

# VIRGINIA TECH WHITE PAPER

## NORTHERN VIRGINIA EDUCATION INNOVATION PARTNERSHIP

The Northern Virginia Education Innovation Partnership encompasses the PreK-12 resources of Alexandria City Public Schools (ACPS), Arlington Public Schools (APS) and Falls Church City Public Schools (FCCPS) and the university resources of Virginia Polytechnic Institute and State University (Virginia Tech). The goal of the partnership is to provide unique educational opportunities for all students — through collaboration with community business ventures and Virginia Tech — that could not be provided by a single school division alone. This multi-school division effort has the potential to be a game-changer for the entire region by linking schools, universities, and businesses; and is an opportunity to assess the skills that students will need to be successful in the future, and provide innovative programming to fulfill those needs. Each school division brings something different, but beneficial for future innovation, providing students from all three divisions with expanded course options and opportunities.

The partnership will be an accelerator to support the advancement of expertise; an incubator to grow key areas needed for the future workforce; pathways offering exploration from Pre-K to PhD for all students; and a solution to the critical need for teacher professional development. With cooperative effort, our community is ready to become an Innovation Hub and model for best practices for the nation and the world.



A PreK to PhD Innovation Hub



### An Education Partnership

The Northern Virginia Education Innovation Partnership encompasses the PreK-12 resources of Alexandria City Public Schools (ACPS), Arlington Public Schools (APS) and Falls Church City Public Schools (FCCPS) and the university resources of Virginia Polytechnic Institute and State University (Virginia Tech).

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This effort has the potential to redefine the delivery of public education for ACPS, APS and FCCPS. A comprehensive partnership that connects PreK-12 schools to University education to businesses could transform the entire Northern Virginia region.

This Partnership will include a focus on the future business needs of Northern Virginia and the D.C. metro area, as well as the United States and globally, by creating programming aligned with those future needs. This Partnership provides for many multi-faceted opportunities including public-private partnerships — the direction in which public education is heading.

### Background to the Partnership

As indicated in the Profile of a Virginia Graduate, the urgency and need to design a new and innovative model to improve high school graduation rates, ensure a better prepared workforce, and achieve higher post-secondary rates is paramount. The opportunity for three divisions to work together and develop an educational model in collaboration with Virginia Tech to ensure that more students are fully prepared to succeed after high school is more than a handshake. It is a fundamental belief, collective investment, and deliberate commitment that will truly benefit students, families, and many other stakeholders.

Re-imagining excellence in education is at the heart of this collaborative partnership among ACPS, APS, FCCPS and Virginia Tech at the Virginia Tech Innovation Campus in Alexandria and the Northern Virginia Campus in Falls Church. This shared commitment will

establish an educational model that allows a diverse group of students from three school divisions to experience innovative and experiential learning environments. Ultimately, high school graduates will attain 21<sup>st</sup> Century Workplace Skills for the Commonwealth of Virginia and fulfill requirements to satisfy the Profile of a Virginia Graduate.

The model will promote global awareness, blended and virtual learning, critical thinking, and problem-solving through project-based learning. Students will collaborate in teams, engage in Socratic seminars, and participate in capstone projects involving real-world problem solving, decision making, and research/investigation. A major focus will be on solving problems in local communities, as they relate to the state, national and international focus areas.

Customized and tailored support systems will ensure that all students are able to succeed. The Northern Virginia Education Innovation Partnership will address the diverse needs of the student population to accommodate varying linguistic, cultural, socio-economic, and academic experiences.

## Introduction to the Partnership

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*To be drafted by Alexandria Economic Development*

## Background to Our Three Public School Divisions

### Alexandria City Public Schools

Alexandria City Public Schools (ACPS) has a history of innovation combined with a social conscience that continues to establish it as a leader in education and equity.

