Florida Digital Instructional Materials Work Group

Final Report with Recommendations

Contents

Executive Summary

The work group believes that every Florida student in grades K-12 should have equitable access to a device through which each student can access high-quality digital content anywhere and anytime, with each school district retaining the flexibility to determine the approach which best meets its needs. Additionally, Florida's teachers must be provided with ongoing differentiated professional development to guarantee proficiency in utilizing technology to deliver student instruction. The funding required to ensure that Florida's students and teachers are prepared to successfully transition to digital instructional materials should be viewed as an investment, not only in Florida's education system, but also in the state's economic development as a whole.

This work group developed the following specific goals, according to its legislative charge, for the transition to digital instructional materials. The goals and their accompanying recommendations are outlined in this report.

1) Every student must have equal access to a device and educational content meeting each student's curricular needs.

2) Content initially must emphasize core subjects and courses, and be subjected to a thorough and timely vetting process. Content providers should meet industry standards for interoperability for access across devices and operating systems. Existing resources, including Florida Virtual School content and vetted free digital materials, should be accessible to districts and schools through a single portal.

3) There must be on-going differentiated professional development for educators from the teacher education program to new teachers to transitioning teachers. A thorough compilation of current and effective district-utilized professional development tools must be established, focusing on the use of technology as an instructional tool to be shared across the state.

4) Public-private and public-public partnerships must be initiated, expanded and incentivized to enhance the quality of content, devices, infrastructure and professional development, as well as to reduce implementation costs. Incentive programs may include providing seed funding for districts to form partnerships, expanding district spending flexibility, exploring a statewide technology initiative to bring down costs via economies of scale, and utilizing vendor partnerships.

Introduction

In 2010, the Florida Council of 100 declared that our state "faces an emerging Talent Gap — an urgent shortage of a resource as basic as food, more valuable than gold, and in higher global demand than oil," emphasizing that this "crisis in human capital represents a vast and growing unmet need for a highly skilled and educated workforce — our state's most important resource for driving sustainable economic development and a diversified economy."[1] In fact, while Florida's high school graduation rate has increased 18 percentage points since 2003, it still lags that of 43 other states, and Florida's scores on the National Assessment of Educational Progress, which have steadily increased over the past decade, have begun to plateau.[2]
The cost of such deficiencies is staggering. The Council of 100 estimates that

- Every student requiring remedial training costs Florida businesses an annual average of $459 per worker, or more than $3.5 billion per year;
- Every high school dropout loses a quarter of million dollars in direct lifetime earnings and ultimately costs taxpayers up to $288,000 in direct payments and additional costs of health care, public safety and other social programs; and
- Every student who doesn't graduate from college costs the state an additional $6 million in lifetime economic output.[3]

So what can be done? Florida is already at work implementing educational policies and programs that experts say are the foundation of successful K-12 systems, including rigorous standards and assessments, school grading and other accountability measures, and teacher and principal evaluation tools. There is, however, one transformational element that Florida (and most of the nation) has yet to deploy – ubiquitous digital education. The Partnership for 21st Century Skills notes

> How does new technology affect learning? The prevailing technologies of a particular place and time have always been intimately linked with education, because a society's tools are both the subject and the means of its learning. Today, the fact that technology pervades almost every sphere of life – from home to work to play – results in profound implications for learning, both in schools and throughout life. Students are able to connect – and create – with their peers, and with the wider world, in ways that were unfathomable just a few years ago. Learning tools – media, telecommunication and networked technologies coupled with learning science – are rapidly evolving into a powerful support system for acquiring the skills needed for modern life.
>
> These technologies also change our relationship with information and thus, suggest changes in educational goals. With instant access to facts, for instance, schools are able to reconceive the role of memorization and focus more on higher-order skills such as analysis, synthesis and evaluation. Technologies also change the

> ways in which learning takes place. High-bandwidth networks, sophisticated simulations and adaptive software are all creating new opportunities for collaboration and innovation in and among schools and places of work. Software that adapts to the needs of the individual learner may enable teachers to more effectively blend instruction and assessment.[4]

In reality, such comprehensive use of technology in classrooms has been shown to yield impressive student learning results, including better performance on tests, assignments, class discussions, problem solving and a greater interest in science and math.[5] Further, because universal digital learning can help overcome geographic remoteness and personal situation (e.g., income status, special learning needs, language barriers), it has already "proven in many schools and districts to provide greater opportunities for equity and access by helping reduce the dropout rate, address the achievement gap, and ensure that students are prepared for college and a career."[6] As the Digital Learning Council writes,

> Digital learning is the great equalizer. It holds the promise of extending access to rigorous high-quality instruction to every student across America, regardless of language, zip code, income levels or special needs. New tools and improved services will help schools diagnosis and address special learning needs more effectively and efficiently.[7]

Combined with other reforms, digital learning can have a transformative effect on entire educational systems, increasing both productivity and effectiveness.[8] Such instruction "enables the launch and scaling of major-league advances in the quality and variety of curricular content and the ways it is delivered to learners…. It holds unrivaled potential to transform education from a classroom-based activity confined to the hours of 8:00 to 2:30, Monday through Friday, thirty-six weeks a year, into a bona fide 24/7 opportunity that's accessible just about anywhere. Besides all that, it can help boost the productivity of our K-12 system and thus elicit more bang from ever-scarcer education bucks."[9]

In short, the United Nations Educational, Scientific and Cultural Organization (UNESCO) summarizes the overarching reasons for growing the use of information and communications technology (ICT) within education systems as follows:

- Development of knowledge-society attributes in students, including higher-order thinking skills, lifelong learning habits and the ability to think critically, communicate and collaborate, as well as to access, evaluate and synthesize information.
- Development of ICT skills and competencies in students, as preparation for operating in an ICT-rich workplace and society.
- Resolution of structural problems and deficits in education systems. This can include using ICT to enhance administrative and teaching efficiency, alleviate under-resourcing in specific areas (for example, a lack of textbooks or learning support materials), address equity issues through enabling equality of access to knowledge, resources and expertise, or support

teachers who may be under-equipped to deal with new teaching challenges.[10]

Why are all these groups calling for a digital education revolution? Simply put, hard data is pouring in that demonstrates significant learning gains for digitally-enabled students. One example is in the Project RED study. In schools with a 1-to-1 student–computer ratio that practiced four key implementation factors (using technology in every class; monthly principal-led change-management training; daily online collaboration among students; core curriculum using technology at least weekly), this project's schools reported the following:

- 92 percent report disciplinary action reduction;
- 90 percent high-stakes test scores increase;
- 89 percent report dropout-rate reduction; and
- 63 percent report graduation rate increase.[11]

In fact, one of the school districts in the study, Mooresville (N.C.) Graded School District (currently the national model for digital education conversion), has seen students' end-of-grade test proficiency increase by 15 percentage points (tied for third in the state), high school graduation rates increase by nearly 10 percentage points (seventh in the state), and SAT scores increase by 15 percentage points since beginning the conversion about five years ago.[12] Mooresville was also one of only six school districts (out of 115) to meet all of its Adequate Yearly Progress targets.[13] What's truly amazing is that all this improvement occurred despite being ranked 99th out of 115 schools in terms of per-pupil expenditures and seeing an increase in its free and reduced lunch population from 30 percent to 40 percent.[14]

Of course, this is but one example of the educational benefits of digital learning.

