

redesigning  
the high school  
EXPERIENCE

for College and Career Readiness  
A GUIDE FOR SCHOOL LEADERS

**Volume 4**

*“Inviting Students to Excellence through  
Information Technology”*

Dunbar High School  
Fort Myers, Florida



# REDESIGNING

## THE HIGH SCHOOL EXPERIENCE FOR

### COLLEGE AND CAREER READINESS

#### INTRODUCTION TO THE SERIES

The National Career and Technical Education Foundation (NCTEF) and Microsoft Corporation's U.S. Partners in Learning program have partnered to develop this guide for the series, "College and Career Readiness Program." The series showcases success stories of high schools that are creating a different kind of learning experience. The goals are to engage and educate students and successfully overcome the challenges of students dropping out and lack of preparation for college and career. These schools implement meaningful and relevant programs of study for students aligned to career clusters and 21st century skills. They provide examples and inspiration for other school leaders looking for best practices to guide the same success.

Each guide highlights an innovative initiative designed and launched to give students a high-impact experience within one of the school's programs of study. The initiatives provide a highly visible and tangible activity related to the knowledge and skills required in a career cluster. The goal of each guide is to tell the story of how the school successfully brought the initiative to life, sharing tips and insights for school leaders interested in aligning their curriculum to the Career Clusters model.

#### About the Partners

##### National Career Technical Education Foundation

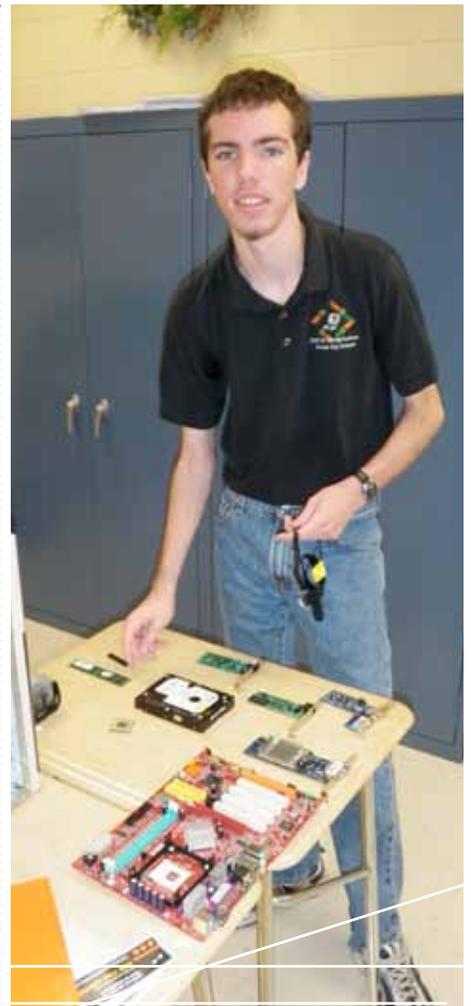
The National Career Technical Education Foundation (NCTEF) is a partner organization to the National Association of State Directors of Career Technical Education Consortium ([www.careertech.org](http://www.careertech.org)) and supports the association's goals and objectives through its 501(c) 3 status. The purpose of NCTEF is to develop and fund activities and programs that are designed to improve the career technical education system at the secondary, postsecondary and adult levels. NCTEF manages the States' Career Clusters Initiative, a nationwide effort designed to transform learning, modernize career technical education and improve student success.

##### Microsoft Corporation

Through the Partners in Learning (PiL) program, Microsoft is investing its resources—people, partnerships, services, philanthropy, and products—to stimulate positive change in education. Microsoft wants to help develop individuals and academic organizations to support 21st century learning, digital inclusion, and education reform. PiL projects all aim to:

- Create new 21st century learning communities.
- Help existing schools transform into 21st century learning communities.
- Develop skilled and innovative leaders.
- Increase adoption of innovative learning solutions through scale.

Because Microsoft believes that successfully creating and transforming learning communities can only be done through partnership, we work closely with educators, schools, school districts, state departments of education, and other organizations to create diverse projects that can serve as models for the future. For more information visit <http://www.microsoft.com/education/uspil/default.aspx>.



# CAREER CLUSTERS

CAREER CLUSTERS ARE GROUPINGS OF OCCUPATIONS USED AS AN ORGANIZING TOOL FOR CURRICULUM DESIGN. INSTRUCTION IN A CAREER CLUSTER PREPARES LEARNERS FOR A FULL RANGE OF CAREER OPPORTUNITIES WITHIN THE CAREER CLUSTER, FOCUSING ON CRITICAL KNOWLEDGE AND SKILLS THAT ARE TRANSFERRABLE AS NEW OPPORTUNITIES ARISE AND THE INDUSTRY CHANGES.

## Career Clusters Framework

Career Clusters are groupings of occupations used as an organizing tool for curriculum design. Instruction in a career cluster prepares learners for a full range of career opportunities within the career cluster, focusing on critical knowledge and skills that are transferrable as new opportunities arise and the industry changes. Nationally, 16 career clusters are recognized with 79 career pathways identified. This collection of career clusters and pathways present a way to categorize thousands of occupations currently available.

The Career Clusters framework is an approach used by schools to orient career exploration and career guidance, select curriculum offering, show relevance of academic courses, and engage community civic and business leaders in partnerships. This approach differs from a system where schools provide instruction on specific occupations, often separate from the general curriculum. Career Clusters is valuable in supporting effective transitions between secondary and postsecondary education by impacting the design of programs of study offered by a school. A program of study is a sequence of instruction consisting of coursework, co-curricular activities, work-site learning, service learning and other learning experiences. Approved programs of study are required for school systems to be eligible for federal Carl D. Perkins funds that support career and technical education.

