

Report on the Tuition Grant Program for Graduates of  
The North Carolina School of Science and Mathematics

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## **Report on the Tuition Grant Program for Graduates of The North Carolina School of Science and Mathematics**

The 2003 North Carolina General Assembly passed legislation creating the School of Science and Mathematics (NCSSM) Tuition Grant Program to provide financial assistance to NCSSM graduates through a program administered by the North Carolina State Education Assistance Authority. The Tuition Grant program ensures that graduates of NCSSM receive, at a minimum, a grant equal to the cost of tuition at any of the 16 campuses of the University of North Carolina. The grant is intended to cover tuition only and is reduced if a student receives scholarship or grant assistance from another source.

### **The School**

NCSSM is a public, residential, coeducational high school for juniors and seniors with high intellectual ability and commitment to scholarship. It was created by Governor James B. Hunt, Jr. and established by the North Carolina General Assembly on June 16, 1978. NCSSM is an affiliate of The University of North Carolina. The 27-member NCSSM Board of Trustees is responsible for the organization, management, and operation of the School. The Board of Trustees is made up of appointees by the University of North Carolina Board of Governors, the Governor, President Pro Tempore of the Senate, and Speaker of the House. The chief academic officers of three constituent institutions and the chief academic officer of a private college or university in North Carolina serve as ex-officio members.

NCSSM is the nation's first state-supported, residential high school for students with a talent and interest in science, mathematics, and technology and is a national model for similar schools. The school is accredited by the Southern Association of Colleges and Schools. NCSSM is a founding partner of the 89-member National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology.

Since it opened, NCSSM has graduated 5,300 students and has provided courses and enrichment to another 34,450 students who are not enrolled in the school but who participate in the NCSSM university partnership Summer Ventures in Science and Mathematics (SVSM) programs, distance learning classes, and on-campus residential experiences. Outreach also includes professional development opportunities for educators across North Carolina.

### **The Students**

NCSSM opened in September 1980 with its first class of 150 juniors. Currently, 610 students live and learn at NCSSM. Applicants compete for enrollment based on the congressional district in which they reside and are compared with other candidates from their home high school, county, and congressional district. According to NC General Statute 116-235 and without jeopardizing admission standards, an equal number of qualified applicants must be admitted from each of North Carolina's congressional districts. This mandate has had the effect of assuring that students from all counties of

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North Carolina are served by the school and that the school’s enrollment reflects the geographic diversity of the State. This state-wide diversity also results in racial diversity, a value the school supports by maintaining a full-time minority recruiter. Table 1 provides a five-year summary of NCSSM’s racial demographics.

Table 1  
Five-Year Enrollment Summary % Racial Demographics

School Year	Af. Am.	Asian	Caucasian	Hispanic	Nat. Am.
2000-2001	11.4%	15.4%	70.7%	1.8%	0.7%
2001-2002	12.3%	16.8%	67.5%	1.8%	1.1%
2002-2003	11.5%	19.0%	64.9%	3.2%	1.4%
2003-2004	12.8%	19.3%	63.5%	3.2%	1.2%
2004-2005	11.6%	19.5%	64.6%	2.5%	1.8%

The median family income of NCSSM families is shown in Table 2. Table 3 presents the number of low-wealth students currently enrolled in NCSSM. This portion of low-wealth students is typical for any school year.

Table 2  
5-Yr Summary of Enrollee Family Income

Class of	Median family income
2002	\$70K - \$79K
2003	\$70K- \$79K
2004	\$70K- \$79K
2005	\$70K- \$79K
2006	\$80K- \$89K

Table 3  
Students Currently Enrolled at NCSSM & Reporting Low-wealth Income Levels

Class of	< \$10K	\$10 - \$19.9K	\$20 - \$29.9K	\$30K - \$39.9K	Total Low-wealth
2006	1	9	10	19	39
2005	4	9	10	26	49
TOTALS	5	18	20	45	88 (14%)

In order to attend NCSSM students leave home to begin their advanced academic preparation two years before their peers. The students separate from family and friends and come to NCSSM where they can not drive a car or hold a part-time job. The focus at NCSSM is an intense learning experience. Data collected in a recent NCSSM time-use study indicates that NCSSM students are spending in excess of 25 hours on homework in a normal school week.

### **Student Recruitment and Selection**

Application to NCSSM is open to current 10<sup>th</sup> grade students whose parent or legal guardian is a resident of North Carolina. Applications are available in all North Carolina high schools in the early fall and an online application is also available. NCSSM retains three full-time recruiters who schedule visits in every county of the State. All application forms must be postmarked no later than January 15<sup>th</sup>. Applicants must complete the SAT I between September and January of their 10<sup>th</sup> grade year. As part of the application process, the applicant is also required to attend one of the Discovery Days which are held in the spring. On Discovery Day, in addition to the campus tours and information sessions, applicants take a math and essay writing test which become part of their applicant file.

