

**William M. Davies, Jr.  
Career and Technical  
High School**



**TECHNOLOGY PLAN  
2016-2019**

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## Introduction

The William M. Davies, Jr. Career and Technical High School being a champion among technical education recognizes the significance of moving beyond simple technology integration to adopting a philosophy that allows for technology to transform learning experiences with the goal of providing greater equity and accessibility for all. We believe that technology can accelerate, amplify, and expand the impact of effective teaching practices when carefully designed and thoughtfully applied. We recognize that in today's society typical strategies toward improving student achievement and outcomes will not enhance or enable our students to become productive citizens or life-long learners.

In current education reform initiatives to improve teaching and learning, technology and its infusion has become an integral part of the learning process. However, this is only the first step towards achieving a progression of technological proficiency towards transformation. To be transformative, our educators need to have the knowledge, skills, and tools necessary to capitalize on technology rich learning environments.

In addition, schools must ensure best practices in integrating instruction and technology. Best practices begin with ensuring that all components for successful integration; access, attitude, training, and support must be addressed before the application and implementation processes occur.

At the Davies School, we realize that access occurs only when schools plan and provide the necessary equipment: hardware, software, working devices and most importantly an environment conducive for technology-based learning. We have begun to rethink our use of space to allow for flexible classroom layouts that are suitable to small group or personalized instruction. We have established several model classrooms that have been completely redesigned to accommodate new and expanded relationships among learners, teachers, peers, and mentors.

Davies has made a commitment to providing our educators with high quality professional development to support them in their transition from simply embedding technology into their curriculums to allowing them to transform the way they teach to help their students achieve a more personalized learning experience. Personalized learning gives students more choice over what and how they learn and at what pace, which prepares them to take ownership of their learning for the rest of their lives.

We also realize that there is a need to address attitudes toward not only personalizing instruction for students, but also for teachers. This strategy will allow our faculty to become innovative in their approach to educating our learners with a clear focus on competency based formative assessments that reveal a clear vision of mastery. The data acquired from these technology tools can be used to drive instruction and better teacher supports will enable them to provide 1:1 or small group instruction with students.

The Davies School Technology plan provides meaningful direction and strategies toward improving student achievement and student outcomes through professional development initiatives, assessing current infrastructures, and integrating instructional practices into technology.

The technology plan addresses the following:

- Maintaining the infrastructure needed to handle the rapid changes in hardware and software developments
- Technological tools needed to improve teaching and learning
- Professional development initiatives that will provide appropriate training
- Support mechanisms needed to ensure the continuous evolution of technology-based instruction



- Effective implementation and evaluation of technology
- Approaches to evaluate the impact of technology on student achievement

The goal/objective of this plan is to provide guidance and technical assistance to teachers, administrators, and support personnel. Educators will be supported by technology that connects them to data, content, people, resources and learning experiences that can empower and inspire them to provide more effective teaching for all learners. It is also the goal of this plan that all learning technology resources be aligned with intended educational outcomes. The focus on providing Internet access and devices for students should not take precedence over the importance of preparing teachers to teach effectively with technology and to select engaging and relevant digital learning content.

## **Mission**

The mission of the William M. Davies, Jr. Career and Technical High School is to ensure that all students and staff effectively use technology tools and applications to support, facilitate, and enhance student achievement, and outcomes in an educational environment that is conducive for learning and working.

## **Vision**

The vision of the William M. Davies, Jr. Career and Technical High School is to apply technology and its usage throughout the school environment that ultimately impacts all students and staff members in the use of technologies needed to access and organize information, solve problems, reason analytically, facilitate enhanced learning, and increase efficiency and productivity.

