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Technology's impact on student learning in grades K-8

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TECHNOLOGY'S IMPACT ON STUDENT LEARNING IN GRADES K-8

by
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ABSTRACT

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Many research studies have found that educational technology that is accessible, equitable, and properly used can make a significant difference in students' academic performance. The purpose of this study was to determine if Wildwood Crest Memorial School had a well-orchestrated technology plan, which addressed the technological needs of students and teachers and to determine what impact technology had on student learning. A survey developed by the Southeast and Islands Regional Technology in Education Consortium (SEIR*TEC) was used to collect data from students and teachers. An analysis of the data found that the district goals and objectives were being met with the integration of technology into the curriculum and instruction. Technology as a tool was used to stimulate higher order thinking and problem-solving skills. Students' mastery of academic content improved significantly utilizing collaborative and globalized learning and, as such, accelerated, enriched, and deepened students' understanding of the curriculum.

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CHAPTER 1

Introduction

Focus of the Study

Wildwood Crest's Three-Year Technology Plan was approved by the NJDOE on May 11, 2004. This plan included district technology goals and defined a strategic plan with objectives that were used as a roadmap for the plans implementation. The curriculum was to be the thrust behind the plan. Technology goals and objectives are to be driven by the teachers using the tools of technology with their students. The district technology plan was to be a reflection of the educational technology goals and initiatives listed in the New Jersey Department of Education's plan, "Working Toward the Future with Our Children".

The district's goals and objectives were found to have been written and implemented in compliance with New Jersey State Guidelines according to the Telecommunications Act of 1996, which is connected to the Universal Service Fund (USF) or E-Rate and the No Child Left Behind (NCLB) Act of 2001. This study focused on the alignment of the district's plan with state requirements and federal laws according to NCLB. The district plan was reviewed and evaluated for its ongoing vision for educational technology, which was also expressed in the state's strategic plan documenting the role of educational technology in promoting students' academic achievement. An evaluation process for the plan was reviewed and accountability

measures were evaluated to determine if technology goals, objectives, activities, resources and services have been effectively integrated into the curriculum and instruction. Research was obtained to assess if students are meeting challenging state academic standards and developing life-long leaning skills.

Purpose of the Study

The purpose of this study was to evaluate the implementation of the district's technology plan goals, objectives, activities and resources into the curriculum and instruction in order to determine if technology was effectively providing students with the challenges of higher level thinking skills according to state academic standards and federal requirements. This study resulted in an evaluation of the plan with a report of finding which was presented to the district's technology committee (consisting of educators, parents, students, and community members) informing them of the technological opportunities and innovations that were designed and integrated into the curriculum during the school year.

Definitions

The following terms and definitions were used in this study.

Access was the means by which teachers and students obtained the use of educational technology.

Assessment was the evaluation technique or measurement used to check for the understanding of technology.

Computer Assisted Instruction (CAI) was the use of a computer to assist in tutor type application program referred to as Drill and Practice, which was based on the behaviorist beliefs about the reinforcement of stimulus-response associations.

Constructivist was an individual who believes in the theory of learning based on the learners' construction of knowledge who engages in experiences and problem solving strategies involving higher-order thinking skills.

Digital Divide was the gap between individuals having access and use of differential learning opportunities to technology and those who do not.

Distance Learning was learning that took place with teachers and students at different locations through the use of interactive technology such as videoconferencing.

Educational strategies were the techniques and approaches used by educators to deliver instruction to students and adults.

Equity was the parity in which educational technology was deployed and accessible to various segments of the American student population.

Human infrastructure was the people who use the technology.

Infrastructure refers to telecommunications equipment and linkages, such as networks, which transport video, voice, and data.

Internet was the interconnected collection of networks that provided the basic protocol standard for the quick transmission of information to the public.

Schemas were the learning and behavioral patterns that make up how individuals perceive, interact, and respond to the environment.

Socioeconomic Status (SES) "was the relative position of a family or individual on an hierarchical social structure, based on their access to, or control over, wealth, prestige, and power" (Mueller & Parcel, 1981).

Student Achievement was a successful attainment of standards by students.

Technology was "the physical, mechanical, and electronic capabilities of a medium" (Kozma, 1994) that incorporates all the components needed to ensure effective delivery instruction. (Mellon, 1999).

Technology Experiences were the wide array of opportunities for students and teachers to use technology in their learning environments.

Technology Literacy was the ability of an individual to effectively use technology and communication tools to access, manage, integrate, evaluate, and create information.

Technology Plan was a document developed for integrating technology into the curriculum that supports meaningful, engaged learning.

Technology Proficiency was the ability and competence to use the technology to enhance learning, promote creativity, communicate effectively, and evaluate new information.

Technology Standards were a set of criteria, established to meet the needs of students and teachers in education.

Limitations of the Study

The limitations were reflective of information contained within the Three-Year Technology Plan, which was applicable to Wildwood Crest Elementary School according to the equity and access of technology within the district and the district goals and objectives.

The participants of this study included students and teachers, as well as administrators, support staff, parents, and community members assigned to the district's technology planning committee.

Setting of the Study

Wildwood Crest Memorial School is a PreK-8 School located in Cape May County, New Jersey. The Borough of Wildwood Crest is situated on a barrier island, which is 1.1 square miles. The current population according to the census of 2000 is approximately 3,980 people. There are 1,833 households and 1,114 families residing in the borough. By the New Jersey State Department of Education's standard, Wildwood Crest is a District Factor Group (DFG) "B" (on par with a district like Paterson, New Jersey). As of October 15, 2004 Wildwood Crest had 20% of the students qualify for free lunch. These were mostly children of seasonal workers. This number is down due to fewer and fewer low-income rental properties in the town. Some of the residents are very affluent, almost entirely through tourism related businesses such as motels, amusement businesses, restaurants, and real estate. The racial makeup of the borough is approximately 95% Non-Hispanic White, 2% African-American, less than 1 % is south/central Asian and the balance Hispanic. A large, non-voting tax base supports the small school through property taxes. Many of the residents are against any additional school tax burden since they do not have children in the public school system. Of the 3900 residents only 350 school children attend Wildwood Crest Memorial School. Therefore it is imperative that the permanent voting base, the vast majority of which are senior citizens, remain involved in the public school community. The district's history is reflective of only one school budget being defeated in the past 12 years. and a bond referendum, which was defeated twice by only three votes. This is indicative of a school with good community support and participation.

There are five members elected to the school board. The school board proposes a budget and voters choose to ratify or decline the budget in April. A reorganization meeting takes place at the May board meeting.

Wildwood Crest School (WCS) District consists of two administrative staff, 35 certified staff and 14 non-certified staff members. One hundred percent of the teaching staff is highly qualified. The majority of high school students attend Wildwood, Wildwood Catholic, or the Cape May County Technical High School.

At WCS the teachers, students, administrators, and community members work collaboratively in their efforts striving for "Excellence in Teaching and Learning". Curriculum and instruction are the focal points of the programs offered to the students. In order to meet rigorous academic standards, the Federal No Child Left Behind Act (NCLB) of 2001 and the New Jersey Core Curriculum Content Standards provide the district with a "roadmap" to follow.

School based decision-making has evolved into a site-based model where the Planning Team of students, teachers, community members, and administration collaborate on decisions that affect the school. The Parent Teacher Connection represents a cross-section of the community and provides financial and human support for the school. In progressing toward the goal of excellence, many other community organizations and their members help the children at WCS to learn and grow.

Preschool students were provided with the experience to develop physically, emotionally, socially, and academically in the district's morning and afternoon half-day preschool classes. Students in grades kindergarten through eighth receive instruction in

the following academic programs: language arts literacy, mathematics, science, social studies, physical and health education, library media, visual and performing arts. The Language Arts Literacy program in the preschool through fifth grades provides integrated instruction in speaking, listening, viewing, and writing skills. Literature and English/Writing emphasizes the importance of reading using authentic literature as a core component and is taught with a team of teachers in grades six through eight. The middle school English/Writing classroom is a fully equipped computer lab, which enhances the writing process for students. Students in the Mathematics program develop acquisition of skills in number sense, numeration, geometry, measurement, patterns and algebra, data analysis, probability and discrete mathematics and are challenged making real-world connections. Life, Physical, and Earth Science concepts are features of the district's science program and an emphasis is placed on the scientific process as well as lab investigations. An additional component of the math and science programs are the Integrated Studies Lab (ISL), which was offered to students in the sixth through eighth grade. The ISL program provides students with opportunities to use technology and hands-on math and science activities to further enhance their critical thinking, problem solving, and scientific reasoning skills. The Social Studies curriculum introduces the disciplines of history, geography, civics, and economics with respect to the students' community, state, nation, and the world at large. Technology was seen as a tool to advance curricular goals and its use was based on a vision of preparing our students for the 21st century. Internet and Distance Learning technologies have enabled students and teachers increased interaction with a plethora of current information and to experience

"real-life" learning experiences from around the world. Students also receive physical and health education, library media programs, instrumental and vocal music, and Spanish instruction. The enrichment program (gifted) is designed to provide creative problem solving and communication arts experiences in a challenging environment (Wildwood Crest School Report Card: Snapshot, 2003).

Significance of the Study

This project was important in order for the district to comply with state requirements and federal law under The Telecommunications Act of 1996 (E-Rate) and NCLB Title II, Part D, Enhancing Education through Technology. The report and presentation included information which was obtained from the evaluation process in reference to student academic achievement through the use of technology, the assistance every student received in becoming technology literate, the effective integration of technology resources and systems by teacher training and professional development in establishing research-based instructional models, and any funding discounts received by the district to purchase telecommunication services, Internet access, and internal communications.

Relationship of the Study to the ISLLC

This study provided an opportunity to extend and enhance skills in the Interstate School Leaders License Consortium (ISLLC) Standards 1, 2, and 4.

Standard 1: A school administrator is an educational leader who promotes the success of all students by facilitating the development, articulation, implementation, and

stewardship of a vision that is shared and communicated by the school community. The Knowledge of this standard are 2, 4, and 5, the Dispositions are 1-3, 5, and 6, and the Performances of are 1-8.

ISLLC Standard 2: A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth. The Knowledge of this standard 1-8, the Dispositions are 1-4 and 6, and the Performances are 2-7, 10-11, and 13.

Standard 4: A school administrator is an educational leader who promotes the success of all students by collaborating with families and community members, responding to diverse community interests and needs, and mobilizing community resources. The Knowledge of this standard is 3 and 4, the Dispositions are 4, and the Performances are 1–3 and 6.

CHAPTER 2

Review of the Literature

In order to assess the influence technology had on student learning and/or the enhancement thereof, the history and role of technology in the current educational practice was explored and literature related to evaluating its impact on the K-8 environment was reviewed. Although the impact which technology has on learning is becoming a major concern amongst many states, school districts, and funding agencies, it was found that most of the analysis of technology has usually occurred at the individual school or at the classroom level. Research indicated conflicting perceptions regarding whether the mere presence (infrastructure), equity, and access to technology implied student learning.

In 1993, the New Jersey Department of Education (NJDOE) developed a five year technology plan titled, "Educational Technology in New Jersey: A Plan for Action". This plan was developed to guide districts in the effective and equitable utilization of technology. The goal was to implement the plan at every level throughout the state's educational system.

A few years later in 1996, the Clinton Administration introduced the Technology Literacy Challenge (TLC). President Clinton and Vice President Gore announced their vision for every student in the 21st century to benefit from the use of educational technology. In support of TLC and in response to the educational opportunities that were becoming available by technological innovations in the early and mid-1990's, the United

States Secretary of Education, Richard Riley, released the Nation's first Educational Technology Plan in 1996, "Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge". This plan provided the nation with a blueprint for the widespread, effective use of technology in education. It also increased federal, state, local and private investment in technology for education (U.S. Department of Education, 2001).

As a result of the enactment of TLC and the Nation's Educational Technology Plan in 1996, New Jersey, like most other states, required every school district in the state to develop their own five year technology plan to address district technology goals and objectives. Each district participated in a technology planning process, which described how stakeholders were involved at appropriate times in the development of the plan. The first step in the school planning process was to develop a planning committee, also referred to as a planning team, advisory committee, or technology committee. It was the responsibility of this committee to review the district's school-improvement plan and design an overall technology plan which supported curricular goals and considered the learning process. Committee members also needed to build a knowledge base and have access to a wide range of support materials and resources so that sound decisions could be made regarding the district's needs (North Central Regional Educational Laboratory, 1998).

After the committee established a comfortable knowledge base, the next step was to develop a shared vision and/or mission statement, which was the first element, listed on the 1996-2001 technology plan checklist issued by the state. It was important for

committee members to understand how to establish a link between educational technology and the curriculum goals of the school, and that the makeup of the committee express a feeling that everyone's interests were represented even though the structure and committee membership varied among schools.

The committee's tasks included establishing district goals and defining a strategic plan with objectives, to be used as a roadmap for the plans implementation. The curriculum was to be the thrust behind the plan. The goals and objectives were to be driven by the teachers using the tools of technology with their students (Baule, 2001). The district technology plan was to be a reflection of the educational technology goals and initiatives listed in the NJDOE's plan.

When the technology plan guidelines were disseminated by the state in 1996, they referenced three sources of funding on the checklist. These funding sources included: Distance Learning Network (DLN) Aid, Technology Literacy Challenge Fund (TLCF) and the Telecommunications Act of 1996 (Tele Act), which was connected to the (Universal Service Fund or E-rate).

The first source, DLN Aid was state funding distributed at a flat rate of $40 per pupil to all districts for a period of five years. This funding was in response to the Abbott v. Burke (LaMorte, 2002) decision that the state must implement, by September 1997, a funding system that insured equal educational opportunities for all students regardless of the district they attend (New Jersey Department of Education, 2003). The Comprehensive Educational Improvement and Financing Act (CEIFA) established Distance Learning Network Aid. In May 1996, it was recommended that $50,000. be included in the fiscal

year 1997-1998 state budget for a distance-learning network. New Jersey developed a school-funding plan driven by the Core Curriculum Content Standards, which is based on the "efficient" delivery of a "thorough" education. In order for districts to be eligible for this aid, each district was required to develop a long-range plan for becoming part of the distance learning network within the five period (by the 2001-2002 school year) and have an approved district technology plan. This aid was level-funded for a sixth year in 2002-2003, however in 2003-2004 this aid was discontinued and the money was put into the district's Consolidated Fund.

The second source of funding was TLCF, which was a federally funded competitive grant program. The TLC Fund was developed to support the Technology Literacy Challenge of 1996, which was established to ensure that students became technologically literate in order to achieve higher standards by the dawn of the 21st century. In 1997, at the federal level, President Clinton proposed a five-year $2 billion TLC Fund as a resource for schools for the implementation of this goal (Thornberg, 2001).

The Telecommunications Act of 1996 was the third source of funding which provided a federally funded program called the Universal Service Fund (USF) or E-Rate. The purpose of USF was to provide affordable access to telecommunication services for all eligible schools (public and nonpublic) and libraries, especially those in rural and economically disadvantaged areas. Telecommunication services include Internet access as well as Local Area Network (LAN) connections. In order to participate in the USF, districts must have an approved technology plan.

In 1997, with these funding sources available at the federal level, the Governor of New Jersey, Christine Todd Whitman, and the New Jersey Legislature made a commitment and a significant investment to educational technology in New Jersey. Each year for five years, from 1997 until 2002, Distance Learning Network Aid (DLNA) was provided to each district. The total program funding was approximately $275 million (New Jersey Department of Education, 1999). Schools were informed that DLN Aid could be used towards the purchasing of equipment and/or network connections, which they felt would allow students to share resources and enable them to meet the New Jersey Core Curriculum Content Standards. Districts applying for this aid were required to have an approved five-year technology plan.