The city is home to the first publicly-funded school for the poor in America and one of the first schools for enslaved African Americans. It boasts education pioneers such as George Washington and students such as Robert E. Lee, while the unification of its 1971 State Championship T.C. Williams High School football team is immortalized in the Disney movie, *Remember the Titans*.

Today, ACPS is driven by ensuring equity and seeing all students achieve the successes they deserve. ACPS celebrates its diversity as a gift. ACPS is a unique urban-suburban school division with 15,700 students who come from 114 different countries and speak 119 languages. ACPS students come from all socioeconomic backgrounds, with 60 percent

qualifying for free and reduced-price meals. Alumni often come back and tell us they were better prepared for their college experience or work environment because of ACPS.

T.C. Williams High School offers its 4,000 students more than 400 courses, including 33 Advanced Placement courses and 15 Dual Enrollment courses.

Highlights for ACPS programs include **The High School Project**, an innovative approach to keeping pace with the needs of growing student enrollment by redefining the high school experience for future generations and aligning the school division's exemplary programs in a new city campus model called The Connected High School Network.

ACPS also boasts the **Governor's Health Sciences Academy** in partnership with The George Washington University, a nationally recognized middle and high school **International Academy**, as well as an exciting new **Early College Program** with Northern Virginia Community College that will allow students to graduate with an associate degree as well as a high school diploma.

**Science Research** classes allow students to pursue their own scientific questions and develop their skills through authentic research resulting in national acclaim, which saw T.C. Williams senior Ana Humphrey win the Regeneron Science Talent Search in March 2019 - the first Hispanic student to receive the award in 20 years.

## Arlington Public Schools

Arlington Public Schools (APS) educates one of the nation's most diverse and sophisticated student populations. The school division currently serves more than 28,000 PreK-12 students who come from 146 nations and speak 107 different languages.

The 2018 Niche® national rating of K-12 public districts in the U.S. ranked APS as the #1 school division in the state of Virginia and #58 in the nation. The district is also consistently ranked as a top school division by *U.S. News and World Report*, and *The Washington Post* Challenge Index has listed all three APS comprehensive high schools in the top 100 high schools in the metropolitan Washington area.

Academic standards are high, and students consistently score well above state and national averages on standardized tests, repeatedly surpassing their peers in the state and the nation. All 32 APS schools have been fully accredited by the Virginia Department of Education for the last four years. Approximately 79 percent of graduating seniors completed one or more AP or IB classes, and 68 percent of APS graduates earned an advanced studies diploma.

Current innovative programs within APS include: **Arlington Tech** (9-12), a rigorous, project-based learning, high school program that prepares students to succeed in college and in the workplace through collaborative problem solving. Students learn how to effectively apply

their interdisciplinary academic knowledge with skills developed in their Career Technical Education (CTE) classes. Projects serve to integrate these classes and provide hands-on, work-based learning opportunities in which students put theory into action and use critical thinking skills to solve relevant local and global problems in real-time. In their final year, all students work as interns, project managers or researchers through their Senior Capstone Experience. Learning at Arlington Tech is active, authentic, and motivated by the students' interest. Students also have access to over 30 unique Dual-Enrolled (DE) academic and CTE courses.

Campbell Elementary School (PreK-5) is an **EL** School, in which students learn through authentic hands on experiences and through nature.

The APS **Dual Language Immersion** programs provide opportunities for students to engage in the learning of the APS curriculum through the lens of two languages. Students develop fluency in another language while continuing to build literacy in a student's home language and cultivating a love for language learning.

**International Baccalaureate:** The International Baccalaureate Organization aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. These programs encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right. The IB Learner Profile is the IBO mission statement translated into a set of learning outcomes for the 21st century.

