SOUTH CAROLINA
K-12 SCHOOL TECHNOLOGY INITIATIVE

2016-17
PROGRESS
REPORT

Much has been accomplished in the effort to transition K-12 education in South Carolina into the digitally connected era, yet much remains to be done. Achieving this goal requires bold educational and technological initiatives as well as steadfast programmatic and budgetary support from our state's leadership.

TABLE OF CONTENTS

ABOUT THE INITIATIVE

Who are we?

The South Carolina K-12 School Technology Initiative was founded in 1996, as part of the General Assembly's proactive approach to addressing technology infrastructure, connectivity and education in schools throughout the Palmetto State.

The Initiative – steered by a unique public/private partnership that includes the SC Department of Administration, SC Department of Education, SC Education Oversight Committee, SC Educational Television, SC State Library and private sector representatives AT&T and the SC Telecommunications and Broadband Association – guides the distribution of funds appropriated by the Governor and General Assembly. These funds collectively help to meet our schools' needs for software, hardware, connectivity, digital content, instructional technologies, cybersecurity protection and professional development opportunities.

The K-12 School Technology Initiative is extremely proud of its progress in the development and implementation of educational technology as well as the strides that have been made in providing infrastructure initiatives designed to produce more successful students in South Carolina.

It is our hope that South Carolina's leaders will continue their history of using the K-12 School Technology Initiative to guide the provisioning of high-quality, information-rich education for all students.

Who makes up the Initiative?

ABOUT THE INITIATIVE

Initiative Partners

SC DEPARTMENT OF ADMINISTRATION
P.O. Box 2825
Columbia, SC 29211
Phone: (803) 734-8120
Website: admin.sc.gov

SC DEPARTMENT OF EDUCATION
1429 Senate Street
Columbia, SC 29201
Phone: (803) 734-8500
Website: ed.sc.gov

SC EDUCATION OVERSIGHT COMMITTEE
P.O. Box 11867
Columbia, SC 29211
Phone: (803) 734-6148
Website: eoc.sc.gov

SC EDUCATIONAL TELEVISION
1041 George Rogers Blvd.
Columbia, SC 29201
Phone: (803) 737-3200
Website: scetv.org

SC STATE LIBRARY
1500 Senate Street
Columbia, SC 29201
Phone: (803) 734-8666
Website: statelibrary.sc.gov

AT&T
1600 Williams Street
Columbia, SC 29201
Phone: (803) 401-2206
Website: att.com

SC TELECOMMUNICATIONS AND BROADBAND ASSOCIATION
1122 Lady Street, Suite 840
Columbia, SC 29201
Phone: (803) 779-7282
Website: sctba.org

Initiative Principals & Committee Chair

SC DEPARTMENT OF ADMINISTRATION
Marcia Adams, Executive Director

SC DEPARTMENT OF EDUCATION
Molly Spearman, State Superintendent of Education

SC EDUCATION OVERSIGHT COMMITTEE
Melanie Barton, Executive Director

SC EDUCATIONAL TELEVISION
Anthony Padgett, President and Chief Executive Officer

SC STATE LIBRARY
Leesa Aiken, Director

AT&T
Pamela Lackey, State President, AT&T South Carolina

SC TELECOMMUNICATIONS AND BROADBAND ASSOCIATION
Nola Armstrong, Executive Director

COMMITTEE CHAIRPERSON
Keith Osman, Director, Division of Technology Operations

WHO DOES THE K-12 SCHOOL TECHNOLOGY INITIATIVE SERVE?

81
SCHOOL DISTRICTS

1,257
PUBLIC SCHOOLS

193
PUBLIC LIBRARIES

50,443
INSTRUCTIONAL STAFF

760,500
STUDENTS

4,961,000
CITIZENS

1
SOUTH CAROLINA

1. EXECUTIVE SUMMARY

The South Carolina K-12 School Technology Initiative continues to build on the educational and technological foundation developed between its partners and the state's public schools, districts and libraries. Through this partnership, developed over the course of the last two decades, much has been accomplished in helping to build the instructional technology needed to support the state's educational goals and shaping graduates ready to compete in today's highly competitive workplace.

This 2016-17 Progress Report helps tell the story of the strides and advances made by the state and the partners of the K-12 School Technology Initiative. Such progress includes the interconnection of the state's public schools and districts with the South Carolina Department of Education (SCDE), as well as the provision of standards-based educational content from South Carolina Educational Television (SCETV) and the South Carolina State Library.

SCDE also provides powerful online administrative tools, online testing, a robust virtual school platform and data warehousing and analysis capabilities to support academic performance tracking and federal and state compliance matters.

It has become abundantly clear that the footprint of educational connectivity and support for learning must continue to widen beyond the traditional venues of the brick and mortar school classroom or learning lab. As many districts implement one-to-one computing initiatives – accomplished almost exclusively through the use of mobile technology – it is necessary to substantially increase the number and capacity of wireless access points across school campuses and even extending into the region of state-owned school transport.

> **"THE FOOTPRINT OF EDUCATIONAL CONNECTIVITY AND SUPPORT MUST CONTINUE TO WIDEN BEYOND THE TRADITIONAL VENUES OF BRICK AND MORTAL CLASSROOMS AND LEARNING LABS."**

Recent events affirm that this more ample network and internet connectivity footprint necessitates a more robust and aggressive application of network, data and personal security standards.

Digital learning content and data communication infrastructure provided and

enabled by the Initiative's efforts can bring educational opportunities to all communities and all students in South Carolina. Such efforts include the areas of network infrastructure, connectivity and security, high-quality digital learning content for students, professional development and curriculum support for educators, and communications and collaboration opportunities linking learners, educators, parents and the broader community.

The K-12 School Technology Initiative has made, and is continuing to make, great strides in assisting the state's public schools and libraries, especially those least able to provide adequate, highly qualified IT staffing and security infrastructure for themselves, with cost-effective solutions to security concerns.

Meanwhile, the need for teacher and administrator professional development continues to grow. Initiative partners such as the Education Oversight Committee, SCDE, SCETV and the State Library are working in close collaboration to assess those needs and provide technology skills upgrading and certification that combine value with ease and convenience of access.

Finally, the public education enterprise in South Carolina

must have broad community, parental and legislative awareness and support in order to prosper. Initiative partners continue their informational efforts to engage and enable these various segments of society in the task of providing public school learners with a world-class education and providing the state with a valuable human asset to attract and hold the jobs that will be strategic in tomorrow's global economy.
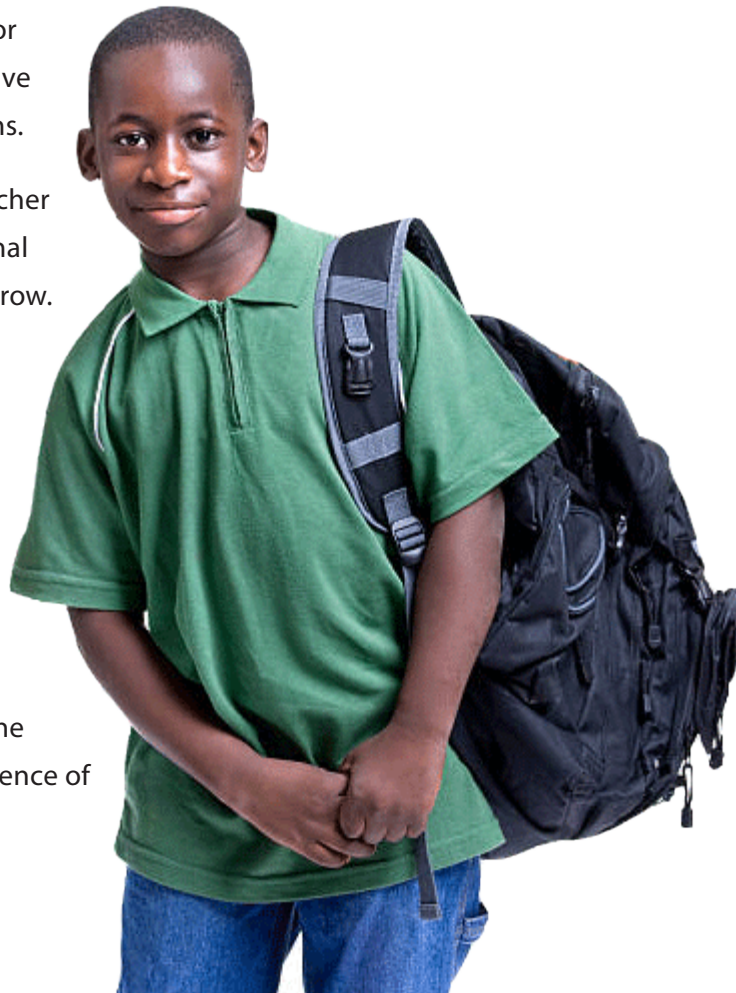
2. STUDENT LEARNING & CLASSROOM TECHNOLGOY

South Carolina Technology Plan Goal:

All districts across the State of South Carolina are striving to improve student learning through technology.

Partner Efforts to Support the Goal:

The citizens of South Carolina want to see their public schools succeed in the task of educating our young persons and rendering them ready to step into the highly competitive, data-driven, global workplace. But how can this success be defined and assessed? How must the public K-12 learning space be configured to produce these successful outcomes?

Twenty-five years ago, the centerpiece of public education was curriculum standards. By insuring that all students, in all schools, under all teachers, are exposed to the same learning tasks and required to demonstrate competency in the same academic skills, we could guarantee that every public school student would graduate with the necessary knowledge and abilities to succeed in the wider world.

Ten years later, much of the focus had shifted to improving the preparation of teachers as a means of producing better educational outcomes. Board certification and ongoing teacher professional development became the watchwords of our efforts.

These initiatives were neither superfluous nor misguided. To the contrary, their objectives remain at the core of modern pedagogy and are central to the proper administration of public education. However, at the same time it has become increasingly apparent that the tools used in public education, including the learning environment itself, must come to mirror the highly connected, collaborative, data-dependent workplace into which our graduates must be comfortably ready to move.

> **"IT IS CERTAIN THAT THE STATE CANNOT REACH ITS ECONOMIC AND EDUCATIONAL GOALS WITHOUT CONTINUING TO PLACE A VERY HIGH PRIORITY UPON DIGITAL LEARNING RECOURCES AND CLASSROOM TECHNOLOGY IN OUR PUBLIC SCHOOLS."**

So the great challenge of today's public education is to provide the learning content resources, the hardware, the communications infrastructure, and, above all, the inspiration to enable students to approach knowledge in news ways and to master new models of both individual and collaborative effort.

The Profile of the South Carolina Graduate features quality control guidelines enumerating a set of skills the successful graduate must possess upon completion of their public education experience. These principles have been validated by act of the South Carolina General Assembly as the criteria by which the success of our public education efforts should be measured.

The core assumption of the Profile of the South Carolina Graduate is that young persons who fit this profile will graduate ready to enter a career or pursue a postsecondary degree, thoroughly infused with, and driven by, information technology.

The partners of the South Carolina K-12 School Technology Initiative have assembled and made available to educators and students a wide array of high quality, standards-based digital learning resources. Collections such as the South Carolina State Library's Discus and StudySC programs and South Carolina Educational Television's (SCETV) Knowitall. org, PBS LearningMedia and StreamlineSC media-enriched, online learning content have continued to assist our state's school districts in meeting their needs for digital instructional materials.

In addition, the enrollment and course offerings provided through the South Carolina Department of Education's (SCDE) VirtualSC, the state's virtual, online public school system, continue to grow at a steady rate.

The ability to access content, interact with others, develop concepts and solutions based upon that content, and apply those solutions to problems, all the while working within the digital domain of a networked computing device is the de facto paradigm of the successful South Carolina graduate. It is certain that the state cannot reach its economic and educational goals without continuing to place a very high priority upon digital learning resources and classroom technology in our public schools.

Discus

Digital Information for South Carolina Users, more commonly known as Discus, is South Carolina's virtual library: a collection of over 50 subscription databases and a vital resource for students of all ages. Administered by the South Carolina State Library (State Library) and supported by the K-12 School Technology Initiative, Discus offers teaching aids to educators and a safe place for students to learn and develop research skills without such outside distractions as advertisements and unreliable websites.

This collection of high-quality electronic resources is available on a 24/7 basis to all state residents through schools, institutions of higher education and public libraries. Access to Discus means thousands of scholarly journals, e-books, primary sources, current event topics, occupation tests and much more are a click away. Each database in Discus is carefully chosen and is designed to align with the South Carolina curriculum standards for all

grade levels. These resources are monitored for usage and the collection is regularly evaluated by the State Library to examine redundancy or potential gaps and the necessity of each resource in relation to the State Library's mission. In addition to assisting South Carolina's learners, Discus is also instrumental for educators by providing professional journals, lesson plans, classroom activities and other teaching tools.

A goal of the State Library is to remove potential barriers of access for South Carolinians. To aid in this effort, the State Library integrated the use of EZproxy with Discus to provide a central authentication solution. This hosted solution provides access to the virtual library without obstacles by working with Discus content providers to ensure South Carolina's citizens are recognized as residents and are automatically granted access, which reduces the need for a username and password. The State Library completed the implementation of EZproxy before the start of the 2016 school year, and since that time, has found that 96 percent of all Discus users have seamless access without the need for credentials.

Having Discus available for schools throughout the state – regardless of economic status, geographic location or school type – supports the theory of access for all and makes the virtual library an integral program for school media centers. Discus serves as a primary research tool in schools and assists in meeting core collection recommendations, regardless of

grade level.

Discus also allows media centers to use their funding on other programing directly related to their student population since the electronic library supports many of the subjects taught in the curriculum. Discus takes much of the funding burden off South Carolina's schools, regardless of whether it is a traditional school, virtual school or home-based school by providing 24/7 access to the collection.

Each private school also has access to the rich collection of information for their students and relies on Discus for its research needs. Due to the increasing number of homeschool associations, Discus has sought opportunities to reach this population through electronic newsletters, exhibits and conference presentations. Without access to high quality, current and age-appropriate information, student learning suffers. As such, K-12 media centers, as well as academic and public libraries, directly benefit from the availability of this virtual library.

The return on investment for Discus is excellent from both a learning perspective and from a cost efficiency standpoint, as indicated through the following information.

- License costs for Discus databases budgeted for FY 2016-17 were $2,373,879.

- If each library purchased access separately, the total cost would be over $57 million.

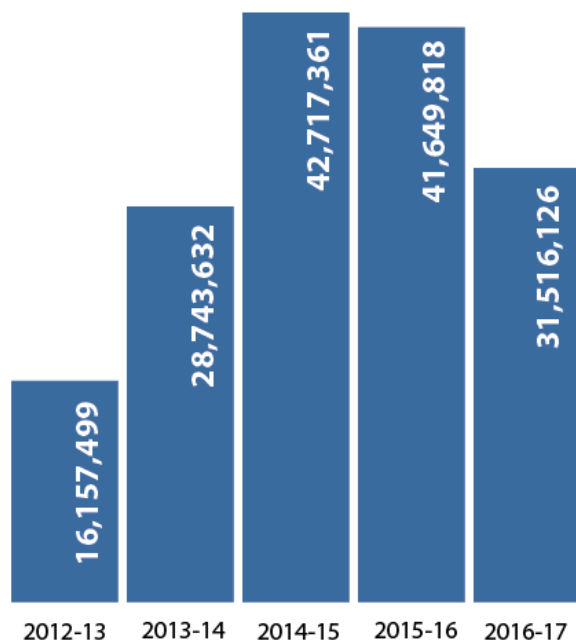- Administration of this statewide program provides cost avoidance of over $52 million

(Discus license renewal costs were over $2 million).

- All state funding for Discus goes directly to database acquisition.

The State Library negotiates with its vendor partners when purchasing statewide subscriptions to get the best rate possible at each renewal. These purchases save schools and libraries millions of dollars each year by bundling packages of resources that are beneficial to all grade levels including academic libraries. The licensing agreements are studied to ensure the best price for the databases along with ample technical and marketing support. Monthly vendor-led webinars supplement the workshops conducted by Discus throughout the year during educator professional days and at statewide conferences.

Discus Usage (Items Retrieved)
Source: South Carolina State Library

Year	Items Retrieved
2012-13	16,157,499
2013-14	28,743,632
2014-15	42,717,361
2015-16	41,649,818
2016-17	31,516,126

The Discus collection helps ensure a level playing field for all South Carolina students by providing access to high-quality scholarly information necessary for success. The collection includes a wide range of subjects that is essential to the Profile of the South Carolina Graduate. Such subjects include science, math, reading, literary studies, health and technology. Social issues are also covered, as are the many cultures of the world.

