

# From District to Desktop: Making the Most of Broadband in Florida Schools



  
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Partnerships Advancing Library Media

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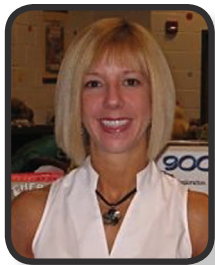
## About the Authors



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# From District to Desktop: Making the Most of Broadband in Florida Schools

A White Paper

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Partnerships for Advancing Library Media (PALM) Center  
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Internet use has increased dramatically in schools in Florida since the adoption of the federal E-Rate connectivity assistance program 10 years ago. Bandwidth needs have been increasing 22-30% annually as digital technology has increasingly become a vital part of teaching and learning (Florida Department of Education [FDOE], 2008).

The upswing in demand is not surprising since infusing robust broadband throughout the learning process has garnered some impressive results:

- Improved student achievement, attendance, and graduation rates, and decreased dropout rates;
- Gains on high-stakes tests that enable schools to meet AYP (Adequate Yearly Progress) and performance benchmarks under No Child Left Behind;
- Heightened school efficiency, productivity, and decision making;
- Advances in teachers meeting requirements;
- Improved student learning skills;
- Assistance in meeting the needs of all students, including those with special needs;
- Promotion of equity and access;
- Improved workforce skills; and
- Increased parent involvement (Ed Tech Action Network, 2008)

If *all* students are to realize these outcomes, equitable high-speed Internet and broadband access is critical. Although national statistics boast almost 98% connectivity in U.S. schools, the speed and capacity of the Internet connection is often problematic and insufficient (National Center for Technology Innovation, 2008).

## Broadband Connectivity is important for Florida Schools

For Americans to engage in a global information society, it is critical that they have access to high-speed, high-bandwidth Internet, meaning broadband. The *Free Press* has called broadband “the essential communications infrastructure of the 21st century” (Turner, 2009). In many communities, public libraries and schools provide the only free public Internet and computer access to millions of Americans.

For public schools to remain vital community Internet access points, they all need to be connected to high-speed broadband (at least 100 Mbps). In fact, representatives from the National Telecommunications and Information Administration (NTIA) have stated that public schools and libraries have a critical role to fill in Internet access. In the 1995 report, *Falling Through the Net*, NTIA concluded that “[C]onnectivity

to...households will not occur instantaneously; rather, there is a pivotal role to be assumed in the new electronic age by the traditional providers of information access for the general public – the public schools and libraries” (National Telecommunications and Information Administration [NTIA], 2000).

In addition to providing free public access to computers and the Internet, schools can serve as anchor tenants on broadband networks, providing the impetus for Internet service providers (ISPs) to build networks into American communities. Indeed, studies have demonstrated the symbiotic relationship between home and school Internet access: a fast connection at home raises the demand for more bandwidth at school and vice versa. Once a local school has gained access to higher connectivity speeds and greater bandwidth, that access infrastructure also has been brought into the community where last-mile connections can expand this high-speed Internet into private homes and businesses (Charytan et al., 2009; Gupta, Berejka, Griffin, & Boyd, 2009; Oblinger, Van Houweling, & Semer, 2009; Sheketoff, 2009).

Despite the known benefits of broadband Internet access, actual speeds and costs vary across Florida public schools. A preliminary study by the Information Institute at The Florida State University College of Communication and Information reported connectivity speeds ranging from 3.0 to over 500 megabytes per second in Florida school districts, as Figure 1 illustrates (Information Institute, 2009a).