**Montessori (K-8):** The Montessori program provides an interdisciplinary, discovery-based approach to learning. The program is based on a philosophy of learning that grows from the belief that children are natural learners, and that learning occurs best in a nurturing, prepared environment that promotes spontaneous cooperative inquiry

## Falls Church City Public Schools

Community has been at the heart of the Falls Church City Public Schools (FCCPS) since its founding in 1948. Citizens sought and won legislation enabling the 2.2-square-mile town to become an independent city with its own school division. As the smallest school division in Northern Virginia, (five schools with a PreK-12 population of 2650), FCCPS is uniquely positioned to be innovative and nimble.

Staff members work collaboratively to build a caring community and culture. FCCPS is able to build relationships with each student and create a personalized learning path to address unique needs. FCCPS is innovative and inclusive, and families move to Falls Church to access excellent services to our students, built on a foundation of equity. Small size, however, requires FCCPS to share some resources with neighboring school divisions to offer additional instructional programming to students.

FCCPS is the first and only Virginia school division offering continuum **International Baccalaureate (IB)** curriculum to all students, PreK-12, and one of seven in the United States. The IB program unites our school division in a common language and pedagogical framework which prepares students for a lifetime of learning, independently and in collaboration with others. An IB education prepares a community of learners who are empowered to engage with global challenges through inquiry, action, and reflection. Each day we encourage students to embody the IB learner profile traits: *Open-minded, Principled, Caring, Knowledgeable, Communicators, Reflective, Inquirers, Balanced, Thinkers, and Risk-takers*. Our instructional practices are consistent with what the Commonwealth of Virginia requires in the Profile of a Virginia Graduate.

FCCPS will be opening a **new, state-of-the-art George Mason High School in 2021**, adjacent to the Virginia Tech Falls Church campus where there are plans to build a state-of-the-art Construction Management program. The new high school will be energy efficient and net-zero ready. This new building provides an opportunity to incorporate sustainable building practices within the curriculum. Geothermal heat, photovoltaic panels, stormwater retention practices, and other environmental advances will be in use, and the data will be made available to teachers and students as part of the curriculum.

**George Mason High School Hydroponics and Aquaponics** program is an innovative partnership between the science and food services departments. Students learn how to grow hydroponic lettuce and raise tilapia, working with both teachers and food services staff. The food services department purchases the food and serves it for school lunches. GMHS teachers collaborated with Virginia State University professors to teach students about Hydroponics and Aquaponics. This program will expand in the new high school.

Numerous successful community partnerships with local, regional and national businesses and universities open the door for real-world experiences for students in all grades. These partnerships range from elementary and middle schools students learning coding with help from corporate partners to high school students participating in internships and externships.

## A Partnership that Lifts All Boats

The **Northern Virginia Education Innovation Partnership: A PreK to PhD Innovation Hub** is proposing a multifaceted partnership that links PreK-12 school divisions in Northern Virginia to Virginia Tech, with a view to providing the skill sets necessary for students to have access to careers that will be available in the future. This multi-school division effort has the potential to be a game-changer for the entire region by linking PreK-12 schools, universities and business.

This Partnership will offer benefits for all parties.

### Benefits to Businesses

- Recruiting tool for new employees
- Job satisfaction/community building opportunity for employees
- Positive PR/news stories about partnerships to the larger community
- Building a connection of educated future employees
- Participating in PreK-12 curriculum planning to prepare students for jobs of the future

### Benefits to Universities

- Recruiting tool for undergraduate and graduate students
- Opportunity to introduce university students to cutting-edge work being done by industry
- Providing college students the opportunity to intern with companies *and* work with PreK-12 students
- Job placement for graduates
- Developing team-building skills by working with older and younger cohorts
- Providing a link between academia and business by keeping professors updated on the latest industry advances

### Benefits to PreK-12 School Divisions

- Creating the schools of the future to meet the needs of all students
- Introducing students to technical skills that will help in careers
- Exposing students to college opportunities
- Introducing students to the interdisciplinary view of the world of work
- Preparing students for jobs that do not yet exist
- Introducing teachers to the jobs of the future
- Providing professional development for teachers in critical need subjects

## Potential Partnerships with Regional Universities and Colleges

- We also recognize that it is beneficial to partner with other public and private universities, colleges and community colleges in the Northern Virginia region as a way to potentially expand this partnership in the future.
- To the extent that public and private universities, colleges, and community colleges are already engaged in this work, we see the proposed model as an opportunity to further enhance and strengthen partnerships throughout the region.