## The Information Technology Career Cluster

Broadly, IT careers involve the design, development, support and management of hardware, software, multimedia and systems integration services. The IT industry is a dynamic and entrepreneurial working environment that has a revolutionary impact on the economy and society. In addition to careers in the IT industry, IT careers are available in every sector of the economy – from Financial Services to Medical Services, and from Business to Engineering and Environmental Services. The Information Technology Career Cluster identifies four career pathways:

- **Network Systems** - Includes careers that are involved in network analysis, planning and implementation, including the design, installation, maintenance and management of systems.
- **Information Support and Services** – Careers involve IT deployment, providing technical assistance and managing information systems.
- **Programming and Software Development** - Includes careers that design, develop, implement and maintain computer systems and software.
- **Web and Digital Communications** – Includes careers that create, design and produce interactive multimedia products and services, including development of digitally-generated media used in business, training, entertainment, communications and marketing.



## CAREERS IN THIS CLUSTER

Animator  
Application Integrator  
Computer Programmer  
Data Communications Analyst  
Database Administrator  
Enterprise Systems Engineer  
Game Programmer  
Graphic Artist  
Help Desk Specialist  
Multimedia Producer  
Network Administrator  
Network Technician  
Operating Systems Designer  
PC Support Specialist  
Security Administrator  
Software Applications Architect  
Technical Support Engineer  
Technical Writer  
Virtual Reality Specialist  
Web Designer  
Webmaster



## DUNBAR HIGH SCHOOL:

### Information Technology Cluster

The Academy for Technology Excellence (ATE) & Academy for Digital Excellence (ADE) programs at Dunbar High School offer 9th-12th grade students a competitive edge in multiple IT career pathways. Through an immersive curriculum taught by industry certified instructors, students are equipped with the training and skills necessary to achieve multiple industry standard technical certifications for careers such as Technical Specialists, Network Engineering, Enterprise Systems Engineering, Desktop Support Specialists, Web Site Designer and more. In addition to the cluster-focused curriculum, a variety of Advanced Placement (AP) and dual enrollment credit courses are also offered for students, paving the way toward college and career readiness.

## MICROSOFT® IT ACADEMY

The Microsoft® IT Academy program provides a cost-effective, global learning solution for schools to help bridge the worlds of education and work. Whether K-12 school programs in the United States or across the globe are preparing students for future higher education or future employability using Microsoft technologies, the IT Academy program provides an education framework for teachers, staff and students and a connection to industry-demand skills and validation. Highlights of the program include:

- Access to a wide variety of Microsoft curricula and certifications
- Extensive teaching resources
- Rich, online learning for teachers and students anytime, anywhere
- Software licenses for lab and classroom use
- A wide range of instruction, from computer basics to high-level programming and architecture

For more information visit: <http://www.microsoft.com/education/msitacademy/default.aspx>

“Challenging yourself! That’s what the academy is all about.” Evan – Student in the Academy for Technology Excellence

# VISIONARY LEADERSHIP

## IDENTIFYING THE OPPORTUNITY

- Dunbar High School is located in Fort Myers, Florida (see map).
- Dunbar is one of 13 public high schools in the Lee County Public School District. The school district serves approximately 80,500 students in Lee County, Florida.
- There are 848 students enrolled in grades 9-12 at Dunbar High School. Three hundred of these students are enrolled in the Academy for Technology Excellence (ATE) or the Academy for Digital Excellence (ADE). Admission to Dunbar High School is through a lottery process from the Office of School Choice. Then, any student who wants to enroll in either Academy must apply and complete an application to enroll in the ATE or ADE programs.



- Approximately 95 percent of the students enrolled in the Academy for Technology Excellence program for all 4 years graduated high school. About 85 percent of those graduates went on to college or the military.
- During the 2008-09 academic year, approximately 62 percent of students grades nine through 12 at Dunbar High School qualified for free or reduced-price lunch. Among students enrolled in the academy, approximately 73 percent qualified for free or reduced-price lunch.
- The student population in the Academy is 47 percent African American, 28 percent Caucasian, 21 percent Hispanic, and 4 percent other.
- According to data from the Lee County Economic Development Office, the three largest employers in the area include the public school system, healthcare systems, and retail. The fastest growing occupation areas within the IT field are network systems and data communications analysts.
- The Academy for Technology Excellence started with a program of study in Network Systems and Information Support and Services Pathways. In 2009 Dunbar added the Academy for Digital Excellence to the IT cluster, which offers programs of study in Web and Digital Design pathway.
- Students may acquire over 18 internationally recognized IT credentials through participation in the academies available at Dunbar High School.

In the early 2000s Dunbar High School faced several daunting challenges. At that time, decreasing student enrollments, fledgling levels of academic achievement and the risk of minority group isolation created a need to rethink the high school experience. School Principal, Carl Burnside, reflected on the situation, “There was a significant need for a unique, rigorous and relevant attractor program that could attract a diverse student population to the school.” The school identified the growing role of technology in virtually every career as a possible area to pique the interest of students across the large school district. The school also identified the Magnet Schools Assistance Program, a federally funded competitive grant, as a potential source for funding the new program. With some initial ideas and a funding source in mind, the school looked to key stakeholders in business and postsecondary education for guidance in shaping this idea into a full-scale solution.