- A meta-analysis of 42 peer-reviewed papers published between 1996 and 2003 found a positive significant correlation of .448 with cognitive outcomes, indicating that average students who used technology would be at the 66th percentile while average students without technology would be at the 50th percentile. The authors observed that "the overall effects of technology on student outcomes may be greater than previously thought."
- In South Africa, a three-year randomized controlled study of the large-scale Khanya project showed math scores were significantly higher for students who participated in a technology program. This Khanya project was an award-winning project to provide a technology-rich environment and professional-development activities to students and teachers throughout the Western Cape region.
- William Penuel performed a research synthesis of 19 programs in Europe, the Middle East, Africa and the U.S. that used technology to link home and school. This study found that technology-supported programs produced positive effects on reading achievement (+0.08 to + 0.10), writing (+0.20 to

+0.34), and math achievement (+0.18 to +0.23), as measured by traditional methods and standards.

- A meta-analysis of more than 500 studies indicated that students receiving computer-based instruction tend to learn more in less time. [15]

It should come as no surprise then, that many top-scorers on the Trends in International Mathematics and Science Study and Program for International Student Assessment exams (e.g., Singapore, Finland, China, Taiwan, Japan) are implementing digital learning conversions of their own.[16] While these and many other nations view digital education as vital to ensuring the competitiveness of their students in the 21st century global economy, a similar cry is rising in the U.S., with experts pronouncing that technology and digital learning provide the critical educational support that U.S. students need in order to respond to the increased pressure for greater academic performance and global competitiveness.[17]

The rationale is simple.

> Knowledge of core content is necessary, but no longer sufficient, for success in a competitive world. Even if all students mastered core academic subjects, they still would be woefully underprepared to succeed in postsecondary institutions and workplaces, which increasingly value people who can use their knowledge to communicate, collaborate, analyze, create, innovate and solve problems. Used comprehensively, technology helps students develop 21st century skills.[18]

And because of this, there is now wide consensus that schools cannot possibly prepare students to participate in a global economy without making intensive use of technology and that digital literacy and universal access to high-quality digital learning are considered essential to the building of a comprehensive knowledge-based economy.[19]

Ultimately, however, state, national and international leaders see digital education as being not only essential to providing students with a high-quality education, but also as necessary to further their constituents' economic well-being, i.e., an economic development "game-changer."[20] Education Impact, an international education consultancy comprised of a global network of education and technology experts, writes

> Governments around the world are eager to have their citizens join the digital revolution and to provide their citizens with the knowledge, skills and competencies to propel social and economic development. The provision of universal access to high-quality digital learning is critical to these efforts.[21]

Based on years of experience and empirical evidence, a comprehensive implementation of digital learning generally can help position countries and regions for significant and sustainable economic growth; prepare businesses, industries, other organizations, and individuals for meaningful participation in local, regional, and global economies; and assure that the

opportunities and benefits of development accrue equitably to all groups. It can also lead to accelerated economic activity and job growth; increased workplace innovation and productivity; increased competiveness in global markets; [and] higher GDP. [22] More specifically, Education Impact cites the following as socioeconomic benefits of universal digital education.[23]

Economic Benefits	Social Benefits: Education	Social Benefits: Other
Increases global competitiveness	Supports anywhere, anytime learning	Increases access to healthcare data, resources and advanced medical services
Accelerates economic activity and job growth	Increases access to healthcare data, resources and advanced medical services	Increases access to income-generating activities, particularly for rural and historically disenfranchised populations
Increases workplace innovation and productivity through more efficient access to timely data and information	Supports development of a technology-literate workforce	Increases opportunities for personal earnings through increased skills development via e-learning
Increases opportunities for GDP growth	Increases student school attendance	Improves access to government services (for example, e-government and workforce development)
Improves opportunities for government transparency and efficiency	Increases student performance and organizational learning	Improves opportunities for equality across genders, ages and cultural groups
Improves communications and increases collaboration	Increases access to education for rural and historically disenfranchised populations	Creates opportunities for increased communication and connection for historically isolated individuals (such as seniors and disabled)

Thus, in the 21st century global-innovation economy, two things are clear – digital education is key to preparing students to excel in college and the workforce, and the integration of such graduates into the labor force is vital to a state's or nation's economic success. As one expert puts it,

> ICT is considered a critical tool in preparing and educating students with the required skills for the global workplace. It educates students so that they can continually adapt to a work world of continuous technological innovations, and makes it easier for students to access knowledge. ICT is regarded as an engine for growth and a tool for empowerment, with profound implications for education change and socio-economic development.[24]

Background

The Florida Digital Instructional Materials Work Group (work group) was established via House Bill 5101 (Chapter 2012-133, Laws of Florida) during the 2012 Florida legislative session. The authorizing legislation specified the work group's scope and membership. As indicated by the authorizing legislation, the work group is charged with developing options for providing

- Access devices for students;
- Content by subject area;
- Training and professional development for pre-service and in-service teachers; and
- Funding, including the reprioritization of existing resources and recommendations for new funding.

Florida Digital Instructional Materials Work Group Members

Name	Representing	Affiliation	County
Shirley Baker	Middle School Principal	Everitt Middle School	Bay
Joe Binswanger	School District Instructional Content	Sarasota County School District	Sarasota
Steven Birnholz	Business	Florida Council of 100	Hillsborough
Connie Collins	High School Principal	Crooms Academy of Information Technology	Seminole
Tom Dana	Postsecondary Education	University of Florida	Alachua
Sharyn Gabriel	Middle School Principal	Ocoee Middle School	Orange
Kim Kendall	Parent	Parent	St. Johns
Katrina Rolle	Parent	Parent	Leon
Gary Weidenhamer	School District Instructional Technology	Palm Beach County School District	Palm Beach

Provision of Devices for Students

Goal: Every student has equal access to a device or content that meets his or her curricular needs.

Recommendations

- An ultimate goal of a 1:1 ratio of devices to students by lease or purchase.
- District flexibility to determine the type and mobility of the device.
- Policies and specifications for minimum requirements for devices and digital content.
- Establishment of optimum infrastructure guidelines for school districts to support digital access.
- Examination of the appropriateness and uniformity of Bring Your Own Device options.
    - Cost savings for student-provided devices versus complications of multiple devices running different operating systems.
    - Development of an appropriate digital curriculum first and then obtain the device which best delivers the curriculum.

1:1 Ratio of Devices to Students

The ultimate goal to achieve digital learning with digital instructional materials is to reach a 1:1 student to device ratio for all K-12 students. The device must be multifunctional and meet the Partnership for Assessment of Readiness for College and Careers requirements as well as mainstream instructional needs. A student must be able to meet all educational needs with a single device to avoid the costs caused by the duplication of utilizing multiple devices to meet instructional and assessment requirements.