Two years later, in the fall of 1999, statistics revealed that the nation's schools had made tremendous progress integrating technology into the teaching and learning environments. Schools were eager to adopt new and emerging technologies, and advances in the affordability and capabilities of technology through funding indicated it was time for the nation to move beyond its 1996 goals. As a result of this rapid growth in technology, the U.S. Department of Education reviewed and revised the National Educational Technology Plan of 1996, and five new national goals were developed.

The revision of the National Educational Technology Plan in 1999 resulted in the NJDOE employing an aggressive, systemic approach to expedite the implementation of educational technology in schools throughout the state. Data gathered from district surveys indicated that technology goals in New Jersey, like that of the nation, were being achieved at a rapid rate. This information resulted in the NJDOE's decision to review and

revise the state technology plan. Once again new technology goals and benchmarks were developed at the state level, and shared with the school districts. The decision by the State Department to update their five-year plan at the end of its third year also prompted the Department to require school districts to do the same. In 1999, each district was required to develop a revised plan for the 1999-2001 school years.

The newest piece of legislation the No Child Left Behind Act of 2001 (NCLB), was signed into law by President George W. Bush in 2001, and it required school districts to be accountable for Title I Funds. Prior to this Act, schools were not monitored as to the districts implementation and distribution of these funds. Title I is a federally funded education initiative for students that are economically and educationally disadvantaged. It came from the Elementary and Secondary Act of 1965, and is designed to provide assistance to improve the academic performance of low-performing students in the areas of language arts literacy and math. The purpose was to ensure that all children have a fair, equal, and significant opportunity to obtain a high quality education and reach, at a minimum, proficiency on challenging state academic achievement standards and state academic assessments (U.S. Department of Education, 2003).

Title I funding was received through a grant application by the state to the federal government. Each year school districts must apply for Title I Funding at the state level. Title I funding to districts was based on a statutory formula the state uses to decide on the funds. The formula was primarily based on the number of children ages 5 through 17 from low-income families, foster home, or institutions for neglected or delinquent

children. Districts determine which schools are eligible to receive the funds. A school was considered Title I eligible if the school attendance area has a defined poverty rate that is at least equal to the district average rate, or is 35% or higher (New Jersey Department of Education, 2003).

When NCLB was implemented in December 2002 school districts receiving Title I Funds were required to update their 2001-2004 district's technology plan. Prior to this, each district had to use the same guidelines and funding sources as was used for their 1999-2001 technology plan. Districts receiving Title I monies were required to amend their plan due to the changes in funding.

Recently, in October 2003, the NJDOE announced that every school district in the State of New Jersey would be required to submit a new Three Year Technology Plan by June 2004 that aligned with state requirements and addresses federal law according to the No Child Left Behind (NCLB) Act of 2001. The guidelines for the July 1, 2004 through June 30, 2007 technology plan were outlined in a checklist developed and revised by the New Jersey Department of Education, Office of Educational and Information Technology which was released October 2003. In order for school district technology plan to receive approval, they needed to meet the eligibility requirements in the Telecommunications Act of 1996, and comply with the many aspects of the No Child Left Behind Act. Due to the requirements of NCLB, the NJDOE, for the third time since its development, revised the state technology plan and re-titled the plan "Working Toward the Future with Our Children". The State Board of Education approved the plan on January 8, 2003.

The NCLB Act of 2001 a revision of the Elementary and Secondary Education Act. It is legislature that was written by the Bush Administration in 2001 and made effective in December of 2002. The Act provides greater flexibility and options for Title I schools, however it also calls for higher levels of school accountability. It expands the federal governments role in the substance and standards of K-12 education. Title I of the NCLB Act, supports programs intended to help elementary and secondary schools establish and maintain a wide range of programs that will improve the educational opportunities of low-income and disadvantaged children. Title I now requires that districts and schools be held accountable for improving test scores, as well as for hiring only certified qualified teachers. In 2002-2003 Congress appropriated $12.3 billion dollars for these programs (Advocacy Center for Children's Educational Success with Standards, 2002).

At the present time NCLB must be based on relevant research, however this requirement may eventually change to scientifically based research (Carmona-Bell, 2003). During the technology plan revision process in New Jersey, public and charter schools needed to take a closer look at how the technology plan supports the curriculum and determine if research supports what the district is doing. In order to help close the achievement gap between disadvantaged and minority students and their peers in New Jersey schools an emphasis on teaching methods that have been proven to work must be reviewed.

The 2004-2007 Local District Technology Plan Checklist provides details on content for specific sections. This checklist is a guide to assist schools with preparing a

plan that will be effective and implement equitable utilization of technology. The purpose of the plan is to provide for good programs, as well as document compliance with E-rate and NCLB (Carmona-Bell, 2003). All public and charter schools in New Jersey will use the same checklist. Each school is required to complete all seven components on the list in order to receive approval from the state. These components include: Executive Summary, Technology Inventory, Three Year Goals and Objectives, Three-Year Implementation Strategies/Activity Tables, Funding Plan (July 2004-June 2007), Professional Development, and Evaluation Plan.

A review of the literature from 1998 found that research conducted by Coley, Cradler, & Engel (1998) had determined equity and access to technology, by examining the penetration of computers in U.S. schools by analyzing data from the 1997 Quality Education Data (QED) survey, the results of which indicated that many states and school districts were making progress placing computers into public schools. At the time of the study, eight years ago, 98% of all schools had an average of 5.7 to 1 student-to-computer ratio.

Becker (2000) analyzed three surveys to determine how demographic factors related to the use of computers, and how computer use was affected by conditions in schools and at home. Two of the surveys examined by Becker were supplements from the U.S. Census Bureau's Current Population Survey of U.S. Households in 1997 and 1998, and the third was from a national survey of schools titled, Teaching, Learning, and Computing (TLC-1998), which contained responses from more than 4,000 teachers describing children's differential access to computers between school and at home.

According to the statistics reported in 1983 Becker found that almost half of the nation's schools had no computers at all; by 1998, all schools were equipped with at least one computer; as were nearly half of all classrooms. The typical school in 1995 averaged 40 students for each computer; by 1998, this average had shrunk to 6 or 7 students per computer. In 2001, the U.S. Department of Education's Office of Educational Research and Improvement (OERI) reported this ratio had decreased to 5 to 1, the national goal. This ratio was viewed by experts of the President's Committee of Advisors on Science and Technology as "a reasonable level for the effective use of computers within schools" and indicates how access to school computers had increased significantly.

Despite this increase in access to computers, an analysis of the data from the OERI (2001) by Coley, Cradler, & Engel (1998) found that a high percentage of minority and Title I students were reported as having a higher than average student-to-computer ratio. Therefore, in districts where the percentage of low-income and disadvantaged children increased so did this ratio based on the OERI (2001) findings. Due to the influence of socioeconomic factors on students' access to computers, and the goal for students living in the 21st century to become empowered to learn, literature investigating the "Digital Divide" was reviewed.

According to Swain and Pearson (2003) the Digital Divide gained attention because of the increased documentation of technological access opportunities of students in the United States in public and private schools. The Digital Divide was defined by Swain and Pearson (2003) as the "difference in use of technology by schools, based on ethnicity and socioeconomic status." Swain and Pearson's contention was that the Digital

Divide was more than access to computers and the equalization of the time students used computers. In order for the Digital Divide to decrease, teachers would need to increase the instructional opportunities for students using educational technologies, and differ the experiences for the students (Swain & Pearson, 2003). According to Wenglinsky (1998) and data on the OERI (2000), students in Title I programs and minority groups reported more frequent use of computers than those not receiving special services, however this frequency of use by these students did not lead to a gain in achievement because the computer was primarily used for low-level thinking activities such as drill and practice.

Additional information obtained from the TLC-1998 data, was that demographic factors did not reflect in the numbers of computers so much as in the type of Internet access. Computer access based on a school's socioeconomic status (SES) from the U.S. Census Bureau's Survey in 1997 and 1998, and the TLC-1998 national survey, revealed that low-SES schools were reported half as likely as high-SES schools to have high-speed Internet access, to have at least one computer with Internet access for every 12 students, or to have half of their classrooms connected to the Internet. The National Center for Education Statistics (NCES), as of 1999, had reported 90% of the public schools serving predominantly low-income students had access to the Internet, only slightly less than the 94% of schools serving predominately high-income students. Data from the 1997 and 1998 Census Bureau Surveys and the TLC-1998 national survey indicated that overall technology available in schools with a large population of students from low-income families had fallen three to four years behind those with high-income families and one to two years behind those with predominantly middle income families (Becker, 2000). The

literature reflected an increase in student's access to computers and the Internet, however research continued to indicate that significant differences exist between low-income and high-income access, which needs to be addressed in district technology plans in accordance with NCLB (2001).

In the U.S. Department of Education report, The Condition of Education 2000, data recorded in 1998 reflected disparities between schools, reported access and students' use of computers. These differences were found in the capabilities and location of computers available to students. According to Becker (2000) access to a computer does not necessarily mean it is being used, or used well.

Therefore, in order for computers to become an integral tool for learning, further improvements are needed not only in the quantity and access to computers in classrooms, but the quality of the computers available and the opportunities students are provided with using technology to learn. One continuous obstacle to effective computer use has been outdated technology in schools. Staying on the cutting edge of technology has remained a constant challenge for schools both financially and culturally. In the mid-1990's schools did began to replace their older computers with models which were introduced within the previous five years (Becker, 2000). Today in accordance with the 2004-2007 Three Year Technology Plan, every district in the State of New Jersey must have a plan for replacing obsolete computers and technology as a component of the district's inventory. Although most schools today have been building on their technology infrastructure by increasing the number of computers, peripheral devices, and software

programs in their technology inventories, most schools could not yet be described as well equipped because they have not permitted routine integration of computer technology into the learning activities of most classes (Becker, 2000).

In order to determine how the presence of computers in schools impacts on student learning, the frequency of computer use and the nature of use-as indicated by the type of software or applications used must be considered. According to the TLC-1998 national survey of teachers, the most frequent and creative uses of computers, which incorporate analytic and higher order thinking skills, are found in computer classes and other specialized classes and electives such as computer, business, and vocational education, rather than in core academic classes such as English, science, math, and social studies. Statistics from TLC-1998, disclosed that only 11% of the English teachers, 11% of the social studies teachers, and 8% of the science teachers had students prepare computer-assisted presentations and multimedia documents (Becker, 2000). Word processing and information retrieval were reported as the most common computer activities linked to the curriculum and dominated computer use (TLC-1998).

In today's society computer literacy is required for almost every job, even the minimum wage fast food restaurants computerized point-of-sale data terminals. In addition to frequency of use, there is a growing need for students to expand their knowledge and computer skills beyond basic word processing and information retrieval. Students need exposure to more complex and intellectually powerful application programs that will provide them with the tools they need to manufacture, distribute, and

purchase goods and services in an economy, which has been increasing computer-base work (Becker, 2000). In order for technology to become an integral learning tool linked to academics opportunities for student use must increase within the curriculum.

According to the TLC-1998, the six factors, which can affect how students experience computers in school are: (1) the availability of computers in the classroom, (2) teacher computer expertise, (3) teacher philosophy and objectives for computer use, (4) teacher collaboration and leadership, (5) teacher judgments of class ability, and (6) school SES level.

Becker (2000) briefly explained the influence the six factors had on student learning as follows: Computer availability can provide students with frequent, systematic, and well-integrated use of technology within the curricula. Teacher proficiency increases the opportunities for students to use a wide array of application programs such as spreadsheets and presentation software, as well as stay current with the cutting edge technologies. The philosophies and beliefs of teachers can help to facilitate learning with technology, and develop constructivist environments, which allow for students to collaborate on projects, which involve critical thinking, problem solving, and real-world applications. Strong professional commitment to technology by teachers provides exposure as well as expanded opportunities for students to use computers. Teacher expectations and beliefs about how different groups of students use computers successfully can impact on the frequency of use and the different experiences they engage in. Just like the classification of different groups by the teacher, the SES level of the community surrounding the school can affect students' use of computers. Becker

(2000) discussed this further describing how a greater percentage of teachers reported weekly use of computer in low-SES schools than in high-SES schools, however the use was more often involving traditional practices and beliefs about student learning such as remediation of skills and mastering of skills taught as opposed to more constructivist and innovative teaching strategies. The data in TLC-1998 reinforced this belief that higher SES schools were found to be advantaged not so much by greater access to hardware but by access to a teaching approach that emphasized the use of technology for developing higher-order skills (Becker, 2000).

In order to determine how technology is enhancing student learning, schools must provide equal access to computer-related learning opportunities for students within the curriculum. Becker (2000) stated that the disparities in students' access to enriched learning opportunities with technology appeared to be increasing. Therefore in addition to acquiring computers and Internet access, lower-income schools must strive to obtain more advanced software and explore better strategies for integrating appropriate and effective computer use within the classroom, if they are to bridge the gap for the less advantaged students in accordance with NCLB (2001).

Yakel and Lamberski (2000), project directors of the Educational Technology Impact Analysis 2 (ETIA2), found from a series of quantitative and qualitative studies conducted on the use of technology in the K-12 environment in Pennsylvania, that the human infrastructure was as vital as the technological infrastructure. The studies revealed however that the human infrastructure was scarce, and the integration of technology into the curriculum was difficult to assess. Research determined that all of the states involved

in the ETIA2 found the integration of technology into the curriculum a difficult task for several reasons. There was no standardized curriculum among the school districts; the technology innovations that were in use were mostly the product of tech-savvy individuals; standardized test scores did little to measure, what if any, impact technology had on K-12 education. According to the ETIA2 study, much of the current technology expertise was obtained from sources outside the walls of the classroom. The study also determined that current innovation in technology requires proficiency in the subject matter in order to properly include it into the curriculum. The creation of technology sophisticated instructors and the ability to keep them current in their craft is key to increasing student knowledge in technology.

Research conducted by Ertmer, Addison, Lane, Ross & Woods (1999); found that teachers did recognize the importance of integrating technology into their curriculum, however, they also found that external and internal barriers frequently hindered successful integration. The external barriers in the study were identified as being extrinsic to teachers and included limited equipment, lack of access to computers and software, inadequate technical and administrative support, insufficient training, and not enough time to plan instruction. In contrast, the internal barriers were described as inherent to teachers and included their preferred instructional methods and corresponding beliefs about computers, teaching and learning methods and strategies, established classroom practices, and unwillingness to change. Brickner (1995) noted that even though securing additional resources and providing computer skills training may eventually eliminate many of the external barriers, dealing with internal barriers would require challenging

teachers' beliefs and the institutionalized routines of one's practice. Proficiency in the field of technology is, as in any other field, the product of instruction and practice. You *can* teach an old dog new tricks. To some it will come easy. To many more, it will not. In-service training is the solution to a technologically deficient staff.

Sanholtz & Dwyer (1997) discuss *The Evolution of Thought and Practice* described in the Apple Classrooms of Tomorrow (ACOT) research project, which explains how teachers progress through a series of five developmental stages in their ability to effectively think about and use technology for teaching and learning. In a report by Rein (2000), ACOT researchers found that a teacher's progress along the continuum had significant impact on how the technology was used in their classrooms, and thus what difference it made in student learning. The five developmental stages according to ACOT (1995) are Entry, Adoption, Adaptation, Appropriation, and Innovation. Rein (2000) described the levels as follows:

The Entry level includes teachers who teach in a traditional fashion using direct instruction and whole class activities to deliver content and skills to their students. They are not comfortable using technology and their classroom computers are "dust collectors".

At the Adoption level teachers use either one or two software programs, such as banner or word processing programs, which they have discovered useful for themselves. Student computer use in the classroom was limited to publication purposes.

Stage 3, was identified as the Adaptation level. At this stage teachers begin to make transitions using technology with their students in the framework of the curriculum.

The first steps to its use are with student's word processing documents. Teachers at this level, who have not made other fundamental changes in their practice and structure, are usually concerned with classroom management, assessment, time, and the impact on student learning when they "add in" this technology,

The fourth stage is Appropriation; at this level teachers begin to use technology. They consider their teaching objectives, the best way to approach those objectives, and the best tools to use. Here, technology provides the potential for higher order thinking collaboration and cooperation enhances comprehension, and problem solving comes alive.