Table 4 provides a summary of the number of applications for admission to the school over the past five years. The NCSSM admissions office believes that the increase in applications from 2005 to 2006 (a 43% increase) is largely due to the 2003 North Carolina General Assembly establishment of the tuition grant program.

Table 4  
Five-Year Applicant Summary Count

Class of	# of Applications
2002	647
2003	769
2004	765
2005	746
2006	1070

The NCSSM Selection Committee consists of faculty and staff from NCSSM, as well as educators, community educational advocates, business and industry leaders from across the state. The selection committee is divided into groups of three members with composition designed to ensure racial as well as gender diversity.

### **The School's Graduates**

Approaching its 25<sup>th</sup> year of operation, NCSSM now has 5,300 alumni and over 60% have pursued careers in mathematics, science, or technology. Since 1990, NCSSM alumni have garnered in excess of eight million dollars in venture capital. According to the alumni database, there are seven alumni who are currently CEO's and/or founders of major national and international companies. Additionally, there are 47 reported alumni who own their own business.

NCSSM graduates live in all fifty of the United States and throughout the world. There remains a strong commitment to the state of North Carolina with over 60% paying NC income tax. Currently over 85% of the school's graduates are choosing to remain in state for their undergraduate education and of those who go out of state to school, at least a

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third are returning to North Carolina after college. Table 5 provides data from the past six years of data collection from NCSSM alumni.

Table 5  
NCSSM Graduates More than Five Years Out of College with Career Standings and Reflections on the NCSSM Experience

Year Survey Sent in 1994, 1999, 2000, 2001, 2002, 2003	CUMMULATIVE
Target classes	'82-'99
1. Number of respondents	<b>3,781</b>
2. Achieved Advanced Degrees (JD, MBA, MD, PhD)	<b>19%</b>
3. Achieved B.A./B.S. in Math, Science, or Technology	<b>66%</b>
4. Pursuing career in Math, Science, or Technology	<b>62%</b>
5. Involved w/ community service.	<b>66%</b>
6. Pay NC Taxes	<b>60%</b>

**Students' College Attendance**

While occasionally a NCSSM student may defer college entrance to take advantage of a travel or intern experience, virtually 100% of NCSSM graduates enter college. Table 6 provides a five-year summary on the type of institution NCSSM students selected for college. The percentage of students attending a UNC campus increased dramatically from 59% in 2003 to 81% in 2004. As a result, there was a 16% drop in the number of students leaving North Carolina to attend an out-of-state institution.

Table 6  
Five-Year Summary of Where Students are Going to College

# of Grads	# of Surveys Returned	Class of	% Enrolled in UNC System	% Enrolled in NC Private	% Enrolled in Other Out-of-State Schools
242	221	2000	52%	16%	32%
263	240	2001	49%	16%	35%
256	246	2002	49.1%	15.1%	35.8%
264	252	2003	59.2%	9.6%	31.2%
256	245	2004	81.2%	4.1%	14.7%

Table 7 indicates the UNC institutions students attended in Fall 2003 and Fall 2004. In nearly every case, the number of students increased after the NCSSM tuition program was established. The largest increases occurred at UNC Chapel Hill (74 to 105) and NC State (41 to 55).

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Table 7  
Number of Students Reporting Attending UNC System Schools  
2003 and 2004

	2003	2004
Appalachian State University	2	4
East Carolina University	7	2
Elizabeth City State University	0	1
Fayetteville State University	1	0
North Carolina A&T State University	2	0
North Carolina Central University	2	5
North Carolina State University	41	55
UNC Asheville	7	6
UNC Chapel Hill	74	105
UNC Charlotte	1	2
UNC Greensboro	0	4
UNC Wilmington	1	5
Western Carolina University	3	0

**Impact on Student Need**

A study of available data on the Class of 2004 indicates that of the 190 students who enrolled in the UNC system, 121 students (64%) received funding from the North Carolina School for Science and Mathematics Grant. The Technical Corrections Act passed in 2004 restricted NCSSM Tuition Grant funds for students who received other grants and scholarships which exceeded the cost of tuition. As a result, 57 students needing financial assistance to enroll in a university were ineligible for the grant. Thirty-four of these students took student loans and/or agreed to work on campus in order to enroll in the University system.

The cost of attending one of the UNC campuses is not limited to tuition. Students have other expenses including required fees, books, room and board as well as the cost of getting to campus and home again. By reducing the NCSSM Tuition Grant by other grants and scholarships, students who most need the assistance are denied access to the funds.

Table 8 presents data for NCSSM students enrolling in the University of North Carolina in the 2004 fall semester. The students with the highest and lowest median parent's adjusted gross incomes received no grant funds because they received other scholarships or need-based aid. The current policy of reducing the NCSSM Tuition Grant due to other aid affects the students from families with the lowest median adjusted gross incomes the most; for example, over 30 students in this category received Federal Pell Grants which are targeted to the neediest students, and many had to take out student loans. Students who had need AND received the grant, received less NCSSM grant money on average than those who had no financial need.