Infrastructure

However, the device is only a part of the solution. For the device to function as an instructional tool, districts will be required to build the network infrastructure necessary to support the 1:1 ratio of devices. The network infrastructure must include both wired and wireless infrastructure to support the classrooms and meeting areas such as the media center, cafeteria and outside courtyards in order for the students to access the instructional resources across the entire school facility. Equipment such as access points, controllers, switches, routers, etc. need to be optimized and strategically planned to ensure proper connectivity for students and staff. If the network infrastructure is not properly sized to meet the demand, students and staff will experience a slow or even unresponsive network that inhibits instruction.

Facility needs such as heating, ventilation, and air conditioning (HVAC), electrical and furniture must be factored into the planning. Provisions must be made for charging battery-powered devices so that students can be productive for the entire day. Presently, most classrooms do not have enough power outlets for all students to charge their devices. Batteries with extended life, charging stations, electrical outlets, etc. are some of the considerations that must be taken into account when implementing a 1:1 student to computer ratio. Also, when computer labs are created, heat generated by devices must be factored into the HVAC planning for the school facilities. Student work areas also must be large enough to hold a device and other necessary materials for the lesson. All parts of the school environment must be examined to ensure a safe and comfortable learning environment.

Cloud Computing

Cloud computing, "the use of a network of external or remote servers to store, manage and process data, rather than using a local server," can be a part of this infrastructure.[25] For example, under cloud computing, a software program can be accessed online instead of having to be downloaded to every student's or educator's computer where it would take up hard drive space or have to be stored on a CD. Such programs "run the gamut" from math tutorials to virtual science labs to classroom management and administrative functions.[26]

Many school districts throughout the country are turning to cloud computing to increase technological performance and save significant amounts of funds. According to a February 2013 survey by CDW-G, 42 percent of IT professionals in K-12 education adopted or continued to use cloud computing in 2012, a 15 percentage point increase from 2011.[27]

Why? According to Tanya Roscoria, cloud computing can provide "powerful tools" for students, teachers and administration.[28] Instructional material software can be flexibly accessed through Internet-enabled devices. Teacher-parent communication could turn electronic, and thus more reliable. As Amy Vernon states, "With cloud backup, 'I left my homework on the bus' will no longer prove a good excuse."[29]

And from an IT perspective, cloud computing can leverage IT staff resources, reducing costs and maintenance time. It can also help districts optimize storage space and manage their networks' ability to handle variable user activity. And according to Mike Bock, it can lower upfront software costs by facilitating subscription-based purchases.[30]

However, there are also significant barriers to the use of cloud computing. These include the security of proprietary or student data (which cloud providers might have access to) and applications; the ability to integrate cloud applications and infrastructure with legacy systems; the need for large amounts of bandwidth (and associated costly infrastructure) so school servers won't slow or crash when users access online programs; the potential for inappropriate content to migrate to the cloud from non-school systems with different levels of security or filtering; and the lack of at-home broadband Internet access due to the "Digital Divide."[31]

If a third-party cloud solution, provided by someone other than the Florida Department of Education or a school district, will hold student information, the third-party must comply with the requirements of State Board Rule 6A-1.0955(6)(g), that student information shall not be disclosed by the third-party in any form to anyone other than appropriate school officials or the third-party's employees or agents as allowed by the referenced rule.

Bring Your Own Device (BYOD) Options

To meet the 1:1 goal, Bring Your Own Device (BYOD) is a means to leverage student-owned, parent-owned and teacher-owned equipment. When discussing BYOD, there are many different devices that can be brought to school by students and teachers. BYOD introduces many different types of devices, with varying operating systems as well as varying screen sizes. With so many possibilities, network connectivity, end-user support, compatibility of resources with the device and equity are some of the issues that will need to be addressed. The devices that are brought must adhere to minimum standards so that Partnership for Assessment of Readiness for College and Careers (PARCC) requirements and general instructional programs will function successfully on the devices. PARCC requirements will help reduce the number of different types of devices.

If BYOD is adopted as a means to help reach the 1:1 goal, network configurations will need to have the appropriate settings to access instructional resources. District staff will need to plan and implement proper controls/settings for personal equipment on the network. Some school districts are implementing virtual desktops as a solution to BYOD. Depending on the virtual desktop solution, cost and network infrastructure will need to be evaluated for cost effectiveness.

School districts will be required to provide a means to store electronic content. Content when stored on network resources will remain safe with proper disaster planning. If stored on individual devices, content will be lost if the devices are lost or damaged. Districts will be required to find solutions to meet storage demands whether it is stored on the local network or a cloud solution is employed. This content will include instructional content, student assignment work and teacher preparation materials.

Providing Content by Subject Area

Goal: Content is provided with an initial emphasis on core subjects and courses and subjected to a thorough and timely vetting process. Content providers should meet industry standards for interoperability for access across devices and operating systems. Existing resources, including Florida Virtual School content and vetted free digital materials (such as Kahn Academy lessons and CK-12 Foundation resources), should be accessible to districts and schools through a single portal.