The school sought out a local expert to assist with the development and implementation of an IT education program. At that time, Jana Hambruch was the Director for the Center of Technology Education at Florida Gulf Coast University in Fort Myers,

Florida. She noted, "There were several factors in our local economy that made Dunbar's initial concept very viable. Unemployment was on the rise as was the need for additional technical training, re-training, and workforce development. Many of the adult learners I encountered at the university sincerely wished they had more opportunities for technical training and certification at an earlier stage in their education." Mrs. Hambruch was hired to write the Magnet Schools Assistance Program application using her knowledge of the IT industry and postsecondary IT program administrator. Principal Burnside commented, "Looking back, a critical factor in the success of this initiative was the fact that the program design was well rounded from day one. It was important to have both industry and educators at the table when designing the program." The solution generated was a program that would offer a rigorous curriculum leading to a variety of IT industry certifications. The envisioned program leveraged the benefits of IT certification and college credit to attract students of all backgrounds.

In 2004 the school received a three-year, \$3.3 million federal grant through the Magnet Schools Assistance Program. This was the catalyst for implementing the Academy for Technology Excellence program. Mrs. Hambruch, reflected, "Having seed money was essential. You cannot have this type of program without up-to-date equipment, certified teachers, and industry-based curricular resources such as those available from quality programs like Microsoft IT Academy. Having clarity around the problem we were trying to solve, a vision for the program, and seed money to make it happen were three essential components that allowed us to seize the opportunity and begin to redesign the high school experience at Dunbar."

"I already have a competitive edge in the job market. On my first interview I learned that my certifications could substitute for years of experience with some organizations. It reminded me of the tremendous opportunity I had through the Academy." Danny – Graduate from the Academy for Technology Excellence



## THE AGILITY TO INNOVATE

"As an instructor, staying current in the field of digital media and design is important to me. In a program like this it is important for instructors to have a true interest in what you are teaching."  
Rita Effing – Academy for Digital Excellence Instructor

Agility is defined as the ability to move quickly and easily. School leaders at Dunbar have focused on creating the infrastructure and securing the resources necessary to ensure that they are able to maintain the agility of the program; to seize new opportunities while operating within the constraints of a secondary setting.

- **Seed Money and a Vision to Begin the Effort** – As leaders at Dunbar reflected upon the development of the Academy programs, they highlighted the importance of securing seed money and having a clear vision for the effort. Mrs. Hambruch commented, "If you don't know what you're trying to build, find someone who does." Having a clear vision and purpose for the program is also critical to securing any type of seed money to fuel your reform effort.
- **Strong Public Relations Efforts** – The list of publications highlighting the academies at Dunbar High School is extensive and notable. This is not by accident. Denise Spence, Lead Academy Teacher, is responsible for public relations regarding the school's achievements. She noted, "It is vital to keep the achievements of your students and teachers in front of your most important stakeholders as often as possible." Mrs. Spence prepares press releases for local media outlets to share key events at the school. She leverages relationships with key vendor companies Microsoft to create large events that generate media buzz in local media and online. Beyond the community, Mrs. Spence submits proposals to "tell the Dunbar story" at industry and education related conferences. Internally, she also shares program success with all teachers at Dunbar, with administrators across the district, and with the school board. Public recognition of the program translates into new opportunities for students and leads to additional funding resources. Further, it ensures the program is positioned well when the district considers changes to the budget.
- **Up-to-date Equipment** – Leaders at Dunbar noted that it is essential to have up-to-date equipment for a program like this to work. Cherise Trent, Assistant Principal of Curriculum, noted that keeping equipment up to date required shifting away from the previous requisition and equipment evaluation process. She said, "This field changes so quickly and for the program to remain relevant to students and the industry we must keep up." As such, the school has implemented a shortened requisition process for the academy program. The lead teacher oversees this process and is in charge of prioritizing purchases.



# THE BOTTOM LINE: STUDENT SUCCESS

## AND 21<sup>ST</sup> CENTURY SKILL DEVELOPMENT

“I think it speaks volumes about our students and this program when the first question students ask if they do not pass is, when can I take it again?” Jana Hamburch – Program Director  
Lee County Public Schools

A critical aspect of redesigning the high school experience is the development of skills to thrive in a fast-paced, technically sophisticated economy. Students at Dunbar High School are learning and practicing 21st century skills through experiences in The Academy for Technology Excellence and The Academy for Digital Excellence programs. Analyzing these unique programs reveals several best practices for encouraging 21st century skill development including integrating internships as part of the curriculum and offering industry recognized credentialing opportunities.

- **Integrating Internship Experiences into the Curriculum** – Students completing this experience have the opportunity to apply what they are learning through internships with business and industry partners in the local community. Program leadership for the Academy works with a Business Advisory Committee to identify internship opportunities in the community. Internship opportunities range from PC Repair Technician for Computer-Me-Tutor, to working in local technical support centers at the headquarters for Chico’s, Inc., to serving as a network technician for First Community Bank of SWFL. Denise Spence noted “While we count on our Business Advisory Committee to offer internship opportunities, we also leverage the Committee’s professional network to cast a wider net so that we can provide this experience to as many students as possible.”