Discus database providers continue to offer tools that enhance the student experience and research needs by integrating Google and Microsoft tools and updating citation software from MLA7 to MLA8. Documenting resources used in student projects is imperative and South Carolina students learn early the necessity of proper citations. As students become more technologically savvy, electronic resources must conform to remain relevant to the research process.

Each database in Discus has its own unique area of focus and target audience, which makes the entire collection well rounded. Abundant thought and consideration are given to each resource and the information it is intended to provide for each library community. The Discus collection provides online books, periodicals and informational databases on a wide variety of subjects and challenges students to become better researchers by presenting multiple sides of issues while developing critical thinking skills. The science, technology, engineering and math (STEM) resources in Discus aid students in their studies by providing scholarly research

that helps with problem-solving skills and using experiments and activities outlined in the Discus databases.

Social issues are presented through two specific databases called Points of View Reference Center and Opposing Viewpoints in Context. Both of these databases present issues and current topics of interest while encouraging dialogue from different sides of the issues. CultureGrams by ProQuest is another popular database due to the easy navigation with areas divided into sections for younger and older learners. CultureGrams aims to foster understanding and appreciation of the world's cultures and peoples by providing a global perspective for all ages.

As South Carolina students become more technologically savvy, their needs change and it is imperative for electronic resources to stay ahead of the technical curve. Developing research skills at a young age, along with the knowledge needed to access the electronic resources reinforces the need to provide these tools to all South Carolina students in order to ensure a successful career path.

The following chart illustrates Discus usage over time and demonstrates the program's contribution to the K-12 learning environment. In FY 2016-17, South Carolinians retrieved 31,516,126 items through Discus, most of which have historically come from the K-12 community. This amount represents a decrease in usage from the previous year, due primarily to a change in the usage calculation method for

the program's Britannica collection. The State Library recognized this error and made the decision to revise the calculation methodology moving forward.

Several other factors are thought to affect the decrease in retrievals such as the stability of the collection offerings and the research skills the K-12 community has continued to hone. Continuing to provide the consistent collection of databases over a period of years makes Discus easy to use and a familiar tool for students. A goal of Discus is to introduce the collection to younger students to familiarize them with the resources and the proper research skills needed so they are knowledgeable with the functionality as they progress down their educational path. The better student searching skills become, the better the results, and consequently, the fewer number of retrievals are needed to find the desired information. In addition, the State Library has worked with its vendor partners to refine the searching algorithms to return results that are more applicable.

The most significant decrease in database usage is found with the two products provided by Infobase, Ferguson's Career Guidance Center and Bloom's Literature. Ferguson's Career Guidance Center provides a place where students can conduct career research using articles and videos for over 3,000 jobs and 94 industries. Bloom's Literature, primarily used by high school and college students studying literary classics and writing essays, includes the full text of more than 800 works, thousands

of images, over 400 full-length performance videos, scholarly criticisms, background essays and discussion question ideas. Like many of the other Discus databases, Bloom's Literature integrates with Google Classroom and Google Drive for use anywhere there is Internet access. The reduction in Ferguson's Career Guidance Center usage is surmised to be due to the current state of the economy and smaller number of citizens seeking a career change.

During FY 2016-17, the resources in the Gale Cengage collection showed a slight increase in usage. Gale Cengage is a highly respected information provider that is relied upon heavily in the K-12 community. Educators and students both recognize the benefit of Gale's innovative technology of integrating Google Apps for Education and Microsoft Office 365 into all of their electronic resources. Incorporating these tools into the subscriptions is significant since many public school districts currently use either Google or Microsoft for their technology needs. These tools provide a means for educators and students to easily research, share and retain valuable information for collaboration and further study. The Gale products cover many subjects and topics in all grade levels.

Credo Reference, a collection of over 3 million full text articles in 876 reference books, has integrated Google Drive into its technology. Research found in Credo can be saved and retrieved by signing into individual accounts wherever internet access is available. This powerful tool has been well received by educators during the past year and is easy to

use. A LibGuide for students studying South Carolina history was developed by Credo Reference and added to the user interface. Material in the LibGuide is researched and curated by Credo and includes an introduction to South Carolina, Native Americans, early history, Civil War, slavery and civil rights, geography, biographies and books.

BrainPOP Jr., for K-3 grade levels, continues to be another extremely popular resource in Discus. This easy to use video-based database for young students, educators and education majors is a great resource for beginning and ending lessons and provides games, quizzes and activities for children that make learning fun. Subjects found in BrainPOP Jr. include space, math, health and wellness, famous people, science and social studies.

To learn more about the State Library's Discus, please visit www.scdiscus.org.

SCETV Education Services

South Carolina Educational Television's (SCETV) Education Services delivers a wide range of high-quality digital learning content for students and educators, as well as professional development and curriculum support, and communications and collaboration opportunities designed to link learners. SCETV collaborates with the K-12 School Technology Initiative to provide such resources used extensively by pre-k-12 children throughout the state.

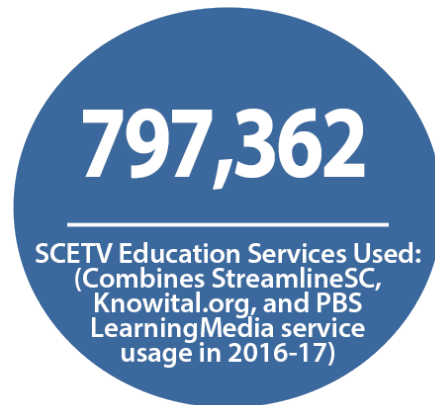As part of this effort, SCETV creates, organizes

and distributes educational content to support pre-k-12 student needs, as identified within the Profile of the South Carolina Graduate, while also providing a variety of online and face-to-face professional development opportunities for teachers, staff and administrators.

As an example, over the past 18 years, K-12 School Technology Initiative funding has helped support SCETV's on-demand multimedia curriculum resource sites StreamlineSC and Knowitall.org. These highly regarded sites, coupled with SCETV's PBS LearningMedia and the new LearningWhy website accounted for 797,362 on-demand pre-K-12 resource uses in 2016-17.

Knowitall.org, a long-standing service offered by SCETV, is a free online collection of original and engaging educational resources designed specifically for classroom use. Three years ago, SCETV began an extensive overhaul of the site in an effort to make it more mobile friendly. Due to these efforts, and the transition of services funded by the K-12 School Technology Initiative, Knowitall.org Media was launched in the summer of 2015. After completing a planned upgrade in 2016-17, Knowitall.org now contains 6,200 multimedia resources, including 3,282 mobile friendly videos, 1,070 audio resources, 1,230 photos, 122 interactives, and the content continues to grow.

Over 13 years ago, SCETV, in partnership with the South Carolina Department of Education (SCDE), created StreamlineSC in an effort to help improve and manage learning resources in the state's schools. StreamlineSC, a standards-based video-on-demand service, delivered the curriculum-based content of Discovery and more recently, Learn360 coupled with its local pre-K-12 content, professional development and partner resources.

797,362

SCETV Education Services Used:
(Combines StreamlineSC, Knowital.org, and PBS LearningMedia service usage in 2016-17)

However, subscription services have become extremely costly while the use of StreamlineSC has trended downward. In August 2017, the Learn360 contract ended and was replaced by two new pre-K-12 resource sites. The new sites include ETV StreamlineSC Collections in Knowitall.org, and SCETV's LearningWhy, which includes pre-K-12 lesson plans for 1:1 environments.

Web resources have increased tremendously in recent years, and Public Broadcasting Service (PBS) is now supporting this focus with its research-proven PBS LearningMedia. In 2016-17, South Carolina PBS's LearningMedia library included more than 89,000 multimedia resources for pre-K-12 educators. In August 2017, SCETV launched a new SCETV PBS Kids broadcast channel that also streams on a 24/7 basis.

To better address current curriculum needs, SCETV created a new website, LearningWhy, to house innovative lessons for tomorrow's graduate. The new site, launched in August 2017, specifically addresses the instructional needs of schools initiating 1:1 technology environments. The project-based and one-on-one lessons are produced by SCETV and qualified partners, including the College of Charleston's School of Education, the National Parks Service and local school districts. LearningWhy lessons are searchable by state curriculum standards and taxonomies, and include step-by-step progressions, assessments and all the media and content links needed for teaching to standards.

For many years, SCETV's statewide distribution to schools was conducted through an instructional television fixed service (ITFS) closed-circuit educational broadcast system. To make spectrum more digitally compliant, the Federal Communications Commission enforced new regulations in 2005 for ITFS systems, creating the Educational Broadband Service (EBS). This development gave SCETV the opportunity to lease the state's EBS channels through a state contract with Sprint.

The resulting contract has allowed SCETV to issue over 200 free Wi-Fi devices to facilities within Sprint's coverage areas throughout the state. These gateways to broadband internet are issued to applicable early childhood educators and other educational organizations, including after-school programs. SCETV bundles Wi-Fi access with its quality professional development and content funded by the K-12 School Technology Initiative. The project helps close the digital divide in South Carolina while preparing early learning students for reading and STEM skills before and after school.

SCETV is one of the many educational institutions taking part in supporting the state's goal of the Profile of the South Carolina Graduate. To assist in these efforts, SCETV surveys teachers, staff and administrators to help identify needs and gauge the use of educational services and technology use in schools. This year, 859 respondents participated in the survey, representing public schools, private schools, charter schools, home schools, childcare centers, adult education centers and higher education institutions.

Over 88 percent of respondents represented public schools. Of the applicable survey respondents, 96.6 percent indicated the ETV Education Services they employed, including content and professional development, helped better facilitate learning to improve student performance and engagement, and met the goals of the Profile of the South Carolina Graduate. Respondents ranked ETV curriculum content as SCETV's top service with 71.9 percent identifying StreamlineSC, Knowitall. org and PBS LearningMedia as the most useful in performing their daily duties. The survey also confirmed that the LearningWhy features built by ETV will be useful and of value to teachers. The results of the survey, including graphs and tables, can be found by visiting SCETV's Education Services Survey webpage.

While digital delivery is becoming increasingly important, traditional means of transmitting content remains the public's first choice of access. In August 2017, SCETV added a fourth 24/7 television broadcast channel and online streaming channel called SCETV PBS Kids. Results from the fall 2015 South Carolina Market Study, conducted by Marshall Marketing, illustrated the importance of ETV content. The study found that 36 percent of households in the state with children watch ETV in an average week (264,000 households). South Carolina households with children were 62 percent more likely to watch PBS Kids on ETV than the average South Carolina household; 53 percent of South Carolina households watching PBS Kids on ETV earned less than $50,000 in household income and 35 percent earned less than $30,000.

StudySC

StudySC is an educational resource created by the South Carolina State Library (State Library) in 2010 to provide online content in support of state-specific curriculum standards. StudySC provides South Carolina-related web resources for homework and project assistance while also offering lesson plans and other content designed to support classroom activities. Students can access information by grade level and subject area while also accessing links to high-quality websites and multimedia content.

The concept for StudySC emerged from feedback indicating the need for a comprehensive portal to assist in locating age-appropriate state information. StudySC was created to meet this need and to support 3rd and 8th grade social studies curriculum standards.

This student-friendly site includes such subjects as government, culture, history, environment and geography. In addition, there is a section on famous South Carolinians, a glossary, county information and South Carolina Book Award nominees from the South Carolina Association of School Librarians. Included this year is a database of lesson plans on South Carolina-related topics from educational institutions such as museums, parks and higher education.

While information on StudySC is reviewed on a continual basis, the State Library is pleased to announce that significant upgrades were made to the website this year. The site is more user-

StudySC Sessions
Source: South Carolina State Library

Year	Sessions
2012-13	89,122
2013-14	96,075
2014-15	51,472
2015-16	34,841
2016-17	29,881
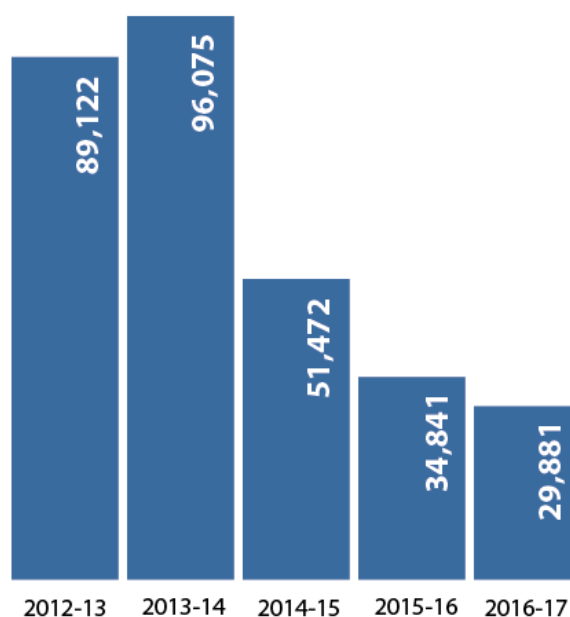
friendly and includes additional Discus resource integration and added content. The website relaunches in the fall of 2017 with additional support and promotion to K-12 educators. In FY 2016-17, StudySC had 29,881 sessions from across the state. StudySC continues to be a valuable and popular resource.

To learn more about the State Library's StudySC, please visit studysc.org.

VirtualSC

VirtualSC, formerly known as the South Carolina Virtual School Program, was developed in 2007 by the South Carolina Department of Education's (SCDE) Office of Virtual Education. Since that time, VirtualSC has become an invaluable resource to students throughout the state by offering online courses for credit, free-of-charge to all South Carolina students. The K-12 School Technology Initiative Committee provided substantial funding to develop and expand the state's virtual school program; however, during this reporting year no funding from the Committee was budgeted for this program.

The virtual school program has become increasingly popular since its inception, as evidenced by the tremendous growth in student enrollments experienced during the last five years. VirtualSC courses, available to any public, private, home schooled or adult education student in the state, are provided via an online learning management system, Moodle. Registration for these courses takes place in the program's customized student

information system, OpenSIS. Teachers remain in contact with their students through a variety of methods, such as by telephone, web conferencing and instant messaging systems like Skype.

To help ensure course offerings meet quality, design and academic standards, SCDE's Office of Virtual Education developed a curriculum team. The curriculum team, which consists of several instructional designers, a media team, a curriculum coordinator and a program coordinator, is responsible for new course design and development, course reviews and revision, and media development for interactive learning objects within new and existing courses.

VirtualSC has also begun to align all courses based on the Quality Matters framework to ensure courses meet accessibility guidelines and follow the guidelines of an external review framework. Future plans include having all courses reviewed by an external review committee using the Quality Matters framework to make sure all courses meet national guidelines and standards, as well as state academic standards. The curriculum team also supports several other virtual academic resources for students, including test preparation for AP, SAT, ACT, Elementary Keyboarding and EdReady Skills Recovery resources.

Courses offered through this program are taught by state-certified teachers who have demonstrated expertise in their individual

subject areas. All VirtualSC full-time teachers hold a rating of "highly qualified" in their subject area by the SCDE. In addition to their outstanding credentials, all full-time and part-time teachers must undergo in-service online professional development training to teach with the program.

VirtualSC used 40 full-time teachers for the academic year, in addition to 101 part-time instructors, to teach the courses offered through the program. The number of full time and part-time teachers has consistently grown over the past year due to the increased student demand for courses.

In 2016-17, VirtualSC was able to serve 39,590 student enrollments from 304 schools in 81 public school districts, 22 home school associations, 72 private schools and 30 adult education centers located throughout South Carolina.

Due to a lack of available funding for teachers, VirtualSC was only able to serve approximately the same number of students as the prior year. VirtualSC implemented a variety of measures to attempt to mitigate this and was able to place 1,976 students who had been on a waitlist after courses filled. But even with the mitigation strategies, VirtualSC had to turn away 2,526 students.

Of the students who completed their course, the program had a successful course completion rate of 85 percent for the school year.

VirtualSC offered courses in 10 subject areas including career and technology education, English and language arts, fine arts, health/physical education, mathematics, science, social studies, world languages, skills recovery and test preparation. The program also offered 81 diverse courses of varying levels, including advanced placement, honors, college preparatory and credit recovery classes. In addition to courses in the core content areas of English, mathematics, science and social studies, VirtualSC offered courses in four languages – Spanish, Latin, German and French – as well as a variety of electives in such popular career majors as health occupations, family and consumer science and business education.