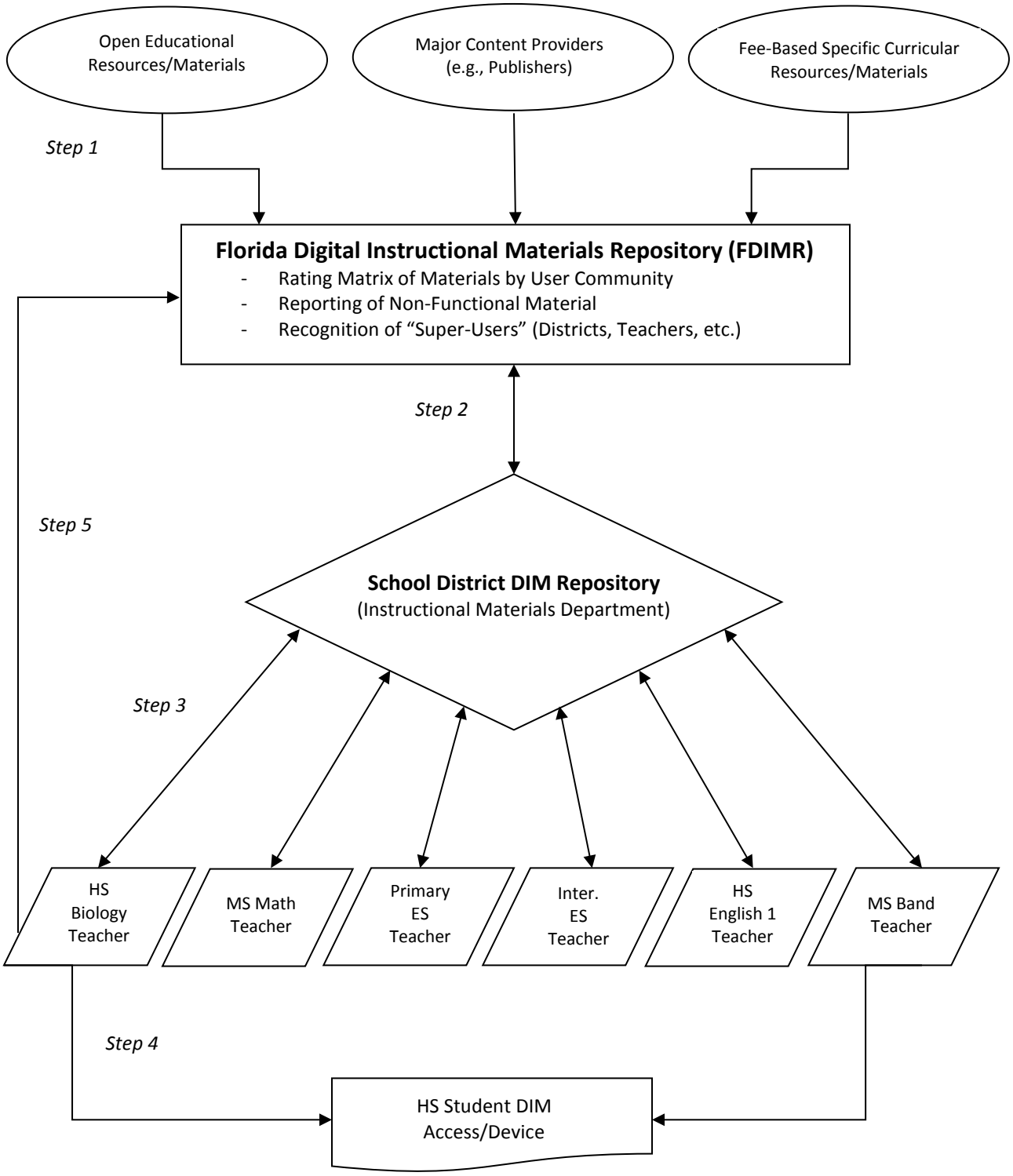
Recommendations

- Utilize a State Digital Content Repository (Florida Digital Instructional Materials Repository).
- Ensure equity in access to digital content that supports student learning tied to standards.
- Ensure equity in access at both school and home for devices and primary/supporting instructional materials.
- Evaluate the current vetting process for improvement, including the utilization of a statewide committee to compile and evaluate free digital content and open educational resources.
    - Amend law regarding adoption in order to open vetting to free resources and open educational resources.

Florida Digital Instructional Materials Repository

The Florida Digital Instructional Materials Repository would be a flexible online warehouse for approved and adopted digital instructional materials to reside. As outlined on the Florida Digital Instructional Materials Flowchart below, up-to-date, dynamic content would be submitted from a variety of sources to undergo a vetting process in order to become adopted material for districts to use as instructional materials.

Florida Digital Instructional Materials Flowchart



A Five-Step Process

Step 1 – Digital Instructional Materials (DIM) are submitted into the Florida Digital Instructional Materials Repository (FDIMR) by an open educational source, major content provider and/or a fee-based specific curriculum provider to go through the vetting process led by the Florida Department of Education, Bureau of Curriculum and Instruction.

Step 2 – Digital Instructional Materials that have been approved for use by districts can then be "pulled down" into a district's local Digital Instruction Materials Repository (DIMR). Districts will have the ability to rate the material for other districts to review, similar to Amazon's five-star rating system. Non-functional material will be reported to the FDIMR to be addressed with the provider. One option to consider is to allow for recognition of "Super Users" who provide high-caliber feedback to the FDIMR. A purchasing process for fee-based content from both major content providers and specific curriculum providers would have to be approved by the state.

Step 3 – Districts would "push out" the DIM to the appropriate teachers for use with their students. A possible landing point for this material is within the district's learning management system.

Step 4 – Teachers would grant access to their DIM to their students on the appropriate device depending on content and/or grade level. In the flowchart, a high school student is receiving the appropriate content from two separate high school teachers.

Step 5 – An option to consider in the design of this process is to allow teachers and others across the state to submit material for review in the FDIMR. The addition of this option adds to the available content, but also will add to the workload of the group vetting the material. A cost-benefit analysis should be done before implementing this step.

The digital instructional materials content could be managed within a district's learning management system (LMS). An LMS is used for the administration and management of learning content and resources as well as tracking student progress. Management of content within the LMS is a natural fit since it is a required component of the Local Instructional Improvement System (LIIS). Section 1006.281(1), Florida Statutes, defines an LIIS as "a system that uses electronic and digital tools that provide teachers, administrators, students, and parents with data and resources to systematically manage continuous instructional improvement. The system supports relevant activities such as instructional planning, information gathering and analysis, rapid-time reporting, decision-making on appropriate instructional sequence and evaluating the effectiveness of instruction. The system shall integrate instructional information with student-level data to provide predictions of future student achievement." All districts must comply with the minimum LIIS standards published by the Florida Department of Education (FDOE) by June 30, 2014. (These standards are available at www.fldoe.org/arra/excel/LIIS-MinStds.xls.).

Utilizing a Florida Digital Instructional Materials Repository would allow access to instructional materials which originate from a much greater population of sources. Instructional materials would continue to come from major publishers, but would also allow for curricular-specific content to be vetted or adopted. The curricular specific content could come from both companies specializing in these areas and open resources. By allowing submissions into the FDIMR to come from a variety of sources, including individual teachers, the instructional materials truly become a dynamic, up-to-date collection relevant to both student and teacher. This empowers districts to focus on the specific needs of not only a subject area or specific standard, but also the individual students themselves.

When content is added to the repository for use across the state, steps must be taken to ensure that copyright/licensing laws are applied to each content source. If licensed content is added, the repository must be able to deliver the content to the correct groups that are licensed to use the content. At the end of the license period, the no-longer licensed content must be removed from the repository.

Under Florida's current instructional materials adoption model, each school district does not use the same publishers for an adopted subject; thus the content cannot be made available to districts that are not licensed to use the content. In addition, content that is submitted by teachers to the district and then to the state must have its copyright laws checked to ensure that the state does not assume a copyright liability without proper controls as to who has purchased the content for use.

A fully functional repository will require full-time staff and a system with the capabilities to apply permissions to manage the end users of the repository. The end users must be able to access the licensed content that applies to their role and location within the state. With the proper staff, system and work flow, the content can be managed without violating copyright/licensing issues.

The FDIMR needs to be built upon a universally compatible platform to take into consideration the diversity found within current infrastructures across districts and the possibility that different devices will be accessing this instructional content. The more flexibility that can be designed into the FDIMR while following industry standards will prepare Florida's educational system to be ready for future challenges. Furthermore, it is imperative that this repository be user-friendly to support the use of and contributions by educators with varying degrees of technology skill levels.

Minimum technical specifications would be necessary for the submission of content into the FDIMR, and for delivery of content from the FDIMR. (See *Appendix A, Technology Guidelines PARCC Assessments Version 2.1 – February 2013 Update*.) A requirement such as this one in Appendix A would allow districts to ensure that selected instructional material would be able to be successfully delivered across their device/platform of choice. This would also encourage

content providers to ensure that their instructional material can be delivered in the least restrictive environment.

Digital Content Access

When implementing a 1:1 learning environment, access to instructional resources beyond the school day must be considered. Florida's school districts will be faced with the critical issue of accessibility. Schools and districts will need to play a vital role in ensuring students are able to access digital content once they are away from their school sites. Accommodations must be made to create equal opportunity for all students to access instructional content, utilizing options such as:

- Assistance programs to help families that cannot currently afford internet service; and
- The loading of necessary resources on a student device for accessibility when an internet connection is unavailable.