Shelly Osterhout, Business Advisory Committee member and owner of Computer Specialists of America, Inc., has provided over 30 internships to students at the school. As a business owner, she views this as a win-win for students, the program and businesses. “Through hiring interns from this program, we are able to tap into a younger generation who knows more than many of the technicians in the job market. Students come to us with technical skills and in return the internship supplements the curriculum by providing additional real-world problems to apply what they are learning. The internship also adds an important component to the curriculum in that it provides an opportunity to learn and practice many of the soft skills that are very important in this industry such as customer service, time management and prioritization.”

- **Offering Industry Recognized Credentialing Opportunities** – Students have the opportunity to earn industry-recognized credentials through completion of the Academy’s curriculum. Mr. John Witenko, Business Advisory Committee member from First Community Bank, is an advocate for this aspect of the program. He said, “I wish a program like this had been in place when I was in high school. I entered the workforce with a masters degree in IT, and I still needed the certifications students at this school are earning. A degree is not enough in this technically sophisticated field and competitive job market.”

The program was designed around the opportunity to earn industry-recognized credentials, such as those offered through the Microsoft IT Academy program. Since beginning the Academy at Dunbar High School 5 years ago, over 1,675 IT certification tests have been passed to date. Program stakeholders at Dunbar cited five important things to remember when offering credentials:

- Check with business and industry and higher education before selecting a credential. Ask yourself if the credential will be meaningful to employers. Look at employment data from the state or region to qualify the certification’s value. Further, consult with postsecondary partners to determine if the credential may substitute for credit at their institution.
- Select a rigorous curriculum that aligns to the chosen certifications. Jana Hamburch highlighted important advice in this area, “Stick with the vendor when selecting your curriculum. For instance, we offer the Microsoft certifications, as such we also use Microsoft’s Official Academic Curriculum.” Mrs. Hamburch noted that the vendor typically has aligned the curriculum very closely with the objectives of the industry certification.
- If possible, find ways to pay the testing fees for students. One hundred percent of the test fees are budgeted and paid for by the School District of Lee County through the Florida Department of Education Perkins’ grant funds. Mrs. Spence noted that students approach the testing situation differently because the fees are covered. Students recognize that the district is offering them something they might not be able to afford on their own and tend to work harder to pass the exams in return.
- Arrange for students to complete the tests on your campus. Dunbar High School has a fully functional testing center, including a certified proctor, on campus. Mrs. Hamburch highlighted that this is essential to the design of the program. Having the flexibility for students to access the testing center without making additional arrangements allows more time in class and gives instructors more flexibility for pacing the curriculum to meet student needs.
- Invest in test training tools to determine student readiness. Students and instructors in the academy have access to training tools from key vendors like Microsoft to prepare for the certification exams. They also invest in other training tools such as Certiprep, Transcender and Learn Key.



## SPOTLIGHT ON SUCCESS

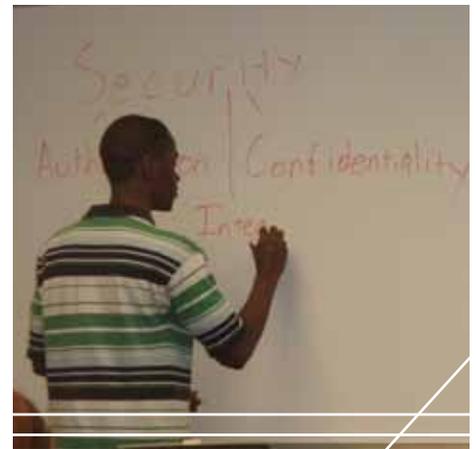
Check out more about Dunbar High School in this Microsoft Showcase Video titled *Real Life Heroes: Dunbar High School Academy for Technology Excellence*. <http://www.microsoft.com/showcase/en/us/details/c8fd04a6-d2c5-45ee-acb8-4d9657141317>

# INNOVATIVE LEADERSHIP AND TEACHING



Another critical aspect involved in redesigning the high school experience for college and career readiness involves a transformation of teaching and leadership practices. Closer examination of the program at Dunbar reveals several critical practices to consider.

- Industry Certified Instructors** – Beyond being licensed educators, teachers in the Academy also have the industry-certifications for the areas they teach. The school district pays for teachers to complete the initial certification and any subsequent testing to keep the certification up-to-date. The teachers and students both reflected that this practice leads to mutual respect in the classroom. Requiring teachers to have this certification leads to a deeper understanding of the material and a deeper understanding of students’ needs as they learn the material. On the other hand, students noted that knowing their teacher is certified led to a deeper respect as well as a sense of pride in the fact that they were working toward a credential that a respected “adult” also earned. Further, certifying the teaching staff has opened the door to providing the same training for other instructors and IT staff across the district. This demonstrates the scalability of the program model and the training of other subject area instructors has resulted in more of those instructors incorporating productivity applications such as Word™, Excel™, PowerPoint™, and Access™ into their classroom instruction.
- Lead Teacher as a Liaison to the Administration and Community** – As part of the program design, a lead teacher position was built into the budget. This person plays a critical role as a liaison between what is happening in the classroom and other key stakeholders in the school and community. At Dunbar, this individual manages the Business Advisory Council, works to promote the program within the school and across the district, manages vendor relationships, coaches the teaching staff, oversees recruitment and retention efforts, manages the testing center, and assists in advising students. Teachers and students identified this particular role as indispensable to the program’s success. Mr. Dan Trembley, Academy Instructor, said, “Mrs. Spence allows me to focus on my classroom and my students. The division of labor is essential. The program could not survive without leadership from this individual and an intense focus on a quality classroom learning experience.”
- Making Learning Meaningful** – Being effective as a teacher in this program requires a focus beyond passing the certification tests. One of the challenges teachers face is finding ways to make the learning meaningful. Several of the certifications in this area have a tendency to focus on recall of information and facts. This can lead to burn out at the high school level. To address this issue, teachers in the academy have learned to incorporate techniques such as:



- advance organizers to help students restructure the information in more meaningful ways,
- hands-on exercises where students get to test out what they are learning,
- making connections to related subject areas such as reading, math and science,
- bringing in business and industry leaders to present real-world “thought challenges” where students can apply what they are learning to real-world IT problems, and
- facilitating community service projects where students use their knowledge (such as a computer refurbishment project, where old computers are repaired and then donated to families in the community).