The final stage is Innovation, a goal just about every district is striving for in the professional development component of the technology plan. Innovation is when the teacher breaks the "education mold" by engaging students in learning activities, which do not resemble conventional teaching and learning. This constructivist approach to learning is when the teacher acts as a facilitator of learning and the students are provided with opportunities to construct their own knowledge in a meaningful context. In this stage, technology is a transparent part of the curriculum used by students whose learning is self-directed. Objectives and standards are addressed through student projects, new technology and new thinking affords the student more alternative to go above and beyond the scope of the instructor. The use of technology also allows the school to stray from traditional instructional behavior.

Yakel and Lamberski (2000) noted how human networks have made it possible for technology to be integrated into the schools and how key people such as technology

coordinators, curriculum coordinators, superintendents, grants writers, and dedicated teachers have driven changes within districts impacting on the successful use of technology. The ETIA2 study did find that although human resources are crucial for sustained technological innovation, they must be nurtured and developed. Technology coordinators and key teachers are often overburdened from wearing too many hats in a district. In many districts teachers assume the roles of the classroom teacher, computer instructor, and network administrator. This has resulted in individuals who are too over committed to do curriculum innovation (Yakel & Lamerski, 2000). Districts looking to alter the face of technology within their schools need to not only increase technology, but also examine the skills required for teachers to use and integrate the technology into the curriculum. To avoid situations where technology enriched teachers are overburdened with trouble-shooting technological problems and too busy to implement curriculum innovations, districts need to identify their key people and establish opportunities specifically for curriculum development.

In addition to the human infrastructure, in considering whether technology is making an impact on student learning, it is essential to consider how it is being used in schools. The capacity to recognize and construct a milieu for technology to be utilized at appropriate or innovative levels is also significant (Rein, 2000).

Baker, Gearhart, and Herman (1994) evaluated the ACOT research project, which was conducted from 1985 until 1995 to assess the impact of interactive technologies on teaching and learning in five school sites across the nation. The study determined that effective technology integration facilitated student improvement in a variety of skills and

that when technology was used appropriately in the classrooms, it facilitated improvement in teamwork, searching of information, problem solving and experimentation, social awareness, and self-sufficiency. These skills were identified as essential in preparing today's students for tomorrow's world (Rein, 2000). In addition to traditional basic skills the SCANS Report, published in 1991 by the U.S. Department of Labor, also identified the following critical skills for tomorrow's workforce: Thinking Skills-the ability to learn, reason, think creatively, make decisions, and solve problems; Personal Qualities-individual responsibility, and integrity.

Up to now, most of the literature identified in this paper did not take into account a students' willingness to learn with technology. Mellon (1999) reminds us of the age old axiom "you can lead a horse to water..." as he points out that no matter how much technology is available to students and no matter how well it is integrated into in to the instructional content by teachers, it is the learner's willingness or ability to learn that is paramount. It is important that the individual learner is not forgotten. In Mellon's report, she reminds educators that each student enters the instructional environment with unique learning styles and schemas, as well as motivations and prior experiences. This brings up an interesting question regarding motivation, "Does technology motivate all learners?"

A study of urban middle school teachers' use of instructional technology conducted by Clark (2000) disclosed that 61% of the teachers had mentioned that the use of technology was an effective means of increasing student interest in their classroom

assignments. Teachers, interviewed during the study, stated that software programs have been helpful by motivating students by providing them with an opportunity to create their own projects reflecting higher order thinking skills and an analysis of the lessons taught.

According to Clark (2000), studies have reported a positive relationship between the use of computer technology and the effectiveness of teaching and learning. Appropriately utilized, personal computers are indispensable for improving student success, according to a report by the Educational Testing Service (ETS) in 1999. The ETS (1999) went on to say that when computers are part of a learning regimen for teaching higher-order concepts, by instructors who are educated in such matters, significant gains were noted in math scores along with overall improvement in the social environment of the schools. Conversely, the research also indicated that computers employed simply for CAI drill and practice can be irrelevant to achievement, and, in some cases, detrimental to student success as mentioned earlier regarding students identified as disadvantaged.

A comprehensive appraisal currently underway by Mackenzie and Howard (2004) is designed to determine how students, using the Internet and ISDN technologies, are becoming educated and how their points of view regarding science are shifting as they take part in applied exercises. In conjunction with Wheeling Jesuit University and the Challenger Learning Center located in Wheeling, West Virginia, students throughout the United States in both middle and high schools have been participating in simulated Earth system science related missions for the past four years. These simulations-based programs (referred to as e-Missions), have been recorded as helping students develop a

deeper understanding and appreciation of their individual and collective relationship to the power of science, mathematics, and technology in today's advancing world (Sturm, 2004). Higher order thinking skills are being used to solve problems, which arise during the e-Mission. This program has been aligned with the National Research Council's National Science Education Standards (1996). Research indicates that national curriculum standards and character building activity objectives can be met with the incorporation of the distance learning method of instruction, which is viewed as a practical instrument for providing the instructor with the tools required to integrate the medium into classroom assignments.

In 2001 the Milken Exchange on education technology analyzed five large-scale studies on the impact of education technology on student achievement and reported on the studies positive and negative findings. One of the five studies analyzed was by James Kulik (1994), who used a research technique called meta-analysis to aggregate the findings from more than 500 individual research studies of computer-based instruction. Kulik found that "students who used computer-based instruction scored at the 64 percentile on tests of achievement compared to students in the control conditions without computers who scored at the 50th percentile" (Milken Exchange, 2001). From this study Kulik also determined that students using computer-based instruction had developed positive attitudes and learned more in less time.

Jay Sivin-Kachala, conducted the second study analyzed by the Milken Exchange in 1998, which reviewed 219 research studies from 1990 to 1997 to assess the effect of technology and achievement across all learning domains and all ages of learners. The

positive findings were that in technology rich environments students had experienced increased achievement in all major subject areas and their attitudes towards learning improved considerably when the computers were used for instruction.

Wenglisky (1998) conducted a national study of Technology's Impact on Mathematics Achievement. The study assessed the effects of simulation and higher order thinking technologies in mathematics achievement on the National Assessment of Educational Progress (NAEP). Data was obtained from a national sample of over 6,000 fourth graders and over 7,000 eighth graders. Gains in the eighth-graders math scores who used simulation and higher order thinking software were recorded as up to 15 weeks above grade level as measured on the NAEP. Additionally eighth grade students whose teachers received professional development opportunities using computers showed gains in math scores of up to 13 weeks above grade level. The information obtained from the study supported the fact that higher order uses of computers and professional development were positively related to students' academic achievement in mathematics for both the fourth and eighth grades. Wenglinsky also found that students who used CAI drill and practice in both grade levels performed worse on NAEP than the students who did not use CAI. Results from the study reinforced the fact that the mere access and frequency of use of educational technologies does not necessarily lead to an improved learning environment for students. The key finding was that technology does matter, however it is highly dependent upon the context in which it is used (Latham, 1999).

The ETIA2 study (2000) revealed that the successful integration of technology into the curriculum was a challenge because technology innovation was usually the effort of a small group of teachers or of an individual teacher. The study also determined that the most successful incorporation of technology occurred in schools that had a plan for systematic growth of technology. Heinecke, Basi, Milman, & Washington (1999) determined technology had a positive impact on basic information retention and procedural knowledge, however the evaluation of educational technology on higher order or meta-cognitive thinking skills was an area that should be determined by benchmarks. A longitudinal study was recommended by Heinecke, Basi, Milman, & Washington which would take into account the changes in the target population and the different phases of a schools integration of technology, including: purchases, installations, training, integration, and instruction. When teachers had integrated technology into the curriculum during the ETIA2 study they began to realize that new types of assessment other than standardized tests were going to be required to evaluate the impact of technology on student learning. Attention is on the motivation and excitement that technology creates in the educational process for students, which is not reflective in standardized test scores.

Many experts agree, "to ensure that technology is effectively integrated into the schools, educators and community members must collaborate to create a formal plan" (North Central Regional Educational Laboratory, 1998). According to Fields, Mann, and Waryanka (2000) the development of a plan which includes "a vision, academic standards, correlation to a master curriculum plan and goals, specified outcomes, professional development activities, standards-driven learning tools, and community

involvement components is required by just about every major funding organization." In order for a district technology plan to be successfully evaluated so that the implementation of its goals and objectives can be measured and its activities can be adjusted in accordance with those results, it is essential to identify and implement assessments. The Teacher and Student Technology Competency Exam, which was first implemented at Boise State University in 1995 is an example of an assessment included in Iowa's plan.

Fields, Mann, & Waryanka (2000) stated that The Teacher and Student Technology Competency Exam, developed by Boise State University is a proven model of student technology assessment used to measure technology skills and capabilities of students as well as plan for future technology integration activities. The criterion-referenced exam was grounded in a thorough research base and is now used in Idaho, Hawaii, Washington State, Illinois, Pennsylvania, and Michigan. According to Fields, Mann, & Waryanka (2000) the examination results have revealed that students are experiencing more active and engaged learning as demonstrated by higher academic achievement. Today, local district technology plans have been developed in accordance with NCLB Title II, Part D, Enhancing Education, and are focusing on access, equity, infrastructure, student literacy, teacher proficiency, student learning opportunities, and curriculum integration.

New Jersey Governor James E. McGreevey in April 2004 signed into law legislation requiring the New Jersey State Board of Education (NJSBOE) to approve core curriculum content standards in technology literacy. The Governor's 21-Point Plan for

Education called for the state to incorporate technology standards into the Core Curriculum Content Standards and requires high school students to pass a technology proficiency test. The standard was derived from the *Standards for Technological Literacy (STL): Content for the Study of Technology*, which was developed as part of a study conducted by the National Science Foundation and the National Aeronautics and Space Administration" (New Jersey Department of Education, 2004). The technology standards apply to all content areas and grade levels.

According to Swain and Pearson (2003) technology literacy standards can assist teachers with the integration of technology at all grade levels and provide them with benchmarks for effective implementation of technology into the daily learning environment. The new standards will take the place of the technology standards that were integrated into the former 1996 Cross Content Workplace Readiness Standards. There is a need to ensure that students in the 21st century have computer experiences that allow them to use higher-order thinking skills, which strengthen their problem solving skills (Swain & Pearson, 2003). In addition to technology literacy for students, it is important for teachers to be provided with technology training related to their classroom activities and instruction in order to effectively integrate and implement the districts technology goals and objectives, along with the new technology literacy standard and its benchmarks.

The implementation process of technology requires a great deal of thought as to how it will fit into the districts curriculum as well as how it will be received by the students. It is certainly more involved than just placing computers and videoconferencing

equipment into classrooms and plugging it in. Survey data reviewed in the literature indicated that, although classroom access to computers is increasing, the most frequent and creative uses of computer technology are not yet linked to curricula and many factors influence the use of computers in schools. As technology continues to play a major role in our modern industrial society and as long as our nation continues to harness technology for education, and our economy provides sufficient support, it is believed that every student and teacher will develop the skills to become technology and information literate.

CHAPTER 3

The Design of the Study

The study took place in the Wildwood Crest Elementary School. The population selection was stratified random since the information gathered and reviewed came from students in grades 5 through 8 as well as the teaching staff within the district.

The purpose of the study was to evaluate the implementation of the district's technology plan goals, objectives, activities and resources into the curriculum and instruction in order to determine if technology was effectively providing students with the challenges of higher level thinking skills according to state academic standards and federal requirements. At this stage of the research, the term technology referred to the computer and videoconferencing equipment in the district, which allowed the students and teachers to implement the plan.

First, a working design for the research study was developed. The subjects to be studied in the district were identified as students in grades 5 through 8 and all of the staff members who interact with these students. The variables were selected and based upon convenience and availability rather than randomly. The study began September 2004 and ended in February 2005.

The second major component of the research design was the creation of a working hypothesis. A research statement pertinent to the pedagogical problem in the study was produced. The following research statement was used in the study: A study of the effects technology has on student learning in grades 5-8 in the WCS District.

To ensure consistency in the research study, the variables and conditions of the study were defined operationally.

Operational Definitions

1. Effects are the results reported on the survey and during the observations.
2. Technology included the computer and videoconferencing equipment in the district, which allowed the students and teachers to implement the plan.
3. Implementation meant the execution and/or achievement of the district goals and objectives within the curriculum.
4. Students are the students in the fifth, sixth, seventh, and eighth grades.
5. Teachers are the instructional personnel responsible for teaching the students in the fifth, sixth, seventh, and eighth grades.

Research Instruments

Quantitative and qualitative data were used in the study. Parental and teacher consent forms were designed. These forms were distributed and returned prior to the dissemination of the survey. The student and teacher surveys were designed by The SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) and employed so that quantitative data could be obtained. The study was both descriptive as well as exploratory.

In qualitative research the intern is considered the research instrument. Data collection was ongoing and the intern was in control for the duration of the study. The intern made all the decisions concerning the data to be collected, which included

observations of students and teachers. According to Wiersma (1991) the researcher's perspective is highly influential in qualitative research.

Sample and Sampling Techniques

The site selected for the study was the Wildwood Crest Elementary School. Since the study was reflective of technology integration across the curriculum all the teachers and students in the district were involved when new computer programs, web based activities, and distance learning (videoconferencing) sites were introduced. However random sampling was used to select subjects from each identified group of stakeholders to participate in the survey and observations.

The population for the research study was fifth, sixth, seventh, and eighth grade students and teachers within the district. Due to the small number of students in grades fifth through eighth, cluster sampling was not considered. There are two heterogeneously grouped classrooms with an equal distribution of boys and girls at each grade level. All eight homerooms were selected to complete the survey and every instructional teacher who taught this population of students. Observations were conducted from the same sampling of students and staff.

Data Collection Approach

Information was gathered in the study to determine the implementation of the district's technology goals and objectives by first reviewing material culture, such as the Telecommunications Act of 1996, the NCLB Act of 2001, the NJDOE's Strategic Technology Plan, the Cape May County Technology Plan, the District's Three-Year Technology Plan (which contains the written goals and objectives, the activities and/or

timelines designed for the implementation process, the proposed integration of technology resources and systems by teacher training and the professional development by which research-based instructional models is to be established), Teacher Professional Development Logs, and Teacher's Lesson Plans. A stratified random survey of students and staff designed by The SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) provided additional information reflecting on technology equity, access, literacy, student achievement, and staff proficiency.

Data Analysis Plan

During the study the following activities took place: (1) the Telecommunications Act of 1996 including the USF (E-Rate) was researched and reviewed, (2) the NCLB Act of 2001 and identify Title II, Part D, Enhancing Education through Technology was researched and reviewed, (3) the goals and objectives listed in the NJDOE strategic technology plan and the Cape May County technology plan were researched and identified, (4) the 2004-2007 Wildwood Crest School District Three-Year Technology Plan including its components was reviewed, (5) the state requirements and federal laws addressed in the district technology plan were identified, (6) the district's technology goals, objectives, activities, resources, and services in the plan were identified and shared with teachers during: staff curriculum writing, collaborative project opportunities, staff articulation meetings, technology training sessions, the district's Technology Committee Meeting, and the School Based Planning Meeting, (7) technology literature from journals and workshops was disseminated to staff providing information on current research-based instructional models, (8) parental and teacher consent forms were designed and a survey

from The SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) was obtained for students and staff in compliance with the district's survey policy which was approved by the IRB, to gather information and determine technology equity, access, literacy, student achievement, and staff proficiency as it related to the district's goals and objectives based on the district's vision, (9) Teacher's Professional Development Logs were obtained and reviewed with permission of the Superintendent to identify technology activities, in-service programs, and college courses reflecting the attainment of specific goals and objectives, (10) teachers' lesson plans were obtained and reviewed in order to identify the integration of technology into the curriculum and instruction, (11) the parental and teacher consent forms were disseminated and after their return the surveys were distributed, (12) the survey data was collected and analyzed to determine technology equity, access, literacy, student achievement, and staff proficiency in relation to the district's goals and objectives, which were based on the district's vision and the implementation and integration of activities, resources, and systems by teacher training and professional development. (13) the plan's Evaluation Process was reviewed, (14) the district's 2003 NJDOE School Technology Survey was reviewed and compared to the information on the district survey, (15) a technology update report was written on the district's progress implementing the goals and objectives, (16) the report was presented during the district's School Based Planning Committee meeting.