In addition to the 39,590 student enrollments served in high school level courses, the

VirtualSC Enrollments
Source: South Carolina Department of Education

	2012-13	2013-14	2014-15	2015-16	2016-17
	16,800	22,107	32,779	39,645	39,053 / 2,526
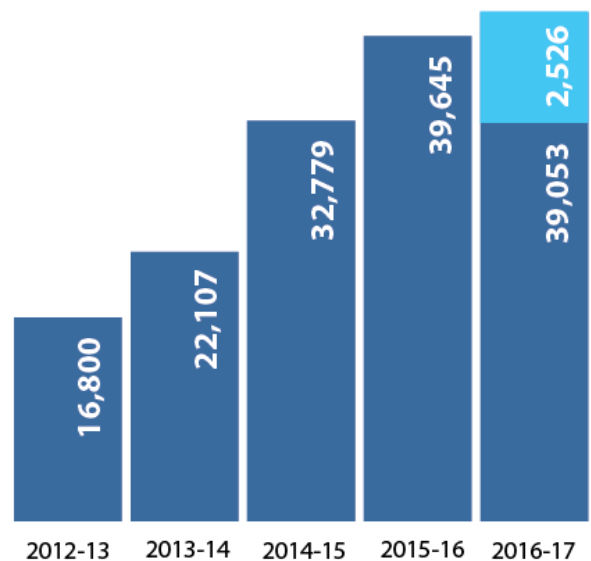
program also served an additional 67,973 elementary school students through its blended elementary keyboarding course. In total, VirtualSC served 107,563 enrollments across all virtual courses and resources, which totals 91,182 individual students from across South Carolina.

During the 2016-17 school year, VirtualSC added a number of innovative options for students and continued to seek out new opportunities for students based on statewide student and school needs. In 2017, VirtualSC was approved as the first statewide online program by College Board to offer the AP Capstone program. AP Capstone consists of two AP courses (AP Seminar and AP Research), which will help to prepare students for the rigorous work of college. If students pass the AP test for the two AP Capstone courses, they will receive the AP Seminar and Research Certificate. In addition, if students pass the test for the two AP Capstone courses and an additional four AP courses, they will receive the AP Capstone Diploma. VirtualSC recognized that not every school across South Carolina has the student interest or demand to offer the courses locally, so the program will add the two courses to its catalog to support schools and students across the state.

As in previous years, VirtualSC has continued to partner directly with schools to offer its Virtual Learning Labs in an effort to help schools fulfill several needs resulting from budget cuts, reduced funding and teaching vacancies at smaller schools across the state. Through these learning labs, schools are provided a standards-based virtual course as well as a highly qualified state certified teacher who meets virtually with students during a set period of the school day to provide instruction.

The program also continued its successful robot pilot program, which became part of the Virtual Learning Lab option. Using "Double Robots," which display a visual image of the actual teacher, the VirtualSC teacher can better physically connect with students in the classroom. During the 2015-16 school year, VirtualSC offered robots to eight schools including a continued partnership to offer keyboarding at LEAD Academy Charter School and Dacusville Middle School, in addition to: McCormick High School, Marlboro County High School, Johnakin Middle School, Wade Hampton High School, Abbeville High School and Orangeburg-Wilkinson High School. The classes across all district partnerships included 490 students and had an excellent overall success rate of 82 percent.

VirtualSC also continued to expand its flexible Franchise Program to schools and districts across the state. This program allows schools to use VirtualSC developed course content, the program's learning management system, Moodle and its student information system.

VirtualSC developed and began offering the Franchise Program to districts during the 2014-15 school year with one pilot district, Aiken County Public School District. In the 2016-17 school year, the Franchise Program expanded to nine districts, serving 4,329 students with an overall success rate of 81 percent. School districts included Aiken County Public Schools, Berkeley County School District, Colleton County School District, Department of Juvenile Justice, Dorchester School District Four, Greenwood School District 50, Jasper County School District, Spartanburg School District 1 and Williamsburg County School District.

Each of the nine districts use its VirtualSC franchise in a slightly different way to fit its own unique needs. As an example, in the Aiken County Public School District, the VirtualSC enrollment was at capacity. Therefore, the District developed a complete supplemental virtual school program designed to fill gaps in what the district can offer and in student schedules.

Dorchester School District Four and Jasper County School District, on the other hand, are using their franchises to support students at their respective alternative schools. When students are referred to the alternative school in Jasper County, the teacher at the high school can continue to view the student's progress as the alternative school works to ensure the student is on track when they leave to go back to their regular classroom. Dorchester School District Four has taken a competency-based approach to get students back on track and

prepared for graduation by blending face-to-face instruction with the online curriculum provided by VirtualSC. When a student is deemed competent in a given area, they are allowed to move on at their own pace instead of being dependent upon others mastering content at the same speed.

Since the implementation of the VirtualSC Franchise Program in Dorchester Four, the district has seen tremendous growth in alternative school student achievement. Such growth can be seen in the number of students earning high school diplomas from the alternative school program, as well as the rise in End of Course Exam (EOCE) scores, which saw increases ranging from nine percent in U.S. History to 21 percent in English 1.

VirtualSC also continued to offer and expand its blended elementary keyboarding program. During the 2016-17 school year, VirtualSC served 67,973 elementary students in 35 districts across South Carolina. The elementary keyboarding program was also enhanced during the 2015-16 school year to include students in grades K-2. As a result, students in grades K-6 can now participate in the program.

The keyboarding program is offered at no cost to schools statewide and the students work with their teacher in a web-based virtual environment to complete tasks, games, and other projects designed to assist with learning effective keying strategies at a younger age. Schools had shown interest in such an offering for several years in an effort to begin preparing

students for computerized standardized testing. VirtualSC was able to add the program based on district and school feedback.

The VirtualSC program completed a review of its five-year strategic plan focused on the Profile of the South Carolina Graduate – a description of the knowledge, skills and characteristics deemed critical for the state's graduates to compete in a global economy – and ensuring that students working with the program are college and career ready. Throughout the strategic planning process, the VirtualSC Leadership Team identified several ways to help meet this goal. Such efforts include working to develop middle school level courses that provide students the opportunity to learn how to take online courses as they prepare for high school and beyond. This ability will help ensure students acquire excellent life and career characteristics beginning as early as middle school.

In the 2016-17 school year, VirtualSC added the program's first middle school course, Exploring World Languages in South Carolina, which focuses on providing middle school students with a basic understanding of several languages, including

German, French, Latin, Spanish and Gullah, as well as the history and importance behind the language in South Carolina. In addition, in the 2017-18 school year, the program is planning to add Introductions to Career Clusters, which will be aimed at students in grades 7 and 8. The program plans to continue the expansion of middle school level courses over the next year.

VirtualSC also has plans to offer a variety of exploratory courses to middle school students to ensure they are properly prepared to enter high school. The virtual school program will also support the Profile of the South Carolina Graduate in a number of ways, including the continued development of advanced world language courses. Currently, the program offers Spanish 1-4, German 1, Latin 1-4 and French 1-2. The program is planning to continue to build out additional levels of German and French, so that the program has a full program of study for high school students in all of those languages.

The program will continue to explore a variety of enrollment opportunities for students to expand upon the availability of the program. In the 2016-17 school year, the program began to offer an eight-week version of many courses during a "fast track" semester. The program is also exploring the feasibility of providing competency-based courses that are offered on a personalized timeline

with no fixed end-date, but will conclude once the student has demonstrated competency in the subject matter through a project or other such assessment. The VirtualSC program is continuing to look for innovative methods for enrollment and course length based on research from other state programs.

Lastly, VirtualSC will be focusing on adding additional Honors level offerings to its course catalog by following the newly State-Board approved Honors Framework. The framework will give the program the ability to add Honors level courses in areas outside of the typical Honors areas (typically, the third and fourth level of a course). Presently, the program has several Honors level courses, but will continually add to the number of courses available throughout this school year.

VirtualSC will be expanding and implementing a plethora of ways to ensure that students obtain world class knowledge, world class skills, and life and career characteristics needed to be academically successful in the a 21st century while supporting the Profile of the South Carolina Graduate.

Additional Funding Needs

The VirtualSC program continues to expand in multiple directions and is poised to assist the state with issues in educational equity to ensure all students have equal educational options and opportunities, regardless of where in the state they live. In the 2016-17 school year, the program was forced to turn away approximately 2,338 student enrollments due to a lack of funding for certified adjunct teachers. While the program was able to continue the pace of growth with other surrounding states, that rapid growth has caused funds for additional adjunct teachers to become depleted. Additional funding for adjunct teachers was not approved by the General Assembly in the 2018 budget year.

South Carolina's virtual school program is looking at a more sustainable model for effectively supporting franchise districts. With the rapid growth and acceptance of the Franchise Programs from districts across the state, VirtualSC will need to look at an innovative approach to serve those districts.

One method VirtualSC is seeking to develop is a new Moodle instance that will deliver the program's content through a Learning Tool Interoperability (LTI) connection. This will allow districts to utilize their own learning management system to provide content to students in a familiar learning environment.

SCDE's Office of Virtual Education is working with vendors to identify a low-cost or no-cost option to provide a learning management system for district's without access to one of their own. Such options will utilize an LTI connection to Moodle, which will contain the course content. This will allow the program to more effectively and securely distribute content to franchise districts and allow the program to continue to grow at the current pace.

To learn more about SCDE's VirtualSC, please visit virtualsc.org.

3. INFRASTRUCTURE AND SECURITY

South Carolina Technology Plan Goal:

Provide a robust, secure and cost effective technical infrastructure that improves equitable access to appropriate technologies for all schools in South Carolina.

Partner Efforts to Support the Goal:

Our best-prepared teachers, most engaged and enthusiastic students, using the most effective and sophisticated learning content and the most up-to-date computers, tablets, smart phones and other personal computing devices cannot achieve their goals without an increasingly powerful and secure network infrastructure, and effective support from in-house or contract information technology (IT) staff.

The partners of the K-12 School Technology Initiative continue to support the improvement of both wide area network and internet connection bandwidth, as well as promoting the expansion of wireless networking capabilities inside public school and public library structures and across their wider campuses. One-to-one computer initiatives continue to grow across the state and new administrative requirements, such as those requiring online testing and student data warehousing, place new strains on network infrastructures.

Initiative partners are committed to assisting public school districts and schools, as well as public libraries, with economic and technical resources to keep pace with these ever-increasing bandwidth needs.

The public-private partnership that the K-12 School Technology Initiative embodies has radically strengthened its efforts to track and report school districts' expenditure of state funding for technology and support staffing.

> **"OUR BEST PREPARED TEACHERS AND MOST ENGAGED STUDENTS CANNOT ACHIEVE THEIR GOALS WITHOUT AN INCREASINGLY POWERFUL AND SECURE NETWORK INFRASTRUCTURE, AND EFFECTIVE SUPPORT FROM IN-HOUSE OR CONTRACT IT STAFF."**

The oversight of technology spending is coupled with an effort to monitor the successful expansion of one-to-one computing, wireless access, network security maturity and readiness for future bandwidth and infrastructure demands.

The model of a statewide partnership of public school districts, the South Carolina Department

of Education, the South Carolina Department of Administration (specifically the Division of Technology Operations), the South Carolina State Library, South Carolina ETV and private telecommunications providers continue to prove effective and invaluable to the state in maximizing the positive impact of federal E-Rate funds. From its inception, the E-Rate program has been indispensable in assisting the state and its public libraries and schools in building an effective network infrastructure to support K-12 education and school administration.

The threat profiles that affect the internet, public and private networks, and individual computing devices continue to multiply and to command our anxious attention. Our public schools and library networks, as well as our teachers and students computing devices, are menaced by the malicious exploits of hackers as much or more than those in any other segment of society. The Initiative, led by the Division of Technology Operations and the Department of Education, has taken concrete steps to provide resources for the monitoring and remediation of hacking attacks. More and better network and data security tools, like the Dell One Identity Manager, which streamlines and secures user self-service authentication and access functions, are being deployed on an on-going basis.

Expansion of High-Speed Broadband Infrastructures

Since 2010, the South Carolina Department

of Administration's Division of Technology Operations (DTO) has strived to expand the network connectivity of the state's K-12 public schools and libraries. The primary focus of this effort is designed to provide a stronger technology foundation for K-12 students, teachers and library patrons as they acquire the skills needed to prepare for 21st century emerging educational technologies and job opportunities. As a direct outcome of this focus, fiber-based high-capacity broadband connectivity continues to be expanded on a statewide basis among school and library entities.

Internet connectivity for South Carolina's public schools has indeed seen tremendous growth over this time. As evidence of this fact, in June 2013, 67 districts had 150 Mbps or less of internet bandwidth, while only six districts had

Growth of Bandwidth Demand
In School Districts (Measured in Gigabytes)

2012-13	2013-14	2014-15	2015-16	2016-17
36.78 GB	52.90 GB	63.99 GB	87.85 GB	112.90 GB
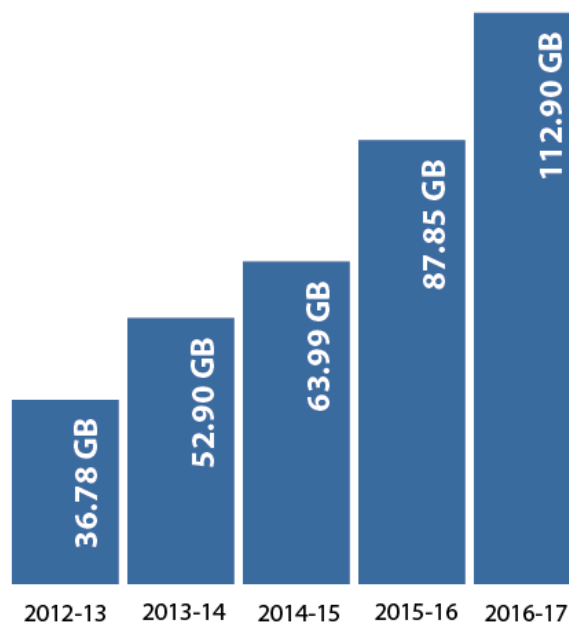
1,000 Mbps of internet bandwidth. Just three years later, there were only 14 districts with 150 MBs or less of internet bandwidth, and all had at least 100 MBs of bandwidth. The number of districts with 1,000 Mbps or more bandwidth had grown from six to 32.

As of FY 2016-17, school districts accounted for 112.9 Gbps of internet bandwidth capacity, which far eclipses the 3.04 Gbps available to library systems and 3.3 Gbps available to charter schools. While the average library system and charter school had roughly 65 Mbps of internet bandwidth capacity, the average school district in South Carolina had 1,411 Mbps of internet bandwidth capacity.

A complete listing of this information can be found in the Internet Bandwidth by District (2012-13 and 2016-17) Table, located on page 52 in the By the Numbers section of the report.

As we witness charter schools continuing to grow and evolve into large schools and, in some cases, small charter school districts with multiple school locations, their internet capacity is expected to take a turn upwards, mimicking the exponential growth in internet bandwidth

capacity experienced by school districts.

The K-12 School Technology Initiative must consider increasing the internet bandwidth capacity in the state's library systems. Internet bandwidth in South Carolina's library systems have remained relatively flat since 2010. A survey of bandwidth utilization among 10 geographically diverse libraries, ranging along the poverty index, found that half were consuming 100 percent of the internet capacity.

Library systems in South Carolina present a unique opportunity for expanding broadband connectivity to all South Carolinians. Leveraging the partnerships of the K-12 School Technology Initiative, the Division of Technology Operations will be able to dramatically increase the internet bandwidth capacity for library systems bringing with it patron access to new resources, bandwidth intensive media and enable library administrators to increase efficiency. A 25 percent increase in internet bandwidth capacity in FY 2018-19 would provide approximately 88 Mbps of internet capacity to library systems. A similar 25 percent increase in FY 2019-20 would provide over 110 Mbps of internet bandwidth capacity to the average library system.

At this point, many library systems would require new, additional network infrastructure to accommodate the increased internet bandwidth capacity. Considering the schools and Libraries Program's five-year Category 2 E-Rate program will be ending, library systems must begin planning for an increase in internet bandwidth capacity today.

