Public Schools of North Carolina
State Board of Education
Department of Public Instruction

Report to the North Carolina General Assembly

Impact of the Coding and Mobile App Development Program

SL 2017-57 (SB 257)

Date Due: September 15, 2021
DPI Chronological Schedule, 2020-2021

STATE BOARD OF EDUCATION

STATE BOARD OF EDUCATION VISION: Every public school student in North Carolina will be empowered to accept academic challenges, prepared to pursue their chosen path after graduating high school, and encouraged to become lifelong learners with the capacity to engage in a globally-collaborative society.

STATE BOARD OF EDUCATION MISSION: The mission of the North Carolina State Board of Education is to use its constitutional authority to guard and maintain the right of a sound, basic education for every child in North Carolina Public Schools.

NC DEPARTMENT OF PUBLIC INSTRUCTION

Catherine Truitt, State Superintendent :: 301 N. Wilmington Street :: Raleigh, North Carolina 27601-2825

Inquiries or complaints regarding discrimination issues should be directed to:

Ronald Paxton, Director of Human Resources, NCDPI
6301 Mail Service Center, Raleigh, NC 27699-6301 / Phone: (984) 236-2220 / Fax: (984) 236-2347

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Legislative Requirements

Session Law 2017-57 (SB 257)

SECTION 7.23.(d) Reporting Requirements. – By **August 1** of each year of the Program, grant recipients shall submit a report to the **Department of Public Instruction**, beginning with an initial report by August 1, 2018, for the preceding year in which grant funds were expended that provides at least the following information on the partnership initiative:

(1) The use of grant funds.
(2) The number of students by grade level participating in the partnership initiative.
(3) The number of students who subsequently participated in work-based opportunities, internships, or apprenticeship programs and a description of the types of opportunities for those students.
(4) Student outcome data regarding job attainment and postsecondary opportunities as a result of the partnership initiative.
(5) Any other information the Superintendent of Public Instruction deems necessary.

By **September 15** of each year of the Program, the Department shall report to the **Joint Legislative Education Oversight Committee** and the **Fiscal Research Division**, beginning with an initial report by September 15, 2018, on grant recipients and implementation of the program, including the information required to be reported to the Department pursuant to this subsection and any legislative recommendations for modifications or expansion of the Program.

Impact of the Coding and Mobile App Development Program

The grant program afforded the opportunity for more than 8,500 students and their teachers, administrators, and other staff members throughout the state to experience a coding or mobile app development course as well as exposure to computer science related work in business and industry. These experiences included embedded activities, work-based learning opportunities, professional development experiences, and other options. Eleven schools or school grant recipients coordinated these experiences.

The eleven participating schools or school grant recipients added or expanded new coding related courses or supporting activities for middle or high school students. The supporting activities included instructional opportunities inside and outside participating classrooms.

Participating Schools or School Districts

1) Beaufort
2) Cabarrus
3) Carter G. Woodson School
4) Edgecombe
5) Guildford
6) Henderson
7) Northeast Academy for Aerospace & Advanced Technologies School
8) Rowan-Salisbury
9) Rutherford
10) Stanly
11) Wilson

Use of Grant Funds

The grant funds were used to purchase equipment, digital materials and cover the costs associated with teacher professional development activities to build capacity in coding, computer science and mobile application development initiatives. Students across the state were exposed to various topics and concepts related to coding and computer science. This exposure expanded beyond the classroom and included interactions with business and industry members, participation in community coding activities, increased course offerings and additional skill building activities which can increase employability. The sections below provide more details on the specific use of funds among the grant recipients.

Professional Development Activities

The Professional Development activities varied in nature and content, but all with the common goal of expanding teacher and administrator capacity to deliver Computer Science concepts to students within their schools. As a result of several hours of training, learning and exposure, students at the grantee sites have the benefit of being instructed by teachers who have participated in the following experiences.