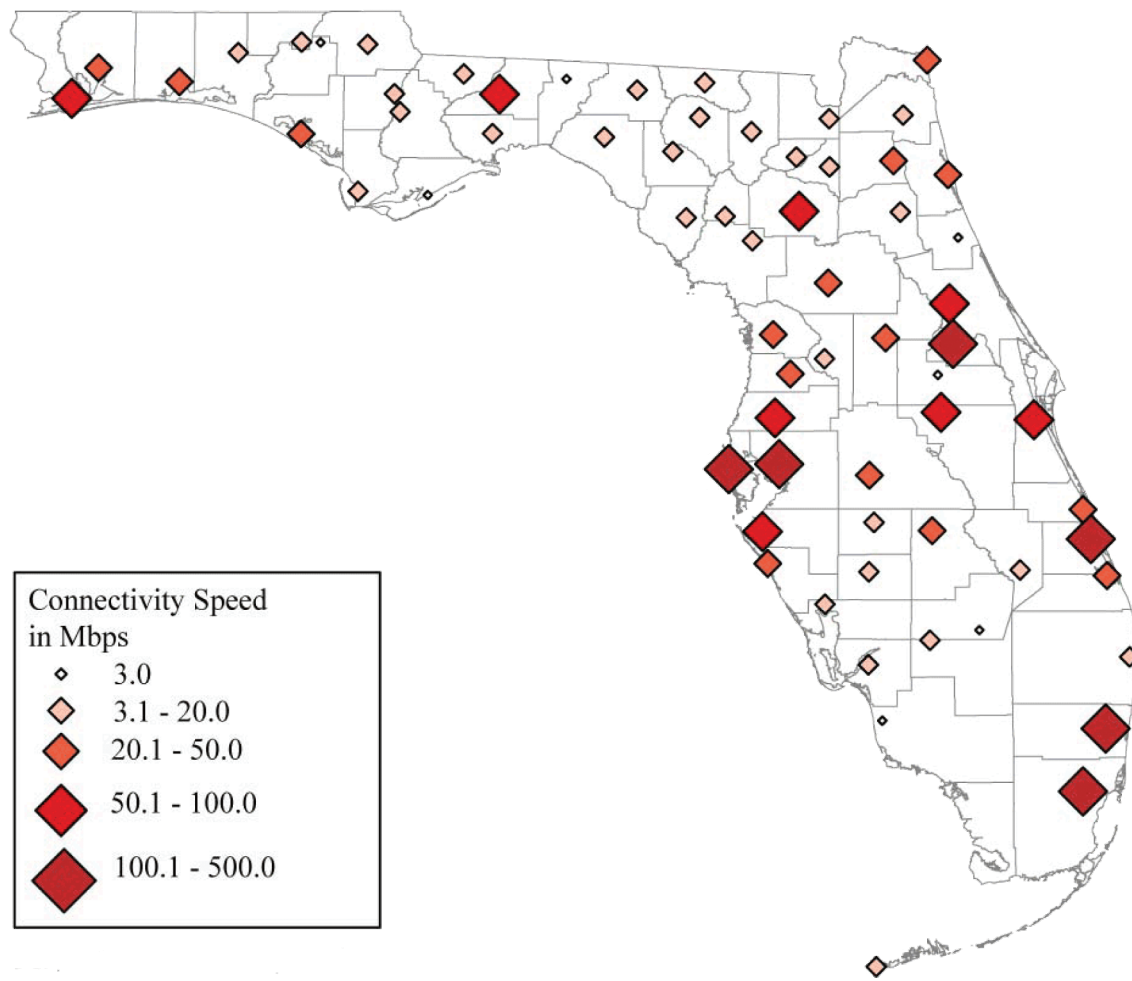


Figure 1. Connection speeds of Florida school districts in 2009. (Information Institute, 2009b)

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Results of this analysis of connectivity speeds highlight the disparate, and often desperate, situations in many Florida public schools. Most often, the slowest speeds are in rural and poor counties where rapid, reliable access to web-based learning resources would be beneficial to students without access and resource alternatives.

## Insufficient Broadband Impacts Florida's Learning Environments

In this scenario, broadband connectivity can enrich learning for students:

*In Ms. Sanchez's third grade classroom, technology is an integral part of the learning process. Ms. Sanchez begins the school day by playing a streaming video from the Internet to engage students and introduce the topic of weather. After a class discussion, she explains that to learn about the weather from various regions of the United States she has arranged a Skype videoconference with three other third grade classes around the country to share and discuss weather in their area. As a part of this project Ms. Sanchez's students will create a presentation on the weather in Florida to share with students across the country. Students are split up into groups according to the seasons of weather in Florida and begin researching online. Before the online presentation to the other classes, students use digital cameras to take pictures outside, upload them to Flickr, and create a slideshow to share with the students in the other states as a part of their presentation.*

With robust bandwidth, Ms. Sanchez is able to engage all of the learners in her classroom. She excites the visual learners with video and digital photography; engages the auditory learners with Skype; and enhances all learners' abilities to use technology appropriate for learning, synthesis, and connecting to the world beyond the classroom. The resources she uses are web-based and free, but make use of reliable, high-speed access to the Internet.

In contrast, consider this scenario:

*In Mr. Davis' third grade classroom the Internet connection is slow and unpredictable. Mr. Davis would like to use the Internet more in his teaching and with his students, but has found that it cannot be relied upon. Mr. Davis begins the school day by asking students to follow along in their textbook as he reads the chapter about weather. He explains that they will be working on a project about weather in different regions around the country. Each group researches facts about the weather in their region and creates a visual aid to present to the class and. Students work in groups using encyclopedias, almanacs, and other nonfiction books to learn about the weather in their areas. One student mentions that his book does not have pictures and seems out of date. Children fight over volumes of the encyclopedia and complain that the project is too hard to complete with so few books. Many students grumble about their better computers and Internet access at home.*

Without reliable Internet access, Mr. Davis struggles to engage students in the relevance of the project and allow them to connect the topic of weather to phenomena outside of the school. He cannot rely on out-of-date and insufficient book sources, so he has lost vital instructional impetus and student focus. The lesson dissolves into behavior issues and leaves the children discouraged.

These two scenarios represent just a few of the effects broadband investment can have on Florida's learners; broadband impacts Florida's learners, teachers, administrators, and equity. The provocative report *High-Speed Broadband Access for All Kids: Breaking through the Barriers* (State Educational Technology Directors Association [SETDA], 2008) frames the issues affecting these four key groups and emphasizes the need to focus on broadband in Florida schools.

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**Issue 1:** *Students need high-speed broadband access in their schools to take advantage of a wide range of new and rich educational tools and resources available for anytime, anywhere learning.*

Innovative learning technologies have become more diverse and more bandwidth intensive. Activities such as podcasting, media streaming, and videoconferencing require a robust network. For example, a connectivity-rich district, Palm Beach County, uses a multitude of web-based, bandwidth intensive applications to support curricular goals, career exploration, research, and science learning. Their list of “Essential Learning Tools” for the classroom consists of the following:

- Learning Tools 4 Kids
- EdLine
- FCAT Explorer
- RiverDeep
- BrainPop & BrainPOP Junior
- Tumblebooks
- Discovery Education Streaming
- MediaShare
- TeachingBooks
- EBSCO

Other connectivity-rich districts in Florida use web-based applications to support mathematics learning, diagnose and remediate reading difficulties, engage English Language Learners, and support children with special education needs. As the number of English Language Learners and children with Individualized Education Plans (IEPs) continues to increase in Florida, districts are turning to online solutions to serve these students. The barriers to all districts using applications to support these pressing needs are not the finances to subscribe to or purchase the services; rather, all too often, the district’s network and connectivity cannot support intensive usage.