## **Guiding Principles**

Technology is an integral component in the education of all students

Students will be able to apply technology skills to real-world problems and situations

Every instructional staff member will employ a wide variety of technology tools to support instruction and learning

The process of instructional improvement is contingent upon on-going comprehensive staff development and training

Technology standards must be incorporated into academic state, national, and industry standards

Every instructional staff member will create a learning environment that supports and fosters the development of each student's technology abilities

## **Technology Goals**

- Continually assess the school's technology infrastructure including its computer hardware and software
- Upgrade the school's infrastructure to meet the needs of the school environment including teaching and learning
- Provide technology-based communication and productivity tools to every administrator, teacher, staff member, and student
- Ensure that technology in the form of computer information systems and communication media are current



- Monitor the utilization of the school-wide management systems to maximize productivity and efficiency
- Ensure that every classroom is connected to the world via technology
- Ensure that all teachers and students use technology as teaching and learning tools
- Provide professional development initiatives to faculty and staff to enhance their knowledge base in technology
- Encourage all ideas for grants, innovative technology practices, and integration of technology in learning
- Provide budgeted resources to maintain and update computer equipment, software, information systems, and communication media

## Teaching & Technology Goals

- Improve curricula, increase student resources and opportunities to learn through technology based simulation and projects and assess student work in order to inform their pedagogy
- Integrate and infuse technology within instructional practices
- Develop teacher leadership experts in specific areas of technology
- Adopt technology tools in every classroom
- Demonstrate a range of technological skills
- Establish specific standards and competencies for teachers in their personal use of technology as a means of increasing learning
- Demonstrate competencies in the use of technology for learning

## Action Plan

**STRATEGY# 1:** *To adopt the ISTE Standards for Administrators and Teachers as our technology proficiency requirement goals.*

### Administrators' Standards:

- 1. Visionary Leadership** - Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization.
  - a. Inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders
  - b. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision
  - c. Advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan
- 2. Digital Age Learning Culture** - Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students.
  - a. Ensure instructional innovation focused on continuous improvement of digital-age learning
  - b. Model and promote the frequent and effective use of technology for learning
  - c. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners
  - d. Ensure effective practice in the study of technology and its infusion across the curriculum



e. Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age collaboration

**3. Excellence in Professional Practice** - Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources.

a. Allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration

b. Facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology

c. Promote and model effective communication and collaboration among stakeholders using digital age tools

d. Stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning

**4. Systemic Improvement** - Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources.

a. Lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources

b. Collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning

c. Recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals

d. Establish and leverage strategic partnerships to support systemic improvement

e. Establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning

**5. Digital Citizenship** - Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture.

a. Ensure equitable access to appropriate digital tools and resources to meet the needs of all learners

b. Promote, model and establish policies for safe, legal, and ethical use of digital information and technology

c. Promote and model responsible social interactions related to the use of technology and information

d. Model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools

### **Teachers' Standards:**

**1. Facilitate and Inspire Student Learning and Creativity** - Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

a. Promote, support, and model creative and innovative thinking and inventiveness

b. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources



- c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes
- d. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments

**2. Design and Develop Digital Age Learning Experiences and Assessments** - Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS·S.

- a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity
- b. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress
- c. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources
- d. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching

**3. Model Digital Age Work and Learning** - Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

- a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations
- b. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation
- c. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats
- d. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning. Effective teachers model and apply the NETS·S as they design, implement, and assess learning experiences to engage students and improve learning; enrich professional practice; and provide positive models for students, colleagues, and the community.

**4. Promote and Model Digital Citizenship and Responsibility** - Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

- a. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources
- b. Address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources
- c. Promote and model digital etiquette and responsible social interactions related to the use of technology and information
- d. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools





**5. Engage in Professional Growth and Leadership** - Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources.

- a. Participate in local and global learning communities to explore creative applications of technology to improve student learning
- b. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others
- c. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning
- d. Contribute to the effectiveness, vitality, and self renewal of the teaching profession and of their school and community

**STRATEGY# 2:** *To gauge each teacher's individual technology proficiency level through the use of surveys, workshops, collaborative endeavors, etc.*

- Beginning
- Developing
- Proficient
- Transformative

**STRATEGY# 3:** *To identify professional development training opportunities that will address the four levels of technological proficiency and to offer tailored professional development sessions to teachers.*