The Gathering of Evidence Showing Impact

Data obtained from the surveys identified the experiences students and teachers had with the different technologies, the activities, which had taken place, the subject

areas where the technology was used and the instructional opportunities that were provided to the staff. The gathering of evidence by survey and observation was reflective of the integration of technology and the implementation of the technology plan in the district and the impact it had on student learning.

CHAPTER 4

Presentation of Research Findings

This chapter will attempt to answer two major questions, "What information was found?" and "What does it mean?" Data was collected through several modes including, the SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) Faculty surveys (see Appendix A), the (SEIR*TEC) Student surveys (see Appendix B), and by reviewing material culture, such as the Telecommunications Act of 1996, the NCLB Act of 2001, the NJDOE's Strategic Technology Plan, the Cape May County Technology Plan, the District's Three-Year Technology Plan (see Appendix C), Teacher Professional Development Logs, and Teacher's Lesson Plans. The setting of this research study was the Wildwood Crest Memorial School. Students and staff were selected to participate in the data collection effort.

The (SEIR*TEC) Faculty and Student surveys were the instruments used to assist the Wildwood Crest Memorial School in learning about their school and understanding their needs in terms of technology. The items on both surveys were designed to evaluate topics such as technology access, literacy, attitudes, experience, and proficiency.

The faculty instrument contained one essay question and eight multi-part questions, which required participants to rate items, select the best response listed in multiple-choice questions, and describe in writing their needs for technology integration. This profile was administered to twenty-nine teachers in October of 2004. Data was reduced to percentages. The report data will illustrate some remarkable and some not so

remarkable findings. The student instrument contained five questions requiring participants to rate items such as their experience with technology, how often they do a specific activity with technology in their classrooms, their use of computers in specific subject areas, and how much they agreed with each statement which was listed in the question regarding technology. In December of 2004 eighty-six surveys were returned from the students in the fifth through eighth grades with parental permission slips and the data was used in this study.

The following information was obtained through the data collection and analysis task of both the faculty and student surveys. Eighty-eight percent of the faculty indicated a great deal of experience with computers as opposed to 64% of the students. Students also reported much greater experience with multimedia software (50%) than the staff (10%). Instructional (educational) software responses showed that students indicated 22% with a great deal of experience and faculty with a mere 10% for the same question. With regard to computer experience in all the survey questions that were compared to both students and staff, the only one that indicated more experience by the staff was email, 86% to the students 41%. All in all, the majority of student responses indicated they had either some or a great deal of experience with computers. This data reflects that faculty and student access to computers at Wildwood Crest Memorial School was taking place and that technology literacy was being taught. The four highest experience rated questions for the students were: computers in general 64%; word processing 74%; web browsing 74%; and games 66%. The four areas with the most experience from the staff survey were email 86%; web browsing 55%; computers in general 48%; and productivity

tools at 21%. The faculty also showed a lack of experience with regard to web-publishing, as 55% of the teachers indicated no experience. The same percent indicated no experience with specific technology, such as graphing calculators, language translators, and 90% indicated either no experience with or access to desktop video conferencing.

With regard to classroom activities, 66% of the students indicated they often write reports utilizing word processing software, 48% used the computer to search for information and 44% indicated they frequently played games on the computer.

The survey also reflected how students used computers in specific subject area classrooms. In language arts 48% and in English 23% of the students reported using the computer often in the classroom. The results also indicated much less use of computers in math, science, social studies, and foreign languages.

Students reported they wished they had more time to use computers in school (91%) and would like to see instructors utilize technology more often (73%). Seventy-two percent of the students indicate it is easier to learn when teachers integrate technology into the lesson.

The survey also asked if the school provided computer instruction to the parents of the students. Ninety percent of the students indicated that the school did not offer such training. In the comments and suggestions area, two main themes emerged. Twenty-three percent of the students want to use computers more for instruction, instant messaging, and games. Instant messaging...has the time-honored tradition of passing

notes in class met its match? Twenty percent of the students also took issue with the content filtering software "Bess" on the schools network, and made a point of venting their displeasure.

The faculty survey indicated that 90% of the staff would like to learn all they can about computers. The majority of the teachers, 41%, also responded that students spend less than thirty minutes per week (outside of required time in the computer lab), 7% indicated at least forty-five minutes per week and 10% indicated more than an hour per week. Twenty-eight percent of the teachers indicated computer time was not applicable to the teaching assignment. Forty-eight percent of the staff reports having less than 20 hours of coursework (instructional training) with a computer. Thirty-four percent indicates more than 20 hours of training in computers.

The faculty was provided with a list of possible ways technology could be used in education-of most importance was having the ability to access lesson plans and other resources on the web, 80%; evaluations and selecting the appropriate software for teaching and learning, 76%; communication with other teachers or experts via the web, 65%; and going on electronic field trips, 62%.

The staff was also asked how the school has changed as a result of implementing technology, 87% of the faculty indicated improvements in professional development and training opportunities, 83% saw improvement in the "way" they taught and new skill development, and 82% indicated that students interest in learning has improved.

Finally, 93% of the faculty indicated that technology into the curricular would be very important and 90% of the teachers want to know what other teachers are doing with technology.

A review of material culture resulted in the following: The district's technology plan was aligned with New Jersey State Guidelines according to the state requirements and federal laws according to NCLB and was approved by the New Jersey Department of Education (NJDOE) on May 11, 2004. The plan reflected its ongoing vision for educational technology, which was also expressed in the state's strategic plan documenting the role of educational technology in promoting students' academic achievement. The focus of the plan was on creating a learning environment to help students achieve their potential. It was based on education, not technology, in other words technology could be a tool used to accomplish educational goals, not an end unto itself. The evaluation process for the plan and accountability measures determined the district's technology goals, objectives, activities, resources and services were being effectively integrated into the curriculum and instruction however, according to the plan and survey results additional training would be needed to further infuse technology into curriculum and instructional practices in order to enhance skills in all of the classrooms Kindergarten through eight.

Data from the spring of 2004 proficiency tests, the New Jersey Assessment of Skills and Knowledge (NJASK 3), the New Jersey Assessment of Skills and Knowledge (NJASK 4), and the Grade Eight Proficiency Assessment (GEPA) has shown that WCS students are meeting academic standards. In fact, student's scores are among the top in

the state. One factor, which has contributed to the student's success in Language Arts Literacy, has been the implementation of a Computer/Writing Program in grades three through eight. In accordance with the New Jersey Language Arts Literacy Standards and Technology Literacy Standards, this program provides integrated instruction in both writing and the use of technology. Teachers have found that word processing allows students to interact with text in a positive manner, which also encourages painless addition or enhancement to a piece of writing. Furthermore, multimedia and presentation software allows the students to bring a piece of writing to life and invites enthusiasm for sharing. Technology integration in Language Arts Literacy has contributed to the successful and consistent statewide test scores in recent years, which has helped to develop pride in WCS student accomplishment, and allowed for individual needs and abilities to flourish.

CHAPTER 5

Conclusions, Implications, and Further Study

Wildwood Crest School (WCS) provides children with the knowledge and skills necessary to lead them to productive lives and cultural continuity. In our society, schools have taken on a critical role ensuring equal opportunity for the less-advantaged children by providing access to a wide range of enriching experiences, including exposure to computer technology. Students at WCS have been provided with equitable and easy access to technology and the Internet, with appropriate accommodations for disabilities. The increase in access has been a result of the building of the districts computer inventory since its 1996-1999 technology plan. For many of the children at WCS, the school provides the greatest opportunity for them to use computers, which reflects the school administrator's commitment in promoting student success by sustaining a school culture and instructional program conducive to student learning as stated in ISLLC Standard 2.

Although nearly all public elementary and secondary schools have access to computers and sufficient Internet-connected computer infrastructures, schools find themselves struggling to keep up with the rapid pace of technological and cultural changes taking place in our world today. WCS is a "minimum aid district" (sustaining its operations from nearly 90% local funding) the bulk of technology according to the district's technology plan is from local sources. Many factors influence the use of computers in schools such as funding, training, and administrative support. WCS has an

administration which supports technology in the district and tries to help defray local technology costs by exploring the use of E-Rate funding, federal and state programs, and through competitive grants. The district, where feasible makes facility modifications and upgrades compliant with the guidelines set forth in the New Jersey Department of Education's Facilities Standard's for Technology in New Jersey Schools.

WCS continues to plan for the technological future of the district in the 21st century. The administration promotes the success of all students by the facilitation of a shared vision for technology as noted in ISLLC Standard 1. The school recently upgraded a majority of its computers from Windows 98 to XP Service Pack 2. A new Polycom ViewStation FX was purchased in order to connect with the current Internet Protocol (IP) capabilities and to provide opportunities for students to participate in an array of electronic field trips. Four new white boards were obtained through a grant providing two more classrooms with this interactive means of technology.

Technology made a difference in the school as well as in the community of Wildwood Crest. Employment and training of human resources for technology has been a challenge in the district, especially with a small teaching staff and a limited budget. The establishment of a student tech team and the district's ability to out source service has helped with some of the responsibilities of a human infrastructure

As part of the district's Three-Year Technology Plan and requirements of NCLB the ability to make a difference with technology will be largely dependent on creating and maintaining the technological proficiency of teachers as well as the technology literacy of

students according to the new state standards. Teachers need avenues for training, which encompass new skills such as managing digital products like lesson plans, and activities that have been created by teachers for classroom use.

Research has determined that the gap in the availability of computers and Internet access between schools in affluent and poor areas has decreased dramatically, however many teachers, including those at Wildwood Crest, are still having difficulty with incorporating technology into instruction. This human infrastructure, which has been referred to as an internal barrier and intrinsic to teachers, can have a significant impact on the implementation of a district's technology plans goals and objectives as well as determining how technology enhances student learning within the district. The process in achieving teacher proficiency in order for teachers to achieve objectives associated with appropriate standards takes time, professional development, and administrative support. Survey data indicated that, although classroom access to computers is increasing, the most creative uses of computer technology linking technology to the curriculum is still at a minimum.

It is important for district technology plans to reflect and share national, state, and county technology visions and initiatives in achieving educational technology goals. Although the content and funding sources for technology plans has changed over the past decade, research and evaluation studies have shown that school improvement programs employing technology for teaching and learning have yielded positive results for students and teachers. Effective technology plans, which have involved educators, parents, community members, and business leaders with technological expertise, and that are

based on shared visions, whether at the national, state, or local levels, have strengthened curriculums. Technology continues to play a major role in our modern industrial society and as long as our nation continues to harnesses technology for education, and our economy supports it, students and teachers need to further develop the skills, which are necessary to become technology and information literate.

State and local evaluations of technology programs such as technology plans should support the dissemination and use of research-based information to improve teaching and learning during this time period when technology continues to transform our society. Technology remains a powerful and essential tool in creating an educational environment for our students, teachers, and the community. A technology plan has an important purpose in every district and should be designed as a part of the overall school-improvement plan to support education reform.

In the future WCS needs to continue to reflect on as well as strengthen its educational community's understanding and recognition of advanced technology integration into the curriculum in every subject area and at every grade level. ISLLC Standard 4 points out the importance of the administration collaborating with the community, responding to diverse interests and needs, and mobilizing community resources. In planning for the future with technology at Wildwood Crest School the implementation process of using technology for higher level thinking skills according to state academic standards and federal requirements requires a great deal of thought as to how it will fit into the districts curriculum as well as how it will be received by the students. Integration involves more than the placement of the equipment into the

classrooms and plugging it in (Russell & Sorge, 1994). Students need technological experiences. Faculty and student survey results indicated how student's interest in learning had greatly improved when technology was used during the instructional and learning process. In order for the district to catch a glimpse of its vision of a learning environment which helps students achieve their potential, students need to expand their knowledge and computer skills beyond basic word processing and information retrieval integration As previously mentioned in Chapter 2, students need exposure to more complex and intellectually powerful application programs that will provide them with the tools they need to manufacture, distribute, and purchase goods and services in an economy which has been increasing computer-base work (Becker, 2000). Additionally, in order for more innovative software applications to become more prevalent in the future at WCS, teachers must be trained and learn to value the skills and experiences that these new applications have to offer the students.

Technology in the current educational practice significantly impacts on the students potential to learn in the K-8 environment. The literature, data, and review of material culture in this study illustrated the importance of technology in the classroom as well as its impact on student learning. Technology is a nationwide and worldwide mandate for producing competent workers in the 21st century. Schools have the responsibility of preparing students and teachers with the tools necessary to become technology literate and proficient. WCS has an opportunity to be a powerful influence by providing technology resources and systems for teacher training and professional development.

References

A National Survey of Schools and Technology: 1998, Teaching, Learning, and Computing (TLC), Retrieved August 12, 2004from the World Wide Web: http://www.crito.uci.edu/tlc/html/tlc_home.html

Advocacy Center for Children's Educational Success with Standards (2002) Title I Funding and the No Child Left Behind Act in December 2001, U.S. Congress, Retrieved August 2, 2003 from the World Wide Web: http://www.accessednetwork.org/resources/issuebriefs/nclbtitle1.PDF

ACOT, Apple Computer, Inc. (1995), Changing the Conversation About Teaching, *Learning & Technology: A Report on 10 Years of ACOT Research*, Cupertino, California.

Baker, E. L., Gearhart, M., & Herman, J.L. (1994), Evaluating the Apple Classrooms of Tomorrow(SM), In E.L. Baker & H.F. O'Neil, Jr. (Eds), *Technology Assessment in Education and Training,* 173-198.

Becker, H. J. (2000), Who's wired and who's not: Children's access to and use of computer technology, *The Future of Children*. 10 (2), 44-75.

Baule, S. (2001), *Technology Planning for Effective Teaching and Learning*, Worthington, Ohio: Linworth Publishing Company.

Bennett, D., Culp, K., Honey, M., Tally, B. & Spielvogel, B. (February, 2000), It All Depends: Strategies for Designing Technologies for Education Change, EDC/Center for Children and Technology, Retrieved August 5, 2004 from the World Wide Web: http://main.edc.org/

Bourge, C. (September, 2002), No Hyperlinks to Test Success, *Insight on the News*, 18 (36), 28-29.

Brickner, D. (1995), The effects of first and second order barriers to change on the degree and nature of computer usage of secondary mathematics teachers: A case study. Unpublished doctoral dissertation, Purdue University, West Lafayette, IN.

Carmona-Bell, L. (2003), NJ Department of Education's Technology Plan 2004 Requirements and More, Lakewood, New Jersey: NJ Department of Education, New Jersey Association of Educational Technology Fall Conference Presentation.

Clark, K. (2000), Urban Middle School Teachers' Use of Instructional Technology, *Journal of Research on Computing in Education* 33 (2), 178-196.

CEO Forum (2000), School technology and readiness report: Washington D.C., Retrieved August 5, 2004 from the World Wide Web: http://www.ceoforum.org/reports.cfm.

Cohen, V. (2001), Learning Styles and Technology in a Ninth Grade High School Population, Journal of Research on Computing in Education, 33 (4) 355-367.

Coley, R., Cradler, J., & Engel, P. (1998), *Computers and Classrooms: The status of technology in U.S. schools.* Princeton, NJ: Educational Testing Service.

Council of Chief State School Officers (1996), *Interstate School Leaders Licensure Consortium (ISLLC) Standards for School Leaders*, Washington, D. C.

Duffy, M. & Jonassen, D. H. (1992), *Constructivism and the Technology of Instruction: A Conversation*, Hilldale, New Jersey, Lawrence Erlbaum Associates, Publishers.