Efforts to make learning meaningful have resulted in improved Florida Comprehensive Achievement Test (FCAT) performance. Every year since 2006, students in the magnet program have consistently scored above the state and district averages on the reading and math portions of the FCAT. The following table summarizes 2006-2009 data and demonstrates how 9th and 10th grade students in the magnet program outperform peers’ average scores on the reading and math portions of the FCAT over the three-year period.

	Average Points Above 9th and 10th Grade Peers in the District	Average Points Above 9th and 10th Grade Peers in the State
Reading	128	126
Math	43	57

“I’ve had the opportunity to teach in a similar program in another state. Unfortunately, it was not as successful as the program at Dunbar. Adequate funding and the administration’s trust in the staff to do our jobs are differentiating factors that make the Academy for Technology Excellence a success.” Matt Miller – Academy for Technology Excellence Instructor

# PARTNERSHIPS THAT MAKE A DIFFERENCE

“The Academy for Excellence in Technology inspired my imagination.” James - Student in the Academy

Collaboration is a hallmark of many successful efforts to redesign the high school experience. Dunbar High School leaders recognize the integral role partnerships play in making this program successful. Partnerships have resulted in funding, recognition opportunities, professional development, dual enrollment credit, strategic connections within the school district, and learning from other schools. Several of the partnerships leaders at Dunbar High School recommended pursuing include:

- **Business Advisory Committee** – This group is made up of business leaders from the local community. The committee helps to analyze trends in technology and makes recommendations regarding the curriculum to ensure students are marketable in the workforce. In return, the program provides networking opportunities for the business leaders on the committee, as well as, a source for qualified interns. The committee also works to create awareness about the program to help solicit support for the program throughout the year.
- **College and University Partners** – Key postsecondary partners such as Florida Gulf Coast University, Hodges University, Southwest Florida College, Rasmussen College, Edison State College, and ITT Tech have established dual enrollment agreements with Dunbar High School. The colleges and universities benefit by creating a pipeline of motivated and self-directed students for their institutions and students benefit by entering their postsecondary program with several college credits.
- **Lee County Public School District** – While the district in which the school resides may not immediately seem to fit the typical definition of “partner,” leaders at Dunbar indicate that this is one of the most important partnerships to the program. Principal Burnside noted that it is important for the program to demonstrate how it can tie into strategic improvement plans within the district. Staying involved with the district administration team and recognizing opportunities to leverage the program at Dunbar to advance district school improvement goals is an important aspect of this partnership.
- **Professional Associations and Other School Districts** – The leaders at Dunbar noted that professional associations such as Microsoft Learning, Adobe Education, CompTIA Education Foundation, SW Florida Regional Technology Partnership, SW Florida PC Users Group, the Association of Information Technology Professionals and other school districts with an IT program are also key partners. Mrs. Spence noted that these groups provide networking and professional development opportunities for the instructors, student programs, and knowledge sharing opportunities.

# TECHNOLOGY FOR 21<sup>ST</sup> CENTURY LEARNING

Technology is obviously core to the success of this program. Analysis of Dunbar High School’s unique program reveals several principles for effective incorporation of technology to promote 21st century learning. First, make it a priority to put students in touch with best-in-class learning tools designed to support the program. Second, rely on support from quality vendors to stay on top of current needs for the program.

- **Best in Class Technology Tools** – Academy Instructors Matt Miller, Dan Trembley, Rita Effing, and Mark Hufnagel all noted the importance of having the right learning tools to facilitate this curriculum. Mr. Hufnagel, who teaches the first tier of the program with ninth grade students, noted that it’s important to have resources for the students to “tinker” with while they are learning. He suggests that it is important to have a mixture of high quality equipment as well as some “breakable” equipment that teachers do not have to worry about students breaking. Some essential learning tools the teaching team recommended include:
  - Business grade office furniture
  - Interactive Smartboards
  - LAN School monitoring
  - LCD monitors and PCs with removable hard drives
  - “Breakable” computers and tool kits
  - Real switches and routers
  - Internal LAN
  - Networking tools
  - Classroom performance system
  - Simulator software
  - Virtualization programs
- **Quality Vendor Support** – The leadership team at Dunbar also noted the importance of finding and maintaining quality vendors. Dunbar has aligned their program with key vendors like Microsoft, CompTIA, and Adobe. For example, the academy is a certified Microsoft IT Academy. Students benefit from this alignment with a key partner like Microsoft by receiving internationally recognized industry certification opportunities and rigorous training. The program also benefits from the technical support, online resources, and discounted vouchers for testing.