For cyber safety, school districts are required to be Children's Internet Protection Act (CIPA) compliant and have networks with the appropriate controls. As required by CIPA, section 54.520(c) of the Federal Communications Commission's rules requires that an Internet-safety policy must include a technology-protection measure that protects internet access by both adults and minors to visual depictions that are (1) obscene; (2) child pornography; or, with respect to use of the computers by minors, (3) harmful to minors. Furthermore, Section 54.520(c)(1)(i) of the rules require a school to certify that its Internet-safety policy includes "monitoring the online activities of minors."

In addition to the existing CIPA certifications required of schools in Section 254(h)(5) of CIPA, the Protecting Children in the 21st Century Act requires the school, school board, local educational agency or other authority with responsibility for administration of the school to certify that, "as part of its Internet safety policy, [it] is educating minors about appropriate online behavior, including interacting with other individuals on social-networking websites and in chat rooms and cyberbullying awareness and response."

However, private homes and many open public networks at locations in the community are not CIPA compliant and require parental guidance when attaching. If a school district deploys a Bring Your Own Device (BYOD) program, the district's wireless network would apply the CIPA-compliant measures. However, if a student has a 3G/4G subscribed service and does not attach to the district network, the student would be able to bypass the CIPA-compliant measures that are deployed by the school district. It is thus important for school districts to teach and demonstrate digital citizenship to its students.

It should be noted that some non-Florida school districts have formed public-private partnerships with community centers and local businesses to provide students with Wi-Fi access so that

students may have access to content once away from school. (See page 23 for a discussion of public-private partnerships.)

Digital Content Committee

To ensure that Florida's 67 school districts have access to the best digital content available, a digital instructional materials committee should be created and given the responsibility to research, vet and select digital content to ensure alignment with Florida's Next Generation Sunshine State Standards and Common Core State Standards. The formation, oversight and technical assistance for this committee may necessitate allocating additional FLDOE staff for digital content.

It is difficult to predict the number of people needed for a committee charged with the responsibility to research, vet and select digital instructional materials for the state. At a minimum the committee membership needs to include an expert in digital content licensing, district staff, school librarians and media specialists, teachers, parents and community volunteers. Student representation on this committee would also be beneficial and should be considered. The frequency of meetings should be left to the committee's discretion, but should be scheduled at least once a year.

Adoption Cycle

Florida has a five-year adoption cycle for instructional materials. Section 1006.36, Florida Statutes, states that "the term of any instructional materials must be a 5-year period beginning on April 1 following the adoption, except that the commissioner [of education] may approve terms of adoption of less than 5 years for materials in content areas which require more frequent revision. Any content for instructional materials may be extended as prescribed in s. 1006.34(3)." Free and fee-based digital instructional materials resources are continuously being created and modified. As a result, Florida's adoption process needs to be revised to reflect this facet of the digital content market and also to become more flexible in accommodating new and modified resources.

Student Assessments

A rich student assessment experience should be a component of any digital content adopted. Currently, Educational Testing Service and Pearson are the only test providers for Florida. Other assessment options should be explored to determine if they might provide an approach that would accommodate the flexibility needed for digital content while simultaneously adhering to Common Core State Standards and other Florida standards.

Provisions for Training and Professional Development

Goal: Institute on-going differentiated professional development for educators, including administrators, ranging from teacher/administrator education programs to new teachers/administrators. Establish a thorough compilation of current, effective district professional development tools for sharing across the state, focusing on the use of technology as an instructional tool.

Recommendations for Teacher Professional Development

- Require initial teacher preparation programs to fully integrate digital instructional materials into lessons that support Florida's education standards (Next Generation Sunshine State Standards/Common Core State Standards).

- Provide all new teachers, including those new to Florida, with professional development training to fully integrate digital instructional materials into lessons that support Florida's education standards (NGSSS/CCSS).

- Provide all administrators with professional development training on technology integration and the administrator's role in leading instructional change.

- Ensure initial funding for Digital Implementation Professional Development for a minimum of three years.

- Provide educators a one-year head start for technology implementation.

- Utilize existing models such as the International Society for Technology in Education National Education Technology Standards and the Florida Digital Educators for establishing comprehensive professional development opportunities for administrators.[32]

- Align the Technology Integration Matrix with the professional development needed for digital implementation.[33]

- Create an instructional coach/master teacher endorsement for educators who can provide technologically-enhanced and technology-based professional development and, if possible, provide additional funding for the endorsement.

Career-Spanning Professional Development

The Florida Department of Education should develop an on-going plan for professional development that will span an educator's career. Components should include training for pre-service, beginning and experienced teachers. The plan should also be differentiated in order to meet the varying technological proficiency levels of current educators. The University of South Florida Digital Educator Program is a current model that includes all of these components and provides resources through its website at http://etc.usf.edu/fde/index.php.

Professional Development for Administrators

Research findings draw a correlation between a school's leadership and its success. Michael Fullan stated, "Effective school leaders are key to large-scale, sustainable education reform."[34] Thus, the Florida Department of Education should develop professional development opportunities specifically for administrators. Components should include training related to indicators for effective digital integration and strategies for facilitating instructional reform.

Funding for Professional Development

Training every teacher in Florida is essential for the successful shift to digital instructional materials. To ensure that districts have the resources to provide quality professional development for the considerable number of teachers in the state, funding should be allocated to districts for a minimum of three years. Districts should submit a Digital Implementation Plan to the Florida Department of Education as part of the requirements for this funding. These plans will require that districts outline a professional development plan for the effective integration of digital technology for instructional enhancement. The allocation of funding for professional development should be contingent upon the department's approval of a district's Digital Implementation Plan.

Head Start for Teachers

The learning curve for most teachers will be steep during the initial implementation of digital instructional materials. To allow teachers time to become proficient with utilizing technology, it is recommended that they receive hardware and software one year in advance of issuing devices to students.

Florida Digital Educators Program

The University of South Florida's Digital Educators Program currently provides a myriad of professional-development options for integrating technology into the curriculum. The program includes training for pre-service and current teachers, including an opportunity for teachers to earn a designation as a Master Digital Educator. The program can serve as a model for the state in planning for districts' long-term professional development needs for integrating digital instructional materials.

Technology Integration Matrix

The Florida Center for Instructional Technology developed the Technology Integration Matrix (TIM). The TIM illustrates how teachers can use technology to enhance learning for K-12 students by defining the levels of technology integration into the curriculum (i.e. entry, adoption, adaptation, infusion and transformation). Aligning professional development plans with the levels of technology integration will facilitate identifying and planning for the varying levels of professional development needs.

Instructional Coach/Master Teacher Endorsement
To ensure fidelity from workshop to classroom use of technology, teachers will need ongoing support. Similar to a reading coach, an instructional coach/master teacher will provide on-the-job training and support to teachers through modeling, identification of resources and other technical support. An instructional coach/master teacher will complete specialized training to receive an endorsement fully described by the Florida Department of Education.

Options for Funding

Goal: Initiate and expand public/private and public/public partnerships, provide incentive funding for districts to form partnerships, expand district spending flexibility, explore a statewide technology initiative to bring down costs and utilize vendor partnerships.