- Non-faculty & staff are eligible to participate in Davies' OED (Organizational Employee Development) program
- Faculty are eligible to participate in Davies' SIPE (School Improvement and Professional Enrichment) program
- Everyone may participate in Davies scheduled Professional Development days

**STRATEGY# 4:** *To encourage the development of technology enriched common tasks that can be used to support digital-age learning and work.*

**STRATEGY# 5:** *To establish technology coaches for colleagues.*

- Davies began to offer a model blended learning classroom during the 2013-2014 school year and Faculty was encouraged to drop in to observe technology integration best practices
- The classroom educator offered structured professional development opportunities to other Davies' faculty in an effort to promote these best practices and we established additional blended learning classrooms over the next couple of years
- Recent surveys revealed willingness by staff to become technology mentors for colleagues if additional training is provided. This is a huge step forward for our technology adoption and implementation goals.

**STRATEGY# 6:** *To build a review component into our teaching expectations process.*

- Assess effectiveness of technology PD by reviewing data:
  - Teacher survey results
  - Measurement of student performance targets



## Learning & Technology Goals

- Improve student learning with the use of technology in meaningful ways
- Emphasize applied higher order concepts, thinking skills, and problem solving skills with technology-based instruction
- Demonstrate technology-based learning and active engagement in the process of learning tasks
- Illustrate best practices in technology-based learning
- Create technology projects that require creativity or collaboration with the goal of increasing student learning
- Demonstrate the distribution of knowledge theory - the idea of using technology at home and in other places to expand technology infusion beyond the walls of the classroom
- Demonstrate a range of technological skills

## Action Plan

**STRATEGY# 1:** *To adopt the ISTE Standards for Students as our technology proficiency requirement goals for Students.*

### Students' Standards

- 1. Empowered Learner** - Students leverage technology to take an active role in choosing, achieving and demonstrating competency in their learning goals, informed by the learning sciences. Students:
  - a. articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.
  - b. build networks and customize their learning environments in ways that support the learning process.
  - c. use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
  - d. understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.
- 2. Digital Citizen** - Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:
  - a. cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
  - b. engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.
  - c. demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.
  - d. manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.
- 3. Knowledge Constructor** - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others. Students:



- a. plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.
- b. evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.
- c. curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
- d. build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

**4. Innovative Designer** - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions. Students:

- a. know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- b. select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- c. develop, test and refine prototypes as part of a cyclical design process.
- d. exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

**5. Computational Thinker** - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:

- a. formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
- b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
- c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
- d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

**6. Creative Communicator** - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals. Students:

- a. choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- b. create original works or responsibly repurpose or remix digital resources into new creations.
- c. communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- d. publish or present content that customizes the message and medium for their intended audiences

**7. Global Collaborator** - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally. Students:

- a. use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.
- b. use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.



- c. contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.
- d. explore local and global issues and use collaborative technologies to work with others to investigate solutions.

**STRATEGY# 2:** *To provide students with quality information on digital citizenship and responsible use policies*

- Offer sessions to students at start of school
- Reinforce concepts throughout academic and technical instruction

**STRATEGY# 3:** *To provide equitable access to current and emerging technologies and digital resources with connectivity for all students.*

- Each classroom and instructional space has been wired for 1 GB local area networking and Internet access
- Every classroom has a networked printer or multi-function device for students in addition to a dedicated teacher PC and printer
- Most classrooms have been outfitted with interactive white boards, projectors and document cameras
- Davies campus has ubiquitous wireless coverage
- Updated computer labs
- Two Polycom video conferencing solutions to facilitate improved technology access and enrichment
  - Davies is in the process of reviewing video conferencing content subscriptions for virtual field trips, STEM opportunities, or general curriculum content

**STRATEGY# 4:** *To establish a program that will create student technology mentors for other students*

- Work with technical instruction areas to identify student's with aptitude and abilities
- Work with School-to Career department to establish in-house internships
- Work with PBIS committee to reward students who excel in this area

