Broward Digital "Learning Environment" for Teachers and Students
Empowering the teacher and student to excel in a digital world

How can the Broward County Public Schools best prepare its students to be successful in the rapidly changing environment of the 21st century? This is a question of paramount importance to the leadership, teachers, parents and community. The No Child Left Behind Act (NCLB) of 2001 is providing some direction by mandating technology literacy for students by 8th grade and by including technology literacy under its definition of a "qualified teacher." Most importantly, NCLB recognizes the importance of technology in the global world that surrounds our students and challenges educational leaders to ensure that technology literacy become a "basic skill" needed in much the same way as reading and math for success in the students life.

What kind of world is facing our students? Students will spend their adult lives in a multitasking, technology-driven, multi-cultural and energetic world and they must be equipped to handle it. For many students, everyday life is already technology-driven. Students connect with friends via email, instant messaging and chat rooms, search the web to explore their interests, express themselves with multimedia, learn with software, play video games in virtual realities, manipulate digital photos and take pictures with cell phones. Yet, they come to school and learn with traditional methods using paper and pen, they read from textbooks, and take one-dimensional assessments to express their knowledge. Clearly, there is a profound gap between the knowledge and skills most students learn in school and the knowledge and skills needed in today's communities and workplaces. Prensky (2001) frames the issue in this way, "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach." Prensky goes on to give some information on today's students that can clearly guide Broward County stakeholders as they plan for an educational system that meets the future needs of students. These characteristics are:

- Students (K through 20) represent the first generations to grow up with computers, videogames, cell phones, the Internet and other tools of the digital age.
- Today's average collage graduates have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games.
- Because of this ubiquitous, technological environment and the way students interact with it, *students think and process information fundamentally differently from their predecessors*.

So, what are these "new" students of today being called? Some refer to them as the NET Generation (Tapscott, 1999) while Prensky (2003) has coined the term "Digital Natives" to indicate that our students are "native speakers" of the digital language of computers, video games and the Internet. If the students are the "Digital Natives" then what about the adults that are guiding and leading them into the future? They, according to Prensky, are the "Digital Immigrants" who, while adapting to the new technological environment, always retain their connection to the past. Here is an example of how a "Digital Native" and a "Digital Immigrant" might handle similar tasks.

Task	Digital Immigrant	Digital Native
Using email	Printing out your email or having your secretary print it out for you	Read, respond on the spot and delete
Sharing a web site	Bringing people into your office to see an interesting web site	Emailing the URL to the people
Receiving information	Like to receive information slowly and absorb it over time	Used to receiving information rapidly and making quick decisions
Learning strategy	Linear, step by step approach, one thing at a time, individually and above all seriously	Parallel process and multi-task, prefer random access, instant gratification, expect frequent rewards, prefer games to "serious" work and function best when "networked." Learning can be "fun."

What is the result in our classrooms? "Our Digital Immigrant instructors, who speak an outdated language (pre-digital age), are struggling to teach a population that speaks an entirely new language" (Prensky, 2003). Digital Immigrants assume that learners are the same as they have always been and that the same methods that worked for the teachers when they were students will work for their students now. *But that assumption is no longer valid. Today's learners are different.*

So as a result of this situation, what should educators do? There are really only two answers - either the Digital Native students will learn the old ways or the Digital Immigrant educators will learn the new. Prensky states that it is unlikely that the Digital Natives will go backwards and states that it may be impossible anyway because their brains may already be different. Also the research on cultural migration indicates that kids born into any new culture learn the new language easily and forcefully resist using the old.

So, unless we want to forget about educating Digital Natives until they grow up and educate themselves, we must confront this issue. And in doing so need to reconsider both our methodology and our content.

First, let's look at our predominant, current methodology. If one goes into a typical classroom of today, they may see the Teacher as the lecturer imparting information and knowledge to a group of students who are passively absorbing the information. There may be some interaction but it would be under a controlled environment, within a specific schedule and the content would be delivered through a linear, step by step process. Technology may be used as a supplement to instruction and in a few classrooms may be used creatively.

Contrast this with an environment in which various activities may be occurring simultaneously at various learning centers, where students are making effective use of technology for communication, information retrieval, and project based learning. In this environment the teacher is the guider of the learning process and seamlessly moving students through the learning in an interactive and engaging manner.

Content also takes another dimension. Relationships among content, called interdisciplinary learning, are also an integral part of the way students learn and help them make "real world" connections to the information they are receiving.