Educational Technology Impact Analysis 2 (2000), Case Studies Documenting the Use of Technology In Pennsylvania Education, Retrieved August 24, 2004 from the World Wide Web: http://www.sis.pitt.edu/~etia2/case_studies/index.html

Ehrmann, S. (February, 2000), Computer-Intensive Academic Programs: An Implementation-Evaluation Process That Does Not Focus on Technology, The Flashlight Program, Retrieved August 5, 2004 from the World Wide Web: http://www.aea2.k12.ia.us/technology/research/263.PDF

Ertmer, P., Additson, P., Lane, M., Ross, E., & Woods, D. (1999), Examining teachers' beliefs about the role of technology in the elementary classroom, *Journal of Research on Computing in Education*, 32 (1), 54-73.

Educational Testing Service (1999), The Educational Testing Service's report, Computers and Classrooms: The Status of Technology in U.S. Schools, Retrieved August 5, 2004 from the World Wide Web: http://www.ets.org/research/pic/compclass.htm

Gingerich, D. (2003), Technology and NCLB, *Research for Better Schools*, Philadelphia, Pennsylvania, 1 (VII), 9.

Fields, M., Mann, A., & Waryanka, D. (2000), A Proven Method of Assessing Technology Integration For Teachers and Students, Retrieved August 5, 2004 from the World Wide Web: http://l2l.org/iclt/2000/papers/151a.pdf

Green, D. & Staley, A. Using Information Technology in Traditionally "Soft" Subjects, Retrieved August 5, 2004 from the World Wide Web: http://121.org/iclt/2000/papers/198a.pdf

Heinecke, W.F., Basi, L., Milman, N., & Washington, L. (1999), The Secretary's Conference on Educational Technology-1999, Retrieved August 5, 2004 from the World Wide Web: http:// www.ed.gov/rschstat/eval/techconf99/whitepapers/paper8.html

Jonassen, D.H. (2000), *Computers as Mindtools for Schools*, Upper Saddle River New Jersey: Pearson Education.

Kulik, J.A. (1994), Meta-analytic studies of findings on computer-based instruction, In E.L. Baker, and H.F. O'Neil, Jr. (Eds.), *Technology Assessment in Education and Training*, Hillsdale, New Jersey: Lawrence Erlbaum.

LaMorte, M.W. (2002), *School Law Cases and Concepts*, Boston, Massachusetts.

Latham, A. S. (1999), Computers and Achievement, *Educational Leadership,* 56 (5), 87-88.

Lonergan, J. (2001), Preparing Urban Teachers To Use Technology for Instruction, *ERIC Digest*, Retrieved August 5, 2004 from the World Wide Web: http://ericir.syr.edu/plweb-cgi/obtain.pl.

McKenzie, J. (2001), *Planning Good Change with Technology and Literacy*, Bellingham, Washington.

Mellon, C. (1999), Technology and the great pendulum of education, *Journal of Research on Computing in Education* 32 (1), 28-36.

Mueller, C. W., & Parcel, T. L. (1981) Measures of socioeconomic status: Alternatives and recommendations" Child Development, (52) 13-30.

National Center for Education Statistics (NCES), Statistical Analysis Report as of 1999 OERI, 1999b, 2001, Retrieved August 5, 2004 from the World Wide Web: http://search.nces.ed.gov/query.html

National Research Council (1996), National Science Education Standards, Washington, D.C. National Academy Press, Retrieved September 12, 2004 from the World Wide Web: http://www.nap.edu/readingroom/books/nses/html/

New Jersey Department of Education, (1999), A Survey of its Use in New Jersey's Schools, *Technology for Learning*, Trenton, New Jersey.

New Jersey Department of Education, (2003), Distance Learning Network Aid, Retrieved November 8, 2004 from the World Wide Web: http://www.nj.gov/njded/techno/

New Jersey Department of Education, (2003), Office of Title I Program Planning & Accountability, Trenton, New Jersey, Retrieved September 14, 2004 from the World Wide Web: http://state.nj.us/njded/title1/funding/

New Jersey Department of Education, (2003), Working Toward the Future with our Children: The Education Technology Plan for New Jersey, Retrieved September 6, 2004 from the World Wide Web: http://www.nj.gov/njded/techno/state_plan.htm

North Central Regional Educational Laboratory, (1998), Critical Issue: Developing a School or District Technology Plan, *Pathways to School Improvement*, Retrieved August 3, 2004 from the World Wide Web: http://www.ncrel.org/sdrs/areas/te0cont.htm

Picciano, A. (2002), *Educational Leadership and Planning for Technology*, Upper Saddle River, New Jersey: Pearson Education, Inc. Colorado Technology in Teacher Education Consortium.

President's Committee of Advisors on Science and Technology. (1997). Report to the President on the use of technology to strengthen K-12 education in the United States. [Online document]. Washington, DC: U.S. Government, Office of Science and Technology Policy. Available: www.ostp.gov/PCAST/k-12ed.html

Rein, D. (2000), What is Effective Integration of Technology, and Does it Make a Difference? Retrieved August 5, 2004 from the World Wide Web: http://l2l.org/iclt/2000/papers/181a.pdf

Russell, J. & Sorge, D. (April, 1994), Improving technology implementation in grades 5-12 with the ASSURE model, *T.H.E. Journal*, 21 (9), 66-71.

Sandholtz, J.H. Ringstaff, C., & Dwyer, D.C. (1997), Teaching with Technology Creating student-centered classrooms, New York: Teachers College Press.

Sivin-Kachala, J. (October, 2002), The Lowdown on Scientific Research and What it Means for Schools, *Technology & Learning,* Retrieved November 10, 2003 from the World Wide Web: http://www.techlearning.com/db_area/archives/TL/2002/10/lowdown.html

SouthEast and Islands Regional Technology in Education Consortium (2000), Technology Surveys, Retrieved June 10, 2004 from the World Wide Web: www.serve.org/seir-tec/surveys

Sturm, N. (2004), The Challenger e-Mission Program: Operation Montserrat, Wheeling, West Virginia: Challenger Mission Control Center, Partners in Distance Learning10th Annual Conference Presentation.

Swain, C. & Pearson, T. (Spring, 2003), Educators and technology Standards: Influencing the digital divide. *Journal of Research on Technology in Education*, 34 (3), 326-335.

Teaching. Learning and Computing (1998) A National Survey, Retrieved August 5, 2004 from the World Wide Web: http://www.crito.uci.edu/tlc/html/findings.html

The Milken Exchange (2001), The Impact of Education Technology on Student Achievement, Retrieved September 12, 2004 from the World Wide Web: http://www.mff.org/

The Secretary's Commission on Achieving Necessary Skills (SCANS) (1991), What Work Requires of Schools: A SCANS Report for America 2000, U.S. Department of Labor.

Thornberg, D. (2001), Technology Literacy Challenge Grant, Thornberg Center, Retrieved November 4, 2003 from the World Wide Web: http://k12.de.us/rehoboth/tlcfbackhtm

U.S. Department of Education, Elementary and Secondary Education (2001), No Child Left Behind Act of 2001, Retrieved August 5, 2004 from the Word Wide Web: http://www.ed.gov/policy/elsec/leg/esea02/107-110.pdf

U.S. Department of Education, Office of Educational Research and Improvement (2000a), Internet Access in U.S. Public Schools and Classrooms: 1994-99, (NCES Publication 2000-086), Retrieved September 12, 2004 from the World Wide Web: http://nces.ed.gov/pubs2002/internet/4.asp

U.S. Department of Education, Office of Educational Research and Improvement (2000b), Teacher use of Computers and the Internet in Public Schools (NCES Publication 2000—090), Retrieved September 12, 2004 from the World Wide Web: http://nces.ed.gov/pubs2002/internet/4.asp

U.S. Department of Education, Office of Educational Research and Improvement (2001), Internet Access in U.S. Public Schools and Classrooms: 1994-2000, (NCES Publication 2000-071), Retrieved September 12, 2004 from the World Wide Web: http://nces.ed.gov/pubs2002/internet/4.asp

U.S. Department of Education, (May, 2001), Putting a World-Class Education at the Fingertips of All Children, *Ed at a Distance*, Retrieved November 8, 2003 from the World Wide Web: http://www.usdla.org/html/journal/MAY01_Issue/article06.html

U.S. Department of Education, (2003), Title I – Improving the Academic Achievement of the Disadvantaged, Ed.gov, Retrieved September 12, 2004 from the World Wide Web: http://www.ed.gov/policy/elsec/leg/esea02/pg1.html

U.S. Department of Education, (2001), No Child Left Behind Act of 2001, Department Education, ED.gov, Retrieved September 8, 2004 from the World Wide Web: http://www.ed.gov/policy/elsec/leg/esea02/index.html

Yakel, E. & Lamberski, R. (2000), Searching for the Differences Technology Makes, Retrieved from the World Wide Web: http://121.org/iclt/2000/papers/176a.pdf

Wenglinsky, H. (September, 1998), "Does it Compute? The Relationship between Educational Technology and Student Achievement in Mathematics." Princeton, NJ: Educational Testing Service, Policy Information Center, Retrieved from the World Wide Web: http://www.ets.org/research/pic/dic/preack.html

Wiersma, W. (1991), Research Methods in Education: An Introduction, (5th ed.) Boston: Allyn and Bacon.

Appendix A

The SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) Faculty and Staff Survey Results

Technology Survey for

Faculty and Staff Survey

Designed by the Southeast and Islands Regional Technology in Education Consortium (SEIR*TEC)

1. Please indicate your experience within the following technologies. If you do not have access to the technology, circle NA. *Circle the appropriate number/letter for each item.*

KEY: (4) = Great Deal of Experience (3) = Some Experience (2) = Very Little Experience (1) = No Experience (NA) = No Access	**(4)**	**(3)**	**(2)**	**(1)**	**(NA)**
a) IBM PC/PC Compatible or Apple Macintosh Computers	48	38	7	0	3
b) Productivity Tools (e.g. Word Processing, Spreadsheets, Database)	21	62	17	0	0
c) Graphics and Multimedia Software (e.g. PowerPoint, Hyperstudio)	10	45	41	3	0
d) Instructional Software (e.g. Math Blaster, Jostens)	10	41	41	3	0
e) Email	86	10	3	0	0
f) Web Browser (e.g. Netscape, Internet Explorer, etc.)	55	38	7	0	0
g) Web Publishing (e.g. Designing Homepages)	10	10	17	55	0
h) Imaging Devices (e.g. Scanners, Digital Cameras, Video Cameras)	10	28	52	10	0
i) Specific Devices (e.g. Graphing Calculator, Language Translator	3	10	14	55	17
j) Computer Projection Devices (e.g. TV or LCD Panel)	14	28	41	14	3
k) Desktop Video Conferencing (e.g. CUSeeMe)	0	3	7	62	28
l) Other (Please Specify)	0	0	0	0	14

All data represented in percentages

Questions 2-5 are multiple-choice questions. Please circle the number that best describes your response to the question.

2. As far as learning about computer technology is concerned:

a) I would like to learn all that I can
b) I would like to learn a little bit about them
c) I know about all that I need to learn
d) I have little interest in learning about computers

a	b	c	d
90	7	3	0

All data represented in percentages

3. At school, aside from any required time in the school's computer lab, most students in my class (es) spend the following amount of time working on the computer:

All data represented in percentages

a) Less than 30 minutes per week
b) At least 30 Minutes per week
c) At least 45 Minutes per week
d) One or more hours per week
e) Not applicable to my teaching assignment

a	b	c	d	e
41	0	7	10	28

4. How much time do you spend using computers?

a) Daily
b) Once or twice a week
c) Once or twice a month
d) Little or none

a	b	c	d
100	0	0	0

All data represented in percentages

5. How much training have you had in computer use? (Mark all that apply)

a) I have completed 20 or more clock house of coursework/inservice
b) I have completed 10-19 clock house of coursework/inservice
c) I have learned about computers mostly through self exploration
d) I have had little or no training in the use of computers

a	b	c	D
34	48	17	0

All data represented in percentages

6. Below is a list of possible ways technology could be used in an educational setting. Please indicate how important each of these is to you. *If you would like to have training on that topic, also circle NT.*

KEY: (4) = Highly Important (3) = Important (2) = Somewhat Important (1) = Not Important (NT) = Needs Training	**(4)**	**(3)**	**(2)**	**(1)**	**(NT)**
a) Design and deliver instructions using technology	17	31	24	14	21
b) Access lesson plans and other educational resources on the Web	21	59	17	3	10
c) Evaluate and select appropriate software for teaching and learning	28	48	21	0	10
d) Trouble-shoot computer hardware and software problems	17	31	21	7	45
e) Communicate with other teachers or experts through the Internet	24	41	24	0	21
f) Have students use technology to create products for critical review by authentic audience	14	14	34	21	14
g) Use models and simulation to build student's depth of knowledge in content areas	14	45	17	7	17
h) Use technology to support on-going assessment	3	45	28	0	31
i) Use teacher utility and classroom management tools to keep records and record student data.	14	34	31	0	45
j) Use technology to support collaboration between students	7	31	28	17	17
k) Use broadcast instruction, audio/video conferencing and other distance learning applications	14	38	21	10	28
l) Go on electronic field trips to museums, science centers, and other places	14	48	17	3	34

All data represented in percentages

7. How much has your school changed, if any, as a result of the implementation of technology in the past two years?

All data represented in percentages

KEY: (4) = Great Improvement (3) = Some Improvement (2) = Not Certain (1) = This is a barrier to improvement	**(4)**	**(3)**	**(2)**	**(1)**
a) The time students apply themselves to tasks	0	31	69	0
b) Student attendance	7	3	90	0
c) Equitable access to technology resources for classes and students	31	38	17	10
d) Student's interest in learning	34	48	17	0
e) Teachers' way of teaching	31	52	5	0
f) Professional development and training opportunities	28	59	14	0
g) Student's active involvement in their own learning	3	55	41	0
h) Communication and collaboration among teachers	14	62	24	0
i) School organization and scheduling	7	31	59	3
j) Student achievement scores	0	14	79	3
k) Network access opportunities	10	52	28	7
l) Student collaboration with peers	0	21	76	0
m) Understanding of technology on the part of students and teachers	10	69	14	3
n) New skill development	7	76	17	0
0) Student interest in world events, other cultures and societies	0	45	52	0

8. Please circle the extent of your agreement with each statement using the following key:

NOTE: All totals may not equal 100% due to occasional blank responses and rounding off.

KEY: (5) = Strongly Agree (3) = Not Sure (1) = Strongly Disagree	**(5)**	**(4)**	**(3)**	**(2)**	**(1)**
a) Technology integration into the curriculum is very important	55	38	7	0	0
b) I would like to help other teachers in their use of technology	14	34	38	3	3
c) Technology does not fit the way I teach. I have doubts about integration	0	7	14	41	38
d) I am ready to develop an entire new learning environment to utilize technology	14	14	55	17	0
e) Using computers in the classroom takes too much time away from instruction	0	3	34	31	28
f) Technology will enable an interdisciplinary approach to teaching	21	45	21	3	3
g) I am concerned about not having enough time to learn, practice, and use technology skills	31	38	14	14	3
h) I doubt how technology will approve students learning	0	7	21	31	41
i) I am concerned with classroom management when technology is used	3	14	38	24	21
j) I would like to know what resources are available if we decide to adopt technology	28	59	7	0	0
k) I believe technology integration is better than what we have now	17	21	41	10	7
l) I would like to know what other teachers are doing with technology	38	52	7	0	0
m) I would like to excite my students about technology integration	41	41	14	0	0
n) I have integrated technology into my teaching	17	38	17	14	7

9. Please describe what you need to better integrate technology into your classroom and lessons (e.g. training, equipment, etc).

76% of the respondents answered the question. Most were concerned with unreliability of current equipment, and need for training.