**STRATEGY# 5:** *To build a review component into our learning expectations process*

- Assess effectiveness of Davies' adoption of ISTE Standards for Students by evaluating student achievements in these areas
- Survey Davies' population as to the effectiveness of student mentors and adjust program as needed

## Infrastructure Technology Assessment

The initial technology infrastructure assessment was conducted during the 2004-2005 school year. Follow-up reviews were done during each subsequent technology plan review period. The results of the initial assessment revealed that major upgrades were needed for the school's networking components, wiring, personal computers, servers and applications. All of the key areas identified during these assessments were addressed:

- Transition from Token Ring to Ethernet (2006)
- Consolidate and upgrade NetWare 3.x servers to Novell Open Enterprise 6.5 (2006)
- Upgraded server environment to rack mounted hardware (2006)



- Implemented AlertNow's automated dialing system for use in both emergency and general broadcast community outreach efforts (2008)
- Wiring upgrade from 100 MBPS CAT-5 to 1 GB CAT-6 (2010)
- Layer 2 switches replaced with Layer 3 PoE switches (2010)
- PIX firewall replaced with ASA 5510 (2010)
- VLAN's created to segment traffic (2010)
- Personal computers were replaced for teachers and students
- Classrooms outfitted with new technology - digital projectors, interactive white boards, PC's, and printers
- IP based security cameras added campus wide - Phase I (2010) and Phase II (2012)
- Created a virtual server environment with HP blade servers and SAN (2009)
- Acquired Barracuda backup appliance for daily cloud based backups (2011)
- Upgraded SIS to SQL version (2010)
- Migrated the grade book application to a cloud hosted service which resulted in 24x7 availability and increased parent involvement and awareness of their student's academic performance (2010)
- Replaced Novell NetWare's eDirectory with Microsoft Active Directory summer (2013)
- Adopted GAFE - Google Apps for Education schoolwide in (2010)
- Updated Cisco switch infrastructure to 3560X and 3750X units summer (2015)
- Replaced pilot Cisco wireless system with Aruba wireless school wide through RIDE's Wireless Classroom Initiative. Phase I completed summer (2014) and Phase II completed summer (2016)
- Replaced all Windows XP faculty and staff PC's with Windows 7 Pro units summer (2015)
- Acquired laptops and carts for students and some staff (2015)
- Acquired hundreds of Chromebooks with carts for student use beginning (2014)
- Replaced AlertNow with One Call Now because it offered better integration with our SIS summer (2015)

### **Professional Development Achievements:**

Davies had 23 faculty members participate in RITTI training during the summers of 2007 and 2008. This training was made possible by funds that were awarded through the Enhancing Education through Technology (E2T2) Model Classroom Grant (MCG) program. These participants gained valuable technical training and were able to purchase technology equipment for their classrooms. As a result of this training, the school acquired approximately \$97,000 to purchase over 70 PC's, 15 laptops, 24 multi-function printers, 9 DLP projectors, and a Texas Instruments Navigator classroom bundle for 32 students, along with assorted networking components.

All faculty were trained on InfoSource's Digital Learning Management System during the 2008-2009 school year. Davies acquired this Internet based training software to evaluate technology proficiency levels and to offer ongoing professional development training on integrating technology into the curriculum and to understand the National Education Technology Standards for Teachers (NETS-T).

During the summer of 2012, Davies sponsored one of its teachers to attend a technology symposium at Harvard University called Teaching with Technology Teacher Training Institute. As a result of attending this summer institute, this teacher was able to offer her own six hour professional development workshop to all faculty and staff during the 2012-2013 school year. This hands-on lab covered all of the latest classroom technology concepts such as wiki's, blogs, flipped classroom, podcasts, Google Docs, social networking and many other topics to inspire other teachers to enhance their knowledge and skills in creating a more engaging classroom for their students. This workshop was so popular that it was offered again the following year.



Davies understands the importance and necessity of technology training and as an example of this belief, currently requires classroom teachers to receive training on interactive whiteboard technology before these units are purchased for the classroom. Much of the initial training was offered by a professional; however, we have adopted a train the trainer approach to this and encourage teachers to help one another.