The Partnership for 21st century skills coalition of business and education leaders (2003) indicates that six key elements must be present for assisting students in gaining the knowledge and skills needed for future success. These elements, they state, need to be incorporated in every curricular program and teaching and learning process in our schools and can be summarized as:

• Building knowledge on core subjects. No Child Left Behind identifies these as English, reading or language arts, mathematics, science, foreign languages, civics and government, economics, art, history and geography focused beyond basic competency to the understanding of academic content at high levels.

• Focus on life long learning skills. These have been defined as information and communication skills, thinking and problem-solving skills and interpersonal and self-directional skills.

• Use of digital tools to develop learning skills. Students need to be proficient in using digital tools to access, manage, and evaluate information, construct new knowledge and communicate to others to participate in society.

• Teach and learn in a 21st century context. Students need to learn academic content through real-world examples and experiences both inside and outside of school. With the power of the Internet, learning can also be expanded beyond the classroom walls, allowing learning to take place "anytime, anywhere" access to the Internet can be obtained.

• Teach and learn 21st century content. Educators and business leaders have defined these areas as global awareness, financial literacy and civic literacy. Much of this content is not captured in existing curricula or taught in depth in schools today.

• Using assessments that measure 21st century skills. Standardized tests alone can measure only a few of the skills and knowledge needed in today's world. Assessments that offer alternative means for students to express their knowledge are needed along with information technologies that record and analyze data on student performance.

According to Istance (2002), to live in the 21st century, students also need to be given the tools to cope with a complex, rapidly changing world in which they live, with personal development and global citizenship being equally important to cognitive knowledge.

As Broward develops its vision, it can benefit from some of the future schooling scenarios that are being proposed by various world organizations. Istance (2002) delineates three visions that may be emerging.

1. *Attempting to maintain the status quo*. With this scenario, the basic features of the existing systems are maintained well into the future whether from public choice or from the inability to implement fundamental change.
2. *Reschooling*. This scenario sees major investments in schools with high priority placed on both quality and equity. *Schools as Core Social Centers* leads to extensive shared responsibilities between schools and community bodies, sources of expertise and institution of further and continuing education. *Schools as Focused Learning Organizations* are centered around a strong knowledge rather than social agenda in a culture of high quality, experimentation, diversity and innovation. New forms of evaluation and competence assessment flourish.
3. *De-schooling*. Rather than high status and generous resourcing for schools, the dissatisfaction of a range of key players leads to the dismantling of school systems to a greater or lesser degree. This may translate to *Learning Networks and the Network Society* in which various cultural, religious and community voices take on the functions of schools. Small group, home schooling and individualized education are some examples. Another scenario may be described as *Extending the Market Model* Many new providers are stimulated to come into the learning market, encouraged by reforms of funding structures, incentives and regulation.

Broward County Public Schools vision is to close the gap between how students live and how they learn in school. This is also essential if we are to provide equal opportunities for our students as it becomes apparent that students without access to technology at either school or at home will be at a disadvantage in 21st century society. Therefore, providing students with routine and regular access to technology both from school and home will be an integral part of the educational plan.

This vision includes a restructured learning environment that takes the best of the future scenarios, integrates the research on the growth and development of today's students and incorporates 21st century skills.

Broward's digital learning environment aligns with Istances (2002) Re-schooling concept. Broward's schools would be transformed into Community Learning Centers with 24/7 learning opportunities. Some schools would be open in the evening to the community with flexible scheduling of classes in high school allowing students to continue to learn in the evening when needed. But most importantly what is occurring in the classroom itself has been transformed. The traditional classroom setting of crowded rows of desks with the teacher at the front has been replaced with a learning environment

designed to provide an interactive venue for students. There is an area for small group presentations with a permanently set up video projector device and a laptop. In this area, students can use technology to present their understanding of subject knowledge. In other areas of the room are learning stations with the technology tools needed to teach curriculum content in reading, mathematics, social studies and science. There is another area for group projects or small group discussions. Project based learning and interdisciplinary strategies provide students with a well-rounded understanding of curricular content and an atmosphere of discovery, deep thought and reflection, participation and interaction is encouraged. The teacher is facilitating the learning and has a firm understanding of each students learning needs because she has immediate access to data to assist in planning and delivering learning programs. Each student has a learning device (laptop or new device) that is used for learning, productivity and communication. The student and teacher are connected to a wealth of information and curricular content through this tool and communicate through it to each other and anyone from a large network of learning specialists. Parents have immediate access to information on the progress of their children and can readily communicate to teachers and school staffs through the Internet,

Students in all grades can take classes via an online environment and combination online and classroom courses are common. Student to student interaction is also an essential component of learning. Students are expected to join learning networks and work together on group projects and activities. The critical 21st century skills are central to the learning and students are taught to be team players, take on leadership roles, be critical thinkers and active citizens in the community. These skills are also advocated by business organizations (SCANS report, 19__) and reflect the skills needed in a global working environment.