*It makes no sense to me that so much money is poured into technology and online programs for our students yet it seems our server is often not capable of handling our district’s usage. Our school often has issues with slow Internet speed even though we supposedly have a “fast” connection. Teachers use online programs such as Accelerated Reader, Compass Odyssey, United Streaming, and FCAT Explorer daily during reading and math center time or during instruction. We have grown to rely on these programs to supplement our curriculum. We even cite these programs as interventions for low achieving students. They should be supported by a server/Internet connection that is the most reliable.*

-Third Grade Teacher, Polk County, Florida

A lack of access to web-based learning applications and reliable network access has the effect of stifling technology use in the classroom overall. As Figure 2 illustrates, in Florida elementary schools (N=2848) students have very low access to simulation (n=142), multimedia (n=370), and presentation (n=541) technology with limited access to tool-based creation (n=940) and research (1025). Students’ major use of technology is in the areas of drill and practice (n=1908) and integrated learning systems (ILS) (n=1880), and even these basic technology uses have not saturated elementary schools.

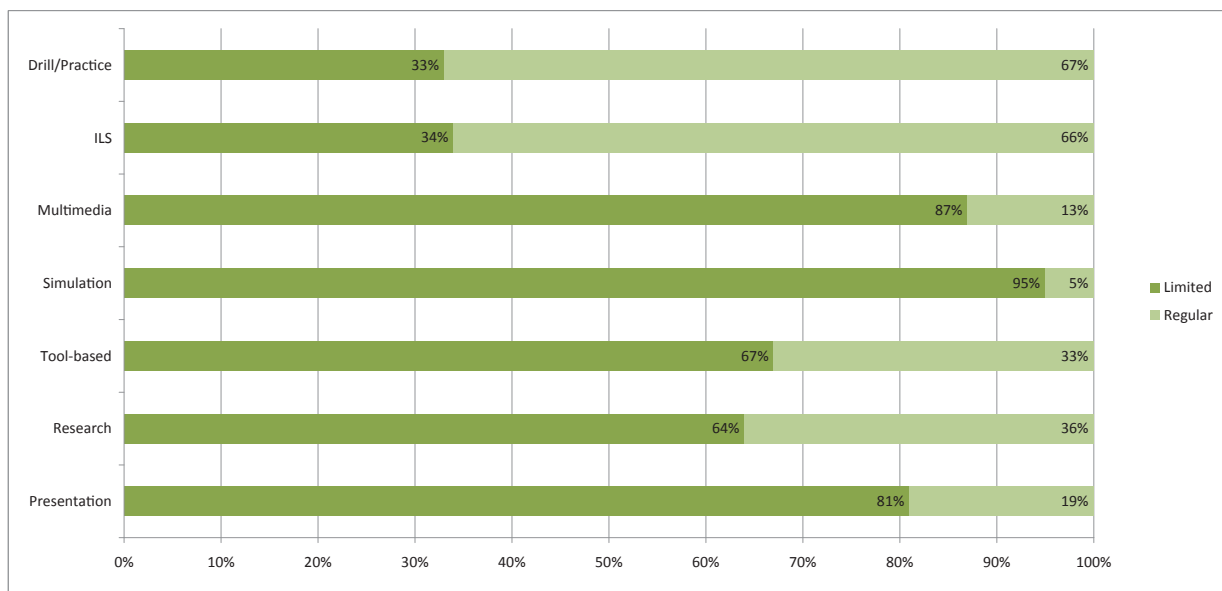


Figure 2. Elementary schools' use of technology in Florida. (Florida Innovates, 2009)

When elementary students have access to technology tools mediated by robust bandwidth, powerful learning occurs. Across Florida, the possibilities afforded to learning enabled by fast, reliable networks and applications are boundless:

*The Book Battle Blog*, a joint project by the *St. Petersburg Times Newspaper in Education Program* and the Pinellas County Schools Office of Library Media /Technology encourages students in the Tampa Bay area to talk about books online. They share their views on books nominated for the Sunshine State Young Readers' Award with other students from around the state. Young people also can create videos related to the books that are posted on the site.

A computer lab manager and tech coordinator at an elementary school in Florida recently worked with fifth grade and pre-kindergarten students to produce a digital storybook on the alphabet. Students posed in the shape of alphabet letters and recited the letter's name and phonetic sound. The fifth grade students, who had practiced the basics of digital video, photographed and recorded the children and then edited the clips together in Apple's iMovie video editing software. The completed project was then saved in Quicktime movie format and used on classroom computers in pre-kindergarten through first grade classrooms to teach and reinforce phonetic and letter recognition skills.

At Chets Creek Elementary School in Jacksonville, FL, technology coaches used VoiceThread to collaborate on a digital story to share with the student body. They used Vimeo to host the classroom videos on a wide range of subjects and Glogster to create "virtual posters" of imagery and text. Wikis enabled students to pool knowledge and contribute to bodies of research and ideas created by other children in the school. (Riddle, 2008).