Appendix B

The SouthEast and Islands Regional Technology in Education Consortium (SEIR*TEC) Student Survey Results

Baseline Data

Student Survey

Designed by the Southeast and Islands Regional Technology in Education Consortium (SEIR*TEC)

1. Please tell us about your experience with the following technologies. *Circle the appropriate number for each item.*

All data represented in percentages

KEY: (4) = A Lot of Experience (3) = Some Experience (2) = Very Little Experience (1) = No Experience	**(4)**	**(3)**	**(2)**	**(1)**
a) IBM PC/PC Compatible or Apple Macintosh Computers	64	31	1	3
b) Word Processing Programs	74	20	5	1
c) Data Management Programs (Spreadsheets, Database, Gradebook)	12	35	36	15
d) Multimedia Productions (HyperStudio, KidPix, etc.)	50	41	7	1
e) Educational Software (Math, Science, Reading, Foreign Language, etc.)	22	42	30	5
f) Email	41	28	22	9
g) Web Browser (e.g. Netscape, Internet Explorer, etc.)	74	21	3	1
h) Recreational Games	66	28	3	1
i) Other	13	10	2	6

2. Below is a list of activities that might be done by using the above technologies. *For each activity, please indicate ROUGHLY how often you do the activity in your classroom.*

All data represented in percentages

KEY: (4) = Often (3) = Frequently (2) = Rarely (1) = Never	**(4)**	**(3)**	**(2)**	**(1)**
a) Using word-processing software to write reports	66	24	7	1
b) Searching for specific information using the Internet or a CD-Rom	48	44	10	5
c) Playing recreational games	44	28	17	9
d) Exchanging Email with students in other schools	10	13	17	59
e) Exchanging messages with teachers/mentors	1	8	14	77
f) Using a program to learn a special concept or a topic	17	38	33	10
g) Practicing keyboarding	21	38	27	14
h) Developing multimedia presentations (PowerPoint, Hyperstudio, Kidpix)	28	48	17	6
i) Developing brochures or newspapers using computer programs	5	17	41	37
j) Participating in Internet projects with classes in other places	12	21	21	45
k) Electronic field trips to museums, science centers, or with adult mentors conducting a scientific or creative activity	5	19	47	29
l) Doing Desktop video conferencing	2	7	28	62
m) Other (describe)	3	1	1	10

3. In which subjects do you use a **computer?** *Circle the number that describes how often you use the **computer** in the class*

KEY: (4) = Often (3) = Frequently (2) = Rarely (1) = Never	**(4)**	**(3)**	**(2)**	**(1)**
a) Mathematics	0	8	15	76
b) Science	12	15	30	43
c) Social Studies	8	19	21	52
d) Language Arts	48	29	13	9
e) English	23	31	29	16
f) Foreign Languages	0	5	8	86
g) Other (Describe)	13	12	8	7

All data represented in percentages

4. How often do you use computers in each of the following locations?

KEY: (4) = Daily (3) = Weekly (2) = Sometimes (1) = Never	**(4)**	**(3)**	**(2)**	**(1)**
a) At home	58	28	13	1
b) In the computer lab	33	59	7	0
c) In the classroom	15	23	45	16

All data represented in percentages

5. Please circle the number that best describes how much you agree *with each statement.*

KEY: (4) = Strongly Agree (3) = Agree (2) = Disagree (1) = Strongly Disagree	**(4)**	**(3)**	**(2)**	**(1)**
a) It is easier to learn when the teacher uses technology in a lesson	17	55	26	2
b) I wish the teacher would use technology more often	31	42	23	3
c) I wish I had more time to use a computer in school	50	41	7	2
d) My friends use a computer more than I do	17	27	41	14
e) There is software available for me to learn and do new things	28	50	19	2
f) There are computers in the school, but students do not use them much	12	15	37	36
g) If I am having trouble at a computer, it is easy to get help to solve the problem)	38	43	13	6
h) The school offers computer training for my parents	1	8	23	67

All data represented in percentages.

6. Please use this part to add comments and suggestions.

In this area, two main themes emerged. 23 % of responding students want to use computers more for instruction, instant messaging and games.

20% of the respondents complained of the Internet watchdog program, "Bess"

Statement:

If the erasures and changing of answers on the respondents' sheets is any indication, the students took the survey very seriously.

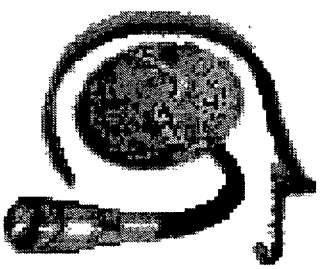
All surveys have a margin of error. This one is no exception. There is some question as to whether or not all the students had a firm grasp of the questions. To illustrate, one respondent indicated on question #1 that he or she had no experience with IBM PC/PC Compatible or Apple Macintosh Computers, however, on the parental permission slip, the same respondent indicated he or she had 5 years experience with computers.

Appendix C

The 2004-2007 Educational Technology Plan

Wildwood Crest School District

Educational Technology Plan
For The
Wildwood Crest Board of Education



Approved by the Board of Education: March 16, 2004
Submitted to the Department of Education: April 2004

Educational Technology Plan
For The
Wildwood Crest Board of Education

Mission Statement

The Mission of the Wildwood Crest Board of Education is to provide all the students of the District with an appropriate high quality education that allows them to build the knowledge, skills, and attitudes needed to become successful, well adjusted members of a constantly changing global society. To this end, the Wildwood Crest Board of Education realizes that educational technology can be an important component in the creation of a learning environment, which will help students achieve their potential. From the first Educational Technology Plan implemented in 1993, the Wildwood Crest Board of Education has agreed that their Educational Technology Plan is not based on *technology*, but on *education*. Technology, in the Wildwood Crest Educational Technology Plan is a tool to be used to accomplish educational goals, not an end unto itself.

As part of the Board's mission, technology is used to reduce the disparity between the small, isolated school they operate and the large, centrally located districts elsewhere in the country. Technology, the Board believes, can help level the playing field and be used to expose the students of this District to foreign cultures, advanced sciences, remote experts, and more, while helping to preserve the unique qualities of their community.

Vision Statement

The vision for using education technology as set forth in this plan describes a school that:

Provides all members of the learning community with equitable and easy access to appropriate local and global information and communications for teaching, learning, managing, and supporting schools;

Prepares all students to access, analyze, synthesize, apply, and communicate information effectively so they will be successful lifelong learners in a changing, information-based global society;

Enables all staff to become adept users of the technology tools needed to carry out their job functions;

Transforms the classrooms from a teacher-centered, knowledge-based model to a student-centered, learning-based model supported by current technology applications;

Uses current technology, including distance learning tools and opportunities, to help in achieving the Core Curriculum Standards,

Contributes to a technology literate citizenry and internationally competitive workforce;

Integrates the technology and the change in the instructional model across the curriculum, reducing the compartmentalization of knowledge;

Uses the school library as the academic hub of the school;

Sees, and uses, technology as a tool for instruction, support, and management of a caring, academically challenging school.

II. Technology Inventory

A. See attached 2003 NJDOE Technology Survey

B. Currently, the Wildwood Crest Board of Education uses the following equipment to deliver Educational Technology:

Quantity	Description	Year Purchased
30	Pentium IV, 2 GHz, multimedia PC's, Win98	2003
50	Pentium III, 1 GHz, multimedia PC's, Win98	2002
50	Pentium II, .8 GHz, multimedia PC's, Win98	2001
50	Pentium I, .5 GHz, multimedia PC's, Win98	2000
3	Windows 2000 Server	2003
1	Windows NT server	2000
2	Pentium IV, 2.6 GHz multimedia laptop	2003
2	Smartboard/ whiteboard	2003
1	Cisco router	2002
1	Satellite Dish, 3 meters, positionable	1995
1	Picture Tell Model 400 video conferencing system	1995
4	Fax machines	2002
1	Cable television modulator	1995
30	Hitachi, VCRs	1995
30	Hitachi, 30@ televisions	1995
2	Ethernet, 10/100 Base T hubs	1998
10	Ethernet, 10/100 Base T hubs, various brands & sizes	2001, 2002, 2003
280	Network connections	1994 to present
1	Dukane digital public address system with telephone interface	1998
1	Digital telephone switch, expandable	2000
50	Telephone handsets (every classroom, office, and instructional area)	1994 to present
40	Cable TV connections	1994 to present

The district has a single local area network which includes an Intranet component. The network connects the building to a wide area network and Internet Service Provider (ISP) at the Cape May County Technical High School. The primary network operating system (NOS) is Windows 2000 with some NT legacy components. 4. User accounts are configured to permit access to different areas of the network based upon acceptable needs.

The network is currently an Ethernet, 10/100 Base T systems. At this time network utilization is generally well below 30%. The network's resources are utilized for file storage, print sharing, and similar functions. It places all multimedia functions at the desktop in order to minimize bandwidth utilization across the network. Previously, after experimenting with network delivery of multimedia, it was determined that the greatest flexibility and cost efficiency was gained by equipping each desktop unit with multimedia capability. This provides the maximum instructional control and flexibility, while limiting the expense of a district-wide infrastructure re-equipping every time the

demands of multimedia exceed the capabilities of the infrastructure. By supplying that delivery at the desktop, updated equipment can be placed strategically where it will have the greatest impact immediately, without a complete restructuring of the entire network. Network based multimedia delivery requires a complete reworking of the infrastructure to deliver the new capabilities to even one single desk. Video-streaming files are stored on a central server, but retrieved to the local desktop machine for viewing. Internet caching is maintained at the ISP and through an in-house server to reduce "fetch" time and bandwidth utilization while browsing the Internet.

Internet browsing access is currently available through a 1.5 megabyte T1 network connection. Using standard IP addressing, the District is able to deliver Internet browsing to any desktop in the district. Access to that capability and filtering of content in compliance with the Children's Internet Protection Act (CIPA) is handled through the District's Internet Service Provider (ISP). They maintain the filtering software to ensure the restrictions are current and appropriate.

Utility company infrastructure will not be a concern during the term of this tech plan, barring any new technological breakthroughs. A complete electrical upgrade of the building was performed in 1995, at the time of a significant renovation to the building and the installation of air conditioning throughout the building. As there should be no new significant load on the electrical service (i.e. air conditioning systems), it should be sufficient for the school's needs for at least another 10 years. With the completion of the current construction project (a lunchroom) no new construction is anticipated for the District. Renovations will be undertaken as needed and will take into consideration any and all electrical service upgrades required. Telephonic services from the telephone provider were upgraded at the time of the building renovation, with the installation of a completely new service trunk which currently has 100 pairs of wire currently unused, and is capable of providing bandwidth equivalent to 10 T1 lines into the facility. In the Fall of 2000 the main telephone system switch was replaced with a new digital based telephone system, and all main extensions had new connecting wires run to them, replacing the internal telephone wires which had been in place since the original construction of the facility, beginning in 1962.

The District uses a variety of in-house and Internet based tools for curricular support. These include Follett's Circulation Plus, Follett's Webcollection (which provides links to websites related to books retrieved during a search), Turnitin.com (a website for checking term papers, etc. for plagiarism), go.Grolier.com (a website with on-line research materials such as encyclopedias, reference materials, teacher materials, and more, which are available and geared to specific grade levels), and dozens of CD-ROMs for curricular supplementation. The District uses software for translating documents to Spanish for non-English speaking families. The Child Study Team uses IEP software for creating and tracking a student's IEP. Teachers use a variety of software packages for curriculum support – everything from sign making applications to appropriate

reinforcement drill software. Other technology used is a variety of adaptive technology, depending on the student's needs, including but not limited to PhonicEar and other technological systems designed to assist students in overcoming and obstacles they may face. For the filtering of content the District uses "Bess" for Internet content. This application is managed through the District's ISP, the Cape May County Technical High School.

Facilities, Maintenance, and Obsolescence Planning

Current Facilities

The Wildwood Crest Board of Education operates a single building, the Crest Memorial School. The school is a 70,000 square foot building with 44 classrooms and instructional areas. All computers in the facility are Microsoft-based multimedia computers that have Internet capability and MS Office, as well as classroom specific software. There are two complete computer labs, each capable of seating 24 students at individual computers plus one instructor's computer in each lab. One of the labs has a smart board/ white board. The library, which is 10,000 square feet, has a computer mini-lab with 12 computers for student use, a circulation desk computer, and a computer for the media specialist. The student computers serve as workstations as well as OPAC stations. At the rear of the media center is an area for use in Distance Learning programs. The enrichment classroom also has a mini-lab with 12 multi-media, Internet accessible computers. The middle school level Literature room is designed around the pattern of a 24-station computer lab, with a single instructor's station. All of these computers are multimedia, with Internet access. Each additional classroom in the building has at least three multimedia computers. Each secretary and administrator has a multimedia desktop computer for their use. The Supervisor of Maintenance has a multimedia desktop computer for his use, also. All computers in the building are networked through Microsoft based file servers. Every classroom, instructional area, and office has printers of a quality appropriate for their use. Each classroom has a telephone for teacher use, a television connected to the local cable system, and a VCR. Many of the classrooms also have DVD players, which are being phased into the entire building over a four-year span. Each television in the building is capable of receiving simultaneous transmission from the satellite through a channel modulator located at the point in the building where the satellite system is interfaced with the cable system. This same system is configured so that any transmission received by the PictureTel video conferencing system can be broadcast to any, and all, classrooms in the building. Additionally, this system may be used to transmit videos or DVDs to all, or specific, TVs in the entire building.

Plans for Upgrading

The District has always adhered to a schedule of upgrades and improvements to its technology. This has included the computers themselves, the software, the training, and the infrastructure. Specific upgrades are addressed with an eye towards stabilizing the technology for maximum utilization, and a cost analysis helps determine in which areas an upgrade is most advantageous. Where feasible, the District will makes all facility modifications and upgrades compliant with the guidelines set forth in the New Jersey Department of Education's Facilities Standard's For Technology In New Jersey Schools.

Over the next three years, the District will:

Upgrade the speed of the network's topology to the next appropriate level as data throughput demands accelerate;

Continue to purchase new computers on an annual basis, replacing the oldest models as they are no longer able to appropriately support the District's instructional needs (while attempting to find other uses for those older computers, such as print servers, secretarial workstations, network management stations, etc.);

Consider the reconfiguration of the satellite system to a multi-band unit as the need for receiving and using multiple channels arises;

Consider the expansion of the video conferencing as the need for receiving and using multiple simultaneous transmissions arises, using industry standard IP addressing across existing networks via the Internet;

Maintenance of the District Internet site, being mindful of the possibility of providing an access point for students working at home, during after school hours, for access to school based resources such as network based databases, etc. versus security issues;

Maintenance of the District's web site for the sharing of key information about the District's activities and accomplishments;

Expansion and maintenance of the District Intranet site to expand it's usefulness as an administrative tool for the sharing and dissemination of information to staff members, especially in the area of purchasing, budgeting, and human relations management;

Ensure that any renovation is designed, and constructed, with sufficient electrical, voice, video, and data capacity to meet the needs of all of the instructional areas in that addition at the time of construction. Additionally, any renovation must be designed with the capability of upgrading the voice, video, and data infrastructure easily and without major structural obstacles (i.e. additional wire conduits installed, use of wire troughs, etc.);

All expansions and upgrades to the technological and software (NOS) infrastructure will attempt to ensure interoperability with existing systems while being open ended enough to readily adapt to changing technologies.

The District understands that it is important, when attempting to do this that periodic upgrades ease a conversion when large leaps in technology occur. A shift from DOS to Windows XP, for example, would be extremely complex and expensive.

Additionally, the Board recognizes that it is unnecessary to upgrade a computer or operating system every time a minor enhancement is made. The District will need to assess the impact and effect of each major upgrade, innovation, and change in terms of its cost and instructional impact. The District will endeavor, however, to keep current in the areas of hardware, software, and operating systems, while maintaining interoperability within their environment and the world environment, also.