School and Library E-Rate Program

Since 1998, the Schools and Libraries E-Rate Program has proved to be transformational for education technology in public schools and libraries across South Carolina. Today the support provided by this program is being utilized by the Division of Technology
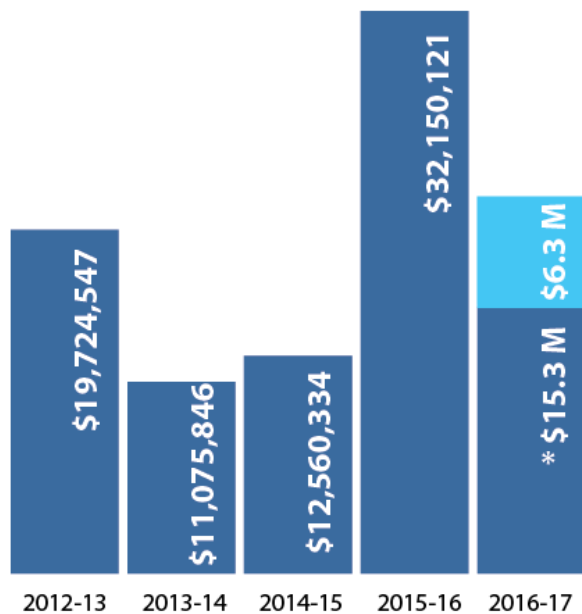
Operations (DTO) to acquire broadband services for the state's public K-12 school and library network participants.

DTO is also responsible for the administration of the South Carolina E-Rate Consortium (Consortium) which includes 84 school districts, 40 charter and special schools, and 42 library systems. The Consortium prepares and files annual applications for network connectivity on behalf of the majority of the State's public schools and libraries, removing the administrative burden on those organizations.

In addition, the Consortium staff assist school districts and libraries with navigating the complex process of filing their own E-Rate applications. Such assistance is provided through the K-12 School Technology Initiative website with current program news, resources and deadlines. Assistance is also provided through a series of live training sessions held in multiple locations throughout the state.

To support the Consortium, DTO manages funding from the K-12 School Technology Initiative that is used to pay service providers who supply internet access to connect public schools and libraries with wide area network (WAN) services. These high-speed networks are being built to meet the ever-expanding needs of students, teachers and library patrons for enriching content.

The funding support offered by the Schools and Libraries E-Rate program is essential to the continued expansion of education technology in districts and library throughout the state.

E-Rate Funding Disbursements
Source: Division of Technology Operations

Bar chart data:
- 2012-13: $19,724,547
- 2013-14: $11,075,846
- 2014-15: $12,560,334
- 2015-16: $32,150,121
- 2016-17: *$15.3 M / $6.3 M

* Note: FY 2012-13 to 2015-16 equals the non-Consortium, category 1 and 2 E-Rate funding disbursements to applicants. Due to the fact that applicants continue to submit invoices for funding year 2016-17, this data represents the funding amount, or the maximum amount of funding applicants could request for disbursement in that particular funding year.

E-Rate Program Trends

Despite significant challenges to the Schools and Libraries E-Rate Program – such as the troubled roll out of the E-Rate Productivity Center (EPC) and the phasedown eligibility of voice services – schools and libraries in South Carolina have been able to fund drastic improvements to network infrastructure. Such improvements have been possible due in part to the Schools and Libraries E-Rate Program's Category Two funding mechanism.

In FY 2016-17, South Carolina school districts and library systems requested over $14.3M in reimbursements for Category Two products and services such as routers, switches and other internal connections. As of December 2017, those school districts and library systems were disbursed $10.3M as reimbursements from the E-Rate program.

The total amount of reimbursements disbursed to school districts and library systems for FY 2016-17 will continue to rise well into 2018 as school districts and library systems continue to submit invoices to the E-Rate program for payment until late February 2018. If all $14.3M in requested funds are ultimately disbursed to school districts and library systems, the total value of the products and services would exceed $23M, which includes the reimbursed funds and the cost share funds from school districts.

In reality, even though E-Rate funding requests are approved for reimbursement, school districts and library systems may be denied

funding based on noncompliance of program rules or decide not to seek reimbursement if a new school or library hasn't completed construction as planned, for example.

From a statewide perspective, the Consortium has observed changes in how districts and libraries participate in the Schools and Libraries E-Rate Program, along with a significant amount of variability in the money actually reimbursed from the E-Rate Program. In FY 2015-16, school districts and library systems invoiced over $32 million in Category One and Category Two E-rate funds. Just two years earlier, in FY 2013-14, $11 million in E-Rate funding was invoiced.

> **"THE AVERAGE COST OF INTERNET SERVICE FOR CONSORTIUM MEMBERS DROPPPED FROM $25.53/MBPS TO $5.02/MBPS UNDER THE NEW STATE CONTRACT. THESE COST SAVINGS ALSO FUELED THE ABILITY TO INCREASE BANDWIDTH CAPACITY."**

Another developing E-Rate Program trend can be found in the Request to Commitment to Disbursement ratio. As stated, applicants must request funds, receive commitment from USAC, and then invoice for the disbursement of funds. In the ideal scenario, the Request to Commitment ratio would be equal and the Commitment to Disbursement ratio would be as close to 100 percent as possible. However, in

South Carolina this is not the case, and as such, an opportunity for significant improvement is apparent.

In FY 2014-15, South Carolina applicants requested over $58 million in Category One and Category Two E-Rate funding, the largest amount in the past five years. However, applicant's requests were reduced due to non-compliance issues with program rules, leaving a mere $15.6 million committed to applicants. In addition, applicants invoiced for only $12.5 million of the $15.6 million available to them. The ratio between these two figures should be as close to 1:1 as possible, however ratios less than 1:1 are acceptable because it is widely understood that applicants may overestimate the amount of E-Rate funding needed for certain products and services.

$79 Million

Expected Savings of the New Internet State Master Contract Over the Life of the Contract.

For example, a school district building a new school would like to use E-Rate funding for internal connections in the new building. The school district applies for the funding needed to complete the work; however, construction of the school is delayed. In this example, the school would not need the funding for the

internal connections despite the application being funded by USAC.

For FY 2014-15, applicants received only 21 percent of the requested Category One and Category Two E-Rate funds. In contrast, FY 2015-16 represented the best year for the state's request to commitment to disbursement ratio as applicants received over 71 percent of the requested funds.

With the goal to reach 100 percent requested to commitment to disbursement ratio, the Consortium and the K-12 School Technology Initiative must provide additional opportunities for E-Rate training for school districts and library systems that apply for E-Rate funding, but are consistently denied for non-compliance of program rules. Additionally, the Consortium must also assist applicants during the invoicing process.
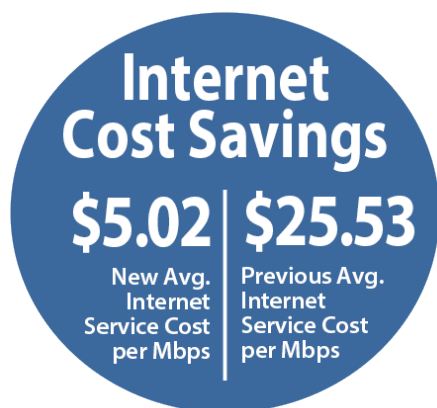
Value of State Master Contracts

In fall 2016, the Division of Technology Operations (DTO) awarded Spirit Communications a seven year internet State Master Contract valued at a projected $32,000,000. The new State Master Contract was expected to save the South Carolina E-Rate Consortium approximately $79,000,000 over the life of the contract.

The new State Master Contract initiated an aggressive eight month migration of services for approximately 95 South Carolina E-Rate Consortium customers that took place between November 2016 and July 2017. During this

time, internet service rates were incrementally reduced with normalized rates taking effect July 1, 2017.

The migration of services between the incumbent internet service provider and Spirit Communications required a thirty-day test period. This test period provided customers with the ability to test the new service with the added convenience of being able to revert back to the incumbent's internet service in the event of any technical issues. In doing so, the thirty-day test period required double billing, the price of which was absorbed by the South Carolina E-Rate Consortium.

Internet Cost Savings

$5.02 | **$25.53**

New Avg. Internet Service Cost per Mbps | Previous Avg. Internet Service Cost per Mbps

For these reasons, significant cost savings were not fully realized during FY 2016–17. However, the long-term effects of the new State Master Contract have already begun to be realized. For example, the average cost of internet service for South Carolina E-Rate Consortium members dropped from $25.53/Mbps to $5.02/Mbps under the new State Master Contract.

In addition, the cost savings from the new State Master Contract fueled the ability to increase

internet bandwidth capacity. In particular, the Bandwidth Allocation and Network Security Monitoring Policy was amended to increase the minimum internet service for school districts from 100 Mbps to 250 Mbps at no additional cost to the school districts.

The internet service cost reductions lowered the cost shares for Consortium members making higher bandwidth internet service more affordable.

DDos Protection Service

In an effort to help South Carolina's schools and libraries combat the increased use of distributed denial of service (DDoS) attacks, the K-12 School Technology Initiative began offering a new managed security service in the summer of 2015. The DDoS Protection Service, offered through an agreement between the Division of Technology and Spirit Communications, is designed to help detect and mitigate DDoS attacks before they can reach a K-12 connection.

The service helps identify and block malicious packets in near real time, while allowing productive internet traffic to continue to flow. This prevents any possible negative and disruptive effects such attacks have on their intended targets.

DDoS attacks, which attempt to render an organization's online services unavailable by overwhelming it with network traffic from multiple sources, are extremely costly in both time and financial resources. Without

protection, organizational resources are quickly overwhelmed by various types of resource depletion or simply by sheer volume of the traffic directed against targets.

With our growing dependency on the Internet-based delivery of data and other education-related services, the cost of DDoS attacks is expected to continue skyrocketing in the years to come. A June 2015 article appearing in the Infosec Island website stated that DDoS attacks could cost victims "as much as $40,000 per hour in lost revenue, loss of consumer trust, sensitive data theft and intellectual property losses."

A number of school districts in South Carolina have experienced major DDoS attacks in the past several years, while many others have experienced the same attacks to a somewhat lesser degree. Initial reports gathered during the first three months of the DDoS Protection Service indicate the frequency (averaging more than one per week) and the duration (ranging from hours to days) of smaller attacks are increasing as well.

This is particularly true during times when students may be motivated to disrupt school activities, such as online testing, that are dependent on internet service. Students, or any other attacker, can initiate various types of DDoS attacks at a very low cost with little fear of being discovered or prosecuted. In some cases, students share the DDoS attack information with classmates, which quickly breeds additional attacks that may cause greater disruption of the targeted service.

It may not be possible to prevent DDoS attacks; however, it is imperative that they be mitigated quickly and effectively. The DDoS Protection Service helps to maintain the integrity and efficiency of internet based resources for South Carolina's school and library administrators, teachers and students.

Dell One Identity Manager Project

The South Carolina Department of Education (SCDE) selected the Dell One Identity and Access Management (D1IM) solution to replace its existing access and authentication systems, which consist of an in-house developed application and a commercial off-the-shelf solution that was at end-of-life. Dell One's solution is flexible and extensible to meet agency, district, technical and security requirements.

The D1IM solution also allows for end-user self-service access requests for a wide variety of areas. Such areas include provisioning, de-provisioning, reprovisioning of accounts, entitlements and permissions; attestation and segregation of duties (SOD); role based access controls (RBAC); and compliance and audit alerting and reporting. In addition, D1IM also allows users to enable single sign-on (SSO), just-in-time cloud provisioning identity federation, access control and auditing for browser-based applications; empower agency and district users to manage policies and events without having to engage the help desk or IT.

In addition, the D1IM solution saves valuable time for SCDE and district staff by allowing

access to various applications through the SSO portal, providing the ability to reset passwords in a secure environment with pre-determined validation questions, and updating demographic information such as phone numbers and physical addresses without having to involve the SCDE help desk.

The project has been in the development phase with internal testing taking place with the SCDE's Chief Information Office and Chief Information Security Office staff. This phase identified connection issues related to in-house built applications, which has delayed completion. In addition, changes to the technology environment that have occurred since the project started have impacted ongoing costs. SCDE is currently conducting a cost-benefit analysis of the recurring costs for D1IM compared to use of newer technology tools.

Report on Expenditures of K-12 Technology Initiative Funds

Since Fiscal Year (FY) 2014-15, the General Assembly has appropriated lottery revenues and EIA revenues of approximately $100 million to improve technology infrastructure in public schools. A breakdown of the yearly amounts are included below.

- FY 2014-15 – $29,288,976 (Lottery)
- FY 2015-16 – $29,288,976 (Lottery)
- FY 2016-17 – $29,288,976 (Lottery)
- FY 2017-18 – $12,000,000 (EIA)
- Total – $99,866,928

The annual provisos governing the allocation and accountability of these appropriations to school districts have not changed since FY 2014-15. Funds are allocated to districts based on the prior year's 135-day average daily membership (ADM) and on the poverty index of the district accordingly:

- For a school district with a poverty index of less than 75, the allocation is $35 per ADM;
- For a school district with a poverty index of at least 75 but no more than 85, the allocation is $50 per ADM; or
- For a school district with a poverty index of greater than 85 or a special school with no defined poverty index, the allocation is $70 per ADM.

School districts and special schools may expend the funds for three purposes, which are directly tied to specific state technology goals:

1. To improve external connections to schools, with a goal of reaching at least 100 kilobits per second (Kbps), per student in each school by 2017;
2. To improve internal connections within schools, with a goal of reaching at least 1 megabit per second (Mbps), per student in each school by 2017; and
3. To develop or expand one-to-one computing initiatives.

A district who has achieved the above state goals for technology infrastructure may submit a plan to the K-12 School Technology Initiative Committee for permission to expend its allocation on other technology-related uses.

The provisos governing the program in FY 2016-17 and FY 2017-18 require the Education Oversight Committee (EOC) to develop a form that districts use to report to the K-12 School Technology Initiative Committee on how funds were expended. Working with the South Carolina Department of Education (SCDE), the EOC in 2017 formulated questions that were included in the 2017 SC Technology Counts Survey to capture the following information:

- How were K-12 Technology Initiative Funds expended in FY 2016-17?

- Are school districts and schools meeting the three state goals for technology infrastructure?

- How many districts sought and received permission from the K-12 School Technology Initiative Committee to expend these funds on other technology uses?

All 82 school districts, including the South Carolina Public Charter School District, and eight special schools responded to the survey. The SCDE provided to the EOC July 14, 2017, responses to questions related to the K-12 technology initiative program from the 2017 SC Technology Counts Survey. Hereafter, all references to the July 14, 2017, data are referred to as "Original Responses."

Q: How were K-12 Technology Initiative Funds expended in FY 2016-17?

School districts were asked to respond to the following question on the 2017 SC Technology Counts Survey:

In FY 2016–17 the General Assembly appropriated over $29 million to school districts for the K–12 Technology Initiative, Proviso 3.6 (does not include other local, grant or alternative sources of funding). The law requires that districts must provide an itemized report on the amounts and uses of these funds. In collaboration with your district's finance/business officer, please provide an account of how the funds allocated to your school district in FY 2016–17 will be expended for Sub-fund 963 and Revenue code 3630. (The TOTAL should equate to the amount allocated in FY 2016–17).

The total amount of funds available to districts to expend in FY 2016-17 was approximately $34.5 million, $29.1 million in FY17 appropriations and $5.4 million in projected funds carried forward from FY16 to FY17. The projected carry forward amounts are estimated based on the districts' reporting of projected expenditures. Because districts typically use the summer months to upgrade technology infrastructure and to purchase devices, carry forward from one fiscal year to the next are significant, representing at least one-fourth of all available funds. This table

Districts were asked to report how the funds were expended. The survey questions as designed by the EOC staff gave districts multiple options for reporting. The survey responses were similar to those in last year's survey. However, the survey as approved was not identical to the survey as implemented

online. The approved survey had numbered items 1 through 8 with the following instructions between items 3.b. and 4: "with approved plan from K-12 Technology Initiative Committee." Item 3 began with the following language, which quotes the proviso: "3. Develop or expand one-to-one computing initiatives." It also had space to enter projected 2016-17 expenditures and 2017-18 carry forward funds. Under that language were item A (refresh or replace existing 1:1 devices) and B (add new devices to expand 1:1). The online survey had the language from item 3 ("develop or expand one-to-one computing initiatives") but did not permit entry of dollars in expenditures and carry forward. Some districts reported placing development or expansion that did not fit under 3.a. or 3.b. in "other."

In the Corrected Responses data, SCDE added another reporting category - Develop 1:1 Computing Initiatives.