CS Discoveries Training	NCSU CS Professional Development	CodeHS Training
Python 2 Training	Cyber Education Discovery Forum	Drone Pilot School Training
Remediation Platforms for Support (Coding in Minecraft, FIRSTNC Robotics, Project Lead the Way, Code.org activities)	AI Applications Training	Internet of Things (IoT) Training
Cybersecurity 101 Parts I and II	Sphero Virtual Training	Vex Robotic Training

Equipment and Software

Teachers and students accessed computer labs, equipment, and software as integral or enhanced components of the grant program. The following table contains a summary of the equipment and software used.

Chromebooks & Chromebook carts	Desktop Computers & Monitors	Apple iPads & charging stations	Spheros & Mini-Spheros
VR Headsets	Drones	Lenovo Thinkpads	MacBook Pros
Vex Robots	Code & Go Robots	LilyPad Temperature Sensors	Vibe Smartboards & Stands
Raspberry Pi Devices	Circuit Scribe Builder Kits	CUE Robots & Accessories	Air Quality Sensors

Student Demographics

Student participants at the various grantee sites were exposed to Coding and Computer Science concepts in a variety of ways. In the same manner, student participants represented a diversity of backgrounds and experiences, adding to the richness of the program impact throughout the state of North Carolina. The tables below include demographics specifically related to gender, ethnicity, and grade for participating students. The following information is self-reported by grantees. Please note, the tables are not correlated.

Total Participants	Males	Females	Gender Not Available
8692	4657	3886	149

Caucasian	African American	Hispanic/ Latino	Native American	Asian	Other	Ethnicity Not Available
4109	2261	1475	24	340	321	162

6th Grade	7th Grade	8th Grade	9th Grade	10th Grade	11th Grade	12th Grade
1585	1968	2483	737	806	573	540

Work-based opportunities, internships, or apprenticeship programs

Due to the COVID-19 pandemic's unexpected and devastating impacts, work-based opportunities, internships, or apprenticeship programs were particularly challenging for students. Due to social distancing and gathering requirements as well as the transition to teleworking, many students were unable to follow up with or complete these types of opportunities.

Lessons Learned and Sustainability*

Fiscal year 2020-21 presented a unique challenge for some grantees that were completely out of their control; however, individual supports and responses were put in place to help districts and schools navigate these unprecedented challenges. Due to the COVID-19 pandemic & its unexpected and devastating impacts, North Carolina closed schools from March 2020 through the end of the school year and were open at a limited capacity for the 2020-21 school year. Because of this global health crisis, many grant recipients were completely virtual and unable to function in the manner in which they had originally planned. This created a challenge in expending the grant funds and remaining consistent with the program as outlined in the grant applications.

As in the previous years, there were several lessons learned among the grantees, especially in light of navigating COVID-19. The following lists successes & sustainability notes from the grant administrators or teachers. The responses vary, providing great insight for program planning, implementation, and maintenance:

Lessons Learned

- Implement models of shared decision making for feedback and input from stakeholders at every level in planning events
- Coding and computer science should be offered at all levels of K-12 in order to support robust programming and experiences through a student's educational career
- Equity and access remain a concern for our classrooms in rural areas
- Much more hardware and software for computer upgrades were needed than anticipated for middle and high schools.
- Technology should be kept current to continue to pique student interest and simulate higher education and industry environments
- Cultivating relationships with experts in the various avenues of computer science assists with increasing knowledge of respective subject matter content
- It is important to adjust and adapt strategies to further engage students and to incorporate ever-evolving components which will increase the rigor of the current curriculum

As the Coding and Mobile App Development Grant Program has finished its fourth year of existence, it is important to note that the expansion of Coding and Computer Science curriculum has grown extensively as these are areas of consistently evolving pieces. Students from a diversity of backgrounds are being exposed to the curriculum as an increasing number of teachers and administrators are receiving professional development and training to help expand course offerings. This expansion of curriculum and technology with younger generations has the potential to positively impact the economy in the state of North Carolina as more students are being exposed to and developing the skills necessary to meet workforce demands. Grantees have overwhelmingly expressed their desire to continue along this path of computer science expansion and exposure as we move into the future.