Most recently during the 15-16 and 16-17 school years, we have begun to offer Professional Development tailored to each teachers' request for technology instruction and allow them to choose the topic and expertise level most suited to their skills and abilities. The feedback from these sessions has been very positive and we are encouraged to offer more sessions of this type. For our latest PD days, we engaged the services of Highlander Institute to assist us in offering the latest strategies on Blended and Personalized Learning and Google Classroom to help our faculty achieve that transformative level.

### **Technology Action Plan**

- Goal # 1: Upgrade Windows Server Operating Systems and VMWare Software
- Goal # 2: Explore replacing the blade server environment with a converged or hyper converged architecture solution
- Goal # 3: Explore replacing faculty and staff desktops with a Virtualized Desktop environment using thin clients
- Goal # 4: Continue to acquire and support low cost devices for students to replace outdated desktops
- Goal # 5: Explore options to simplify network access with Single Sign On
- Goal # 6: Automate account provisioning and data feeds between MMS and other systems.

### **Administrative & Instructional Support → Software**

Every educator has access to a core set of tools: Internet, email, word processor, spreadsheet, database, presentation, and publishing. Davies transitioned its core applications to cloud based solutions. Moving its grade book and email services to the web has greatly increased availability and overall user satisfaction with these applications. The Davies website is hosted by SchoolWires and we use Follett Destiny, a web enabled application for Library services.

In addition to support services, Davies also utilizes online content to support its academic recovery and enrichment efforts in the classroom. These efforts combined with the school's recent acquisition of over 450 Chromebooks and campus wide wireless has greatly increased our demand for Internet bandwidth. As a result of this increased utilization we requested an upgrade from our previous allocation of a 100MB circuit to 250MB in order to sustain current usage and to support anticipated future growth. Our actual current bandwidth has been increased to 500 MB.



Category	Current Application
Office Productivity Suite: Word Processor, Spreadsheet, Presentation, Publishing	Microsoft Office 2013, Google Docs, Libre Office
Office Suite: Database	Microsoft Access 2013, MySQL
Email	Google Mail
Document Management	Google Mail
Personal Calendar, Tasks	Google Mail
Graphic Organizer	Inspiration
Student Information System	MMS Generations SQL
Grade Reporting	Pinnacle Gradebook
Academic Recovery	Edgenuity
Web Page	SchoolWires
Diverse Populations	TieNET
Library	Follett Destiny
Parent/Community Outreach	One Call Now
Online Curriculum	TenMarks

### Administrative Support → Data Management

Davies uses Computer Resources, LLC. Modular Management Systems Generations Student Information System to effectively manage all student records. The MMS SQL database is centralized in-house and accessible by all school faculty and administrators.

Current MMS Modules Available	License
Biographical	<input checked="" type="checkbox"/>
Attendance	<input checked="" type="checkbox"/>
Discipline	<input checked="" type="checkbox"/>
Grading*	<input checked="" type="checkbox"/>
Scheduling	<input checked="" type="checkbox"/>
Health	<input checked="" type="checkbox"/>
Teacher Classroom Attendance	<input checked="" type="checkbox"/>
Teacher Grade book	<input checked="" type="checkbox"/>
Precision Report Writer	<input checked="" type="checkbox"/>
Telephone Messaging	<input type="checkbox"/>
Parental Internet Access	<input type="checkbox"/>
MMS 3 <sup>rd</sup> Party Bridges	<input checked="" type="checkbox"/>
District Processing Module	<input type="checkbox"/>
MMS Custom Software	<input type="checkbox"/>
Record student test scores	<input type="checkbox"/>

\*The Grading module is currently not used. Davies' teachers prefer Wazzle Solutions Pinnacle grade book product.



## Administrative & Instructional Support → Future

Davies continually evaluates its current software and infrastructure, assessing existing and future needs. We are currently investigating software that has both instructional and assessment components to screen, intervene, and to support classroom instruction in all core content areas. Davies will also continue to evaluate any proposed RIDE offering for data quality and management capabilities and implement those products where needed.