Recommendations

- Invest new resources in, or reprioritize existing resources for, the statewide expansion of digital education, including instructional materials and professional development and related hardware, software and infrastructure.
- Develop and utilize public-private partnerships (PPPs) to help districts and schools provide students and educators with the hardware, software, infrastructure and professional development needed for the success of 21st century digital education.
- Include other PPP options to help provide resources while also abiding by district policies on business partnerships.
- Reprioritize funding for the implementation of digital education to include, but not be limited to, a re-examination of the class-size requirement in order to maximize technological advancements.
- Evaluate and modify the instructional-materials requirements to give districts increased flexibility on the use of funds.
- Perform, initially and regularly, a comparative analysis of the Florida Department of Education's digital education proposal and the school districts' federal Race to the Top $700 million grant expenditures to ensure no unnecessary duplication of efforts and products.

Invest new resources in, or reprioritize existing resources for, the statewide expansion of digital education
Digital learning is not the latest education fad. Rather, it will be an economic development game-changer for the nations and states that implement it fully and properly. Digital education

can significantly increase student-learning results and may transform our entire educational system, generating both higher productivity and greater effectiveness.[35]

Thus, it is widely accepted that a comprehensive implementation of digital learning can help position countries and regions for significant and sustainable economic growth; prepare businesses, industries, other organizations, and individuals for meaningful participation in local, regional, and global economies; and assure that the opportunities and benefits of development accrue equitably to all groups. It can also lead to accelerated economic activity and job growth; increased workplace innovation and productivity; increased competiveness in global markets; [and] higher GDP. [36]

It is therefore imperative that Florida view the provision of additional funding for digital education not just as a typical line item in the education budget, but also as an investment in the state's economic future. Such an investment is as crucial, if not more crucial, than any of the other standard tools used to spur the economy. Failure to act decisively and immediately could leave Florida's workforce behind its economic competitors.

State policy makers need to find ways to prioritize or reprioritize significant funding to provide comprehensive instruction through digital education to its students as quickly as possible.

Develop and utilize public-private partnerships (PPP) to help districts and schools provide students and educators with the hardware, software, infrastructure and professional development

For a long time, public-private partnerships (PPPs) have been a valuable source of expertise and resources for K-12 educational programs, projects and reforms. These relationships have helped expand access to high-quality education for students of all levels and backgrounds and have assisted educators in their efforts to deliver state-of-the-art instruction.

PPPs can come in many shapes and sizes, so what do we need? Education Impact, an international education consultancy comprised of a global network of education and technology experts, describes digital learning partnerships in this way:

> They can involve many partners or as few as two. They can be formal, contractual, close-ended arrangements or more informal and open-ended. The goals and objectives can be highly focused or more broad in scope….For some, the term PPPs is a useful catch-all term when discussing partnerships in education. For others, it connotes a very specific kind of partnership, one that is formal and contractual. The term multi-stakeholder partnerships in education (MSPEs) is a more recent term coined to refer to more informal arrangements involving a coalition of public-private and civil society partners organized in a shared effort to achieve a clear set of specific goals and objectives. The term partnerships for education (PfEs) is an even more recently coined term meant to be

> broad and inclusive of all forms and types of partnerships in education.[37]

The salient point though, as Education Impact goes on to explain, is that "whatever language one chooses to use, public-private partnerships are playing key roles in expanding access to digital technologies and the development of sustainable digital literacy initiatives."[38] In fact, there are many examples of successful PPPs fostering digital education programs of all types. For example, "through its Global Education Initiative, the World Economic Forum (WEF) has endeavored to develop a model for multi-stakeholder partnerships. The aim is to promote greater integration of technology in schools and education systems and, at the same time, to develop local ICT infrastructure and ICT industries through the creation of new products and services. Efforts begun by the WEF in Jordan, Egypt, and India are continuing through a new joint WEF-UNESCO initiative, Partnerships for Education."[39] The United Nations Educational, Scientific and Cultural Organization (UNESCO) also describes several fruitful PPPs:

> The private sector has played an important role, in this regard [providing technological resources, expertise, and help that can support education change and, in turn, advance development goals], particularly high tech companies that collaborate with governments and NGOs to promote education reform and economic development. Intel, Microsoft, Cisco, Apple, and HP all have international programmes to support infrastructure development in schools. These companies have not only brought financial resources to the table but significant expertise. For example, Intel's has mounted a major effort, the Teach program, in which over 6 million teachers in over 50 countries have been trained in both technological literacy and pedagogical skills. The Cisco Networking Academy is a global education programme that teaches students how to design, build, troubleshoot, and secure computer networks. As of late 2009, the programme had more than 9,000 academies in 165 countries and has trained more than 800,000 students each year since its launch in 1997. Microsoft offers national teacher forums in more than 100 countries where teachers have an opportunity to build communities of practice, collaborate with colleagues, access quality content developed by their peers, and develop their use of technology. The most innovative teachers are selected to participate in regional and worldwide forums.[40]

We also see tremendous partnerships contributing invaluable resources to help bridge the digital divide in areas converting to universal digital education. Comcast, for example, has created a program named Internet Essentials to offer home Internet service for only $9.95 a month to households of children who receive free or reduced-price lunches.[41] Such service is already available in several areas in Florida.[42]

Similarly, Connect2Compete is a national nonprofit organization whose members include community, private sector and major foundation leaders.[43] Its mission is to help Americans access technology through three PPP programs: free digital literacy training (online), discounted high-speed Internet ($9.95 per month high-speed Internet for free school lunch families) and low-cost computers ($150 laptop or desktop computer for free school lunch families).[44] So far, Connect2Compete has received billions of dollars in donations and pledges and soon plans to expand the program to all 50 states.[45]

Connect2Compete exemplifies how the private sector can make significant contributions to digital education programs and conversions. As Dr. Robert Kozma, Emeritus Director of SRI International, writes

> Traditionally, private companies have contributed to economic growth through innovation and improved productivity that benefit their bottom line. But strategic investments in education reform by private companies can launch sustainable development and result in huge, long-term benefits for the country, the economy, and the company.[46]

Include other PPP options to help provide resources while also abiding by district policies on business partnerships

- Universal Access Fee Grants - This program provides discounts to assist most schools and libraries in obtaining affordable telecommunications and Internet access. It is one of four support programs funded through a universal service fee charged to companies that provide interstate and/or international telecommunications services.

  The Schools and Libraries Program supports connectivity - the conduit or pipeline for communications using telecommunications services and/or the Internet. Funding is requested under four categories of service: telecommunications services, Internet access, internal connections and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20 percent to 90 percent of the costs of eligible services. Eligible schools, school districts and libraries may apply individually or as part of a consortium.
- Volunteer groups to help with community training or building of computer stations.
- Construction supplies donated from local businesses.
- Computer vendor training for media specialists on how to run an in-school IT help desk for managing and repairing non-warranty computer equipment. Vendors could also train students to do such work, with the students earning elective course credit.

