4-24-2003

Analysis of instructional technology in the Runnemede school district

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ANALYSIS OF INSTRUCTIONAL TECHNOLOGY IN THE RUNNEMEDE SCHOOL DISTRICT

by
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A Thesis

Submitted in partial fulfillment of the requirement of the Masters of Arts Degree
of
The Graduate School
at
Rowan University
(April 9, 2003)

Approved by_____
Professor

Date Approved April 24, 2003

Abstract

Gentile, David N. — Analysis of Instructional Technology in the Runnemede School District, 2002-2003.
Robert Kern, Ed. D.
School Administration

The purpose of this study was to describe and evaluate the effectiveness of technology as a tool of instructional delivery. The results informed teachers, administrators, and board members of their current technology status and served in the development of future goals. The goal of the study was to survey the professional teaching staff to gather input and create a focus group to analyze the results.

The Intern surveyed the professional teaching staff at the Volz Middle School to assess how technology was being used to deliver instruction in the Runnemede Public School District. The Intern interviewed a focus group to solicit their reactions to the findings of the survey. There were several discrepancies between the TAGLIT survey results and the focus group's responses.

The Runnemede Public School District has made significant overall gains in the development of its technology program. To address the areas needing improvement, specifically participation in technology professional development workshops, the Intern suggested conducting a professional development survey. To improve communication, the Intern recommended that the technology planning committee conduct articulation meetings with fellow staff members and the community. Further, the researcher suggested the creation of a technology news bulletin to facilitate better communication.

Mini-Abstract

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Acknowledgments

I would like to thank the professional staff members of the Runnemede Public School District for providing the educational setting for my internship. The staff's patience, understanding, and time were key components to my success. Runnemede's team atmosphere inspired cooperation to improve the educational environment.

I would like to express my gratitude to the Superintendent of Schools, Mr. Joseph Sweeney for his guidance. I want to thank my field mentor, Mr. Michael Kozak, for sharing his knowledge and experience. Mrs. Sue Milon provided essential support and assistance. Dr. Robert Kern's attention to detail was extremely helpful. His practical knowledge bridged the gap between theory and reality.

I must thank my sister, Dr. Kristie Wentzel, for serving as my editor. I could not have completed the thesis without her assistance. Finally, a loving acknowledgement to my wife, Kristie, for her patience and support during the long hours spent pursuing my graduate goals.

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Chapter 1

Introduction

Focus of the Study

The Intern wanted to understand how technology was being utilized to deliver instruction within the district. The Runnemede Public School System is committed to remaining current in the area of technology. This commitment demanded that they examine how technology was being used successfully to deliver instruction and remove equipment that was no longer applicable to the needs of the district. The Intern gathered data about how technology was being used to deliver instruction and the staff's comfort level in doing so. This project contributed to the development of the district's technology plan. It also identified areas for professional development needed in instructional technology for the teaching staff at the Volz Middle School.

Purpose of the Study

The purpose of this study was to describe and evaluate the effectiveness of technology as a tool of instructional delivery. The results informed teachers, administrators, and board members of their current technology status and served in the development of future goals. The goal of the study was to survey the professional teaching staff to gather input and create a focus group to analyze the results. The district will use the findings to allocate resources more effectively.

Definitions

Technology: Electronic or digital products and systems considered as a group.

Instruction: Anything that is intended to foster human learning or development.

Project participants: Vested individuals within the Runnemede School System.

Factor group: The District Factor Group (DFG) is an indicator of the socioeconomic status of citizens in each district and has been useful for the comparative reporting of test results from New Jersey's statewide testing programs. The measure was first developed in 1974 using demographic variables from the 1970 United States Census. "A" is the lowest on the scale.

Sending district: Runnemede Public School System sends 8th grade graduates to Triton Regional High School.

Instructional technology techniques: Methods for using technology to deliver instruction.

Transforming technology instruction: Going beyond simply using technology to support current teaching methodologies. Using teaching methods that support technology instruction.

Learning focused paradigm: Educational systems that focus on what is being learned.

Limitations

The boundaries of the project limited the ability to generalize any results beyond The Runnemede School District Volz Middle School. The size of the sample was small and caution should be exercised when generalizing the results beyond the project participants. The techniques for gathering data were limited to a survey of the teaching staff at the Volz Middle School in the Runnemede School District.