Technology and broadband access is equally as important for older children, but the *Florida Innovates* report details similarly unsophisticated uses of technology for basic research and drill-and-practice (Florida Innovates, 2008). In addition to using bandwidth-intensive applications to conduct research, manage information, and create learning products, the Florida Virtual School (FLVS) provides access to high school courses for credit recovery, scheduling conflicts, AP courses, and other reasons (Sloan Consortium, 2009). Since its inception less than a decade ago, enrollment has grown exponentially, as Figure 3 illustrates.

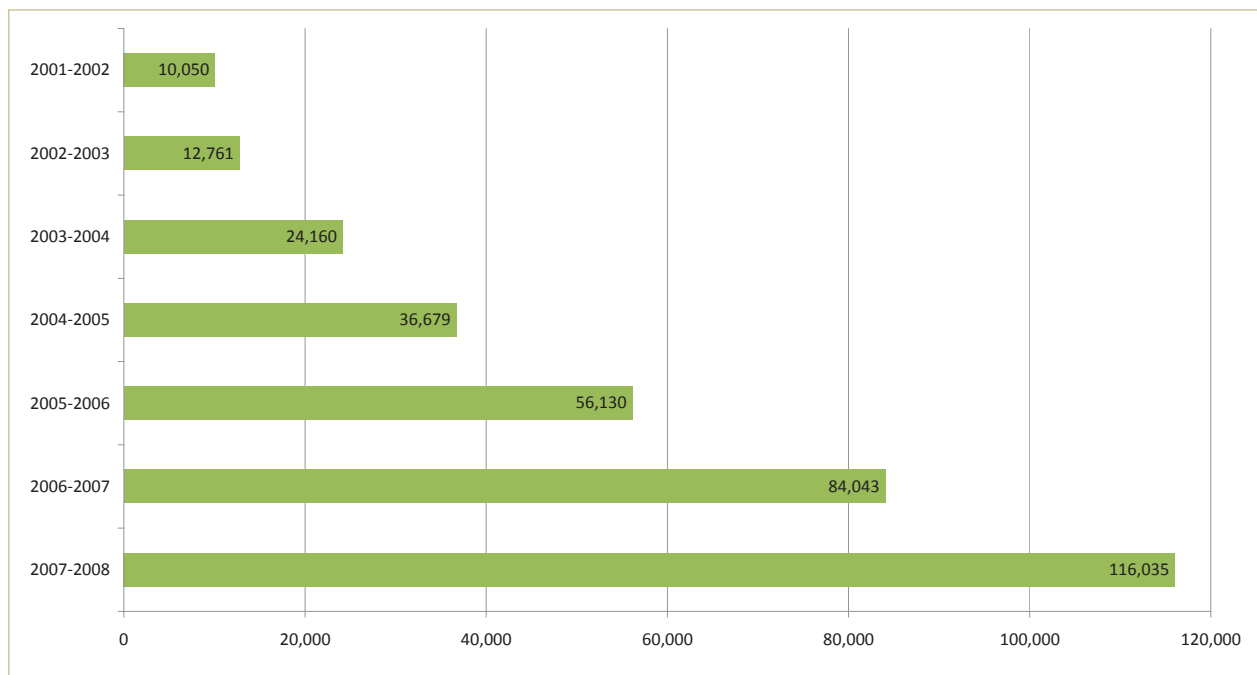


Figure 3. FLVS completion rate as of April 2009. (Florida Virtual School, 2009)

As children enter high school with a greater variety of learning wants, needs, and challenges, demand for options and flexibility with completion will only continue to grow. A recent report from Project Tomorrow estimates that bandwidth limitations not only decrease the options for student learning within the classroom, a lack of high speed connectivity may also mean the difference between high school completion or college entry.

**Issue 2.** *Teachers need high-speed broadband access for professional development, and engaging in professional learning communities as well as accessing new educational resources such as curriculum cadres and education portals.*

Ensuring that children have access to high-speed connectivity in school is merely a part of improving their learning experiences. Teachers who have the up-to-date content knowledge and pedagogical strategies necessary to create an equitable learning environment for all children must facilitate these experiences.

A substantial body of research conducted across the country has demonstrated that when teachers are not comfortable integrating new techniques and tools in their practice, they tend to avoid embracing innovation (Adams & Krockover, 1997; Apple & Jungck, 1992; BellSouth Foundation, 2003; Bolliger, 2006; Cooper & Bull, 1997; Cornelius-White, 2007; Engel & Randall, 2009; Smerdon et al., 2000; Trotter, 1999; Willis & Mehlinger, 1996; Zeichner & Tabachnick, 1981). Indeed, Figure 4 would seem to confirm this conclusion by showing that, in the 2756 schools surveyed, Florida's teachers use technology at a fairly low level and mainly for personal or managerial, rather than instructional purposes.