49.7%

Percentage of technology infrastructure funding spent on expanding 1:1 computing.
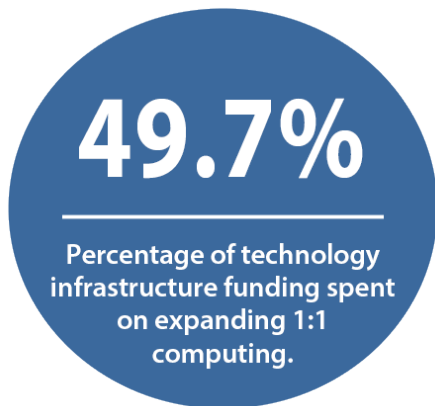
The following listing reflects how districts reported spending the available funds for technology infrastructure using the corrected responses. The information is self-reported with

no data or invoices to document the results.

- Improving external connections (4.0%)
- Increasing broadband (0.3%)
- Improving internal connections (19.6%)
- Refreshing 1:1 computing (17.5%)
- Expanding 1:1 computing (49.7%)
- Develop 1:1 Computing Initiatives (1.6%)
- Funds carried forward FY16-17 to FY17-18
- Other (7.3%)

The "other" category of expenditures, as reported by districts, include such responses as improving security, professional development for teachers and other educators, technical assistance for district technology staff, and "other/explanations."

It should be noted that the prior year's survey included comparable "other" category identifications. However, in FY 2016-17 districts in the Original Responses reported spending 26 percent of funds on Other Expenditures, which is significantly more than reported in the prior two fiscal years. It should also be noted that three districts (Aiken, Calhoun and Lexington 1) did seek and were approved waivers by the K-12 School Technology Initiative Committee to expend K-12 Technology funds on other technology uses.

It should also be noted that the instruction line between the approved items 3.b. and 4 was not included in the online survey. After inquiry from the EOC, the SCDE contacted districts without permission from the K-12 School Technology Initiative Committee concerning their reporting

of expenses in what were lines 4-8 of the approved survey. Districts reported confusion about the various technology funding streams and purposes, and whether their approved district technology plan was approval from the Committee for other use of funds. The revisions to the "Original Responses" reflect corrected responses after superintendents were contacted concerning the questioned survey answers.

Furthermore, 33 school districts who did not seek a waiver reported expending one hundred percent of their K-12 Technology funds to improve external connections, broadband, internal connections and 1:1 computing.

Analyzing the "Other"/Explanations data and written comments provided, districts reported spending funds for the following:

- Teacher and student workstations
- Software and software licenses
- Instructional/content technology
- Computer lab tables
- Salaries and fringe benefits for instructional technologists
- Network infrastructure maintenance
- Travel to technology conferences
- Digital curriculum
- Charter school payments

Q: Are school districts and schools meeting the three state goals for technology infrastructure?

The Division of Technology Operations (DTO)

within the South Carolina Department of Administration (Admin) administers the state's collective E-Rate applications to leverage federal funds for the continued development of K-12 educational infrastructure. The General Assembly appropriates annually in EIA revenues approximately $12.3 million to support the state match for the E-Rate program for county libraries and public schools. The K-12 School Technology Initiative Committee is responsible for ensuring the administration of these EIA funds.

40%

Percent of schools have over 91% of students with 1:1 learning.
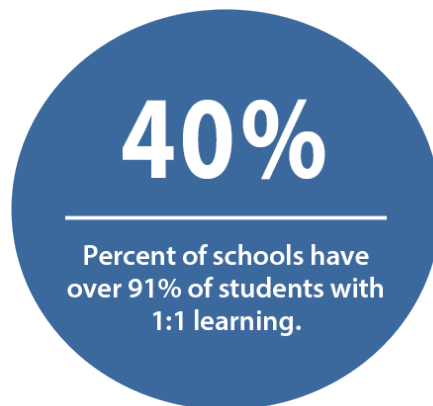
The Internet Bandwidth by District (2012-13 and 2016-17) table, found on page 52 in the "By the Numbers" section of this report, documents internet bandwidth to the school districts at the conclusion of FY 2016-17 and compares the growth since 2012-13 and since 2015-16. In FY 2016-17, no district had less than 200 MBs of bandwidth as compared to 2012-13 when 67 districts had less than 200 MBs of bandwidth, and in 2015-16 when 14 school districts had internet bandwidth of 100 to 150 MBs.

Not included are the South Carolina Public Charter School District and the Oconee

County School District, which are not part of the South Carolina Consortium (Source: Data provided to EOC by Division of Technology Operations at the South Carolina Department of Administration, Aug. 17, 2017.) The 2015-16 information was also updated for one district.

In the 2017 SC Technology Counts Survey, each district or special school answered the following questions for each school under its jurisdiction:

- What percentage of classrooms in this school has access to your school's wireless network? A classroom is defined as "a room with a certified teacher who provides direct instruction to students."

- What percentage of students in your schools is served by 1:1 learning?

- Please provide the total number of devices dedicated for student use.

Districts and special schools responded to each question for 1,195 schools including primary, elementary, middle and high schools.

On classroom access, districts and special schools report that over 99 percent of schools had at least 91 percent of the classrooms with access to the wireless network. Details regarding this information can be found in the Classroom Access to Wireless Networks in Schools table, located on page 52 in the "By the Numbers" section of this report.

At the student level, approximately 40 percent of schools had over 91 percent of students served by 1:1 learning in 2016-17, as compared

to 28 percent of schools in 2015-16. This information is detailed in the Percentage of Students with 1:1 Learning" (2015-16) table, and the Percentage of Students with 1:1 Learning" (2016-17) table located on page 53 in the By the Numbers section of this report.

Finally, districts reported that 564,577 devices were dedicated for student use in these 1,195 schools. The average number of devices per school was 472, and the median number of devices, 371.

Q: How many districts sought and received permission from the K-12 School Technology Initiative Committee to expend these funds on other technology uses?

In FY 2017-18, the K-12 School Technology Initiative Committee approved waivers from three school districts: Aiken County School District, Calhoun County School District and Lexington 1 School District.

Overall Findings

1. Districts and special schools reported spending in FY 2016-17 between $24 and $26 million in K-12 technology funds. The variations are attributed to the different data sets.

2. Based on the Original Responses, as much as three-fourths of the K-12 technology funds were expended for internal and external connections and for 1:1 computing. Another one-fourth of the funds were expended for other technology uses. Data from the Corrected Responses

document approximately 7 percent of total expenditures on other technology uses.

3. Of the 82 school districts that reported in the Original Responses, 33 districts reported spending 100 percent of their district allocation on improving internal and external connections and on 1:1 computing.

4. Three school districts (Aiken, Calhoun and Lexington 1) requested and were approved waivers by the K-12 School Technology Initiative Committee to expend their K-12 Technology funds on other technology uses.

5. Regarding the impact of the K-12 Technology funds, districts and special schools reported the following in 1,195 schools:

   • On classroom access, over 99 percent of schools had at least 91 percent of the classrooms with access to the wireless network.

   • Approximately 40 percent of schools had over 91 percent of students served by 1:1 learning in 2016-17 as compared to 28 percent of schools in 2015-16.

   • There were 564,577 devices dedicated for student use in these 1,195 schools.

A complete listing of technology fund allocations by district and special school for FY 2016-17 can be found in the Allocations of K-12 Technology Funds (FY 2016-17) table, located on page 54 in the By the Numbers section of this report.

SC Technology Assistance Initiative

The South Carolina Technology Assistance Initiative, an program of State Superintendent of Education Molly Spearman and funded by the General Assembly, provides technology technical assistance, readiness assessments and technology planning services to South Carolina's public school districts.

As part of this initiative, the South Carolina Department of Education (SCDE) engaged skilled temporary staff to offer individualized Technology Readiness Analyses, an effort initially focused on promoting readiness for the legislative mandate that all students in grades

3-8 be administered online state assessments beginning in 2016-17.

The study, which began with a prioritized list of rural and plaintiff districts of the Abbeville v. South Carolina equity lawsuit, addressed a number of areas including district's technology readiness to deliver state-required and other local online assessments, 1:1 computing, enhanced internet connectivity for the support of instruction in their schools, and IT aspects of school operations.

SC Technology Assistance's Readiness Analysis provides an evaluation of each school district's ability to organize and conduct districtwide testing for their students in grades 3-8. These proactive analyses provide a benchmark for districts and their schools in several key areas and provide a technology readiness score that leads to a roadmap of detailed tasks and deliverables that are necessary to increase the likelihood of successful online testing.

The three specific objectives of this analysis include:

- Analyze the strengths and weaknesses of the school district's technology infrastructure and quantify its ability to carry out online testing activities in 2017 and beyond, while documenting any major gaps in "readiness."

- Identify recommendations to bridge the gap between where the district is with technology and where they need to be in terms of readiness to carry out these activities.

- Collaborate with the district to put in place a blueprint for completing any tasks (or procurements) necessary to achieve "technology readiness."

Determining Online Testing Readiness

A number of primary areas of readiness were identified that could affect district's ability to successfully conduct online testing of students. These areas include facilities, infrastructure, hardware, teacher readiness, student readiness, funding mechanisms, strategic planning and the IT support model. These categories were tested with the early adopters of the assessment, with areas of focus continually refined and expanded to incorporate lessons learned.

Readiness Study Participation

Since the implementation of the South Carolina Technology Readiness Study, the number of participating school districts has expanded beyond the initial list of plaintiff, rural and high poverty districts. Other K-12 entities, including the Governor's Schools and individual charter schools, have also taken advantage of this opportunity to ensure they are prepared to administer online testing to their students.

The first year's funding (2015-16) provided enough resources to complete assessments for 38 districts. The positive results and feedback from the participating districts helped SCDE secure additional funding to expand these voluntary assessments to other districts. Invitations to participate in the next round of readiness assessments were sent out in

early 2017. Thirty districts and special schools accepted this invitation and many have successfully completed the analysis process. In addition, a workbook for gathering data for external or self-assessments, along with a webinar on the process, are available to districts on SCDE's South Carolina Technology Assistance Initiative webpage.

Overview of Rating Scale

A rating scale was created to evaluate the readiness of districts in a variety of areas including facilities, infrastructure, hardware, teacher readiness, student readiness, funding mechanisms, strategic planning and the IT support model. This scale, which rates districts from 1-5 with half point increments, can be used to track future readiness decisions and is summarized below.

- **Rating 1**: The district did not provide evidence it can successfully complete online testing in 2017.

- **Rating 2**: The district could feasibly conduct testing in 2017, however, there are multiple areas to be improved to make this happen. If these improvements are not completed, testing will more than likely be unsuccessful.

- **Rating 3**: The district will be able to meet the 2017 online testing requirements. The district will not be able to handle additional subjects or grade levels without significant improvement in multiple areas.

- **Rating 4**: The district will be able to meet the 2017 online testing requirements and

it can meet a few extra subjects or grades, but not all future needs.

- **Rating 5**: The district is prepared for 2017 and beyond. It does not have any measurable risks associated with online testing for 2017 or beyond, and can handle online testing for all grades and subjects.

2.6

Overall average score for plaintiff districts in the Technology Readiness Study.

Please note that readiness at any point in time fluctuates as vendor requirements for online testing change. For example, in June 2017, SCDE's contractor DRC changed its system requirements and no longer supports iPad 2 and iPad 3rd Generation. This change has affected some districts' readiness.

Needs Analysis

Because of the initiative, each participating district received a report detailing the teams' findings on its testing readiness. This report was presented directly to the district's superintendent and in several cases to the district's school board, to emphasize the importance of adequately preparing for testing activities.

The team worked with representatives of each district to create a detailed listing of specific

needs that could be tied directly to increasing online testing readiness. Examples of such needs include additional space, bandwidth, routers, access points, computers, monitors, desks, chairs and professional development.

Once the specific items were listed, the team assisted districts in identifying sources of funds that could be used to ensure that expenditures were maximized.

Summary of Findings

The average score for plaintiff districts was 2.6 for all areas being assessed. The average score for non-plaintiff districts was 3.9. This substantial variance is quantified in each of the categories evaluated. There were disparities in most of the primary areas except Teacher Readiness and Student Readiness.

These scores were significantly lower for plaintiff districts. Additionally, the level of technology support available in plaintiff districts was severely limited due to the challenges of attracting and retaining skilled labor and the inability to fund these positions in a sustainable manner. The chart titled "Plaintiff vs. Non-Plantiff Districts – Average Readiness Scores," located in the By the Numbers section of this report, illustrates the average scores across all categories for plaintiff and non-plaintiff districts.

A common theme identified across many plaintiff districts was the need for effective strategic planning. Districts that scored higher in the strategic planning category always scored higher in their overall assessment. This was not a coincidence. The evidence clearly showed that it is critical for all stakeholders, to include school boards, superintendents, teachers and other key district staff to develop and maintain effective plans that are clearly aligned to student needs.

Health Checks

Follow-up studies began during the 2016-17 school year to evaluate the progress made by the original plaintiff districts since their original analysis. The evaluation identified additional needs and the districts' comfort level with proceeding with online testing for their students in the spring of 2018.

Resource Challenges

One of the common denominators of many participating districts is a lack of resources associated with technology support across the district and within schools. A summary of the findings can be found below.

Technology Resources

Many districts have a lack of technology staff support. On average, each district is lacking at least two very specific types of support resources: (1) technology coaches or high-quality embedded professional development and (2) hands-on technology support personnel. Many of the mid-sized and larger districts struggle with even greater shortages. Struggles include:

- Lack of staff for hands-on, embedded

professional development.

- Episodic technology classes (both for IT staff and for teachers) may be available but difficult for staff in smaller, rural and less affluent districts to access. Moreover, it is not as effective as day-to-day coaching and embedded professional learning.

- Some districts cannot afford sufficient, qualified technology support specialists. To assist in this area, a SC Technology Assistance initiative is to facilitate efforts to collaborate among districts to share staff.

Staff Skill Sets

Many districts have increased their existing IT staff by promoting media specialists to manage technology platforms. In some instances, these staff members were not properly trained for the more technical duties, nor were they equipped to complete many of the technology support activities currently needed.

Many of these resources may be highly skilled in one area, but have only general knowledge in other important areas.

Examples include the following.

- Scarce networking expertise.

- Desktop support staff skilled in one specific operating system may struggle to support other operating system-based products.

- Managing websites is challenging and time consuming.

- Managing IT security is extremely complex and requires skill sets many districts do not possess.

- Examples of specific skills in need include such areas as: router, firewall and switching; networking/server; disaster recovery; internet/IT security; infrastructure/database/virtualization; professional development/training; classroom/instructional technology.

Funding/Salary Structure

Another major challenge facing districts is how IT salaries are budgeted and funded. Districts understandably first put their available funding toward insuring all instructional needs are met. Technology-related funding has often been expressly, or by policy, restricted to non-personnel expenditures. Staff members with the needed expertise expect, and can demand, higher salaries than some districts plan for or can currently afford.

Today technology is a necessity, not a luxury, and decision makers need to treat all technology-related needs as recurring annual expenditures. Successful 1:1 initiatives require continual refreshing of equipment

as IT infrastructure has a typical life span of three to five years. Due to this limited life span, district plans to fund replacement infrastructure should accompany installation of the existing technology.

Rapidly changing requirements also mean that today's skilled staff must have the time and funding to continually learning the intricacies of the next updates and innovations. In addition, as devices age they may no longer meet the technical requirements for online testing.

IT salary structures among South Carolina school districts vary widely. Sometimes more affluent districts acquire talent from their neighbors.

District Collaboration

A significant outcome from the assessments is the expanded relationships among districts. Multiple meetings have taken place in which districts shared best practices, discussed lessons learned and proactively sought areas on which to collaborate.

Many of the collaboration opportunities are being explored through existing consortia – such as the Pee Dee, Salkehatchie, Old English and WPEC – and in some cases, districts are collaborating with others that have spare resource capacity to share outside geographic consortia.

The data collected from the readiness assessments has been shared with districts to help facilitate these conversations. The team

that led the assessments has offered to help facilitate and explore innovative ways for districts to share fixed costs and deliver better service to students and employees.

For more information, please visit SCDE's [South Carolina Technology Assistance Initiative webpage](#).

4. PROFESSIONAL DEVELOPMENT

South Carolina Technology Plan Goal:

Improve teacher and administrator integration technology in the classroom, administration, and overall learning process.

Partner Efforts to Support the Goal:

As previously stated, teacher training has become more, rather than less critical as a result of the online automation of learning tasks and the heavy infusion of technology into the learning environment.