Simply put, PPPs will likely "continue to be critical in ongoing efforts to expand access to technology and digital literacy education. Evidence mounts for the potential of such partnerships to significantly enhance digital literacy initiatives and to positively impact local economic development, and resources are being gathered and organized to assist countries in organizing effective partnerships."[47] Thus, when implementing its own digital education programs, Florida

should look strongly at building, nurturing and capitalizing on public-private partnerships both as a means of mitigating cost and as a way of bringing specialized expertise to the table when designing and building programs to address, at a minimum, pedagogy, training, equipment and infrastructure (both in and out of school).

Reprioritize funding for the implementation of digital education to include, but not be limited to, a re-examination of the class size requirement to maximize technological advancements

Currently, the state spends $3 billion annually to implement class size requirements.[48] And still, this year, 31 out of 67 school districts remain out of class-size compliance and are opting to pay fines versus hiring new teachers at a greater expense to the school district.[49]

Meanwhile, it is an economic imperative that the state find hundreds of millions of dollars to fund a digital education transformation to ensure our students' competitiveness in the 21st century economy. We therefore recommend that the legislature examine a possible 2014 ballot amendment to modify the class-size provision in order to free up monies for other educationally vital programs, such as meeting the state's digital implementation needs (including, but not limited to, infrastructure, devices, materials and professional development).

Evaluate and modify the instructional materials requirements to give districts increased flexibility in the utilization of funds

Section 1011.62 (6)(b), Florida Statutes, allows school districts to use instructional materials funds available after March 1 to purchase hardware if all instructional material purchases necessary to provide updated materials aligned to Next Generation Sunshine State Standards and benchmarks and that meet statutory requirements of content and learning have been completed for that fiscal year. In practice, school districts rarely have unexpended instructional materials funds available after March 1. School districts could be provided additional flexibility to use instructional materials funds to purchase hardware before the statutory March 1 date. A number of other states that have an instructional materials adoption process, including Texas, California, Georgia, Tennessee, West Virginia, Louisiana and Idaho, allow districts the flexibility to use instructional materials funds to purchase hardware or other instructional resources.

Perform, initially and regularly, a comparative analysis of the Florida Department of Education's digital education proposal and the school districts' federal Race to the Top $700 million grant expenditures to ensure no unnecessary duplication of efforts and products

The Race to the Top Grant funds are divided between the state and school districts over a three-year period from 2010 to 2013.[50] One of the key requirements is that Florida school districts must "ensure that each school possesses the technology, including hardware, connectivity, and other necessary infrastructure, to provide teachers and students sufficient access to strategic tools for improved classroom instruction and computer-based assessment."[51]

Although Race to the Top funds have already been allocated, they have not yet all been spent. Thus, because both the state and districts are charged with similar digital implementation requirements, it is possible that the state and districts might be allocating funds for the same digital education implementation activities.

In fact, the Florida Department of Education has not surveyed districts for such planned expenditures.[52] It is therefore vital that the department gather such information in order to avoid duplicating costs in its estimates of districts' technological needs.[53]

Appendix A

TECHNOLOGY GUIDELINES FOR PARCC ASSESSMENTS
VERSION 2.1 – February 2013 Update

Current updates and additional information are available at:
http://www.parcconline.org/technology

The Partnership for the Assessment of Readiness for College and Careers (PARCC) is pleased to provide these technology guidelines to inform schools and districts as they make technology decisions to best meet the instructional needs of their students. The information in this document is intended to answer questions about whether existing computer inventories and new instructional hardware that schools may purchase as they implement the Common Core States Standards, will also meet PARCC's 2014-15 minimum requirements for computer-based assessment administration.

***PLEASE NOTE: Technology Guidelines for PARCC Assessments Version 2.1* updates, and therefore supersedes, the Version 2.0 document previously released in December 2012.**

Updates in this version include:

- Clarification about the minimum RAM for iPads running iOS 6.
- Clarifications about the requirements for input devices including touchscreens and Bluetooth/wireless keyboards.
- Clarification about screen resolution requirements.

This document provides two sets of guidance regarding technical specifications:

Minimum Specifications

Minimum Specifications address the oldest operating systems and lowest levels of hardware capacity that can reasonably be compatible with PARCC computer-based assessments in 2014-2015.

- Minimum Specifications apply to existing school technology inventories.
- Computers meeting the Minimum Specifications can be considered as satisfying PARCC guidelines for **2014-2015**.

Considerations regarding computers meeting, but not exceeding, minimum specifications:

- Computers with these minimum specifications may not be adequate beyond the second year of PARCC assessments in **2015-2016**. PARCC recommends that schools upgrade or replace computers that have older operating systems and lower memory to raise their capacity to Recommended Specifications levels as soon as possible.
- Computers that meet only the Minimum Specifications will be compatible with the PARCC assessment delivery platform, but may be more likely to experience slower performance than higher capacity computers.

Recommended Specifications

Recommended Specifications outline the levels of computer and network capacity that are more likely to meet growing demands for school technology that supports learning, assessment, and administrative uses simultaneously across classrooms.

- Recommended Specifications apply to both existing inventory and new hardware purchases.
- Computers meeting the Recommended Specifications can be expected to satisfy PARCC guidelines through the **2018-2019** school year.

TECHNOLOGY GUIDANCE FOR DECISION MAKING

While the ongoing processes for assessment and technical platform design continues, *Technology Guidelines for PARCC Assessments Version 2.1* **is intended to help states and districts inform their own readiness preparations and decision-making.** As test components are piloted through Item Tryouts in 2013 and Field Testing in Spring 2014, PARCC will continue to supplement the guidance in this document to reflect current knowledge about what states will need to administer PARCC's computer based assessment components. The most current version of this document and most up-to-date information is maintained at http://www.parcconline.org/technology.

BANDWIDTH RECOMMENDATIONS

Minimum bandwidth requirements will be determined based on the final specifications of the PARCC assessment delivery platform and the level of multimedia and technology enhanced items in the final assessment design. PARCC will provide minimum specifications by October 2013.

As schools plan for PARCC assessments concurrent with enhancing bandwidth to support instructional needs, PARCC is modeling recommended specifications on those advanced by the State Educational Technology Directors Association in its May 2012 publication *The Broadband Imperative: Recommendations to Address K-12 Education Infrastructure Needs* (http://www.setda.org).

	Minimum Specifications	Recommended Specifications
External Connection to the Internet	To be determined by October 2013	100 kbps per student or faster
Internal School Network	To be determined by October 2013	1000 kbps per student or faster

SECURITY REQUIREMENTS

Eligible devices of any type (desktop, laptop, netbook, tablet, thin client) or operating system (Windows, Mac, Linux, iOS, Android, Chrome) must have the administrative tools and capabilities to "lock down" the device to temporarily disable features, functionalities, and applications that could present a security risk during test administration, and should not prevent a PARCC secure browser or other test software to be determined from entering the computer into lock down mode. Features that will need to be controlled during test administration include, but are not limited to, unrestricted Internet access, cameras (still and video), screen capture (live and recorded), email, instant messaging, Bluetooth connections, application switching, and printing.

The operating systems listed here as approved for PARCC assessments meet this security requirement, but provide different mechanisms for managing user security settings at the individual device and/or enterprise levels. School technology administrators should be familiar with the particular requirements of the systems they will be using for PARCC assessments to ensure test security is maintained.