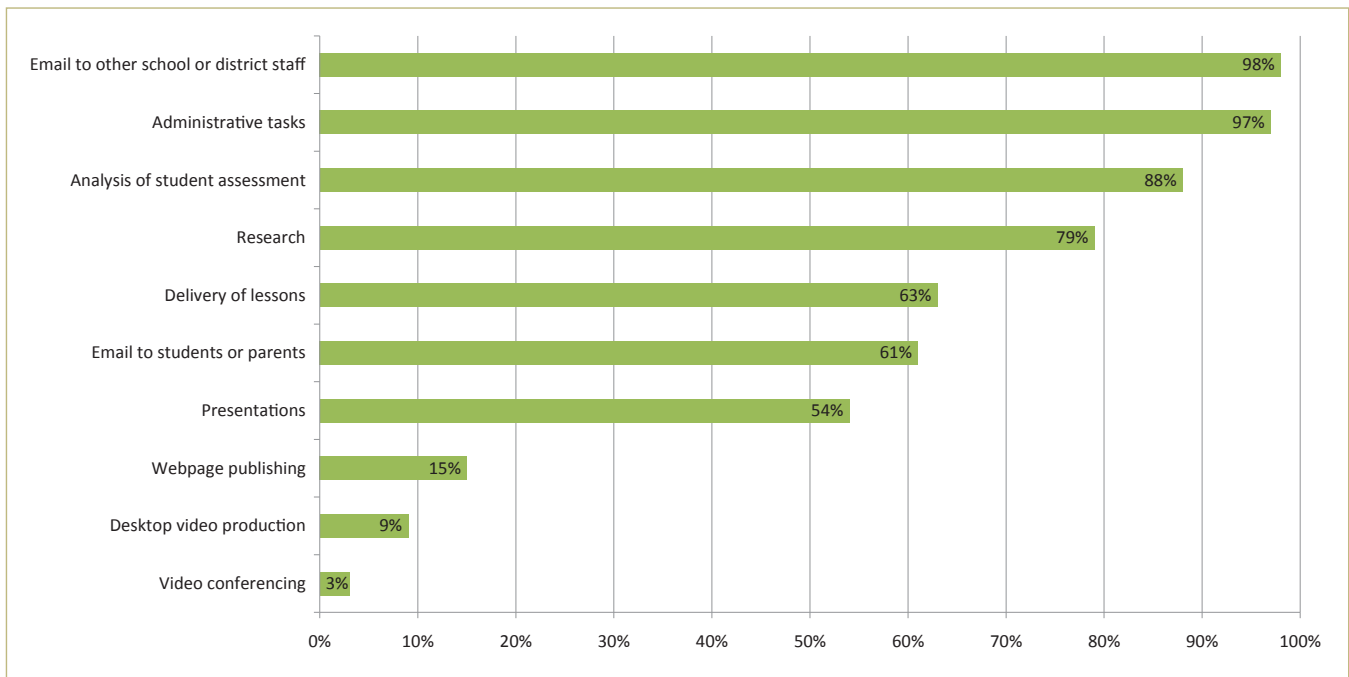


Figure 4. Percentage of schools reporting more than 50% of teachers using technology for a variety of purposes. (Florida Innovates, 2008)

Therefore, it is essential that any strategy to increase connectivity in schools contains a component to ensure that teachers have access to professional learning opportunities. There are teacher resources like education portals that deliver courses and provide discussion forums for educators (e.g., TAPPED-IN, Teachers.net, PBS TeacherLine), virtual conferences like *The K12 Online Conference*, a free conference for educators interested in integrating emerging technologies into classroom practice, and virtual worlds like SecondLife. In addition to these national and international resources Florida has a unique array of state-level teacher web-based resources:

- **Sunshine Connections** (<http://www.microsoft.com/education/sunshineconnections>) offers teachers resources to manage the classroom, maintain student performance data, plan coursework, find instructional resources, and find professional development opportunities. Sunshine Connections is a partnership between the Florida Department of Education and Microsoft.
- The Panhandle Area Educational Consortium (<http://www.paec.org>) offers the **Florida Education Channel (FEC)**. The FEC is broadcast nationally via the Dish network and reaches every classroom in the state. It provides distance learning to each school in the state of Florida. Originally funded by the Florida Legislature in 2000 (Florida Education Channel, 2009), the FEC provides teachers with web-based training and instructional materials. In addition, live television programs from the FEC are broadcast through the Panhandle Area Education Consortium website.
- The **Florida Knowledge Network** is an instructional television broadcast service of the Florida Department of Education. The Network is a partnership of the Department of Education, Florida school districts, and Florida public television stations. The channel broadcasts educational programs that support Florida's K-12 curriculum and professional development programming for educators. School district representatives annually nominate and select instructional programming. Find out more at <http://www.floridaknowledgenetwork.org>

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- The **Florida Association of School Administrators (FASA)** (<http://www.fasa.net>) hosts a variety of on-demand learning videos on timely topics such as differentiated instruction, brain-based learning, student assessment, and classroom management. Free to Florida educators, one only needs a fast Internet connection to view the videos.
  - **University of South Florida iTunes U** (<http://itunes.usf.edu/>) gives teachers access to free K-12 resources and content for classroom use, including Lit2Go audio books and TechEase, a collection of tutorial vodcasts that guide educators through the latest technologies such as online photo sharing and social bookmarking. Podcasts are also available which highlight innovative uses of technology in K-12 lessons.

In addition to these professional development resources, Florida's universities offer online degrees and coursework in library and information science, reading instruction, and a variety of advanced educational opportunities.

Yet, even the most excited and engaged children and innovative and technology-savvy teachers cannot change the bandwidth environments in their schools. Administrators must see the need to invest in high-speed connectivity.

*Issue 3. Administrators need high-speed broadband access to conduct online assessments and to access data for effective decision making.*

In addition to facilitating a climate of constant professional improvement, district and building-level administrators must monitor student achievement and ensure that students are assessed in a timely and accurate fashion. Many of the tools that Florida's school administrators need to accomplish these important tasks are available online and require secure, reliable, robust network infrastructure.