Teachers are becoming enablers of technology-driven learning processes and guides to learners in adopting new models of individual research and collaborative productivity. This shift calls for equally innovated methods of professional development and constant skills upgrading to keep pace with the rapidly mutating learning environment.

The partners of the K-12 School Technology Initiative have long understood the intrinsic link between positive educational outcomes in the technology-driven learning environment and the professional development offered to teachers. The South Carolina Department of Education (SCDE), South Carolina Educational Television (SCETV) and the South Carolina State Library, continue to provide powerful, effective, cost-efficient, flexibly scheduled professional development opportunities for thousands of teachers annually.

SCETV Training and Recertification

South Carolina Educational Television (SCETV) is historically committed to serving South Carolina's districts, schools and educators by providing quality face-to-face professional development and online teacher recertification. These efforts play a key role in helping to meet the needs of teaching professionals, who affect learning each day in classrooms across the state. SCETV provides the support needed to assure the success of such K-12 School Technology Initiative funded projects as Knowitall.org, StreamlineSC and LearningWhy.

> **"TEACHER TRAINING HAS BECOME MORE, RATHER THAN LESS CRITICAL AS A RESULT OF THE ONLINE AUTOMATION OF LEARNING TASKS AND THE HEAVY INFUSION OF TECHNOLOGY INTO THE LEARNING ENVIRONMENT."**

SCETV contributes to developing and maintaining the professional capacity of South Carolina's teachers, staff and administrators.

Over 88 percent of respondents to SCETV's 2016-17 annual survey indicated they use the internet daily, often or extensively. To assist in this ongoing transformation, SCETV conducts hands-on training on how to use SCETV web content and technology in the classroom.

Teachers' preferred method of receiving training are through SCETV's online courses. South Carolina's educators can save valuable time and effort in finding certificate renewal and graduate level courses using the searchable website, SCETV Teacher Courses. SCETV Teacher Courses contains all courses offered by SCETV Teacher Recertification, TeacherLine Southeast and TeacherStep. Through this site, educators cannot only search by curriculum interest, professional development and credit needed, but can also readily find out if courses qualify for technology credit.

To learn more about SCETV Teacher Courses, please visit SCETV's Teacher Courses webpage.

SCETV also provides face-to-face and blended training for public, private and home-school teachers, staff and administrators. Hands-on training services offered through SCETV include assessing training needs, conducting school, districtwide and regional training for educators on how to use the educational content, and technology for personalized and project-based learning.

Online Professional Development for Certified Staff

The South Carolina Department of Education's (SCDE) Office of Virtual Education recognizes the importance of improving teacher technology proficiency to help ensure students are receiving the appropriate instruction to become productive citizens in the 21st century.

The Office of Virtual Education has continued to offer online professional development courses for South Carolina certified staff. The courses that are offered are all technology integration courses and courses that help to lead to the Online Teaching Endorsement, as well as other endorsements, for certified teachers and administrators.

Courses are offered for both renewal credits and graduate credits to assist teachers in renewing their teaching license. Courses are taught by current classroom or former classroom teachers that had exemplary skills in integrating technology into their daily lessons.

The main purpose of taking courses through the program is to ensure that teachers have the skills to enhance their daily instruction by including technology in every way possible for the benefit of the students. Through taking these courses, we are more assured that teachers are preparing their students for becoming good digital citizens and are prepared with 21st century skills.

In 2016-17, the program saw continued growth by serving 11,282 educators. This year, the program has expanded to serve educators who are working to meet the requirements of the Read to Succeed legislation.

The Office also collaborated with the SCDE's Literacy Office to provide one course to educators at no cost by utilizing literacy specialists as the online instructor. The office provided training, professional development and mentorship to the literacy specialists as they began teaching their first online course through the program's systems.

Currently, the program is an approved provider of the full suite of courses required to complete the Read to Succeed endorsement, as well as, the online teaching endorsement. Popularity has been growing for both of these endorsements.

The program will continue to expand and explore online professional development opportunities for educators that are needed to ensure that teachers can best serve their students in their classrooms.

Discus Professional Development

The South Carolina State Library's Discus program continues to develop and offer a variety of on-site and online training opportunities for educators throughout the state. Teachers, counselors, librarians and media specialists are offered live sessions, webinars or previously

recorded trainings conducted by Discus vendor partners that are available for viewing in the Discus online training archives.

During FY 2016-17, Discus presented at statewide conferences, school district professional development days, public libraries, academic libraries, community and parent outreach programs and technology fairs. Presentations were made to a variety of organizations including the South Carolina Independent School Association (SCISA), the South Carolina Association for School Librarians (SCASL), South Carolina Public Charter Schools, South Carolina Council on Social Studies, and the Lowcountry Homeschool Convention.

These varied venues provide the opportunity to introduce parents and new educators to the electronic resources available in Discus and remind veteran educators of the new advances being made in the Discus offerings. Educators had access to 53 Discus training opportunities delivered online and via live sessions and presentations, with 956 educators participating. In addition, exhibit booths at 10 major statewide conferences and five local conferences further extended the Discus message to 2,476 booth visitors.
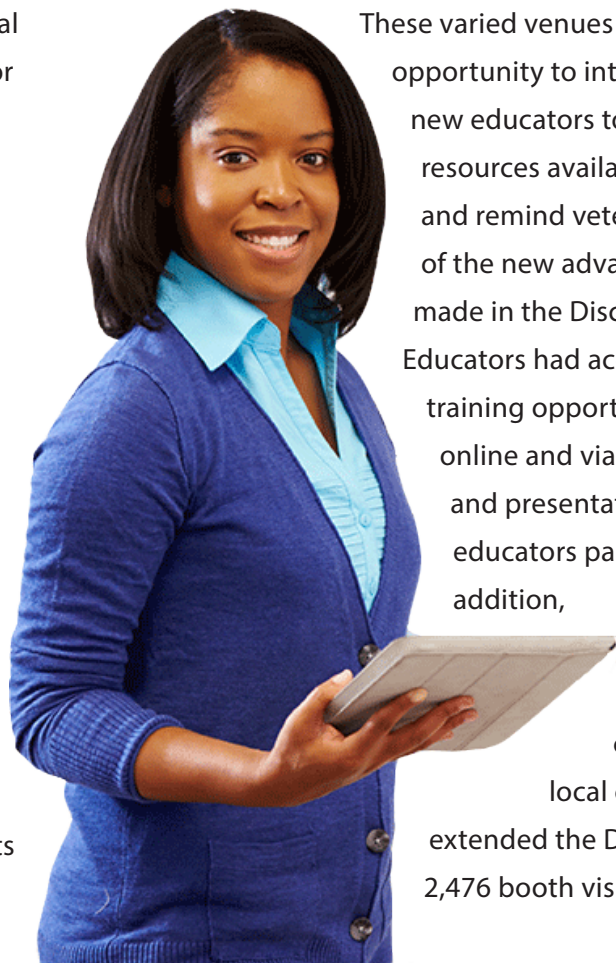
5. COLLABORATION OPPORTUNITIES

South Carolina Technology Plan Goal:
Identify innovative ways for state agencies, local school districts, schools, families, and local businesses to collaborate to enhance the learning experiences for the students of South Carolina.

Partner Efforts to Support the Goal:
Success in public education has never been determined solely by what takes place within the bricks-and-mortar walls of a public school building or a public library. Awareness of the challenges facing students and educators, community support, both fiscal and civic, and the engagement of student's families and outside community support structures are critical to achieving the goals set forth in the Profile of the South Carolina Graduate.

Today, this need for public siupport and family engagement has escalated from being a key component to being irreplaceable in the state's public education efforts. The reach of the learning process from the school building into the outside world – on the school campus, on school buses, at a local community center after-school program, or in the leaner's own home – is no longer encapsulated in printed schoolbooks and homework notebooks. Today, virtually all instruction leverages online content resources, web-based learning management systems and email enabling learners to contact with one another and with their teachers. While many districts and schools are rapidly expanding one-to-one computing programs – allowing students to take school-issued computing devices such as tablets and laptops home with them – many of these students are unable to benefit from these efforts due to lack of access to the Internet once they leave the school or public library facility.

> **"SUCCESS IN PUBLIC EDUCATION HAS NEVER BEEN DETERMINED SOLELY BY WHAT TAKES PLACE WITH THE WALLS OF A SCHOOL OR LIBRARY. AWARENESS OF THE CHALLENGES WE FACE ARE CRITICAL TO ACHIEVING THE GOALS SET FORTH IN THE PROFILE OF THE SC GRADUATE."**

The K-12 School Technology Initiative, with South Carolina ETV and ETV Radio at the vanguard, works to build awareness of the new footprint on the modern, connected learning environment, and how that model interfaces with and requires the active support of each learner's family and the larger community.

SCETV Public Awareness Efforts

In an effort to help inform citizens about the availability of educational programs, services and technologies, South Carolina Educational Television (SCETV) and South Carolina Public Radio share stories of projects that serve to address the needs of teachers and students throughout the state. A number of national and statewide television series and educational specials – including SCETV's Palmetto Scene and Carolina Classrooms – are broadcast and streamed for use in schools and classrooms, providing significant reach to both SCETV's television and radio audiences.

Content broadcast through these mediums provide case studies and best practices for use throughout the state. Promotion of these programs and services were provided through a variety of platforms, including SCETV communications, educational websites and broadcast interstitials, as well as community education outreach efforts through K-12 conferences, presentations and awards.

SCETV's Carolina Classrooms, a school-year series designed for teachers, educators and parents, features educational initiatives in South Carolina schools including those geared toward equity in education, assessments and literacy. State and local educators, as well as policy and business leaders, participated in this effort. Radio broadcasts of educational content included Walter Edgar's Journal, South Carolina A-Z and Science Friday.

To learn more about Carolina Classrooms, please visit scetv.org/carolinaclassrooms.

Throughout the year, SCETV provides education-related newsletter blogs and collaborates with the South Carolina Education Oversight Committee (EOC) and the South Carolina Department of Education for the promotion of SCETV education features. SCETV Education, working with the EOC, provides a monthly newsletter for pre-K-12 administrators, teachers and staff, to assist in informing teachers of timely resources and services. SCETV also uses social media including Facebook and Twitter to engage the education community.

To learn more about SCETV's Education Blog, please visit the SCETV Education Blog webpage.

6. REPORT CONCLUSION

The last twenty-five years have witnessed perhaps the largest shift in educational methodology, expectations, and in impact on the greater community outside the school building, since the transition from the one-room schoolhouse more than a hundred years ago. As always, shifts of this magnitude present opportunities and challenges to all facets of society.

No better validation of this truth can be found than the fact that the school classroom is no longer a sequestered haven, cut off from the problems of the outside world. For many, this is a matter of great and justified concern.

It is also true that the modern learning environment now more closely resembles the world into which our graduates will make their way. The factors that elevate the risks in today's learning environment, such as enhanced connectivity to online resources, are the same elements that promote mastery of technology-driven learning and the critical thinking skills that have become the currency of the modern workplace.

Recognizing the risks and problems of today's K-12 learning paradigm while providing the technology and infrastructure support our schools and libraries is a challenge that the members of the K-12 School Technology Initiative have willingly, energetically and responsibly tackled. While the Initiative has promoted and witnessed many successes since its inception, it must be recognized that much more remains to be done.

> **"THE OUTSIDE WORLD IS NEVER STATIC AND THE NEEDS AND EXPECTATIONS THAT COME TO BEAR ON OUR SCHOOLS AND LIBRARIES MUST SHIFT ACCORDINGLY. THUS YESTERDAY`S SUCCESSES WILL ALWAYS, IN TIME, BECOME CALLS TO FURTHER ACTION."**

The outside world is never static and the needs and expectations that come to bear on our K-12 schools and libraries must inevitably shift accordingly. Thus yesterday's successes will always, in time, become calls to further action. It is the duty of every South Carolinian to do his or her part to ensure that our students receive the kind of education that will guarantee them a productive and rewarding place in the emerging world in which they will be living and working.

APPENDIX A:
INITIATIVE BUDGET

FY 2016-17 K-12 School Technology Initiative Budget Plan

FY 2016-17	
Funds Available via Direct Appropriations:	
Base Appropriation: School Technology	$12,271,826
Total Appropriations :	**$12,271,826**
Carry Forward:	
State Library	$0
SCETV	$0
SCDE	$0
Department of Administration	$0
Total Carry Forward :	**$0**
Total Available Funds:	**$12,271,826**
E-Rate Funds (Estimated)	$29,277,206
Total Funds Anticipated:	**$41,549,032**
Total Budget Requested:	**$41,549,032**
Net Remaining funds:	**$0**

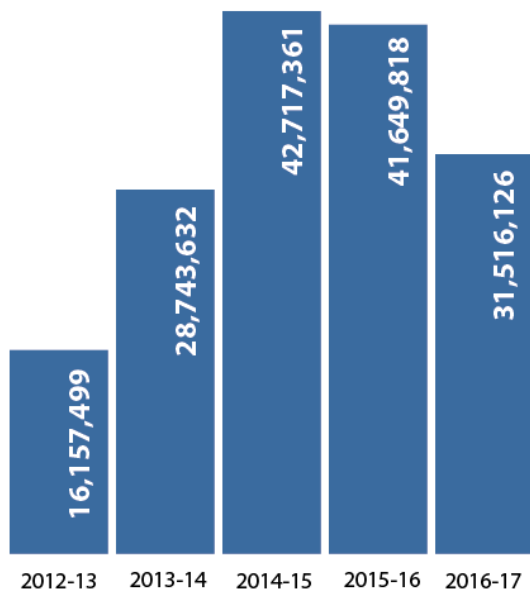| Priority	Principals Budget Requests	Budget Requests	School Technology Appropriation	E-Rate Funds (Estimated)	Approved Budgets
	DEPARTMENT of ADMINISTRATION				
1	Network Connectivity Costs	$39,729,864	$10,452,658	$29,277,206	$39,729,864
2	E-Rate Field Training and Outreach	$2,960	$2,960		$2,960
3	Security Monitoring	$1,095,558	$1,095,558		$1,095,558
4	DDOS Protection	$470,400	$470,400		$470,400
		$0	$0		$0
	Total:	**$41,298,782**	**$12,021,576**	**$29,277,206**	**$41,298,782**
	STATE LIBRARY				
1		0	$0	$0	$0
	Total:	**$0**	**$0**		**$0**
	SCDE				
1	SC State Educational Plan 2017	$60,000	$60,000		$60,000
	Total:	**$60,000**	**$60,000**		**$60,000**
	SCETV				
1	Knowitall Upgrade Phase 3	$146,250	$146,250		$146,250
2	Projects Module Phase 3	$44,000	$44,000		$44,000
	Total:	**$190,250**	**$190,250**		**$190,250**
	PILOT PROJECTS				
		$0	$0		$0
	Total Carry Forward From Previous year:	**$0**	**$0**	$ -	
	Grand Total:	**$41,549,032**	**$12,271,826**	**$29,277,206**	**$41,549,032**

APPENDIX B: BY THE NUMBERS

Discus Usage (Items Retrieved)
Source: South Carolina State Library

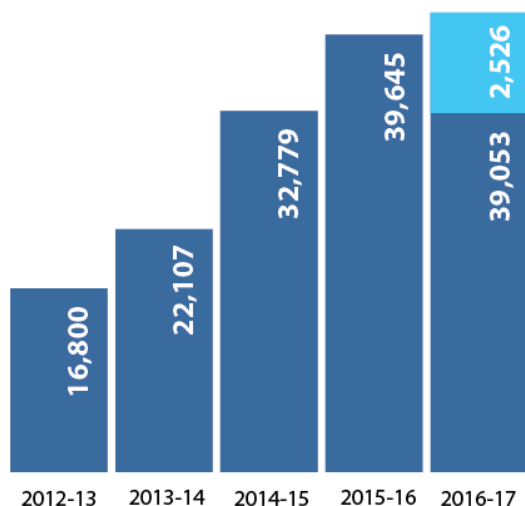| Year	Value
2012-13	16,157,499
2013-14	28,743,632
2014-15	42,717,361
2015-16	41,649,818
2016-17	31,516,126

StudySC Sessions
Source: South Carolina State Library

Year	Value
2012-13	89,122
2013-14	96,075
2014-15	51,472
2015-16	34,841
2016-17	29,881

VirtualSC Enrollments
Source: South Carolina Department of Education

Year	Value
2012-13	16,800
2013-14	22,107
2014-15	32,779
2015-16	39,645
2016-17	39,053 / 2,526

Growth of Bandwidth Demand
In School Districts (Measured in Gigabytes)

Year	Value
2012-13	36.78 GB
2013-14	52.90 GB
2014-15	63.99 GB
2015-16	87.85 GB
2016-17	112.90 GB

E-Rate Funding Disbursements
Source: Division of Technology Operations

Bar chart of E-Rate Funding Disbursements:
- 2012-13: $19,724,547
- 2013-14: $11,075,846
- 2014-15: $12,560,334
- 2015-16: $32,150,121
- 2016-17: *$15.3 M ($6.3 M)
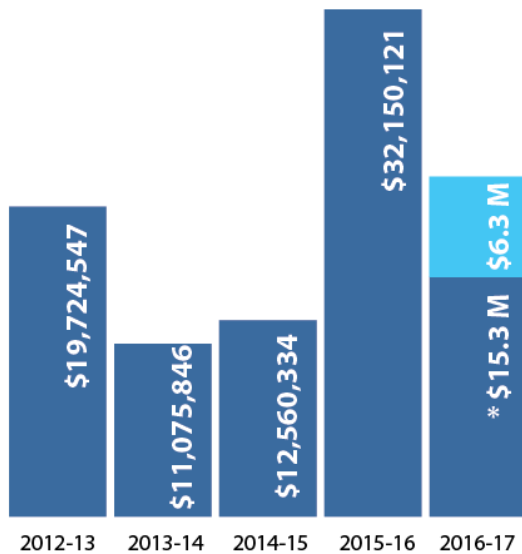
* Note: FY 2012-13 to 2015-16 equals the non-Consortium, category 1 and 2 E-Rate funding disbursements to applicants. Due to the fact that applicants continue to submit invoices for funding year 2016-17, this data represents the funding amount, or the maximum amount of funding applicants could request for disbursement in that particular funding year.