TESTING PLATFORM SOFTWARE / WEB BROWSER REQUIREMENTS

Software and/or browser requirements will be defined by October 2013, driven by the design choices for test items and the assessment delivery platform.

DEVICE SPECIFICATIONS

Desktops, laptops, netbooks (Windows, Mac, Chrome, Linux), thin client, and tablets (iPad, Windows, and Android) will be compatible devices provided they meet the established hardware, operating system, and networking specifications—and are able to address the security requirements described in the Security Considerations section of the Guidelines.

Desktop, Laptop, Netbook, and Thin Client[1]/VDI Computers

Operating System	Minimum Specifications[2]	Recommended Specifications
Windows	[3,4]Windows XP – Service Pack 3	Windows 7 or newer
Mac OS	Mac OS 10.5	Mac OS 10.7 or newer
Linux	Ubuntu 9-10, Fedora 6	Linux: Ubuntu 11.10, Fedora 16 or newer
Chrome OS	Chrome OS 19	Chrome OS 19 or newer
Memory	512 MB of RAM	1 GB RAM or greater
Connectivity	Computers must be able to connect to the Internet via wired or wireless networks.	Computers must be able to connect to the Internet via wired or wireless networks.
Screen Size	9.5 inch screen size or larger	9.5 inch screen size or larger
Screen Resolution	1024 x 768 resolution[5] or better	1024 x 768 resolution[5] or better
Input Device Requirements	Keyboard Mouse or Touchpad or Touchscreen	Keyboard Mouse or Touchpad or Touchscreen
	The input device must allow students to select/deselect, drag, and highlight text, objects, and areas. The input device must allow students to enter letters, numbers, and symbols and shift, tab, return, delete, and backspace. To meet security guidelines, each Bluetooth/wireless keyboard must be configured to pair with only a single computer during assessment administration. Other assistive technologies may be needed for students requiring accommodations. PARCC will release Accessibility Guidelines and Accommodations Guidelines in June 2013.	
Headphone/Earphone and Microphone Requirements	Headphones/Earphones Microphone	Headphones/Earphones Microphone
	Headphones/earphones are required for all students for all PARCC assessments. Some student accommodations may also require headphones/ earphones (e.g., text to speech). Microphones are required for all students taking the Speaking and Listening Assessment. Some student accommodations may also require microphones (e.g., speech to text, voice controls) for other parts of the PARCC assessments.	
Additional Guidance	[1] Each computer operating in a thin client environment must meet or exceed minimum hardware specifications, as well as bandwidth and security requirements. [2] Computers meeting only the minimum specifications for the 2014-2015 assessment are not likely to be compatible beyond the 2015-2016 assessment. PARCC recommends that schools upgrade from the oldest operating systems and lowest memory levels as soon as possible. [3] Windows XP will no longer be supported by Microsoft after April 8, 2014, presenting security and support risks for schools. (http://windows.microsoft.com/en-US/windows/end-support-help) [4] Computers running Windows XP-Service Pack 3 may require a web browser other than Internet Explorer due to HTML5 compatibility limitations. PARCC will issue specific web browser guidance by October 2013. [5] Computers must accommodate the 1024 x 768 screen resolution minimum without panning. PARCC recognizes that some netbook computers may have screen resolutions slightly less than the 1024 x 768 minimum, yet may meet all other minimum requirements. Depending on netbook model specifics, school technology administrators may be able to reset screen resolution to meet PARCC guidelines. By October 2013, following final test design, PARCC will establish a means for schools to evaluate if particular netbook devices are able to display PARCC assessment items without requiring students to scroll or pan.	

Tablets

Operating System	Minimum Specifications	Recommended Specifications
Android	Android 4.0 (with 512 MB RAM or greater)	Android 4.0 or newer (with 1GB RAM or greater)
Apple iOS	iPad 2 running iOS 6 (with 512 MB RAM or greater)	iPad 2 or newer running iOS6 or newer (with 512 MB RAM or greater)
Windows	[6]Windows 8 (with 512 MB RAM or greater)	[6]Windows 8 or newer (with 1GB RAM or greater)
Memory	By operating system	By operating system
Connectivity	Computers must be able to connect to the Internet via wired or wireless networks.	Computers must be able to connect to the Internet via wired or wireless networks.
Screen Size	9.5 inch screen size or larger[7]	9.5 inch screen size or larger[7]
Screen Resolution	1024 x 768 resolution[5] or better	1024 x 768 resolution[5] or better
Input Device Requirements	Keyboard Touchscreen or Mouse	Keyboard Touchscreen or Mouse
	Due to the onscreen space occupied by a tablet's virtual keyboard, PARCC assessments will require external keyboards for test takers using tablets so as not to limit or obscure the view of test item content and related functionalities when text input is required. Research studies to be conducted by PARCC in Spring 2013 are intended to yield data on students' use of virtual versus external keyboards. PARCC will refine this guidance as needed based on these results. External keyboards must allow students to enter letters, numbers, and symbols and shift, tab, return, delete, and backspace. Tablet touchscreen interfaces can be used for student interactions with the assessments other than text input, including to select/deselect, drag, and highlight text, objects, and areas. To meet security guidelines, each Bluetooth/wireless keyboard must be configured to pair with only a single computer during assessment administration. Other assistive technologies may be needed for students requiring accommodations. PARCC will release Accessibility Guidelines and Accommodations Guidelines in June 2013.	
Headphone/Earphone and Microphone Requirements	Headphones/Earphones Microphone	Headphones/Earphones Microphone
	Headphones/earphones are required for all students for all PARCC assessments. Some student accommodations may also require headphones/ earphones (e.g., text to speech). Microphones are required for all students taking the Speaking and Listening Assessment. Some student accommodations may also require microphones (e.g., speech to text, voice controls) for other parts of the PARCC assessments.	
Additional Guidance	[6]PARCC has not yet evaluated the compatibility of Windows RT for 2014-2015. Further information will be issued on Windows RT in Version 3.0 of the PARCC Guidelines. [7]Smaller tablets (screen size less than 9.5"), e-readers, and smart phones will not be supported and will not be compatible with PARCC assessments for 2014-2015.	

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However, the school technology survey does not ask about planned expenditures or planned Race to the Top expenditures. (*See* http://www.flinnovates.org/survey/home-page-printable-schools-12.php, last accessed March 22, 2013.)

And, while the district technology survey asks, "What percentage of the overall district technology budget was spent last year in the following areas?" it does not ask about planned expenditures or planned Race to the Top expenditures. Moreover, while it asks, "Do you have a plan to accommodate growth and expansion of your technology infrastructure?" it does not ask what such plans are. (*See* http://flinnovates.org/survey/home-page-printable-districts-12.php, last accessed March 22, 2013.)

53. On a related note, the Department of Education has begun tracking districts' digital readiness at http://www.flccss.org/. While not looking at future plans, it does ask districts about their readiness based on six factors: Student Computer Ratio, CBT Success, BYOD Policy, Broadband Speed, High Speed Wireless, and Home Internet Access. It should be noted that the benchmark for the Student Computer Ratio is 2.75:1, which does not match the recommendation of the Florida Digital Instructional Materials Work Group of a 1:1 ratio.