## The Proposal

### ACCELERATOR

**The Partnership proposes** that collaboration with Virginia Tech act as an accelerator to support the three school divisions and advance their expertise. This will include connecting teachers and students to university and industry so that they can ensure the skills they are teaching are relevant to the needs of university and workplace. Each school division brings something different, but beneficial for future innovation, providing students from all three divisions with expanded course options and opportunities. Programming would be organized around significant career and technological pathways.

**The Partnership proposes** that Virginia Tech work in concert with FCCPS to create a Sustainability Academy based at George Mason High School, which would be accessible to students from all three school divisions. This first-of-its-kind Sustainability Academy, could become a Virginia Governor's Academy. The future expansion of the Falls Church Virginia Tech campus that is being planned in cooperation with Hitt Construction will be a natural partner for this visionary high school curriculum. FCCPS has current programming aligned around sustainability, and Hydroponics and Aquaponics. The new George Mason High school will be a living classroom for sustainable building practices, providing the solid foundation for a Sustainability Academy.

**The Partnership proposes** establishing a Tech Lab on the site of the Virginia Innovation Campus in Alexandria that would spark the interest of students at all levels through regular field trips, summer programming and immersion courses.

**The Partnership proposes** that Virginia Tech work in concert with ACPS, APS, and FCCPS to design a program that will equip students for highly significant career pathways, including Information and Technology, Cybersecurity, Robotics, and Mechatronics. Students will acquire competencies needed for highly skilled jobs. This will be accessible to students from all three school divisions. APS currently offers Dual Enrollment courses in cybersecurity and computer programming, while ACPS has strong programming in computing, robotics and cyber security, as well as strong cultural programming offerings and an International Academy. Combining program offerings could provide the basis for an

innovative cyber security program with a global flavor on Virginia Tech's Innovation Campus in Alexandria.

## INCUBATOR

**The Partnership proposes** that collaboration with Virginia Tech act as an incubator to support the growth of key areas identified as essential for the future workforce that the three school divisions do not currently offer.

**The Partnership proposes** that new programming, aligned with workforce needs, be developed to connect PreK-12 educators with Virginia Tech courses and the skills of graduate students. For example, this programming could include cybersecurity, computer science, software and systems analytics that require highly trained teaching staff. There is a nationwide shortage of teachers trained in these content areas in the public schools, making it difficult for school divisions to offer a continuum of experiences for students. The demand for cybersecurity professionals will increase by 28 percent between 2016 and 2026 (Bureau of Labor Statistics).

By offering joint programming in these specialized STEM areas of focus the Partnership hopes to leverage the expertise of university professors and graduate students to initiate a groundbreaking teacher training model that includes attainment of professional certifications and helps teachers to gain access to the most current cybersecurity research and practices.

## A PATHWAY FROM PRE-K TO PHD FOR ALL STUDENTS

**The Partnership proposes** the development of opportunities to spark interest in students from PreK all the way through the postgraduate level. It is essential that any programs developed are founded on principles of equity for all. The increasing diversity of the student population requires multiple approaches so that the Partnership programs are accessible to students from all demographics. These programs would be jointly developed by employees of the three school divisions, Virginia Tech and partner businesses. Programs can include classroom visits, field trips to businesses and worksites, and more.