797,362
SCETV Education Services Used: (Combines StreamlineSC, Knowital.org, and PBS LearningMedia service usage in 2016-17)

49.7%
Percentage of technology infrastructure funding spent on expanding 1:1 computing.

$79 Million
Expected Savings of the New Internet State Master Contract Over the Life of the Contract.

2.6
Overall average score for plaintiff districts in the Technology Readiness Study.
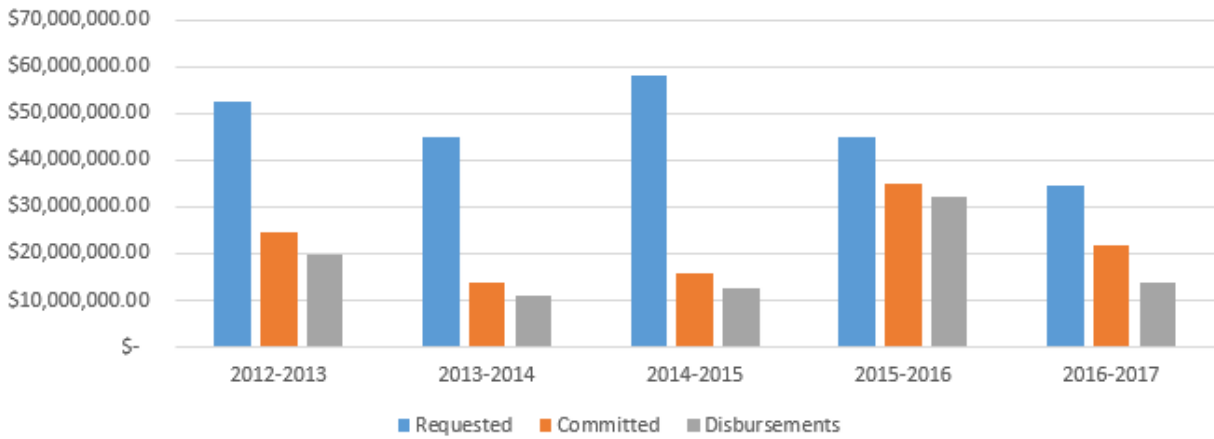
Internet Cost Savings

$5.02
New Avg. Internet Service Cost per Mbps

$25.53
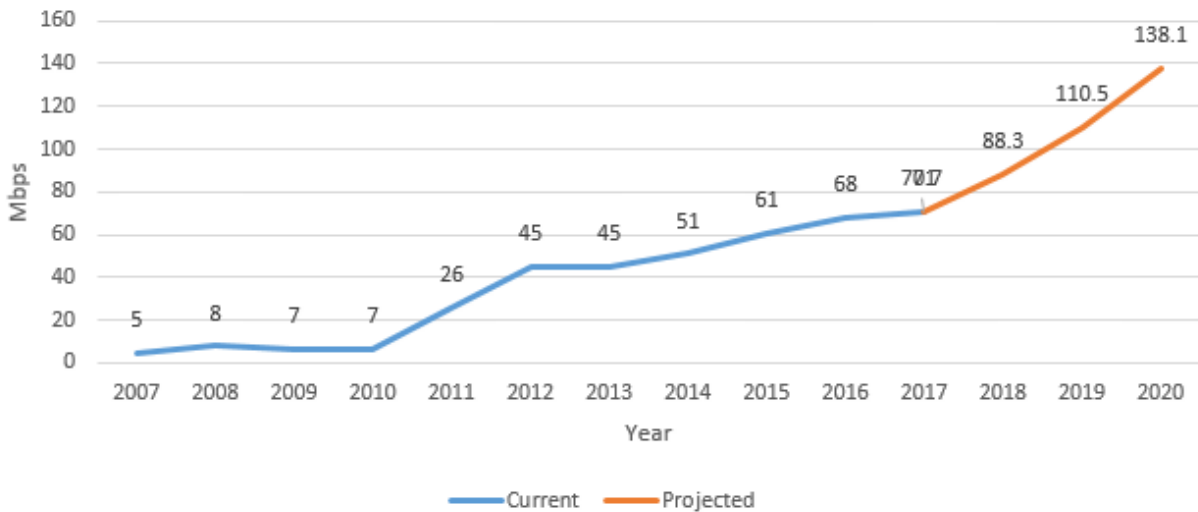Previous Avg. Internet Service Cost per Mbps

40%
Percent of schools have over 91% of students with 1:1 learning.

Annual Changes in the Ratio of E-Rate Funds "Requested, Committed, and Disbursed"

Current and Projected Averge Internet Bandwidth Capacity per Library System

K-12 Technology Initiative Appropriated Funds		
Fiscal Year	Total Appropriation	Source of Funds
2014-15	$29,288,976	Lottery
2015-16	$29,288,976	Lottery
2016-17	$29,288,976	Lottery
2017-18	$12,000,000	EIA
Total:	**$99,866,928**	

Internet Bandwidth by District (2012-13 and 2016-17)

Internet Bandwidth (MBs)	2012-13 # Districts	2015-16 # Districts	2016-17 # Districts
0	1	0	0
10	4	0	0
30 to 90	3	0	0
100 to 150	59	14	0
200 to 250	0	6	14
300 to 350	2	9	6
400 to 450	0	4	4
500 to 550	4	11	11
600 to 900	1	4	6
1,000	6	13	11
1.500	0	2	8
2.000	0	7	7
2.500	0	1	1
3.000	0	4	3
3,500	0	0	1
4,000	0	3	2
5,000	0	2	3
6,000	0	0	1
7,500	0	0	2
	80	**80**	**80**

Note: Not included are the SC Public Charter School District and the Oconee County School District, which are not part of the SC Consortium.

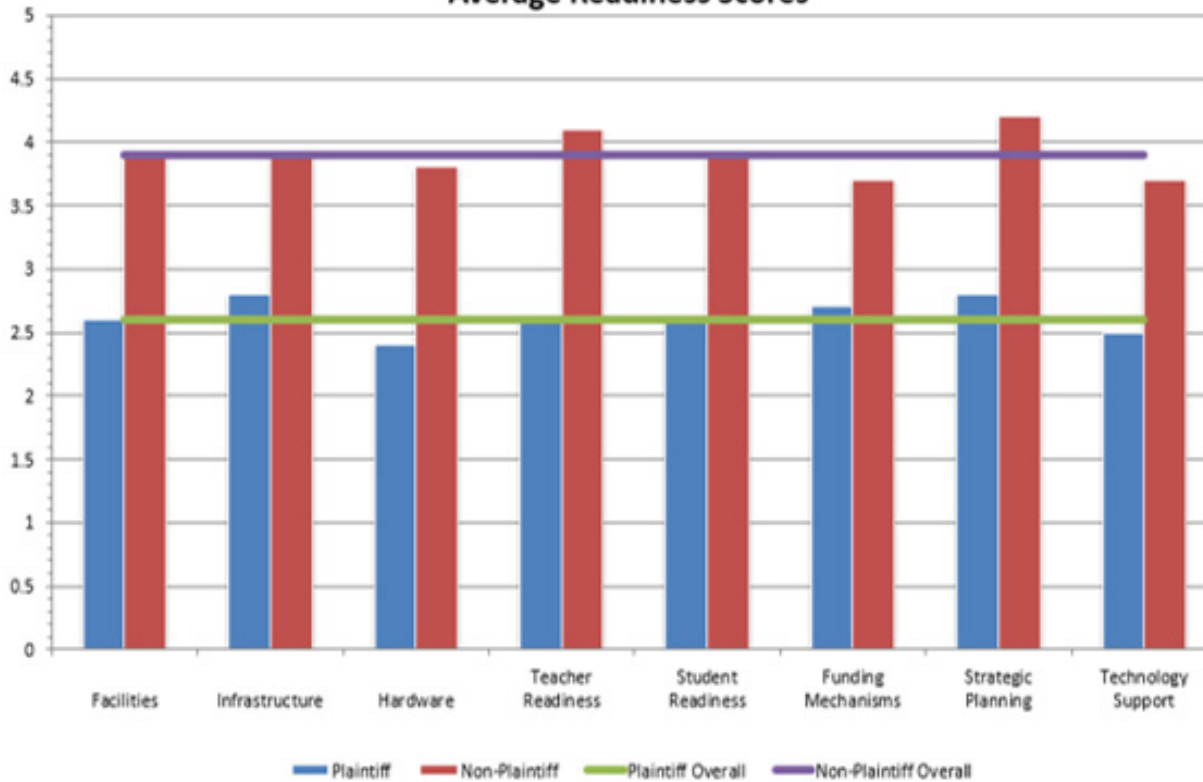## Classroom Access to Wireless Networks in Schools

Percentage of Classrooms with Access to Wireless Network	Number of Schools
0%	3
1 to 10%	1
11 to 20%	1
21 to 30%	0
31 to 40%	0
41% to 50%	2
51% to 60%	0
61% to 70%	0
71% to 80%	1
81% to 90%	1
91 to 100%	1,186
TOTAL:	1,195

Percentage of Students with 1:1 Learning (2015-16)		
Students Served by 1:1 Learning:	Number of Schools	Percent of All Schools
0%	335	26.8%
1 to 10%	95	7.6%
11 to 20%	63	5.0%
21 to 30%	72	5.8%
31 to 40%	31	2.5%
41 to 50%	93	7.5%
51 to 60%	66	5.3%
61 to 70%	25	2.0%
71 to 80%	88	7.1%
81 to 90%	22	1.8%
91 to 100%	353	28.3%
No Answer	5	0.4%
Total	1,248	

Percentage of Students with 1:1 Learning (2016-17)		
Students Served by 1:1 Learning:	Number of Schools	Percent of All Schools
0%	234	19.6%
1 to 10%	54	4.5%
11 to 20%	42	3.5%
21 to 30%	59	4.9%
31 to 40%	66	5.5%
41% to 50%	77	6.4%
51% to 60%	74	6.2%
61% to 70%	41	3.4%
71% to 80%	50	4.2%
81% to 90%	20	1.7%
91 to 100%	478	40.0%
TOTAL	1,195	

Allocations of K-12 Technology Funds (FY 2016-17)			
District/Special School	Amount (Dollars)	District/Special School	Amount (Dollars)
Abbeville	139,548.88	Kershaw	341,474.17
Aiken	784,697.47	Lancaster	408,735.40
Allendale	77,104.29	Laurens 55	267,929.88
Anderson 1	311,609.00	Laurens 56	197,218.57
Anderson 2	122,320.16	Lee	134,760.72
Anderson 3	118,442.50	Lexington 1	803,572.05
Anderson 4	91,631.93	Lexington 2	406,331.17
Anderson 5	409,917.49	Lexington 3	90,561.12
Bamberg 1	63,758.22	Lexington 4	204,253.84
Bamberg 2	43,683.96	Lexington 5	547,008.50
Barnwell 19	43,266.02	McCormick	49,385.10
Barnwell 29	59,668.48	Marion 10	310,595.73
Barnwell 45	102,620.36	Marlboro	260,254.29
Beaufort	682,710.74	Newberry	276,844.43
Berkeley	1,058,910.41	Oconee	330,943.98
Calhoun	110,074.42	Orangeburg 3	181,532.20
Charleston	1,518,725.40	Orangeburg 4	240,031.10
Cherokee	401,787.39	Orangeburg 5	413,023.44
Chester	234,308.24	Pickens	526,917.60
Chesterfield	331,765.66	Richland 1	1,086,026.42
Clarendon 1	48,962.55	Richland 2	878,258.20
Clarendon 2	186,785.12	Saluda	123,547.62
Clarendon 3	38,968.44	Spartanburg 1	157,550.48
Colleton	365,248.90	Spartanburg 2	317,951.53
Darlington	467,334.44	Spartanburg 3	131,464.57
Dillon 3	74,010.29	Spartanburg 4	86,729.16
Dillon 4	268,261.69	Spartanburg 5	257,937.18
Dorchester 2	820,916.37	Spartanburg 6	356,294.05
Dorchester 4	139,537.78	Spartanburg 7	319,571.97
Edgefield	156,355.93	Sumter	776,241.10
Fairfield	171,023.07	Union	184,534.90
Florence 1	517,110.08	Williamsburg	269,306.22
Florence 2	53,247.58	York 1	162,773.13
Florence 3	234,349.05	York 2	232,927.05
Florence 4	45,090.49	York 3	569,439.55
Florence 5	61,426.39	York 4	426,838.60
Georgetown	437,122.64	SC Charter	615,835.53
Greenville	2,441,401.76	John de la Howe	3,419.78
Greenwood 50	411,622.93	Wil Lou Gray Opp. School	25,319.53
Greenwood 51	42,266.81	School for Deaf and Blind	14,282.19
Greenwood 52	52,173.15	Dept. of Juvenile Justice	46,041.42
Hampton 1	150,726.16	Dept. of Corrections	31,279.15
Hampton 2	50,221.65	Gov. School (Science/Math)	8,483.69
Horry	1,962,643.03	Gov. School (Arts/Human.)	7,694.50
Jasper	172,280.19	State Total	$29,156,758.34

Plaintiff vs Non-Plaintiff Districts
Average Readiness Scores

Legend: Plaintiff — Non-Plaintiff — Plaintiff Overall — Non-Plaintiff Overall

APPENDIX C:
PROFILE OF THE SC GRADUATE

APPENDIX D:
INITIATIVE MILESTONES

1996-97

- The South Carolina General Assembly created the K–12 School Technology Initiative.

- The K–12 School Technology Initiative began funding two-way video projects across South Carolina.

1997-98

- The K–12 School Technology Initiative distributed over $12 million to state districts for local technology implementation.

- South Carolina Educational Television (SCETV) began digitizing its video resources for use in schools.

- South Carolina was recognized by the Educational Testing Service as one of five states to provide telecommunications access in all schools.

1998-99

- South Carolina received over $26 million in E-Rate funding.

- South Carolina encouraged the state's school districts to adopt the International Society for Technology in Education's National Educational Technology Standards for Students (ISTE NETS-S) and National Educational Technology Standards for Teachers (ISTE NETS-T).

- By 1998, South Carolina invested more than $84 million in hardware, software and professional development opportunities or schools and districts.

- The K-12 School Technology Initiative began distributing funding for professional development in technology as well as technology implementation to districts,

sending over $16 million in total funding to districts statewide.

- 86 percent of South Carolina's schools were equipped with satellite dishes in order to receive education programming, compared to a national average of 29 percent.

- 67 percent of South Carolina classrooms were connected to local-area computer networks (LANs), compared to 53 percent nationwide.

- Technology Counts '98 reported that South Carolina was one of only five states in the nation to provide Internet access to 100 percent of its schools.