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Table 8  
NCSSM Tuition Grant Summary

	<b>Number Recipients</b>	<b>Number Applied for Aid</b>	<b>Median Parents' Adjusted Gross Income( known only for those who applied for aid)</b>	<b>Average NCSSM Grant</b>
<b>No Need/no grant</b>	12	8	\$118,400	0
<b>No Need/grant</b>	99	55	\$89,500	\$2,943
<b>Needy/grant</b>	22	22	\$70,900	\$2,506
<b>Needy/no grant</b>	57	57	\$35,500	0

**Recommendations**

1. The NCSSM Tuition Grant Program should be continued.
2. The current policy of reducing the NCSSM Tuition Grant does not benefit the lower income graduates of NCSSM. It is recommended that the NCSSM Tuition Grant be restricted only if the student receives grant or scholarship assistance which exceeds the total cost of attendance, not just tuition. (Such a policy for the 2004-2005 academic year would have resulted in 44 additional students with financial need being eligible for the tuition grant funds. The other scholarships or grants the students receive would help pay the other non-discretionary costs of attending college.)

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**Appendix A**

Outreach Initiatives

## Appendix A NCSSM Outreach Initiatives

### The School's Outreach

NCSSM has taken seriously the legislative mandate “*to develop, evaluate, and disseminate experimental instructional programs; and to serve all schools of the State through research and outreach activities...*” NCSSM has taken this unfunded mandate and developed proposals that have resulted in innovative programs for those beyond the school in Durham. NCSSM has established teacher summer institutes, student summer research programs, special programs for traditionally underserved populations, and four television studios that operate throughout the school day to provide credit bearing courses, mentorship opportunities, and enrichment programs.

#### Outreach to North Carolina's Students and Teachers

Kinds of Programs	Participation Last 5 years	Participation 2003-2004
Student Credit-bearing courses and classroom collaborations	2,927	536
Student distance learning enrichment sessions	8,732	1,379
Student Summer Programs (SVSM on six UNC Campuses and special student programs at NCSSM)	2,566	612
Teacher Professional Development Programs – onsite	10,730	427
Teacher Professional Development – distance learning	1,821	280

### Return on Investment

The citizens of North Carolina, through the leadership and support of the North Carolina Legislature, have made a considerable investment in the North Carolina School of Science and Mathematics. School founders envisioned a return on this investment. For example the school would develop future leaders, the State's scientific workforce would grow, the teaching of mathematics and science throughout the state would improve, and the school would be a shining star and add to our state's national stature. The distinctions listed below are examples of realizations of this original vision. The school continues to take very seriously a return on investment.

- NCSSM has served as a model for 13 other states who have established publicly-funded, residential, statewide schools for students with high interest and ability in science and mathematics. NCSSM was the first such school and remains one of the two largest. These schools and over 70 others are members of the National Consortium for Specialized Secondary Schools of Science, Mathematics and Technology, of which NCSSM was a founding member.
- NCSSM is a national leader in the Siemens Westinghouse Science Competition, the country's most prestigious science competition for high school students. In 2001 and 2004 NCSSM won first place nationally for student teams. In each of

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the past two years, NCSSM has produced more finalists in this competition than any other school in the nation.

- NCSSM is a national leader in mathematical modeling. NCSSM students first entered the Mathematical Contest in Modeling in 1986 and received an *outstanding* designation. This team competition is designed for university mathematics majors. After initial reluctance in admitting high school students to the competition, NCSSM teams now compete with over 250 U.S. teams and over 200 foreign teams each year. The only institutions in the country to receive more outstanding awards than NCSSM have been Harvey Mudd College and West Point.
- Since the school opened, NCSSM has had the highest number of National Merit and National Achievement finalists in the state. NCSSM SAT scores are the highest in the state and, with rare exceptions, the highest average SAT scores of any entering class of any institution in the University of North Carolina system.
- 32% of NCSSM teachers hold doctorate degrees and 19% of NCSSM teachers have received National Board for Professional Teaching Standards Certification. (All faculty who have applied have received NBPTS certification.)
- NCSSM alumni are also making an impact in the world of medicine and healthcare. Currently, 21% of the NCSSM graduates work in the medical field. Of that number, over half are practicing physicians. Many have ground-breaking research to their credit and have attracted large research grants.
- In the last five years, NCSSM has produced the largest percentage of finalists for the Teacher Fellows program of any North Carolina high school. Twenty-two percent of alumni in the NCSSM alumni database have chosen education as a profession, from classroom teaching to college professorships. And, ten percent of NCSSM's alumni have chosen to teach in and work in rural, underserved areas.
- Currently four of NCSSM teaching faculty are alumni and eight alumni serve on NCSSM boards.
- NCSSM Distance Learning is the largest provider of high school interactive video courses. The school has developed three online courses and has been tapped as part of the leadership team for a North Carolina Virtual High School.