The **Florida Association of School Administrators (FASA)** (<http://www.fasa.net>) provides a series on on-demand seminars on school leadership topics like leadership for school improvement, time management, new principal support, and data-driven decision-making. Administrators can gain this important knowledge anytime, anywhere if they have a stable, fast Internet connection.

The State of Florida makes data available for a number of administrative applications, providing users have the software and connectivity necessary to visualize the data sets. For example, the **Florida Education and Training Placement Information Program (FETPIP)** (<http://www.fl DOE.org/fetpip>) provides data about high school graduation rates and post-graduation outcomes. Longitudinal data are also available on FCAT scores, other aspects of student performance from kindergarten through college, school ratings, and Adequate Yearly Progress (AYP) through the Department of Education's **Educational Data Warehouse (EDW)** (<http://edwapp.doe.state.fl.us/doe>). However, administrators need the skills and the online access to download and analyze the data sets.

**Florida Leaders.net** (<http://www.floridaleaders.net>) has a series of online course modules available to administrators to provide the hands-on experience needed to complete these tasks. In addition, the site also hosts *Taking a Good Look at Instructional Technology (TAGLIT)*, an online tool that helps administrators assess the impact and needs for technology in their schools. Yet, it is quite possible that administrators in districts and schools without adequate bandwidth cannot access the tools and applications they need to even obtain the information to make these crucial decisions about the importance of technology and connectivity!

Table 1. School library media specialist leadership roles as they pertain to the four areas of broadband implementation in schools.

	Teacher	Instructional Partner
Access	<ul style="list-style-type: none"> <li>• Promote awareness of Web 2.0 and other broadband-enabled applications available in the school and school library</li> <li>• Support e-portfolio creation by students</li> </ul>	<ul style="list-style-type: none"> <li>• Co-plan, co-teach, and co-assess assignments that make effective use of broadband-enabled applications and digital resources</li> <li>• Ensure equal access for all students, subject areas, and grade levels via curriculum mapping and sharing connections and overlap with teachers</li> <li>• Develop unique electronic resources to supplement curriculum</li> </ul>
Skill	<ul style="list-style-type: none"> <li>• Design professional development using latest research about professional development for technology</li> <li>• Facilitate after school clubs for students to create media and participate in online learning experiences</li> </ul>	<ul style="list-style-type: none"> <li>• Co-teach aspects of revamped lessons that include digital resources, broadband applications, and 21st Century Skills</li> <li>• Provide support and professional development for integration of streaming video</li> <li>• Serve as a model for broadband enabled applications in your own instruction</li> </ul>
	Teacher	Instructional Partner
Policy	<ul style="list-style-type: none"> <li>• Educate students and teachers on capacity limitations, copyright and safety implications of broadband applications</li> <li>• Promote digital citizenship</li> </ul>	<ul style="list-style-type: none"> <li>• Collect information about instructional events that make use of broadband and present in annual or quarterly reports to administration and school board</li> <li>• Participate on technology-planning committees that make decisions about bandwidth, equipment, and resources</li> </ul>
Motivation	<ul style="list-style-type: none"> <li>• Promote Web 2.0 applications that make good use of bandwidth and are engaging for learners</li> </ul>	<ul style="list-style-type: none"> <li>• Share co-teaching successes with digital resources and broadband applications with other teachers</li> <li>• Facilitate digital field trips</li> </ul>

Resource Specialist	Program Leader	Even Further
<ul style="list-style-type: none"> <li>• Maintain school library website to allow 24-7 access to catalog and databases from home and other locations</li> <li>• Locate sources of free, downloadable digital video, learning objects and e-books to integrate objects into catalog</li> <li>• Correlate physical and digital resources to school textbook series in OPAC</li> </ul>	<ul style="list-style-type: none"> <li>• Determine match between desktop and district connectivity speeds as well as desktop computer adequacy as part of technology planning process</li> <li>• Maintain extended hours in the school library</li> <li>• Facilitate the integration of online course offerings</li> <li>• Serve as an advocate for student access</li> <li>• Develop partnerships to obtain funding and free resources</li> </ul>	<ul style="list-style-type: none"> <li>• Use RSS and push technologies to make teachers aware of new learning resources</li> <li>• Help teachers to develop and tailor online learning options</li> <li>• Design and facilitate online interactions with students, faculty and experts in remote locations</li> </ul>
<ul style="list-style-type: none"> <li>• Collect a variety of tutorials and just-in-time PD resources</li> <li>• Work with student assistants to create step-by-step "job aids" for innovative technology activities like video creation</li> </ul>	<ul style="list-style-type: none"> <li>• Survey teachers on professional development needs</li> <li>• Seek own professional development for network administration and new application use</li> <li>• Educate parents on copyright, safety, and implications of broadband</li> </ul>	<ul style="list-style-type: none"> <li>• Promote a collection of "just in time" professional learning digital videos and resources</li> <li>• Incorporate digital media into school television production</li> </ul>
Resource Specialist	Program Leader	Even Further
<ul style="list-style-type: none"> <li>• Ensure that collection policy pertains to collecting and describing digital resources</li> <li>• Develop Acceptable Use Policies that include Web 2.0 applications</li> </ul>	<ul style="list-style-type: none"> <li>• Determine future bandwidth-intensive application needs and communicate those to district personnel</li> <li>• Review compatibility between filtering policies and use of bandwidth-intensive applications.</li> </ul>	<ul style="list-style-type: none"> <li>• Perform ongoing measurements of policy impact and adjust on an ongoing basis</li> </ul>
<ul style="list-style-type: none"> <li>• Create an online repository of student-created digital work</li> <li>• Set up stations in the library for student creations</li> </ul>	<ul style="list-style-type: none"> <li>• Share research on student learning with technology</li> <li>• Collect and share school-based data on student success with technology</li> </ul>	<ul style="list-style-type: none"> <li>• Facilitate an online community for student learners to share ideas and projects</li> </ul>