1999-00

- South Carolina, an E-Rate leader, received over $42 million in funding.

- The South Carolina State Library's (State Library) Discus website was launched.

- The new student-information collection system, Schools Administrative Student Information (ASIxp), was provided free to all districts.

- 100 percent of all state K-12 schools have digital satellite reception.

2000-01

- South Carolina E-Rate funding continued to climb to over $52 million.

- State K–12 appropriations for educational technology funding increased to over $40 million.

2001-02

- The South Carolina General Assembly passed the Teacher Technology Proficiency Proviso, requiring districts to verify that teachers demonstrate technology proficiency during each recertification cycle.

- South Carolina received $44,280,175 in E-Rate funding.

- The K-12 Partnership provided $400,000 of funding, for technical training for district's technology support personnel.

- SCETV's Knowitall.org Web portal was officially launched.

- SCETV's Distance Education Learning Centers were operational in all school districts.

- The K-12 School Technology Initiative provided over $18 million in flow-through funding to districts for local technology and training.

- The South Carolina Education Oversight Committee (EOC) issued its long-range planning document, citing technology use as necessary for South Carolina to reach its 2010 goal of being ranked in the top half of states nationwide with regard to student achievement.

- ETV American Graduate, a public media initiative funded by the Corporation for Public Broadcasting (CPB) helped South Carolina's communities find solutions to address the dropout crisis.

2002-03

- K–12 School Technology Initiative funding decreased from a high of $40 million in 2001, to a five-year low of $19 million.

- South Carolina encouraged its school districts to adopt the International Society for Technology in Educations (ISTE) National Educational Technology Standards for Administrators (NETS-A).

2003-04

- The student-information collection system SASIxp was fully implemented in all state school districts.

- The Division of State Information Technology (DSIT) filed the calculations for all schools and districts for the E-Rate Discount Program, resulting in over $49 million for the state and school districts in discount payments.

- K–12 School Technology Initiative funding provided the Intel Teach program to educators across the state.

- The South Carolina Department of Education (SCDE) released its State Educational Technology Plan, 2003-08: Realizing the Dream, to all South Carolina stakeholders.

- K–12 School Technology Initiative funding supported 30 Technology Coaches.

- SCDE released a new SASIxp template and the Data Collections Manual, initiated quarterly collections and bean to rely on the new South Carolina Educational Data System (SCEDS).

- SCDE's South Carolina Online Professional Development (SCOPD) program, now known as eLearningSC, was officially launched.

- A new Training Teachers in Technology (T3) professional development CD-ROM entitled "The Nature and Needs of Gifted and Talented Students" was offered to districts.

2004-05

- SCDE's ePortolio project pilot was launched to assess teacher technology proficiency and to provide information on professional development offerings.

- SCETV's Internet video-on-demand service, StreamlineSC, was officially launched.

2005-06

- The South Carolina Legislature called for a feasibility study to investigate computer-based assessment in the state.

- SCETV's StreamlineSC reached 100 percent of the state's K–12 schools and had 1.3 million views within its first full year of operation.

2006-07

- The South Carolina Virtual School pilot was officially launched by the SCDE.

- SCETV's Knowitall.org celebrated its 10 millionth hit.

- SCETV's Knowitall.org launched two new sites, Knowitall Healthy! and Road Trip.

2007-08

- The State Library's Discus program launched its new website featuring Web 2.0 technology.

- The State Library began the implementation of SchoolRooms, an online multimedia discovery place for the K-12 community.

- The K-12 School Technology Initiative approved the implementation of a service offered by DSIT to provide security and monitoring of K-12 Internet bandwidth usage.

- SCETV procured a $1.94 million grant that began SCETV's transition from analog video over microwave delivery of educational content to a streaming media delivery in 33 of 85 school districts.

2008-09

- SCETV launched OnePlaceSC, its newest K-12 education Web portal.

- SCETV launched Digital Education Services (DES), an upgraded service of the Distance Learning Education Centers (DLEC), designed to transition existing analog and digital broadcasts to live and video streaming on-demand systems.

- SCETV live-streamed both SCETV radio stations, enabling the stations to be added to the OnePlaceSC programming lineup and for the general public to listen to SCETV Radio on the Internet.

2009-10

- SCDE released its State Educational Technology Plan for 2009-13.

- The State Library's Discus program launched

SmartSearch, enabling the retrieval of information from multiple sources through a single "Google-like" search.

- The State Library's Discus program implemented IP geolocation technology through SmartSearch, allowing students to be recognized as being in South Carolina and automatically granted access without the need for usernames or passwords.

- The State Library added a number of career and workforce development products to Discus including Ferguson's Career Guidance Center, LearningExpress Library and the NetLibrary Career eBook collection

- The State Library launched the StudySC.org website, a resource designed to provide online links and multimedia content for homework help, project assistance and classroom use.

- The State Library received a Presidential Citation Award from the South Carolina Library Association in recognition of ten years of Discus, South Carolina's Virtual Library.

- SCETV's StreamlineSC video-on-demand service had 3.16 million views during the 2009-10 school year, and the highest per-teacher video-on-demand usage of any such service in the nation.

- SCETV's Knowitall.org portal had 6.01 million views in FY 2009-2010.

- SCETV's Web of Water site, part of Knowitall.org, was awarded a Corporation or Public Broadcasting MySource Education Innovation Award in March of 2010.

- SCETV's Digital Education Services (DES) systems were implemented in 44 of 85 state K-12 school districts.

- SCETV added new content to several of its most popular Knowitall.org Web sites, including Artopia, RiverVenture, Generations of Heroes, GullahNet, Educator+ and Career Aisle.

- DSIT filed E-Rate applications for network connectivity costs of $22.7 million in eligible services in 2009-10, and received federal E-Rate

reimbursements of $13.8 million.

- The K-12 School Technology Initiative, in conjunction with DSIT, developed version four of the Internet policy, designed to ensure the equitable use of available funds to supply sufficient Internet bandwidth to all districts.

- SCETV procured a $1.4 million American Recovery and Reinvestment Act grant through an agreement with SCDE. The funds were used to add an additional 26 school districts to districts viewing all media via SCETV's IP Media server technologies.

- Through SCETV, 73 of the state's 81 school districts received all district televised media via streaming Media Server constellation.

2010-11

- SCETV's website "Web of Water," received the nationally prestigious Corporation for Public Broadcasting (CPB) Innovation in Education Award.

- The State Library implemented five new products in its Discus program. The products included Biography In Context, Opposing Viewpoints In Context, Science In Context, U.S. History In Context and World History In Context.

- The State Library's Discus program added Ferguson's Career Guidance Center, LearningExpress Library and the EBSCO Career eBook Collection to its Discus Job and Career Resources component.

2011-12

- SCETV began offering the PBS Learning Media service.

- SCETV finalized the Educational Broadband System (EBS) transition from 67 four-channel groups to a streamed down single channel per group (EBS mid-band) dedicated to transmitting ITV programming for all school districts in the state.

- SCETV developed and instituted an agreement to migrate all StreamlineSC content to the constellation of IP Media servers, allowing districts to have a Streamline server on their internal Ethernet network. The higher capacity storage also enabled the districts to access the entire StreamlineSC asset library.

- Through a CPB American Archive Content Inventory Project grant, SCETV inventoried over 100,000 physical and electronic assets and compiled a database of metadata that can be accessed for educational and documentary projects.

- The State Library's Discus program conducted an extensive evaluation project during FY 2011-12, resulting in a new collection for FY 2012-13 that will retain many of the most heavily used products while adding much needed content in other areas.

- The State Library forged a partnership with the Partnership Among South Carolina Academic Libraries (PASCAL) which has helped to provide a richer array of resources utilizing combined funding efforts.

2012-13

- K-12 School Technology Initiative partners participated in the TransformSC initiative.

- SCETV partnered with Lexington School District Four to provide literacy resources to its pre-K and K-3 students to include scholarships for facilitators of the PBS "Raising Readers: Preparing Preschoolers for Success" initiative. This initiative addressed reading proficiencies and works directly with classrooms and the afterschool alliances in the district.

- SCETV secured and hosted a second grant from CPB for a new SCETV American Graduate Youth Media Summit and Civil Rights Forum in the spring of 2013. Students interviewed civil rights veterans, which were archived as part of SCETV Civil Rights History inventory.

- SCETV added a new K-12 service, PBS LearningMedia, a media-on-demand service that features PBS award winning content.

- SCETV added a new social media site to

support the Common Core State Standards Initiative. The site uses the Edmodo platform for teachers to share activities, best practices and useful websites.

- South Carolina Virtual School Program (SCVSP) legislation was amended to lift the credit limitations placed on students using the SCDE program.

- SCVSP piloted 8th-grade English and Math Intervention courses with approximately 150 students in two districts. As a result of this success, 6th and 7th-grade English and Math Intervention courses were developed and offered in the summer of 2013.

- SCVSP partnered directly with schools to offer blended learning opportunities to help fulfill several needs resulting from budget cuts, reduced funding and unfilled teaching vacancies at smaller schools across the state.

2013-14

- The South Carolina Virtual School Program was officially rebranded and renamed VirtualSC by SCDE.

- SCETV conducted a statewide Teacher Survey designed to assess ways educators use K-12 resources, as well as professional development areas of need. The survey included responses from over 2,000 participants.

- SCETV Education, in conjunction with the EOC, began a new monthly newsletter desinged to increase teacher awareness of available resources and services. The newsletter was subscribed to by over 73,000 teachers and staff.

- SCETV launched ETV Teacher Courses, a new website designed to provide teachers the ability to easily search and find relevant recertification credit informtion from such sources as SCETV's Teacherline Southeast, Teacher Recertification and TeacherStep.

- SCETV began offering week-long recertification courses using a blended hands-on, Web-based curriculum called "Using Video in the Classroom."

- SCETV added a similar course titled "iBloom: Using the Internet and iPads to Support Bloom's Taxonomy," which covered the use of free Web tools and applications in the classroom, in conjunction with Project Based Learning and Flipping the Classroom instructional strategies.

- SCETV introduced a simplified and improved OnePlaceSC website, which no longer required a teacher to log-in and locate or record the resources needed to facilitate learning.

- SCETV was awarded an 18-month $200,000 grant from the CPB for "American Graduate: Let's Make It Happen." SCETV, one of 33 hub stations nationwide, convened groups from across the state in an effort to improve outcomes for students from cradle to career. Reports on these efforts were broadcast on television, radio and online.

2014-15

- The State Library's Discus program implemented IP geolocation technology for its individual databases, thereby allowing all South Carolinians to be recognized as being a resident and automatically granted access to Discus without the need for user credentials.

- Discus implemented the EBSCO Discovery Service, which provides a streamlined search tool incorporating high-end indexing, subject indexing, and relevance ranking. This "Google-like" search provides a way to retrieve multi-media, reference resources, academic journals, newspaper articles and primary sources through one search box.

- The implementation of SCETV's Digital Asset Management System provided a process to tag and catalog digital assets with the successful inventory of 104,787 assets under the American Archive grant. As a result, approximately 3,000 hours were preserved and digitized. These assets reside on servers located at SCETV and the WGBD/Library of Congress.

- SCETV and the production team at the National Black Programming Consortium completed

a two-hour documentary titled "180 Days: Hartsville," that aired in March 2015, on PBS. The documentary, a part of CPB's American Graduate: Let's Make It Happen initiative, captures the unflinching determination of teachers and principals, backed by a committed business community, that sets a high standard for excellence in Hartsville, South Carolina.

- SCETV began an extensive redesign of Knowitall.org. The service, rebranded as Knowitall.org Media, offers a wide variety of new mobile-friendly videos and a sleek efficient design.

- SCETV's online series "Original SC" and the documentary "Zip Code: Your Neighbor, Your Health" both won a 2015 Telly Award. K-12 sites across the state access the programs via StreamlineSC.

- The Bandwidth Monitoring Program, administrered by the Division of Technology, has monitoring sensors deployed in each of South Carolina's 81 public school districts, as well as six charter schools and 42 public library systems. The program ensures that connectivity and Internet bandwidth are best being used to serve the state's educational needs.

- The K-12 School Technology Initiative began a Distributed Denial of Service (DDoS) Protection Service designed to help the state's schools and libraries detect and mitigate the risks associated with this form of cyber attack. The service is offered through an agreement between the Division of Technology, Spirit Communications and AT&T.

- The K-12 School Technology Initiative, through the Division of Technology, began a Security Training Voucher Program designed to enhance cyber and information security defense proficiencies among the state's public school districts.

2015-16

- The South Carolina State Library's Discus program implemented the EZproxy

hosted service. This advanced technology solution adds a higher degree of seamless authentication for South Carolina's citizens and reduces the number of obstacles and passwords users need to remember for access to the electronic resources.

- SCETV offered a new Wi-Fi service to support reading and STEAM in pre-K-12 communities, increasing access to SCETV content to students before and after schools through Wi-Fi facility hotspots and quality professional development.

- SCETV and the K-12 School Technology Initiative began the development of a new curriculum resource site, LearningWhy, to host educational lessons for schools implementing 1:1 environments.

- SCETV has launched its first station-branded public media app. The SCETV App features local, education and national content, giving patrons mobile content at their fingertips.

2016-17

- The K-12 School Technology Initiative's 2014-15 Progress Report received a 2016 Notable Document Award from the South Carolina State Library.

SCETV began its new ETV StreamlineSC Collections within Knowiall.org, featuring local, partner and subscription content.

- SCETV launched LearningWhy, a new innovative lessons website intended for 1:1 and project-based learning environments.

APPENDIX E:
WHAT OTHERS ARE SAYING

Discus

- "Awesome source of info! Reliable."
  Sally Brady, Jackson Middle School

- "Access to relevant, current, authoritative information."
  Vicki Smith, Pendleton High School

- "I direct students there to make sure they find accurate, appropriate information."
  Rebecca Roper, Carver Middle School

- "Our students use the databases available when doing their National History Day project research and teachers adore using BrainPOP, Jr. in their lesson planning – as do I."
  Jessica Ellibee, Lake City Early Childhood Center

- "Discus has helped my kids enjoy research. It is very user-friendly and on their level."
  Lori Harper, Andrews Elementary School

- "Britannica is an invaluable resource at my school. Students cannot only begin their research at a reading level that is appropriate for them; they can listen as well and continue on to referenced websites."
  Lisa Chaperau, Belvedere Elementary School

- "Discus rocks! We are a small school that cannot afford to pay for the resources you are providing. We are 1/3 Hispanic and are trying to get the parents into using the adult resources."
  Paula Hart, Nativity School

- "It's a huge resource at my tiny school. Without it, my reference collection would be pitiful. My students use it regularly."
  Janet Deavor, Saint John Catholic School

- "Teachers are able to rely on resources that are age appropriate for their middle school students. In this age of fake news, Discus provides a platform to have that discussed with students."
  Sharmen Oswald, Gilbert Middle School

- "The resources available to us through Discus would cost us several thousand dollars each year! We use them often."
  Pamela Maggio, Rudolph Gordon Elementary School

- "We use it daily and love how easy it is for our elementary students."
  Margie Uttormak, Marrington Elementary School

SCETV Education Teacher Training Online Courses and Knowitall.org

- "SCETV supports our teachers and our classrooms and is an essential resource to educate our students." *Laura Bouknight, School District of Newberry County*

- "This course provides a supermarket of website choices, many of which are explained and worked on in rubber-meets-the-road ways. I would highly recommend this course to those who are just beginning to get comfortable with technology as well as those who are comfortable in this venue."
  Teacher, Varnville Elementary School

- "Because I had never taken an ETV class before, I was pleasantly surprised at the depth of the class content. Being able to get information with real examples demonstrated in the comfort of my home and on my schedule was key to my decision to look for other ETV classes to take."
  Cynthia P., Dorchester School District Two

- "Why haven't I used ETV's Knowitall site before? It is so jammed packed with such interesting topics and information that could be used in my classroom, knowledge I can share with my students, a site that is easy to use and free!"
  Karen M., Teacher, ETV Teacher Recertification Participant 2017

- "I went from knowing very little to knowing so much. I had used Streamline, Knowitall.org and my class loves Detective Bonz, but this class provided me so much more to offer my class."
  Pam Oates, Ben Lippen School

SOUTH CAROLINA K-12 SCHOOL TECHNOLOGY INITIATIVE
4430 BROAD RIVER ROAD
COLUMBIA, SC 29210
WEBSITE: HTTPS://SCK12TECHINIT.SC.GOV