Administrators and support staff maintain the learning environment and provide essential organizational and management functions. Technology is seamlessly integrated into all instructional and management operations because a well-trained and efficient support level of staff is provided. **School leadership learned from previous experiences that having a highly efficient and effective technology support system was paramount to the successful creation of this new digital learning environment.**

Most importantly, students are succeeding at high achievement levels and are part of an engaged, active learning community that believes that every student *will* learn.

To incorporate these elements into the everyday delivery of curriculum will take the effort of a community that shares the vision of changing teaching and learning to accommodate to a changing 21st century world and Broward County is positioned to take the national leadership in this area.

How does BCPS move forward in its efforts to implement this vision?

The first major step is for leadership to communicate the vision to all its stakeholders. Parents, business partners, teachers, administrators and students must understand the

vision, understand the context and reasons for the change, and be able to contribute to the goals and objectives leading to the creation of the vision. To do this, effort must be made to engage all stakeholders in conversation centered around implementing the vision. The Partnership for 21st century skills (2003) lists nine-step strategy for building a shared vision. These steps are:

- Embrace a powerful vision of public education that includes 21st century skills.
- Align leadership, management and resources with educational goals.
- Use the rubric included in Appendix A as a tool to assess where schools are now.
- Develop priorities for 21st century skills
- Develop a professional development plan for 21st century skills.
- Make sure students have equitable access to a 21st century education.
- Begin developing assessments to measure student progress in 21st century skills.
- Collaborate with outside partners.
- Plan collectively and strategically for the future.

21st century vision with 21st century tools (CD/IM)

Next, the current five year educational technology plan must be updated and enhanced to implement the vision over the next five years. This new "educational technology" plan would provide a blueprint for moving the district forward towards its vision of a restructured educational system that accommodates to the new challenges and opportunities brought forward by a global, technology driven world.

Updates to the following components must be part of the plan.

• a process to accelerate the professional development plan for "retrofitting" our teachers to be able to integrate technology into the curriculum on a regular and daily basis.

• a plan to accelerate the development and implementation of the Curriculum Development/Instructional Management tool for teachers including hardware, software, curriculum, and Internet access aspects that enable the effective use of the tool.

• a plan to accelerate the development and implementation of a student portal of digital resources and services (hardware, software, curriculum, and Internet access). Included in this plan would be examining the basic equipment lists, the availability of electronic textbooks, a strategy for providing student laptops or appliances to enable 24/7 learning and a strategy to insure that every student meets NCLB compliance guidelines in the area of meeting technology standards through curriculum delivery.

• a plan to provide leadership with the skills to implement the vision on a local level and monitor and guide the progress.

• a plan to provide parents with timely information about how their children are progressing and to include them in the academic life of their children.

• a plan to involve the community in the implementation of the vision through the sharing of the responsibility and reaping the benefits of a successful educational process that prepares "all" students to meet the challenges of a 21st century world.

• a plan to provide the budget and funds to implement the vision.

• a technical plan to provide the underlying infrastructure (network, hardware and software) to support the educational plan.

Baseline Data: Florida STAR (School Technology and Readiness) Chart

School districts have No Child Left Behind (NCLB) goals of technology literacy for all students and technology integration in the curriculum. NCLB requires state educational agencies to report adequate yearly progress towards the attainment of these educational technology goals. In order to provide measurements of progress, the Office of Educational Technology/Florida Department of Education solicited school district input to develop two instruments in 2002-03: (1) a common definition of technology literacy and (2) a School Technology and Readiness (STAR) rubric of technology benchmarks related to a variety of educational issues.

The common definition of technology literacy is derived from the research on 21_{st} century skills conducted by the Partnership for 21_{st} Century Skills. **Technology literacy** is the ability to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21st century.

The Florida STAR Chart provides a framework to measure how well schools are prepared to equip students with the knowledge and skills they need to meet the challenges of expanding technology. Every Broward school has a baseline STAR chart, which was generated by completing the 2002-03 STAR survey. The STAR survey is a self-report, as opposed to self-assess, instrument. The STAR Survey has five strands:

- Technology Administration and Support
- Technology Capacity
- Educator Competency and Professional Development
- Learners and Learning
- Accountability

Each strand has multiple benchmarks (categories/columns). Each benchmark has indicators at four levels of achievement: Entry, Intermediate, Advanced, and Target. The baseline STAR average of Broward Schools (completed in Fall, 2003) showed that the Broward average matched the state average in all but two benchmarks (instructional technology staffing and teacher computer access). The Broward average lagged the state average in instructional technology staffing, but exceeded in teacher computer access.