“I begin Tier 1 with an overview of the IT industry. Students always leave amazed at how many opportunities there are in this field.” Mark Hufnagel – Academy for Technology Excellence Instructor





# ENACTING CHANGE IN THE REAL WORLD

As with any large initiative, obstacles will emerge, and solutions must be generated to deal with them. The Academy developed at Dunbar High School is no exception to this rule. Jana Hambruch, Program Director, recalled that the most significant challenge they faced was maintaining the “fidelity” of a program of study that is typically enacted in professional or postsecondary settings into the constraints of a secondary school. She said, “It was important to us that we didn’t water down the curriculum, but that we did make appropriate adjustments for the context and students.” As a result, the group has to address issues such as scheduling, infrastructure, curriculum, and finding qualified instructors.

- **Scheduling** – One of the first issues the planning group had to tackle was scheduling. The high school operated on a traditional seven period days. However, it was essential that students had more class time than typically afforded in this type of schedule. The group initially solved this issue by placing students in the academy in back-to-back class periods where they had adequate time for the instructional activities specified in the curriculum. Recently the school moved to a block schedule. Denise Spence, Lead Academy Teacher, noted that this was a valuable shift for the students and teachers. Beyond ensuring the proper amount of class time, Assistant Principal Trent also suggested several techniques from her experience with building a high school schedule around this unique program:
  - Offer options for fitting in classes required for graduation such as online classes from partner institutions and statewide initiatives.
  - Establish several “scheduling scenarios” to ensure students in the program will meet graduation requirements.
  - Ensure students develop a four-year plan when they enter the program – it is not possible to schedule in isolation.
  - Make sure students and parents are aware of graduation and scholarship requirements when they begin the journey.
- **Establishing a Flexible Plan of Study** – When the Academy began, the plan of study was aligned with grade levels. The intent was that students would begin with the first year and finish in the fourth. After the first few years of implementation the leadership at Dunbar found that this approach didn’t offer flexibility for easy transition into and out of the program of study. Mrs. Spence noted, “The program isn’t for every student. If a student decides this isn’t for them they need to be able to transition out of the program. Likewise, often, students decide that the program is for them after their ninth grade year. We want to welcome those students too.” To create a more flexible approach the school leaders decided to establish four tiers within the program of study for the academy. Each tier focuses on the development of a different set of IT related skills. While a student may complete the tiers sequentially, they can also “jump in” to the program at any of the first three tiers provided they demonstrate readiness through a placement interview with the lead teacher. By making each tier independent of the next, the leadership was able to create a more flexible program of study that could better support student transitions in and out of the courses as needed.
- **Classroom Environment** – Initially the program faced healthy skepticism from the district IT staff. The program designers requested open access to the computers within the classroom’s technology backbone. The IT staff at the district level was hesitant, and rightly so, to provide this level of access for students. However, as instructors and students noted, open access to the classroom computers is essential for the classroom environment to be conducive to the kind of work involved in an IT training program. For instance, working in an open environment with full permissions is essential to learning how to set up and maintain a network system. As a compromise, program leaders at the academy worked hand-in-hand to design an architecture that would provide the program an IT “bubble” in which they would operate off the school district’s network to ensure the integrity of the district wide network.

## CREATE VALUE WITH CREDENTIALS

The Academy offers a variety of industry-recognized certifications (see list below) through several plans of study. The district estimates a fair market value for this training of approximately \$50,000. Further, according to national workforce and economic development trends, entry-level employees with one or more of these credentials will have earning potential ranging from \$35,000 to \$50,000 annually.

- CompTIA A+ Essentials/ IT Technician
- CompTIA Network+
- Cisco Certified Entry Network Technician
- Cisco Certified Network Associate
- Microsoft Certified Professional
- Microsoft Certified Desktop Support Tech
- Microsoft Certified Systems Administrator
- MCTS: Windows Server 2008 Active Directory Configuration & Network Infrastructure Configuration
- MCTS: Microsoft Windows Vista
- MCITP: Enterprise Support Technician
- MCITP: Enterprise Administrator
- Microsoft Certified Application Specialist
- Adobe Certified Associate

# KEY ISSUES TO SUSTAINING INNOVATION

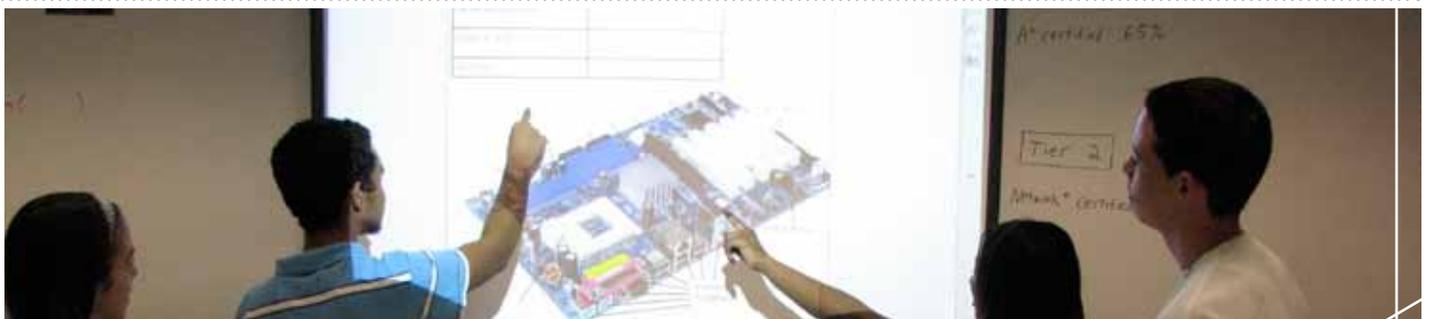
The Academy for Technology Excellence and Academy for Digital Excellence programs at Dunbar High School provide students with a life changing experience. The program leaders have honored the importance of planning for sustainability from the very beginning of the program. They identified attracting and retaining qualified instructors, generating student interest, and securing funding and support as the key issues to sustaining innovation.