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**Issue 4.** *Students need high-speed broadband access to overcome the digital divide in rural and low socio-economic areas.*

As Figure 1 illustrated, Florida's children are in a wide variety of connectivity situations. Rural areas are hit hardest by a lack of connectivity, and this rural-to-urban variation has perpetuated a digital divide that once fell solely along economic lines. While the Florida Information Resource Network (FIRN2) network provides some broadband access and email to schools, there has been an effort in certain areas of Florida to bridge the digital divide for students and their parents in need of broadband access at home, creating a vital home-to-school connection.

For example, Digital Harmony is a program developed by Commissioner Andrew Gillum in Tallahassee, Florida. The program provides computers to incoming sixth grade students attending R. Frank Nims Middle School free of charge and provides a help desk staffed by Florida State University's College of Communication and Information. Prior to the 2007-2008 school year, R. Frank Nims was a school in dire need of reform. The school received a grade of F from the Florida Department of Education. For the past two years, incoming sixth grade students have benefited from Internet access provided by Digital Harmony and are connected to software for individualized instructional needs in reading, mathematics, and language arts. Without the program, it was highly unlikely that the students' parents would have been able to provide them with the computers, Internet access, and specialized software. Consequently, the school grade and enrollment at R. Frank Nims has begun to increase. The school earned a C for the 2007-2008 school year.

The situation at R. Frank Nims illustrates the importance of providing broadband access and technology opportunities to children. Increasingly, learning with technology has gone beyond mastering curriculum into real life opportunities like job application, college enrollment, and driver's training. The Florida Safety Council provides the mandatory Florida First Time Driver Drug Alcohol Traffic Awareness (DATA) course. The First Time Driver DATA Course is required by the State of Florida for all first-time drivers' license applicants. Teen drivers are strongly recommended to take both the DATA course as well as school-offered driver education classes, but a slow Internet connection may mean that some teens cannot access this important information.

Moreover, bandwidth is a key aspect of parental involvement as many Florida schools have created networks for information distribution through the use of email lists, broadcast messages, and blogs. It is commonplace to access school websites featuring newsletters, calendars, lunch menus, and school and faculty contact information. All of this information serves to keep schools in touch with the communities they serve.

The **State Technology Goals for Florida** ask all education stakeholders to:

- Engage students in their education in ways never before possible.
- Invest in leadership programs to develop technology savvy leaders at all levels of the educational system.
- Empower educators with the skills necessary to integrate technology to improve students' rates of learning.
- Expand access to innovative digital technologies and learning opportunities.
- Establish that all public schools have the infrastructure that supports dedicated, high-speed connections to the point of learning, and provide "just-in-time" technology support. (Florida Innovates, 2006)

Yet, essential to realizing these goals is the connectivity.

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## Going the Last Mile for Broadband in Schools

A solution to these situations is on-site support to streamline and enable effective use of broadband-enabled technology. For most schools, the school library media specialist can expertly direct this “last mile” implementation in broadband access, skill, policy, and motivation.

In their roles as school leaders, school library media specialists provide tech coordination, support, and leadership necessary to address access issues from desktop to district. As one of the only faculty members who works across curriculum areas and grade levels, the school library media specialist has unique knowledge of classroom activities throughout the schools and places in which technology would enhance learning. Moreover, it is the school library media specialist who often provides desktop-level technology support and liaises with district-level technology staff to identify the needs of teachers and students.

The school library media specialist role encompasses integrating technology into the teaching and learning process for both teachers and students. School library media specialists develop and facilitate professional development with technology equipment and instructional resources to help teachers make the best use of the district’s investments in these areas. The school library media specialist also uses the principles of *Standards for the 21st Century Student Learner* to help teachers bring new technology, interdisciplinary skills, and learning resources to students through class instruction and one-on-one learning. Such standards highlight the importance of integrating technology within schools and reinforce the institutional roles played by school library media specialist at the K-12 level in facilitating high levels of overall student educational achievement. Students see the school library as a digitally enriched place where information can be located and used, projects can be designed and created, and knowledge can be expressed within and beyond school walls. The school library media specialist is often the guide to these technology-mediated experiences and ensures that students are learning essential skills and dispositions of 21st century learners.

Because the school library media specialist sees the use of technology and connectivity at both the desktop and district levels and has knowledge of not only the issues inherent in instructional integration but also technology infrastructure, this person is in a unique position to anticipate and articulate needs for policy creation and revision. Experienced in developing policies for the school library, the school library media specialist is knowledgeable about ensuring equal and safe access to learning for all members of the school community in policies that support the district’s mission and goals.