Setting of the Study

The study took place in the Runnemede Public School System. The Mary Volz Middle School was the primary source of data. Mr. Michael Kozak, middle school principal, served as the Intern's mentor and Dr. Robert Kern served as the Intern's advisor. Ms. Marie Gallagher, elementary school principal, along with the superintendent, Mr. Joseph Sweeney, provided key guidance and knowledge to the Intern.

The community has evolved over the past 350 years from an Indian village to a quiet residential community. According to the 2000 Census Profile, the total population of the borough was 8,533 people. The median household income (dollars) was 41,126. The racial make-up, and educational attainment of the adult community are reflected in Tables 1 and 2.

Table 1
The Racial Breakdown of the Population

Ethnic Group	Total Number	Percent of Population
White	7,831	91.8%
African American	321	3.8%
American Indian	9	0.1%
Asian	132	1.5%
Native Hawaiian	1	--

Table 2
The Educational Attainment of the Population 25 Years and Over (5,803)

Grade Level Attainment	Percent
Less than 9th grade	5.5%
9th to 12th grade, no diploma	15.9%
High school graduate (includes equivalency)	46.2%
Some college, no degree	14.7%
Associate degree	5.2%
Bachelor's degree	9.2%
Graduate or professional degree	3.4%

According to the New Jersey Department of Education School Report Card the administrator and faculty academic degrees are reflected in Table 3:

Table 3
Academic Degrees of Administration and Faculty in 2000-01

Degree	Percent
BA/BS	78%
MA/MS	22%
PhD/EdD	0%

The district is a Factor Group B, the second lowest socioeconomic group according to District Factor Grouping. The school budget has been passed three out of the last six years. The school system contains two elementary schools and a middle school. It is a sending district; students attend Triton High School following 8th grade graduation. According to the Runnemede Public School's monthly enrollment report, the total number of students enrolled as of September 2002 was 776. The racial breakdown of the student population is outlined on Table 4.

Table 4

Racial Breakdown of Student Population

Ethnic Group	Total Number
White	698
Asian	15
African American	31
Hispanic	30
American Indian	2

According to the New Jersey Department of Education School Report Card for the 2001-02 school year, the middle school had an average class size of 21.8. The student to faculty ratio is 11.6:1. The student to computer ratio is 2.4:1, well below the state average of 5.2:1. The faculty to computer ratio is 1:1. The number of eighth grade students scoring in the advanced proficiency range on the GEPA increased in every category last year. Ninety-four percent of eight grade students scored in the proficient or advance proficient levels in the language arts section. Ninety percent of eighth grade students scored in the proficient or advanced proficient range in science. The math objective of 75% of eighth grade students achieving proficient or advanced proficient levels by 2002 was achieved. There was a 50% reduction in discipline referrals.

Organization of the Study

Chapter 1 was to inform the reader of the intentions and goals of the study. It served to outline the demographics of the community in which the study was conducted. The topics of the remainder of the paper follow:

Chapter 2: Review of the Literature

Chapter 3: The Design of the Study

Chapter 4: Presentation of the Research Findings

Chapter 5: Conclusions, Implications and Further Study

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Chapter 2

Review of Literature

Introduction

The educational leaders of the Runnemede School District have continued to review and revise their instructional technology techniques. The challenge of defining the best roles and functions for technology in education is hardly new, according to Kathleen Fulton, former Project Director of the Web-Based Education Commission. The mission of the Web-Based Education Commission is to recommend actions to help ensure that all learners have full and equal access to the capabilities of the World Wide Web, and to ensure that online content and learning strategies are affordable and meet the highest standards of educational quality. Fulton, an educational technology consultant, states that researchers, developers, and practitioners have been trying to formulate the most effective roles for educational technology since the mid-1960's (Fulton, 2002).

When a new technology is introduced in any field of practice, it is typically used to support the prevailing methods in that field. In the field of education, technology is often used in this manner. Educators simply use the technology to support the methods of instruction already in place. Gradually, over time, people recognize that it can be used to create methods that were previously not feasible. Reugeluth and Joseph suggest that there would be greater value if we invested in finding ways that technology can transform the way we teach and in methodologies that were not available before (Reugeluth & Joseph,

2002). The Intern was interested in analyzing methodologies of technology instruction and the beliefs surrounding them within the school district.

Society is undergoing massive changes that are creating new educational needs and new educational tools. These changes both require and enable a new, learning focused paradigm of education that holds promise for a quantum improvement in meeting the new needs of learners for the information age (Reugeluth & Joseph, 2002). These changes highlight the need for us to go beyond simply using technology to support current teaching methodologies to creating new applications to match the needs of each district.