- **Attracting and Retaining Qualified Instructors** – Students in the program at Dunbar will quickly tell you that their instructors are the most critical aspect of the program’s success. Principal Burnside attributed his success in attracting and retaining quality instructors to candor during the interview and selection process. “The teachers need to know what they are committing to. This is a different type of classroom and a different type of student. Teachers also need to be aware of my expectations. Being candid during the process saves everyone a lot of time.” In addition, he noted three important qualities to look for include coachability, passion for the subject matter and a sincere desire to work with students.
- **Generating and Maintaining Student Interest** – Jesse, a student in the Academy for Technology Excellence, attributed much of the program’s success to the prestige the program holds in the community. “Seeing other students be successful made it an easy choice for me to attend Dunbar.” Jesse is not alone. Parents like Belinda Bell also note the key role public relations play in generating interest in the academy. “I am proud that my son Danny had this opportunity. We read about this opportunity in the paper and encouraged him to apply for the program.” Positioning the program’s success to parents and students across Lee County is essential to generating interest. It is also essential to maintaining student interest. Students in the program noted that they are honored to be “in the news” because of their achievements through the program.
- **Securing New Sources of Funding and Support** – Program leaders identified funding and support as another essential component to program sustainability. The Business Advisory Committee plays a central role in extending the community the school has available to draw upon for support and, in some cases, funding. Program leaders also noted the importance of staying abreast of statewide and federal initiatives and funding trends. The leadership also cited that it was important for them to establish a relationship with a 501(c)3 organization dedicated to supporting the school district. Over time they found that many of their private donors desired the tax benefits of donating to an organization with this non-profit designation. The non-profit, the Foundation for Lee County Public Schools, was established to support Lee County public schools and acts as a fiduciary for some of the funds donated to the program. Finally, the program team noted the importance of staying involved in professional organizations related to the industry and education. Many times these organizations have knowledge or access to funding sources that are difficult to find.
- **Building for Scalability** – The program was built with scalability in mind. The program design and working with resources from national partners like Microsoft IT Academy and CompTIA contribute to the scalability of the program. Currently, the program model and resources have been leveraged to develop several other Microsoft IT Academy certifications for teachers and students at schools across the district. Future plans include working with partners like Microsoft to scale the program to all students in the district as well as branching out to other schools and workforce development sites statewide.



I credit the Dunbar High School teachers, staff and students with blazing a trail by creating a model for developing a sustainable, work-ready educational program for our next generation workforce. Their work is a testament to the power of collaboration between education and industry. Jeff Johnson - Academic Area Lead, Microsoft Learning IT Academy North America

“The program has to have a life of its own. It needs to be based on a strong design and strong connections in the community and industry.” Jana Hamburch – Program Director Lee County Public Schools



Find additional guides from this series at:

[www.careerclusters.org/publications.php](http://www.careerclusters.org/publications.php)

or

[www.microsoft.com/education/uspil/downloads/](http://www.microsoft.com/education/uspil/downloads/)

# RESOURCES TO ENACT CHANGE

The following are free resources available from the States' Career Clusters Initiative.

## Career Clusters Brochures

These brochures provide an overview of the careers and fields of study in the career cluster. Each brochure discusses employment outlook and encourages students to prepare for both college and career. <http://www.careerclusters.org/resources>

## Sample Plans of Study

The sample plans of study can be used by schools to identify the academic courses, CTE courses, and other experiences or activities that can contribute to careers in a pathway. The plans of study become excellent guidance and planning tools. <http://www.careerclusters.org/resources/web/pos.cfm>

## Critical Components for Implementation of Career Clusters - Local Rubric

Those school systems successfully implementing Career Clusters have identified 15 critical components for success. This rubric helps school leaders evaluate progress in implementing Career Clusters and establish objectives for further development. <http://www.careerclusters.org/publications.php>

## Knowledge and Skills Charts

National advisory committees have developed and maintained Knowledge and Skills Charts for each of the 16 Career Clusters and 79 Career Pathways. Each chart identifies the knowledge and skills common to all careers in that cluster/pathway. <http://www.careerclusters.org/resources/web/ks.php>

## Student Career Interest Survey

A free career guidance tool that helps individuals identify the top three Career Clusters of interest. This pencil/paper survey takes about fifteen minutes to complete and can be used in the classroom or for presentations with student audiences. <http://www.careerclusters.org/ccinterestsurvey.php>

The following free resources available from the Microsoft Corporation, through US Partners in Learning, MS Research, and other programs

## Career Forward

Career Forward. Is an online, emotionally-engaging, media rich course that can be used in the classroom or as a stand-alone. It helps students understand the importance of competing in a global economy. <http://nroc.careerforward.org/careerforward/>

## Partners in Learning Network (PILN)

To help administrators and teachers connect with their peers and find trainings and resources to support their work, encourage them to sign-on to the PILN. <http://www.us.partnersinlearningnetwork.com>

## Establishing Public/Private Partnerships

States, districts, and schools all agree that the private sector can help think through cost efficiencies and understand how to leverage business expertise. This paper describes how to form successful education/ business partnerships. <http://www.microsoft.com/education/public.mspix>