## **Networking: Hardware, Software, Services**

Davies' Information Technology department currently consists of an HP C3000 Blade enclosure that supports two blades with multiple virtual servers along with a P2000 SAN and storage blade.

These servers run Microsoft's Windows 2008 R2 operating system and they provide common data access, storage, print, management, security, authentication and other network functions to our user community. The blade servers also support our core applications: Davies' SIS, MMS and document management application, DigiDocs. There are several other stand-alone servers throughout the school to support our antivirus and desktop management utilities' centralized consoles. This infrastructure supports close to 1000 users.

## Infrastructure → Networking → Principles

- Provide a networking environment for students, teachers, staff, and administration that is stable, manageable, and secure.
- Support a networking environment with minimal staffing.
- Build a networking environment that is scalable.
- Provide an end user experience that is both simple to utilize and full featured in capability.
- Centrally manage servers, workstations, user accounts, and applications.
- Automate all networking functions such as application distribution, upgrades, and configuration and workstation imaging.
- Web-Enable applications where feasible

## Infrastructure → Networking → Standards

Davies' technology goals include plans to virtualize its remaining physical servers and complete a server OS upgrade. Mainstream support for our current OS reached end of life in 2015 and extended support will end in 2020. This upgrade will allow Davies to remain current with its service and support agreements and to protect the network against potential vulnerabilities and threats.

With the completion of our file server upgrade project, our standards for Network Operating Systems, Directory, and Management Systems will be:

- **Microsoft Windows Server 2016:** Core file/data/storage system, print handler, web services, DHCP, etc. Core client/server application environment.
- **Microsoft Active Directory:** Core Directory Service provides user authentication, security and management of all Windows systems owned by Davies.





- **Microsoft System Center:** Core management system provides Server and Desktop Management including application distribution and Launcher, imaging, inventory, and User/Workstation Policies to all Server and Workstations.
- **Faronics Deep Freeze with Insight:** Secured desktop configuration with protection against unauthorized applications. Will add a second level of protection from malware, adware, spyware, worms and viruses. Insight product will enable teachers to manage their classroom devices and control student access to applications while allowing students to share their screens for better collaborative experiences.

## Infrastructure → Networking → Equipment: LAN/WAN, and Internet

**MDF:** Davies has a central wiring closet which houses a core stack of Cisco 3750X 10/100/1000 PoE switches, a Cisco ASA 5510 firewall, multiple 48 port patch panels, its file servers, a tape backup unit and a 2 TB Barracuda storage device. The room is climate controlled by an air conditioning unit and contains an APC UPS InfraStruXure system for the physical file servers. The ASA has been repurposed in 2016 to function as a VPN appliance since the firewall has been moved to the cloud to be managed by COX Business.

The Davies campus has approximately 90 internal and external IP Security cameras and the MDF is home to its server and 3 NVR's for digital storage. This closet also contains the fiber optic backbone termination for both the LAN and Wireless networks. The wireless network is supported by an Extreme 440 switch.

**IDF 2-8:** Each closet contains several 24 and/or 48 port CAT6 patch panels and corresponding 24 or 48 port 10/100/1000 Cisco 3560X PoE switches and an Extreme X440 switch along with APC UPS units. Each closet also has a separate Cisco switch to support the independent IP camera network.

**Classrooms:** Every classroom within Davies' old and new buildings, including the portable modular structure, has 7 or more network connections and one wireless access point. These connections are typically 1 Ethernet connection for the teacher and 6 or more Ethernet connections for student access to the LAN, printers and the Internet. Davies has wireless access throughout the entire building including common areas, the library, gymnasium and conference rooms.