The District views obsolescence in equipment as when the equipment can no longer fill the need for which it was purchased, and when it can no longer perform any other necessary purpose. Because of this example, a computer may be "obsolete" in one classroom but not "obsolete" in another. For example, a particular computer may not be robust enough to use as a workstation in a primary classroom where it needs extremely fast throughput for the CD-ROM based games, extensive video processing, and web browsing capabilities. It may, however, be perfectly suited as a workstation in a word processing lab.

Maintenance

The District carries maintenance agreements on its "mission critical" components – file servers, the PictureTel distance learning equipment, and key telephone components. These agreements, because they are on components deemed critical to the District, require 24 hour, on-site repair. On equipment such as desktop units, printers, etc. the District only maintains the standard warranties that come with the purchase of new equipment. The Board believes that the money spent on extended maintenance agreements for these pieces of equipment is better spent either purchasing additional new equipment, replacement components (such as spare disc drives, etc.) or in other areas.

The District does, however, maintain its equipment. Each summer the equipment is thoroughly cleaned (disk drives cleaned, keyboards cleaned, units opened and vacuumed). Hard drives are defragmented, reloaded, and checked for errors. Throughout the year district personnel perform simple repairs. Since parts are readily available by overnight shipping, no significant inventory of parts is maintained. As part of their approach to maintenance, the District avoids proprietary designs in equipment, and prefers units that use standard parts. These can then be replaced easily by almost any other manufacture' s brand meeting the same technical specifications.

Support for major software and networking problems is not contracted for, either. Standard upgrades and maintenance are performed by in-house personnel. When needed, major services are contracted for at the time required. A limited service contract for telephone support on critical software systems (student management, financial management, IEP management) is maintained to facilitate quick resolutions to common problems. It is felt that this method is cheaper and more efficient than retaining the full time services of an on-staff network certified engineer.

The upgrading of desktop computer equipment is done annually and by in-house staff. Historically, each year the District budgeted to replace approximately 20 per cent of it's classroom desktop units. As these units are delivered they are distributed to each classroom, so each room receives a new computer each year. In this way, each classroom always has a current, state-of-the-art computer. Additionally, by phasing the replacement of the units, teachers who develop teaching units around particular software do not need to reinvent those lessons when their computers suddenly disappear. Additionally, a

gradual phasing in of new technologies provides a more comfortable transition for those staff members who find themselves intimidated by technological change. This approach ensures that the District will avoid finding itself with a glut of antiquated equipment, and no equipment that meets the current needs. Obsolete equipment is disposed of in accordance with N.J.S.A. 18A.

As the change in technological innovation has slowed, the need to replace equipment has slowed somewhat. The District should be guided by the functionality of the computers owned. When computers can no longer perform the tasks needed in the classroom they should be replaced. When they perform the instructional task demanded, however, there is no need to replace them simply to have the newest, fastest equipment.

III. Three-Year Goals and Objectives

Several broad goals guide the Educational Technology Plan for Wildwood Crest. These goals, which are designed to provide broad guidance for the Educational Technology Plan, are separate from the instructional goals which support and address the Core Content Standards. This Plan reflects the evolution and progression of the original plan, with appropriate modifications.

Beginning immediately and continuing for the period 2004-2007:

The up-to-date technology infrastructure, which is currently installed, will be maintained throughout the District with appropriate upgrades to meet the needs of the District;

Every classroom, instructional area, and office is equipped with computers connected to a District-wide local area network, and thus to the Internet;

The District-wide network will continue to provide teachers and staff with the tools necessary for performing their duties and engaging in meaning professional dialogs, including email, video conferencing, voice, video and data transmission, using the appropriate technology and software;

Every classroom will have access to high-speed, reliable voice, video, and data networks for the delivery of necessary and appropriate resources and information;

Every classroom will have the capability to access and utilize appropriate digital devices for data collection and application, as appropriate, such as hand held devices, digital camera, etc.;

Each computer has access to appropriate peripherals such as printers, CD-ROMs, scanners, etc.;

The networks are connected to the Internet, through the use of fast and reliable connections, and are ready for the establishment and utilization of a school-wide, countywide and statewide Intranet;

A network security system is used to allow access to the appropriate applications and resources for each individual user;

Equipment that malfunctions is repaired promptly and efficiently;

Equipment is upgraded, when appropriate, to extend its useful life;

A schedule for the purchase of new equipment is in place and budgeted for each year;

In-house staff is used for the installation and maintenance of networks, computers, and peripherals as much as possible.

Instructional applications that infuse technology into curriculum and instructional practices will be implemented and are enhanced on an on-going basis in all classrooms;

Educational technology will be an integral, infused part of a student-centered, learning-based classroom for both students and teacher;

All students will have equitable and easy access to technology and the Internet, with appropriate accommodations for disabilities;

The District will supply opportunities and means to overcome access of equity issues, including but not limited to, open lab time before, during, and after school;

Students and staff will be educated in the safe, ethical, and responsible use of technology, and will be expected to adhere to those guidelines which will be detailed in the District's Acceptable Use Policy (AUP);

Students and teachers will use software and digitally delivered learning materials in a manner consistent and appropriate with the grade level and instructional level of the students to enhance academic achievement and achievement of the Core Curriculum Content Standards demonstrating a proficiency that enhances, increases, and promotes productivity and creativity;

Students and teachers will use appropriate Educational Technology for a variety of teaching and learning purposes, including finding, creating, analyzing, evaluating, and communicating information;

The District will continue to support Distance Learning through the use of appropriate technology that uses the newest innovations, while maintaining flexibility and interconnectivity with other distance learning networks within the county, state, and other regions;

Administrative applications that enhance productivity and efficiency are implemented and enhanced on an on-going basis;

Administrative applications operate on common database platforms, which – where possible – is non-proprietary;

Both custom designed and off-the-shelf software are used to deliver administrative and instructional applications in an efficient and appropriate manner;

Textual, graphical, and multimedia information is available to students, teachers, and staff as needed through the local area network, the Internet, or desktop sources;

Staff is trained to use instructional and administrative applications as appropriate, and on-going training and support are available;

All staff members are trained in the use of the technology required in their jobs;

Teachers are trained to integrate technology into their instructional practices as an effective tool in the delivery of instruction;

Staff members are trained in solving technology-related problems, and learning new software applications as they become available;

The District will maintain its official web site for use by students and staff for the purpose of sharing information about the District's activities and accomplishments and for providing appropriate instructional support;

Technical support is available in the form of trained staff, a part time in-house staff member with demonstrated expertise in the infusion of technology into education, a part time in-house staff member with demonstrated expertise in the planning and implementation of appropriate technology for education, and any necessary out-of-district support personnel needed for the support of the technology infrastructure (voice, video, and data);

Any renovation project will include, as part of the plan, the appropriate technology and technology infrastructure (for voice, video, and data) for the accomplishment of these goals and objectives;

Educational technology will be fully infused into the District's curriculum and instruction, in meaningful ways designed to help the students achieve their educational potential, as the Core Curriculum Content Standards;

The District will partner with appropriate businesses, services, and agencies in order to provide the appropriate and necessary services for a sustained technology infused learning environment;

All professional staff will participate in appropriate high-quality professional development activities and attain, minimally, an "intermediate" proficiency in the utilization of technology for the enhancement of student achievement;

Supervision and evaluation of professional staff will address the issue of effective use of educational technology for student achievement of the Core Curriculum Content Standards;

The District will provide email and telephone access to be used by professional staff members in communicating with other educators, supervisors, and parents, when appropriate;

The District will provide technical support for the LAN and other instructional technologies, including, but not limited to, a technology coordinator, and on-site assistance in the appropriate infusion of technology into instruction;

The District will maintain, and enhance as necessary and appropriate, its broadband, high-speed network and reliable Internet access;

IV. Three Year Implementation Strategies / Activities Tables (Instructional Outcomes) July 2004 - June 2007

EDUCATIONAL TECHNOLOGY PHILOSOPHY

An Educational Technology Plan is not based on *technology*, but on *education*. Technology, in the Wildwood Crest Educational Technology Plan is a tool to be used to accomplish educational goals, not an end unto itself. In keeping with this approach, the use of technology in a classroom is not to be in isolation as a separate course, rather the use of technology is to be as a tool, which helps students, prepare to function and live responsibly in a world, which uses technology throughout day-to-day life. Technical proficiency is demonstrated when students use technology appropriately across the curriculum to integrate and synthesize their learning in all phases of the learning process. The proper incorporation of technology into the curriculum will allow students to:

- be better prepared for the workplace
- accomplish the goals of the New Jersey Core Curriculum Standards
- develop an understanding of the responsible use of digital resources, processes, and systems
- expand the range and effectiveness of their communication skills
- express their individual creativity
- explore, evaluate, and use technology to accomplish independent and cooperative "real world" tasks
- have access to information technology in their classrooms and school
- develop technology and information literacy skills.

It will also allow teachers to:

- use technology effectively to help students achieve high academic standards.
- help students develop technology and information literacy skills.
- Develop, through research, experience, and evaluation, proper and appropriate technology applications for teaching and learning.

Where appropriate, activities will be designed, created, and scheduled to share with other Districts in a cooperative effort, as discussed and agreed upon by the County Curriculum Committee, and as detailed in the County Distance Learning Plan. In some cases, teacher in-service and administrative matters will be addressed in similar ways.

The county ETTC will be used as a hub for the scheduling of these activities, when the number of participants requires that assistance.
All technology related activities and outcomes will relate to the Core Content Standards where appropriate and meaningful.

As has been done for the past several years, the school's library will open before school, remain open after school, and remain open one evening per week in order for those students who have no home-based access to technology to use the District's technology, and related resources, for the completion of their school work, and exploration of their own interests.

LEARNER OUTCOMES

All of these outcomes will be initiated in the first year of the technology plan, with full implementation by the third year. The outcomes will be put into practice according to the grade levels indicated below.

Timeline: Recommended By Grade 4

KEYBOARDING
The student will demonstrate correct keyboarding techniques (posture, correct fingering position, touch typing).

PRODUCTIVITY
The student will:

- use a word processing program to produce documents with text and graphics
- use peripheral devices (scanner, printer, etc.)
- proofread and edit documents
- use a spell checker, and, where appropriate, create simple spreadsheets and databases

INFORMATION PROCESSING
The student will access and retrieve electronic information by utilizing the following:

- electronic encyclopedia, dictionary, thesaurus, atlas, etc.
- electronic magazine indexes and on-line catalogs
- modem, cable, satellite, or other high-speed data/voice delivered services

CURRICULUM ENRICHMENT
The student will use instructional technology to enhance the understanding and development of basic skills and to advance and enrich learning in the following ways:

- using software packages to reinforce learning
- demonstrating creative thinking skills and problem solving strategies
- using simulation software programs
- creating multi-media presentations
- using electronic interactive communications
- publishing original work
- developing visual, graphics and performing arts skills

CAREER AWARENESS

The student will use technology to explore career options as required by the N.J. Core Curriculum Content Standards (Career Planning Standard 1) and gain technological skills to prepare for the future.

Timeline: Recommended By Grade 8

KEYBOARDING

The student will:

- demonstrate correct keyboarding techniques (posture, correct fingering position, touch typing).
- be able to touch type the keyboard. Emphasis should be on proper technique.

PRODUCTIVITY

The student will:

- produce a multiple page, word processing document, e.g. letter, research paper, etc.
  produce a document with graphics and text
- operate peripheral devises (i.e., printers, scanners, etc.)
- proofread and edit documents for language mechanics, grammar, and content
- create and be proficient at data base and spreadsheet
- merge data base or spreadsheet data into a word processing document
- understand the process of creating a multi-media presentation based upon research that incorporates CD-ROM, Internet, scanning, digital photo, and sound

INFORMATION PROCESSING

The student will access and retrieve electronic information by:

- using electronic magazine indexes, on-line catalogs, electronic encyclopedia, dictionary, thesaurus, atlas, etc. to retrieve, download, select, and present information
- using modem, cable, satellite, or other high-speed data/voice delivered services to access information and electronic databases
- collecting data, building databases and spreadsheets, manipulating and interpreting data

CURRICULUM ENRICHMENT

The student uses instructional technology to enhance the understanding and development of basic skills and to advance and enrich learning by:

- using software packages to reinforce learning
- promote creative thinking skills and problem solving strategies

- using simulation software programs
- using electronic interactive communications
- organizing writing skills and problem solving strategies
- understand the creation of multi-media presentations

CAREER AWARENESS

The student will use technology to explore career options and gain technological skills to prepare for the future. (Career Planning Standard #1)

TECHNOLOGY LITERACY

The student knows how to care for computers and understands ethical issues pertaining to computers and their use by:

- expanding their computer vocabulary
- understanding capabilities and uses of computer in society
- knowing about copyright law and its implications for computers
- understanding how to design a home page

Additional Strategies and Activities

B. How will all students will acquire information technology literacy skills?

Teachers will model proper use of technology which, through utilization in the curriculum, will become a mechanism for student expression and productivity.

C. How will all students regardless of gender, race, national origin, special need and religious affiliation have equitable access to educational technology?

The District will continue to promote the use of open computer lab time before, during, and after school and specialized summer programs to enable students full and appropriate access to educational technology. The District will work with local agencies, such as the county library extension, when appropriate, to facilitate technology access for students when school is not in session. Students will special needs will have adaptive technology utilized in an appropriate manner to facilitate their learning.

D. How are resources/services/activities coordinated and shared with projects that are funded from federal, state and local sources?

Resources funded from federal, state, and local sources are, when appropriate, tagged and identified according to funding source. During utilization they are used in accordance with any implementation plan submitted and approved in conjunction with the application process for said funds.

E. How are innovative strategies supported and developed for use in the instructional classroom (such as using distance learning for those areas that would not otherwise have access to such courses and curricula due to geographical isolation or insufficient resources)?

Innovative strategies are supported and developed through professional development opportunities, professional dialoging, and participation in building-wide, countywide, and statewide in-service and training opportunities where ideas are exchanged and reviewed for effectiveness. Following use of the technologies they are assessed for effectiveness using evaluation of student performance, professional assessment, and evaluation methodologies. Additionally, teachers are encouraged to attend workshops and other professional opportunities in order to learn about new opportunities in this area.

F. How will effective use of technology be used to promote parental involvement and increase communication with parents, including a description of how parents will be informed of the technology being applied in their child's education so that the parents

G. are able to reinforce at home the instruction their child receives at school?

A variety of strategies will be utilized to promote parental involvement and communications. The District will utilize a "Homework Hotline" to keep parents informed of academic assignments. The District will utilize their website to provide links for parents, and students, to access on-line resources utilized in classroom instruction. In an effort to assist parents in understanding the role of technology in education, and to help them discover ways they may assist their children in using technology for academic success, the District will provide, when appropriate, classes in the use of technology geared for adults. Additionally, during back-to-school nights the District will model the infusion of technology into the classroom through presentations and activities with parents.

H. How will programs be developed, where applicable, in collaboration with Adult Literacy service providers?

When applicable, and appropriate, the District will collaborate in Adult Literacy programs by permitting use of technology, equipment, and resources.