## Scale Online Tutorial

The best way to save money is to offer existing programs to more students without increasing costs. This is thought of as "scaling up success." This planning tool walks through the process of scaling an existing program across schools, districts, and even states. <http://www.microsoft.com/education/demos/scale/index.html>

## Education Competency Wheel

This competency wheel offsets these costs by outlining four professional proficiency levels for each of the 37 competencies and self-assessment guides to measure professional ability. <http://www.microsoft.com/education/competencies/default.mspix>

## Digital Citizenship and Creative Content

Intellectual Property is a critical 21st century issue we all face. Help students understand creative rights and how to be good digital citizens with this online curriculum. <http://www.digitalcitizenshiped.com/>

## Digital Literacy Curriculum

Offer digital skill development to your students by pointing them to this outstanding curriculum. From using the Internet, to sending e-mail, this curriculum helps you develop the essential skills you need to begin computing with confidence. <http://www.microsoft.com/about/corporatecitizenship/citizenship/giving/programs/up/digitalliteracy/default.mspix>

## Channel 8

Channel 8 is THE place to be for STUDENTS who want to code, connect and create technology. Stay plugged into tech news and share in the experience with students around the world. <http://channel8.msdn.com/>

## Elevate America

Microsoft is committed to strengthening the U.S. economy and increasing global competitiveness by improving access to education and workforce-readiness skills required for twenty-first century jobs. ElevateAmerica is an initiative designed to provide 1 million vouchers for Microsoft E-Learning courses and select Microsoft Certification exams at no cost to recipients. <http://www.microsoft.com/about/corporatecitizenship/us/communityinvestment/elevateamerica.aspx>

# SAMPLE PLAN OF STUDY

This sample plan of study shows the courses suggested for a student interested in the Information Technology Career Cluster. The plan emphasizes college preparation and career-related courses and activities that position the student for success in a broad array of information technology related fields.

To download this sample in either PDF or Microsoft Excel format, visit [www.careerclusters.org/resources/web/pos.cfm](http://www.careerclusters.org/resources/web/pos.cfm). Sample plans of study for all 16 career clusters and 79 pathways are available.



## Information Technology: Network Systems

### Career Pathway Plan of Study for ▶ Learners ▶ Parents ▶ Counselors ▶ Teachers/Faculty

This Career Pathway Plan of Study (based on the Network Systems Pathway of the Information Technology Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. \*This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

# SAMPLE

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Network Systems Pathway	SAMPLE Occupations Relating to This Pathway
<i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>								
SECONDARY	9	English/ Language Arts I	Algebra I or Geometry	Earth or Life or Physical Science	World History	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities are also important including public speaking, record keeping and work-based experiences.	<ul style="list-style-type: none"> <li>• Introduction to Information Technology</li> <li>• Information Technology Applications</li> </ul>	<ul style="list-style-type: none"> <li>▶ Communications Analyst</li> <li>▶ Data Communications Analyst</li> <li>▶ Information Systems Administrator</li> <li>▶ Information Systems Operator</li> <li>▶ Information Technology Engineer</li> <li>▶ Network Administrator</li> <li>▶ Network Architect</li> <li>▶ Network Engineer</li> <li>▶ Network Manager</li> <li>▶ Network Operations Analyst</li> <li>▶ Network Security Analyst</li> <li>▶ Network Specialist</li> <li>▶ Network Technician</li> <li>▶ Network Transport Administrator</li> <li>▶ PC Support Specialist</li> <li>▶ Systems Administrator</li> <li>▶ Systems Engineer</li> <li>▶ Systems Support Leader</li> <li>▶ Technical Support Specialist</li> <li>▶ Telecommunications Network Technician</li> <li>▶ User Support Specialist</li> </ul>
	10	English/ Language Arts II	Geometry or Algebra II	Biology	U.S. History		<ul style="list-style-type: none"> <li>• Fundamentals of Computer Systems</li> </ul>	
	11	English/ Language Arts III	Algebra II or Pre-Calculus or Trigonometry	Chemistry	Political Science Economics		<ul style="list-style-type: none"> <li>• Introduction to Network Systems</li> </ul>	
	12	English/ Language Arts IV Technical Reading	Pre-Calculus or Trigonometry AP Calculus or Advanced Math	Applied Physics			<ul style="list-style-type: none"> <li>• Network System Design (Students are encouraged to have an internship/capstone experience to reinforce workplace skills.)</li> </ul>	
<i>College Placement Assessments-Academic/Career Advisement Provided</i>								
<i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i>								
POSTSECONDARY	Year 13	English Composition English Literature	Calculus	Chemistry	American Government Psychology	All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.	<ul style="list-style-type: none"> <li>• Network System Installation</li> <li>• Network Administration</li> </ul>	
	Year 14	Speech/ Oral Communication Technical Writing	Computer Applications	Biological Science Physics	American History Geography		<ul style="list-style-type: none"> <li>• Network Systems Maintenance and Support</li> </ul>	
	Year 15	Continue courses in the area of specialization.					<ul style="list-style-type: none"> <li>• Continue Courses in the Area of Specialization</li> </ul>	
	Year 16						<ul style="list-style-type: none"> <li>• Complete Network Systems Major (4-Year Degree Program)</li> </ul>	



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# SAMPLE



www.careerclusters.org  
8484 Georgia Avenue, Suite 320, Silver Spring, MD 20910  
301.588.9630 tel 301.588.9631 fax  
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<http://www.microsoft.com/education/uspil/default.aspx>