Finally, because school library media specialists connect work across grades and subjects, they have the ability to help students and teachers make interdisciplinary connections that increase the relevance of classroom content. They also have the resources, technology, and knowledge to ensure that learning is appropriately infused with inspiring techniques and ideas that motivate learning and teaching. School library media specialists know when simulations or other learning objects may be able to express a concept in a more interesting or direct fashion and engage student interest. School library media specialists also know when the creation of a digital video, podcast, or mash-up might illustrate student learning in a way that will be exciting to create and compelling to experience. Table 1 depicts the ways in which school library media specialists are very involved in supporting effective use of broadband in all areas in all of their roles to Florida’s education stakeholders.

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## Concluding Thoughts and Recommendations

Network connectivity opens up a wealth of possibilities to K-12 educators. While it has the potential to result in fundamental changes in teaching methods, it can definitely be used to enhance already effective teaching methods.

However, schools must have confidence in their network infrastructure before network connectivity will be integrated into the classroom. Networks must be reliable and quick; and, if they do not function as expected and technical support is not readily available, then teachers will not use them. Last mile support is essential and all stakeholders must work together to address the main issues facing the improvement of broadband in schools. Table 2 includes some possible approaches to and actors for addressing the main issues facing broadband in schools in light of these six recommendations:

1. Develop a Return-on-Investment (ROI) calculator so that administrators can easily see the benefits of broadband investment.
2. Assemble a statewide advisory panel of “last mile” personnel including school library media specialists, school administrators, and technology personnel to interface with state-level educational technology policymakers.
3. Undertake a vigorous and thorough measurement of current bandwidth capacities and applications at the classroom level.
4. Collect quantitative and qualitative data about the impact of broadband on student learning.
5. Survey Florida educators about their skills with and needs for broadband.
6. Select exemplar schools for in-depth professional development, classroom support, and student achievement study.

Florida’s schools face challenges to the integration of broadband in teaching and learning in the areas of access, skills, policy, and motivation. While it is possible for a school to be connectivity-rich but integration-poor; conversely a school can experience the thwarting effect of inadequate connectivity on instructional innovation. School library media specialists have a vital role to play in helping broadband and school technology work together to maximize teaching and learning for all of Florida’s citizens.

Table 2. Recommended Actors and Actions for Issues Facing Broadband in Schools.

Issue	Actor	Related Recommendations
<p>Issue 1. Students need high speed broadband to access in their schools to take advantage of a wide range of new and rich educational resources available for anytime, anywhere learning</p>	<p>Researchers School library media specialists Teachers Students</p>	<ul style="list-style-type: none"> <li>• Undertake a vigorous and thorough measurement of current bandwidth capacities and applications <i>at the classroom level</i>.</li> <li>• Select exemplar schools for in-depth professional development, classroom support, and student achievement study</li> </ul>
<p>Issue 2. Teachers need high-speed broadband access for professional development and engaging in professional learning communities as well as accessing new educational resources</p>	<p>Researchers School library media specialists Teachers Students</p>	<ul style="list-style-type: none"> <li>• Survey Florida educators about their skills with and needs for broadband.</li> <li>• Select exemplar schools for in-depth professional development, classroom support, and student achievement study.</li> </ul>
<p>Issue 3. Administrators need high-speed broadband to conduct online assessments and access data for effective decision-making</p>	<p>Researchers Administrators</p>	<ul style="list-style-type: none"> <li>• Develop a Return-on-Investment (ROI) calculator so that administrators can easily see the benefits of broadband investment;</li> <li>• Collect quantitative and qualitative data about the impact of broadband on student learning.</li> </ul>
<p>Issue 4. Students need high-speed broadband to overcome the digital divide in rural areas</p>	<p>Researchers School library media specialists Teachers Students</p>	<ul style="list-style-type: none"> <li>• Assemble a statewide advisory panel of “last mile” personnel including school library media specialists, school administrators, and technology personnel to interface with state-level educational technology policymakers;</li> <li>• Collect quantitative and qualitative data about the impact of broadband on student learning.</li> </ul>



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## About the PALM Center

The PALM Center offers an array of services to support school library media specialists and other educators in Florida, throughout the United States, and internationally to improve their districts and schools. A wide range of research and evaluation services is available from large-scale surveys and evaluation of reliability and validity of program implementation, to individualized in-depth case studies of school libraries, technology implementation, and whole school change. The PALM Center has the established research-based expertise to assist with your research and evaluation needs in school and informal educational settings.

The PALM Center has consulting services related to school library modernization, broadband deployment, technology integration, rural schools, leadership development, and other critical areas to support implementation of the American Recovery and Reinvestment Act (ARRA) including Enhancing Education Through Technology (EETT), Race to the Top, Invest in Innovation and School Modernization.

## Current Projects

*Leadership in Action* – A three-year study of school library media specialists’ leadership in technology integration funded by the Institute of Museum and Library Services (\$754,000).

*Project LEAD* is an initiative composed of two projects that resulted in a leadership curriculum for school library media specialists based on the National Board for Professional Teaching Standards which were implemented with 30 teacher-leaders. Funded by the Institute of Museum and Library Services (\$1.5 million).

*Digital Libraries to School Libraries (DL2SL)* – A three year study of the development, deployment, and implementation of push technology and professional development for the integration of digital learning objects into online catalog software and learning experiences funded by the Institute of Museum and Library Services (\$401,000).

*DLConnect* focuses on dissemination of National STEM Education Digital Library (NSDL) resources within school settings through workshops for preservice and in-service Science Technology, Engineering, and Mathematics (STEM) teachers and school library media specialists. This service and outreach project was funded by the National Science Foundation (\$278,618)

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