the senior high science teacher is an improvement over that of the junior high science teacher. Still, 16% of the senior high science teachers were inappropriately certified for their assignments.

Twenty-four percent of the science teachers (7-12) held a master's degree or higher. This sounds encouraging but does not fare too well when compared with better than 50%[1] for the nation.

As male science teachers gain experience, there is a greater tendency for them to leave teaching than for females. It is well-known that some of them go into administration; some leave the profession altogether.

The profile reveals, in part, the status of science teaching in North Carolina. Many strengths and weaknesses are apparent. The situation deserves concerted efforts from many directions by agencies and individuals concerned with improving science instruction.

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[1] American Association of School Administrators, Summary of the Findings of Three NSF-Sponsored Studies on the Status of Precollege Science Education (Arlington, VA: American Association of School Administrators, 1979), p. 7.

Much state and national emphasis is currently being directed toward science and science education. Our rapidly expanding technological world places greater demands on preparing scientifically-literate citizens. Yet, we have not apparently accepted science instruction as an area of high priority, especially at the elementary and middle grade levels. An understanding of basic science concepts and the method of scientific thinking is important for all students. Science is required for all students in grades K-8. In addition, two units or their equivalent of science are required at the 9-12 level. How can science educators be serious about fulfilling the above requirements when 30% of teachers teaching science have NO science certification whatsoever? Would the public stand for the same in other professions?

The writers of this publication believe that critical attention should be given to three areas: (1) assignment of teachers by local administrators, (2) certification requirements, and (3) local staff development.

"When you can measure what you are talking about, and express it in numbers, you know something about it."

- Lord Kelvin