**The Partnership proposes** building a framework to scaffold learning from Pre-K through college. This framework would provide a continuum of simple experiences leading to much more complex experiences as the level of interest and knowledge in an area develops. This continuum envisions a range of opportunities for students across all three divisions including:

- **Elementary school:** single field trip visits to both the Alexandria and Falls Church campuses to engage in design thinking experiences that are transferable to other learning experiences at school sites.
- **Middle school:** Engaging in a design lab for a week-long immersion experience in cybersecurity or sustainability. This would be at both Alexandria and Falls Church Virginia Tech campuses.

- **High School:** Supporting project management, and research elements of a Senior capstone experience.
- **High School:** Relationships with real-world mentors through internships, externships, apprenticeships.
- **High School:** Establishment of an Early College program that includes students exiting with an associate's degree in computer science and direct entry into Virginia Tech to finish a bachelor's degree if they so choose
- **All grade levels:** Virginia Tech faculty will be invited to partner with PreK-12 schools as guest speakers, curriculum consultants, and mentors.

As students progress through this continuum of experiences, they will develop communications, critical-thinking and collaboration skills, in addition to technical expertise. The experiential learning examples described above are just a small sample of the potential in these programs as they develop.

## A SOLUTION TO THE CRITICAL NEED FOR TEACHER PROFESSIONAL DEVELOPMENT

***The Partnership proposes*** establishing immersion opportunities for teachers in businesses and workplaces outside of school in order to hone technical skills they are teaching and better understand the relevance of their lessons to the future workforce.

***The Partnership proposes*** establishing opportunities for further higher education study for teachers to develop their skills in hard-to-fill high-tech areas. The partnership would develop ways to grow teachers capable of teaching Dual Enrollment math and science. This would include professional learning that could lead to graduate degrees or licensure for hard to fill areas and classroom consultants to support teachers in implementing innovative teaching and learning experiences.

***The Partnership proposes*** creating a Professional and Personalized Learning Community (PLC). This will provide a venue for university and public school educators to learn from one another in order to serve students in a creative and cutting-edge environment that emphasizes shared inquiry, investigation, global studies, and career preparation. The instructional model will focus on cultivating the five C's (critical thinking, creativity, collaboration, communication, citizenship) as students develop content knowledge and workplace skills, in alignment with the Profile of a Virginia Graduate.

## GLOBAL PERSPECTIVE

***The Partnership proposes*** establishing opportunities that expand an awareness of global and international innovation, and encourages students to explore the high-tech work through a world lens in line with the concepts and goals of the International Baccalaureate Programming, which currently exists in some format in the three partner school divisions.

**The Partnership proposes** using a peer-to-peer collaborative approach to learning, helping students to learn from one another in a context of global connectedness, cultural responsiveness, and student efficacy and empowerment. This approach will better prepare students for the ever-changing world. The connection of three school divisions and University students and professors will introduce students to adults from all over the world. The international perspective will equip students with the skills and mindsets they need to succeed in a global economy. Various cultures, languages, and experiences will be recognized, valued, and celebrated as students and adults work collaboratively to solve problems confronting our 21st century world.

## IMPLEMENTATION

**The Partnership proposes** establishing liaisons at all organizations (PreK-12 schools, university, and business) who are tasked with building this program through organizational collaboration.

**The Partnership proposes** that this working group of liaisons establish specific grade-level points of connection to forge a multitude of opportunities.

### A PreK to PhD Innovation Hub

This paper is a collection of initial ideas about developing a partnership among ACPS, APS, FCCPS and Virginia Tech. We invite you to the table with us to discuss this proposal, develop it and partner with our school divisions to make the Northern Virginia area a hub for the development of innovative technology and creative thinking in the United States.

Our goal is to develop agility, a global-focus and innovative critical-thinking in our students so that they take these 21st century skills to the next level through higher education and out into the workforce.

At the heart of our diverse, vibrant and talented community is a passion for innovation and learning. Without a doubt, our spirit of entrepreneurship will redefine educational experiences from PreK-12 to PhD, and into the future workplace. With cooperative effort, our community is ready to become an Innovation Hub and model for best practices for the nation and the world.

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