An educated person must be able to acquire information from many sources in many forms such as text, images, audio, video, and info-graphics (Dwyer, 2002). Students must be familiarized with technology to accomplish such a goal. We must use technology to redefine our notion of basic skills, from reading, writing, and arithmetic to an expanded notion of literacy and numeracy. For this to happen, teachers must raise their level of competency with the use of technology in instruction throughout the curriculum because they drive change at the classroom level most effectively (Fulton & Honey, 2002). The Intern believed that a priority list of technology professional development needs would allow educators to make better use of available resources. In particular, professional development designed to meet the specific needs of our district would help raise the level of teacher competency.

In A Vision of Education in the Year 2010, the authors described how a day in the life of an average student would be. It began with a student entering a Learning Center facility and going directly to her personal information panel. After checking in, the

student was prompted to attach her electronic notebooks to upload homework from the prior night and transmit any communication from her parents (Smith & Shelly, 2002). The article continued to describe a scene from what appeared to be a science fiction movie. The traditional school buildings were downsized and there was no longer a need to accommodate more students. The student spent the majority of her time in the field collecting and transmitting data to a learning facilitator. This is an extreme perspective; nonetheless technology instruction is here to stay. It is ever changing and evolving and so must the educational leaders if they wish to provide the quality education the students of tomorrow demand.

New arguments over how far technology can go in education are currently on the rise. Implementing new technology must be done cautiously. A conflict in a Connecticut school district over the use of computers to provide high school courses raised new debate about whether technology can replace teachers (Trotter, 2002). Teachers in the school district were given no meaningful role in the planning and supervising of a special remedial program in which instruction was provided entirely by computer. They contended the program violated a state mandate that a certified teacher be responsible for instruction, evaluation, and grading of students. In this situation, the technology was the sole educator. This case remains in litigation. Regardless of the results, educators must address the issue. If teachers are expected to implement a new technology program such as this, then they should be given a chance to provide input in its planning. This school district did not assess the needs of the district prior to using the program. Once they realized that certified teachers must assign grades, they asked the teaching staff for cooperation. The staff did not support the request because they perceived their

participation and input as an afterthought (Trotter, 2002). If school districts wish to successfully implement new technology, they must gain the support of those who are responsible for the instruction. The educational leaders must assess the needs of their districts and allow teachers to be part of the process if they wish to design professional development plans that will have teacher support.

Advances in technology have changed virtually every aspect of our lives and now influence how educators learn and instruct (Killion, 2002). Teachers and administrators have opportunities to participate in multiple professional and personal learning experiences as a result of these advances. Unfortunately, these opportunities alone do not guarantee successful professional development (Killion, 2002). Simply stated, not all teachers need the same professional development. Administrators must match teachers' strengths and weaknesses with development opportunities that will best help the individual. The Intern believed an assessment of Runnemede's strengths and weaknesses in the area of technology would help match future professional development opportunities with goals specific to the district.

Getting teachers to use technology requires showing them how to use it with their own curriculum (Anderson, 2002). District officials at the Brooklyn and Staten Island Office of the Superintendent concluded, after reviewing the current research and talking with tech-savvy teachers, administrators, and instructional specialists, that its teachers would most benefit from professional development specific to their curriculum. The educational leaders began by assessing the technology needs of the district. They developed a series of professional learning experiences called the HyperTeaching Series

that would give teachers the skills and models to use technology in their classrooms as a tool with existing curricula (Anderson, 2002).

The Intern believed this research to provide key insight into where some professional development plans go astray. If the development does not match the needs of the district then the technology will not be properly used. To be effective and help teachers integrate technology into existing curricula, technology training must shift away from the tradition of teaching software applications and move toward a model in which teachers see how technology can be part of their own classrooms (Anderson, 2002). A needs assessment can be used to customize professional development directly to the strengths and weaknesses of each district.

Professional development is most often successful when districts identify their specific needs. The plans are designed to improve upon specific weaknesses and raise the quality of education for the students (McKenzie, 2002). The literature reviewed highlights two key areas of importance when planning professional development. First, teachers must be allowed to provide input. Second, professional development must be designed to meet the specific needs of each district.