The Florida DOE engaged outside research to validate the results of the STAR survey, and user input was solicited to make the survey more user-friendly. The 2003-04 STAR survey has been modified and improved, and the STAR survey is open for schools to complete from November 3-26, 2003. The STAR survey has also added questions for centralized district staff. STAR results and comparisons will be available Spring 2004.

Progress to Date:

Over the past two years, several programs have contributed to the creation of a digital learning environment for teachers and students. This is a summary of our progress to date. Section 8 of the 2002-2006 district information technology plan contains a

framework for moving forward in the areas of professional development for both teachers and leadership. The programs below are all aligned with this plan.

Learners and Learning

Atomic Learning provides "just in time" training in basic technology literacy skills. Teachers, students, parents and staff can use this system and it assists students with meeting NETS standards for students.

A Broward Virtual High School now assists students with taking online courses "anytime, anywhere" and is a major contributor to virtual education.

Educator Competency and Professional Development

A district-wide professional development program for "retrofitting" teachers to integrate technology into the curriculum is being implemented in partnership with Florida Atlantic University. The Digital Education Teacher Academy will continue to be aligned with the vision and support the re-training of teachers.

The New Teacher Academy assists teachers with understanding the technology tools and curriculum available at each school.

The Broward Virtual University provides online staff development to teachers.

Accountability

The Virtual Counselor now provides student achievement data to parents, teachers, students and administrators via the Internet and assists with instructional planning and communication.

The district has developed and is administering a benchmark assessment test to all students in grades 3-10 as a tool for tracking their progress between FCAT assessments. The results are available through the Virtual Counselor. Future plans are to deliver the benchmark assessment test via the online environment.

Technology Administration and Support

Technology integration courses for leadership are now being offered through the Leadership Development Department for Lead Teachers, Assistant Principals, and Intern Principals.

School Improvement Planning

Centralized budget for hardware and software. District licensing for Filemaker Pro, Macintosh Operating Systems, Foolproof, Deep Freeze, Virus software, Appleworks.

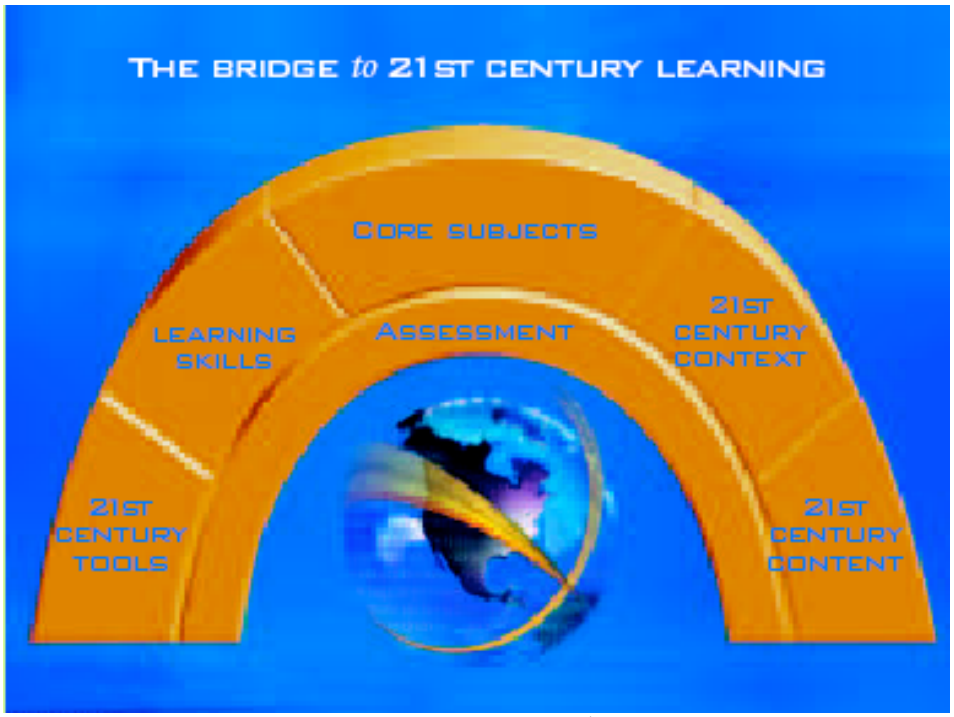
Technology Capacity

Through the refresh process, laptop computers are becoming available to all teachers.