Technology Action Plan Implementation

Strategies (2004 – 2005)

During the next three years the District will:

- Evaluate and realign existing curricula to reflect the utilization of technology is appropriately infused, and it significantly enhances students' ability to achieve the New Jersey Core Curriculum Content Standards, especially in those areas where new textbook series offer opportunities for on-line and electronic supplemental materials;
- Provide availability, teacher training in the use, of student instruction on the implementation and the use of portable technology hardware, such as electronic science probes, hand held devices, etc. to increase students' performance levels in the collection of data, interpretation of data to make and support programs;
- Continue to provide training for teachers on how to use peripheral devices such as digital cameras and scanners to enhance presentations and student work;
- Continue to provide resources and training for teachers on the utilization of United Streaming Video in conjunction with New Jersey Network, to provide teachers and students with opportunities to integrate video streaming into all curriculum areas;
- Continue to provide professional staff development related to technology training for the professional staff so all teachers will have the skills and knowledge needed to use educational technology, as an effective tool to support achievement of the New Jersey Core Curriculum Content Standards;
- Continue to provide all students and staff with equitable access to educational technology and with the opportunity to use and telecommunications as a resource and reference tool by accessing the Internet;
- Renew memberships in the Distance Learning video conferencing consortiums found to offer appropriate opportunities for instructional enhancement;

- Continue to inform parents of the use of technology in their child's education through the weekly "Crest Wave" newsletter, the district's annual Back-to-School Night, and other appropriate opportunities;
- Review the Three-Year Technology Plan with the technology committee;
- Review district technology policies, such as the Acceptable Use Policy (AUP), for network and Internet use, copyright, ethics, and network publishing to address the ethical implications of informational technology and their appropriate use by students, staff, and library patrons;

- Explore expansion of the District's community education program, with a particular emphasis on technology access, technology education, and adult literacy, in cooperation with local agencies engaged in similar projects;
- Review and update the district web page to increase communications with parents and the community;
- Review the Three-Year Technology Plan.

Funding Plan

This Funding Plan is based on the assumption that the student enrollment at the Crest Memorial School will continue to be steady over the three years of this plan.

Each year a consistent level of funding will be utilized to maintain, and enhance, the hardware and infrastructure of the District's technology base. Additionally, electronic resources, such as magazines, research databases, supplemental instructional materials, etc. will be purchased and utilized as appropriate, with funding coming from areas that previously purchased text based materials (i.e. use the funds that used to be spent on hard bound encyclopedias on on-line databases).

Funds will be used for software upgrades, technical assistance, and staff training and development. When, and where, appropriate grant money will be used to fund training and staff development.

Additional funding will be sought through competitive grants (such as the Bell Atlantic / NJASSA grants, E-Rate, equipment manufacturer grants, federal grants, and private grant sources). Federal entitlement grant applications will, where possible, be structured to include funding for technology-based expenses.

Also, federal and state programs designed to assist students in gaining access to technology will be pursued as the funds become available.

Because the District is a "minimum aid district" (sustaining their operations from nearly 90 percent local funding) the bulk of technology funding will be from local sources. To help defray the local costs, the District will continue to explore use of E-Rate funding, and will continue to participate in Verizon's "NJ Access" program to obtain discounted telecommunications services.

Based upon the District's FY05 total operating budget of 5.5 million dollars the approximate percentage spent on technology (staffing, professional development, support, software, supplies, etc.) is about 1 per cent. This level of expenditure has been stable for several years and has been adequate to maintain the level of technology utilization the District feels is appropriate, and they believe it will be adequate for the duration of this plan.

Currently, the District funds hardware upgrades in the amount of approximately $25,000 per year, and software upgrades in the amount of approximately $5,000 per year. The District anticipates maintaining this level of funding over the duration of this plan.

Professional Development

There is a long term, sustainable plan for continued training in professional development with regard to Educational Technology. The goal of this area is to ensure that teachers, administrators, and staff will acquire the skills necessary to effectively manage the Educational Technology learning model promoted in the District's Mission Statement and Vision Statement as a model of the use of technology in learning and teaching.

The District continues to focus on staff development programs to promote the acquisition of skills necessary to improve instruction. Additionally, the current staff development program will be expanded as necessary to assist teachers in the development of the necessary skills for the infusion and integration of technology into the curriculum, while promoting an engaging learning environment.

Currently, the entire staff of the District has been in serviced on the use and implementation of computer technology. Each year the District dedicates one of it's in-service days to the proper use of technology for enhancing instruction. Continued training – in-house and out-of-district – is anticipated for teachers and staff throughout the life of this plan.

The District will continue to explore the offerings of the Educational Technology Training Center (ETTC) and use those seminars and workshops appropriate to the District's needs. Additional training and professional development opportunities using the video conferencing equipment will be explored.

Teachers do, and will continue, to have access to current educational technology in each classroom. Each classroom has a minimum of four multi-media computers, all of which have Internet access. Each classroom has one computer connected to a large screen television so that computer materials may be projected for viewing by the entire class. Digital cameras and digital video cameras are available for use by teachers. Laptops are utilized where appropriate, including a mobile Smartboard/ whiteboard system for utilization in any classroom. Use of PDAs and other data devices in anticipated with the implementation of a new science curriculum.

In-service opportunities have been held, and will continue to be held, on in-service days on the use of technology in instruction, email, Smartboards/ whiteboards, etc.

Each year, through paid additional work, teachers analyze areas of the curriculum as part of an on-going curriculum review and realignment. During that process areas are explored and identified for appropriate infusion of technology. Such findings and recommendations will be analyzed relative to current research to validate the utilization of the resources in these areas, especially as they relate to the Core Curriculum Standards. Additionally, research is used to support the direction and recommendations for the utilization of technology in the curriculum. Professional development opportunities at national, state level, and local conferences provide opportunities for professional staff

members to gain research based insights into new methodologies. Also, the media center has a professional section with numerous professional journals and magazines for staff members to utilize in assessing new methods and ideas.

Surveys of the staff will be utilized, when appropriate, to determine the staff's level of proficiency and growth in several technology areas.

Administrators will also be surveyed to assess their proficiency in the use of technology as it relates to their duties and responsibilities. Appropriate infusion of technology will continue in administrative areas. Administrators will participate in in-service opportunities with the staff when appropriate. Also, administrative personnel will continue to attend conferences and workshops (such as Techspo, NJSBA Annual Conference, etc.) and engage in continued professional development.

In the most recent assessment of staff proficiency with technology 30% of the instructional staff were found to be at the "Beginner" level, 45% were determined to be "Intermediate", 15% were determined to be "Advanced", and 10% were identified as being at the "Instructor Level". Over the next three years the District hopes to increase the Intermediate level to 70%, and the Advanced level to 20%. The Media Specialist is highly proficient in the use of the Follet Circulation Plus system and related components, the EBSCOHost on-line system, and the go.groliers.com on-line database system. The District may use, but not be limited to, the following resources for staff development, training, and technical assistance:

College and university courses;
The ETTC;
In-house staff;
State and national conferences;
The annual New Jersey Techspo Conference;
Outside consultants;
Teachers from other districts with demonstrated expertise in specific areas;
Satellite based training;
Contracted vendors.

Teachers will also promote technology integration into the curriculum based on research available from, but not limited to, the following sources: National Education Technology Standards for Students, North Central Regional Educational Laboratory Studies on Technology Education (www.ncrel.org/sdrs/areas/teccont.htm) , Pathways to School Improvement, Educational Resources Information Center, Research For Better Schools (www.rbs.org), International Society for Technology in Education (ISTE).

Through the use of survey instruments staff in the district have asked for additional training in the use of portable technology hardware (smartboard/ whiteboard); development of training in electronic data collection devices (such as probes, PDAs, etc.); digital cameras; and software related to their use. They have also asked for additional training in Internet search methodologies. Though teachers have been using, and teaching, PowerPoint for several years they have expressed an interest in expanding their knowledge of its capabilities.

A barrier to these opportunities may be funding and time constraints. The District is not able to fund an full-time instructional technology specialist who would work solely to train and reinforce staff members in the use of technology, therefore most of that work will need to be done at workshops on in-service days.

Over the next three years staff will continue to work toward fully integrating effective, and appropriate, use of technology as a means of delivering instructional materials and opportunities. Staff will focus on:

- Management of shared folders and files;
- Development of on-line resources through the Intranet or Internet;
- Revision and enhancement of curriculum to maximize appropriate use of technology;
- Developing mastery of peripheral equipment such as digital cameras and scanners for the enhancement of instruction;
- Learning and developing an ability to properly utilize portable digital devices for data collection and input (probes, PDAs, etc.)
- Utilization of appropriate video streaming into presentations;
- Awareness and reinforcement an understanding of the ethical implications of digital technology, including Acceptable Use Policies, copyright issues, and publishing student work.

VII. EVALUATION PLAN

Reviewing The Plan:

The District will review this Plan at least once a year. Ideally, this review will occur during January of each year so that any changes or recommendations may be reviewed, investigated, and implemented as appropriate prior to the Board's Annual Reorganization at which time this Plan will be adopted each year. As other needs and suggestions arise, from the State or County technology advisors, for example, those changes may also be included for review in January by the Technology Oversight Group. It should be clear, however, that any revision or change that is deemed necessary and appropriate for the instructional integrity of the school may be implemented immediately, without review of the Oversight Group, but in keeping with District Policy.

Each year, prior to the adoption of the plan at the Annual Reorganization Meeting, the District committee charged maintaining the integrity of the Technology Plan will meet and review the past year's success in attaining the goals set the prior year. Adjustments and revisions to the following year's goals will be made at this time.

To conduct this assessment, the committee may review the following:

Collect feedback from all staff and stakeholders (formal and/or informal) with regard to the effectiveness of the technology infusion and professional development. A District developed and standardized assessment instrument will be used in each of the years of this plan;

Report and discuss the results of the surveys and assessments as measured against the goals and implementation plans to determine the progress of the Plan;

As part of the on-going evaluation process, the District will determine the Critical Success Factors of their Educational Technology implementation. This process will determine those factors which are critical to the attainment of the Plan, those things which are useful to the plan, but not critical, and those things which would simply be nice to attain, but which are not critical to the Plan. Each year the Committee will review the successes and failures of the Plan in light of these three categories.

Student success at achieving State mandated goals, with particular emphasis on Core Curriculum Standards, will be evaluated with the assistance of the appropriate District staff members. This evaluation will be used to determine the success of the plan in enhancing education using the technology component. Appropriate adjustments, if necessary, may be recommended.

The Committee will communicate to all of the stakeholders the goals, objectives, and Critical Success Factors of the Plan, and the annual level of success in attaining those identified factors. The Board of Education will accept the plan each year.

County: Cape May **District/ Charter School:** Wildwood Crest

Print Superintendent's/ Lead Person's Name: Dennis J. Anderson, Superintendent

Superintendent's/ lead Person's Signature: _____

Phone number: 609-729-3760 Email: danderson@crestmem.edu

Please indicate below the person to contact for questions regarding this technology plan:

Print name & Title: Gregory S. Rohrman, Business Administrator/ Board Secretary

Signature: _____

Phone number: 609-729-9312 Email: grohrman@crestmem.edu

Review Approvals by the County Coordinating Councils for Distance Learning and Technology:

Print Name & Title: _____ Date: _____

Signature: _____

Print Name & Title: _____ Date: _____

Signature: _____

Print Name & Title: _____ Date: _____

Signature: _____

New Jersey Department of Education
Office of Educational and Informational Technology
Technology Plan Checklist for NJ School Districts/Charter Schools
July 1, 2004 through June 30, 2007

Local District Technology Plan Procedure

New Jersey Department of Education
www.state.nj.us/education

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County: Cape May **School District/Charter School:** Wildwood Crest Board of Education

Grade levels: Pre-K to 8 **Date approved by District Board of Ed/or Trustees:** **March 16, 2004**

District/Charter School web site address: http://crest.capemayschools.com

Is the District/Charter School compliant with the Children's Internet Protection Act (CIPA)? (y/n) Y

Indicate in the first column the page numbers where the item in the second column can be found in the technology plan.

Page		NCLB	E-RATE
3	**I. EXECUTIVE SUMMARY** *Include a vision or mission statement*	X	
5 Appendix	**II. TECHNOLOGY INVENTORY** A. *Attach a copy of the 2003 NJDOE School Technology Survey for each school in the district or for the Charter School.*	X	
5 – 10	B. *Describe the District/Charter School's technology inventory needed to improve student academic achievement through 2007 including, but not limited to:* i. *Technology equipment and networking capacity* ii. *Software used for curricular support and filtering* iii. *Technology maintenance policy and plans* iv. *Telecommunications services* v. *Technical support* vi. *Facilities infrastructure*	X	

	vii. *Other services*		
10	C. *Include a plan for replacing obsolete computers/technology; include your District's/Charter School's criteria for obsolescence.*		
11	**III. THREE-YEAR GOALS AND OBJECTIVES** *Describe the specific goals and objectives for using technology to improve student academic achievement aligned with NJ Core Curriculum Content Standards, include goals and objectives for integrating technology (including software and other electronically delivered learning materials) into curricula and instruction. Also include a timeline for such integration.*		
15, 20	**IV. THREE-YEAR IMPLEMENTATION STRATEGIES/ACTIVITY TABLES (July 2004 – June 2007)** *Describe the implementation strategies and activities that relate to the District/Charter School's goals and objectives. Include strategies and activities that address the following:* B. *how all students will acquire information technology literacy skills;*		
16, 20	C. *how all students regardless of gender, race, national origin, special need and religious affiliation have equitable access to educational technology;*		
20	D. *how are resources/services/activities coordinated and shared with projects that are funded from federal, state and local sources;*		
20	E. *how are innovative strategies supported and developed for use in the instructional classroom (such as using distance learning for those areas that would not otherwise have access to such courses and curricula due to geographical isolation or insufficient resources);*		

21	F. *how effective use of technology will promote parental involvement and increase communication with parents, including a description of how parents will be informed of the technology being applied in their child's education so that the parents are able to reinforce at home the instruction their child receives at school, and*		
21	G. *how programs will be developed, where applicable, in collaboration with Adult Literacy service providers.*		
24	**V. FUNDING PLAN (July 2004 – June 2007)** *Describe a spending plan that includes:* A. *the supporting resources that include services, other electronically delivered learning materials and print resources that will be acquired to ensure successful and effective uses of technology;*		
24	B. *the projected costs of technologies to be acquired and expenses such as hardware/software, digital curricula, upgrades and other services that will be needed to achieve the goals of this plan, including specific provisions for interoperability among components of such technologies;*		
24	C. *the federal, state, local and other sources of funds used to help ensure that students have access to technology, and*		
24	D. *the federal, state, local and other sources of funds used to help ensure that teachers are prepared to integrate technology effectively into curricula and instruction.*		
25	**VI. PROFESSIONAL DEVELOPMENT** *Describe the professional development activities for teachers, administrators, and school library media personnel that include:* A. *how teachers have access to educational technology in their instructional areas (such as using desktops, mobile laptop and wireless units, PDAs);*		

26	B. *the process to identify and modify the core curriculum content area to support the infusion of technology;*		
26	C. *how relevant research is used to integrate technology into curricula and instruction, to improve student academic achievement, as measured by New Jersey's Core Curriculum Content Standards;*		
26	D. *how ongoing, sustained professional development for all administrators is provided to further the effective use of technology in the classroom or library media center.*		
26	E. *Provide a summary of teacher and library media personnel proficiency in the use of technology within the District/Charter School.*		
26	F. *What professional development needs and barriers have been identified in the District/Charter School as it relates to using technology as part of instruction?*		
27	G. *Based on teacher and library media personnel proficiency and the needs in the District/Charter School for professional development, list and describe ongoing, sustained, high-quality professional development opportunities planned for 2004-2007 include the involvement of all partners associated with professional development in the District/Charter School.*		
28	**VII. EVALUATION PLAN** *Describe the process and accountability measures that are used to regularly evaluate the extent to which goals, objectives, activities, resources and services are effective in integrating technology into curricula and instruction, students meeting challenging state academic standards, and developing life-long learning skills.*		

QUESTIONS?

CHECK "FREQUENTLY ASKED QUESTIONS" (FAQ) ON THE NJDOE WEB SITE -
http://www.nj.gov/njded/techno/localtech/faq.htm

County: Cape May **District/Charter School:** Wildwood Crest Board of Education

Print Superintendent's/Lead Person's name: Dennis J. Anderson, Superintendent

Superintendent's/Lead Person's Signature: _____

Phone number: 609-729-3760 E-mail: danderson@crestmem.edu

Please indicate below the person to contact for questions regarding this technology plan:

Print name & Title: Gregory S. Rohrman, Business Administrator

Signature: _____

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Review Approvals by the County Coordinating Councils for Distance Learning and Technology:

Print Name & Title: _____

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