**Internet:** Davies currently connects to the Internet with a 500 MBPS fiber circuit. This circuit increase was necessary to support:

- Yearly additions of classroom PC's and devices
- PARCC testing requirements
- RIDE's Wireless Classroom Initiative
- Online learning opportunities
- Videoconferencing opportunities
- Online grade book
- Online email and collaboration tools currently serviced by Google Apps for Education

## Infrastructure → Networking → Equipment: Desktops

Davies recently upgraded all faculty and staff desktops and is once again faced with what to do with the older student units that are in each classroom. Several teachers have requested the removal of these PC's now that they have access to Chromebooks; however, not all classrooms are equipped yet. We can



explore converting these PC's into Chromebook type devices or simply purchasing new Chromebooks to help with equity for all. The school needs to examine its position on desktops vs. laptops and/or tablets/ thin clients as a suitable alternative to the traditional fat client. A smaller foot print client can offer more flexibility within the classroom as it relates to technology integration, a flipped classroom model or blended learning environment. Once a decision has been made on whether or not it is feasible to virtualize the desktop environment, we will know how best to manage the endpoint life cycle. Davies is quickly approaching a 1:1 environment whether through its acquisition of Chromebooks or through a casual BYOD tolerance. This new reality requires another look at device management options.

## Summary and Recommendations

Davies usage of technology is an integral component in our ability to achieve and maintain our high levels of academic and technical growth and success. To support the district's nearly 1000 learners, instructors, and administrators, the following conditions must exist:

### Personnel

- **Expand professional development opportunities.** To effectively utilize the wealth of resources available to learners, instructors, and administrators, adequate, appropriate, and numerous professional opportunities must be available. District employees need to take advantage of workshops, trainings, Personal Learning Networks, and online documentation and tutorials. The school has recently adopted new policies to support and encourage professional development opportunities for both faculty and staff through the introduction of its OED (Organizational & Employee Development) and SIPE (School Improvement & Professional Enrichment) programs. True personalized learning will happen when educators are allowed to identify their learning goals and be able to choose how, what and when learning occurs.
- **Commit to usage, services, software, and resources.** If we were to measure our achievements against the Rhode Island School Technology and Readiness Chart (STAR), Davies is making significant progress in its move from Developing Technology usage towards its more ambitious goal of Advanced Technology usage. It is now difficult to imagine a typical school day that does not involve 100% participation from faculty and staff to utilize certain core technologies, software, and services to support communication, collaboration and student record keeping. Continued growth and development is necessary to achieve higher levels of progress on our adoption of technology in the teaching and learning, educational preparation and development, and leadership, administration and support categories.

### Budget and Planning

- **Maintain or increase budget and funding levels.** Historically, the IT department has requested very little money for infrastructure upgrades and enhancements. We were very fortunate to have twice received Federal E-Rate monies to offset the costs of our major infrastructure improvements. Faculty and student desktop refreshes were accomplished through internal budgetary reallocations of State funds. A comprehensive budget must be developed to support the ongoing maintenance and improvements to the network, hardware and software. Yearly licensing fees, supplies, replacement, repair, and upgrade costs must be considered. In addition to State funds, alternative funding sources must be explored to cover these costs. These sources include, E-rate, Grant funding, and Title 2D. The disadvantage to relying on grants introduces a high level of inconsistency in planning. Yearly budget fluctuations either slight or significant,



disrupts operations and consistency. The district needs to better plan for long-term replacement and upgrade costs and prepare to match necessary funding.

## Support and Maintenance

- **Focus on support, management, security, accessibility.** Davies' technology infrastructure spans 3 buildings, over 150 rooms, and to home via the Internet. In order to maintain and expand services to this complex infrastructure with minimal staffing and cost, a high degree of centralization and automation is absolutely necessary. Classroom and Office computers must be considered as kiosks for learning, teaching, and administration, granting access to needed resources, as opposed to personal property to self install-applications or otherwise personalize.
- **Maintain or increase adequate staffing levels.** Gartner Research places the average technician to user ratio as 1 technician to 70 users. At Davies, our current technician to user ratio is considerably higher especially when factoring in parent support for Gradebook access and students bringing in their own devices. If additional staffing is not possible, then we need to examine ways to reduce the IT workload through outside consultants or outsourcing arrangements. Davies has recently begun to allocate funding as part of each Chromebook order to provide for White Glove Services which include Chromebook and cart configuration and setup. These small steps help to improve turnaround time for technology integration and allow the IT staff to focus on other priorities. Davies's has made strides toward achieving a highly managed network; however more improvement can be made in this area with the exploration of a virtualized desktop infrastructure or similar solution.