Currently, students use computer labs, wireless carts, media center resources and classroom computers to access instructional technology resources

The school/district/admin level local area networks (LAN) are well designed and constructed. All district LANS administered by ETS are consistent in design, documentation, installation and maintenance. BCPS is considered "best in class" for LANS in K-12 public schools (CELT, 2003).

A resource bank of online lesson plans, curriculum maps, internet based curriculum and student achievement data is now available to the classroom teacher to assist with technology integration



Online Teacher Resources
The Curriculum Development/Instructional Management (CD/IM) Toolbox

What is CD/IM?

While the overall educational technology plan is being developed, a component of the vision, the Curriculum Development/Instructional Management tool, must move forward. This tool will assist the district in providing teachers with digital resources and curriculum content and is necessary to help our teachers, who are the primary deliverers of instruction, and our students, who are the primary beneficiaries, to be immersed in a 21st century, world-class digital learning environment. As the following report will show, various web based tools are available that support the CD/IM project. However, the integration of the current work into one comprehensive system needs to be completed.

Beyond CD/IM: Expanded Vision and Next Steps
Since 1996, a Curriculum Development/Instructional Management (CD/IM) Toolbox for teachers has been one vision of the use of technology to support instruction. This toolbox would contain high quality curriculum content, digital resources, online professional development, an electronic gradebook, an email system and access to student achievement data. By providing a "one stop" access point for resources and services, teachers can easily interact with the CD/IM from both school and home.

Appendix A is a visual representation of the proposed CD/IM system. The resources indicated in green are web applications that have already been created and the resources in yellow are under development. Note that the pieces have been created independently of the other components and there is no system as yet that pulls all the pieces together and connects them to one central system. The center box on the vision that reads, *E-Map, the Curriculum Portal* is a visual representation of the central system that is needed.

(Insert visuals here)

How Does the CELT Assessment and the Technology Blueprint Interact with the SBBC Digital Learning Vision?

The Benton Foundation published a research report entitled "The Sustainability Challenge: Taking EdTech to the Next Level" in 2003. This research drew attention to the need for educational institutions to organize effectively and plan strategically so that the initial impact of instructional technology can be sustained over time. That is to say, forward-thinking school districts realize that they need to organize and operate differently in order to maintain their educational technology investments in good working order. (Dickard 2003)

The CELT assessment outlines the sustainability challenge for Broward County Public Schools (BCPS). BCPS has invested in educational technology to impact student achievement. The findings of the CELT assessment show that BCPS has accomplished

significant initiatives with technology, and the CELT recommendations focus on strategic decisions that will allow BCPS to become an efficient and exemplar organization. What we are calling "21st Century Management" is key to attaining that exemplar status. 21st Century management means that BCPS will:

- Be a 21st century organization – redefine roles in context of digital environment
- Implement 21st century processes – document, simplify, and automate how we work as an organization

"The Sustainability Challenge" identifies three indicators for successful sustainability. Three indicators of effectively integrated technology in a district are:

- Developing a Culture of Innovation
- Institutionalization of Educational Technology
- Gathering and communicating evidence of effective use of Technology

Interaction of SBBC's Digital Learning Environment and CELT Blueprint

There are xx areas of interaction:

- Leadership
- Elimination of barriers
- Organizational efficiencies

Barriers:

- Accountability
- Tech support
- Staff development
- 24 x 7
- centralized management of hardware and software updates
- system of customer service which addresses 24 x 7
- time, money, resources

CELT Recommendations:

- *Re-engineer SBBC processes – become a more efficient organization to plan, management and support enabling technology infrastructure … rationale: document, simplify, automate … this yields efficient use of limited resources of time, resources, money*

Re-organize the SBBC educational enterprise –

References

Partnership for 21st century skills (2003). Learning for the 21st Century: A report and mile guide for 21st century skills.

CEO Forum on Education and Technology (2001). Key building blocks for student achievement in the 21st century.

Istance, D. (2002). Schooling for the future: Trends, Scenarios and Lifelong Learning. OECD/CERI, Paris.

McGain, T. and I. Jukes (2001). Windows on the Future: Education in the age of technology. Thousand Oaks, CA: Corwin Press.

Prensky, M. (2001). Digital Natives, Digital Immigrants. On the Horizon, NCB University Press, Vol. 9, No. 5.

Tapscott, D. (1998). Growing up digital: The rise of the net generation. New York: McGraw-Hill.

U.S. Department of Education. No Child Left Behind Act. Available at: http://.www.ndb.gov