Another avenue to explore would be the creation of a centralized help desk to be staffed by either interns or students who have been vetted and trained. We could potentially offer this position to students for academic or work based learning credit.

## Infrastructure

- **Budget and plan for replacement.** Industry replaces their computers and servers on average every three years. Rather than swapping out individual failing computers in a piecemeal fashion, the district needs to replace older devices in a planned manner and in large numbers to take advantage of bulk pricing and configuration advantages. We typically purchase a three year extended warranty for all Chromebooks. At the end of that time period, the district should consider purchasing new devices for all freshmen and allowing them to keep the device through senior year (a possible graduation incentive) as a first step to achieving a 1:1 initiative.
- **Expand services and implement new technologies.** Any technology that improves scalability, affordability, management, and security must be investigated and implemented if feasible. As a result, the district must consider the adoption of Open Source applications to complement the proprietary vendor applications currently installed.
- **"Web-Enable" where feasible.** The web browser has become the universal application interface. The Internet is the largest and most pervasive network reaching our schools and our homes. Davies needs to take full advantage of the Internet, its reach, its economy of scale, its centralization, and its efficiency by converting or migrating its own applications to this medium. All services and applications need to be assessed for possible Internet delivery, including data management and processing, academic and administrative applications, resources and reference. If a web-enabled solution exists over a locally installed or supported application, the web-enabled solution must prevail assuming our infrastructure can support the bandwidth requirements.



- **One to One and/or BYOD Initiatives.** Davies must explore the feasibility of going 1:1. We are almost at a 1:1 ratio now with the number of devices that we currently own. Sharing Chromebook carts between classrooms is less than ideal and does not ensure access for all. Teachers would be able to better plan their lessons using technology if they knew that all students had access to a device every day. School owned Chromebooks are much easier to centrally manage, control and support than a variety of individually owned devices that students may bring in.

Davies revised its Responsible Use Policies to allow cell phone technology into the classroom in order to support and be responsive to the ISTE Standards.



**Summary →Davies Technology Inventory**

Item	Location	Quantity	Function
HP & Dell PC	Classroom/Lab/Library	263	Student Use/Internet
Apple MAC	Shop Area Labs	115	Student Use/Internet
HP All-in-One PC	Admin Offices	45	Admin Support/Internet/State Access
Dell PC	Faculty	85	MMS/Pinnacle/Internet
Network File Servers	MDF/IDF 5	7	File/Print/Application/Proxy
Cisco Switches	MDF & IDF's	19	Internal Network
HP Chromebooks	School Wide	500	Classroom technology
Laptops	School Wide	155	Admin & Classroom Use
FONS Fiber Interface	MDF	2	Connect Backbone
Cisco Switches	MDF & IDF's	8	Security Camera Network
Cisco ASA5510	MDF	1	VPN Appliance
Extreme Switches	MDF & IDF's	13	Wireless Network
Aruba Wireless LAN Controller	MDF	1	Wireless LAN Access
Aruba WAP's	School Wide	104	Faculty/Student & Guest Access

**Summary →Davies Funding→Budgeted**

Category	Fiscal 2016	Fiscal 2017	Fiscal 2018
<b>Technology Maintenance:</b>			
Supplies, Agreements, Equipment	\$49,490	\$43,000	\$48,000
<b>Internet – Less E-Rate</b>	\$3,300	\$3,438	\$3,500
<b>Professional Development:</b>			
Title II	\$43,903	\$41,379	\$41,501
Perkins	\$6,943	\$6,300	TBD

**Proposed Projects - Estimated:**

Virtual Desktops			\$10K
Windows Server 2016		\$2K	
Hyper Converged Infrastructure		\$25K	
VMWare Tools	\$6K	\$1K	
IT Training	\$6K	\$4k	\$4k



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