Another element of creating a successful development plan is the school culture. Existing personalities must be considered when creating development plans and goals must be clearly articulated so participants know what they are supposed to do with the technology. We can learn as much from examining professional development projects that fail as from those that succeed (Goldenberg & Outsen, 2002). A project conducted at New York University's School of Education is an example of how a professional technology plan commitment is not enough to ensure success. Five dedicated teachers

from separate school districts volunteered to learn and work with each other electronically. The project provided insight into how underlying attitudes, existing relationships, and technology know-how all factored into the challenge they faced. In contrast to the Hyperteaching Series, this study did not begin with an assessment of the needs of the participants, but with a technology opportunity.

Electronic communication is often touted as the solution to professional development issues (Goldenberg & Outsen, 2002). "Anytime, anywhere learning" goes the saying (U.S. Department of Education, 2000). The New York University's professional development goal was to develop an electronic learning community that would foster professional development using technology to promote meaningful communication. This project illustrates the use of technology for technology's sake.

It was apparent the project was not meeting its objective. Though the teachers were given laptop computers and a brief in-service on how to send email, the project leaders soon discovered several problems with the project design. The participants began enthusiastically, yet there was little to no electronic communication occurring in the project. Discussion topics and/or deadlines were not given. Many of the participants expressed frustration at the lack of computer peripherals. For example, emails could not be printed, which would have compensated for the small screens that made reading difficult. Many of the participants used public transportation and did not feel comfortable bringing the computers on the train. In addition to the equipment issues, the project coordinators discovered that the participants were reluctant to write to people they had never met face-to-face. Furthermore, the participants all talked regularly with coworkers about professional needs at their own schools, thus decreasing the need for electronic

communication with participants outside their districts. These factors combined to make this electronic professional goal unsuccessful. This project illustrates the complexity of the professional development process. Although the participants volunteered for professional development, we are again made aware that unless the needs are assessed first, professional development will likely be unsuccessful.

Beyond Toolishness is an article that provides an example of professional development where teachers have been involved in targeting their professional development needs. It outlines one district's ability to engage all teachers in an inviting and generative adult learning journey (McKenzie, 2002). The key term is "generative," meaning that behaviors and daily practices will be changed for the better as a consequence of professional development experiences. Such change does not result from simple software training. The adult learning must be curriculum-rich and clearly focused on enhancing student performance (McKenzie, 2002). This kind of professional development recognizes the need to have clear objectives and reasonable time frames in which to accomplish these goals. Successful professional development and use of technology takes time. As it was obvious with the New York University project, a district cannot simply purchase and use technology for technology's sake.

A continuous improvement process should be implemented to assure a district is current in the field of technology. The district should analyze the effectiveness of the methodologies and revise inferior technology instruction techniques on a regular basis. According to McKenzie, there is far too little assessment being done to guide professional development. Most districts do not know the level of development already achieved by staff, let alone their preferences, styles, fears, and passions. A thoughtful

assessment strategy helps to identify offerings that stand a chance of matching preferences, and then assessment makes it possible to steer a program forward (2002). The Intern aspired to assess the Runnemede School District's needs so future resources could be better used to meet them.

In the current study, teachers were questioned through a survey designed to capture their beliefs about technology strengths and weaknesses in the district. The Intern organized a focus group to assess the findings and make recommendations as to where the available resources could be best spent in the district. The Intern assessed the methodologies of technology instruction being used by the teachers in the Runnemede Public School System to better plan professional development that targets the weaknesses of the district.

The Intern's mentor, Mr. Michael Kozak, recommended using TAGLIT to assess Runnemede's technology strengths and weaknesses. TAGLIT, *Taking A Good Look at Instructional Technology*, is a web-based technology planning tool designed to help principals and other school leaders gather, analyze, and report information about how technology is used for teaching and learning in their schools. TAGLIT is supported by NJ Elite, a resource for professional development for NJ educators (NJ Elite, 2002). TAGLIT is supported by other states such as Florida. The Florida Leaders.net also supports the use of TAGLIT. Florida Leaders.net is an interactive professional network of school leaders using technology to communicate, collaborate, solve problems, and share innovative ideas designed to improve student performance in Florida's school systems.

TAGLIT was originally designed and used throughout North Carolina's school systems. TAGLIT provides a free online resource that contains extensive information

about technology use in schools. It aids educational leaders in organizing information to determine strengths and weaknesses. It provides school leaders with access to a comprehensive technology snapshot based on input from professional staff members and students to guide whole systems change through technology integration. It provides statistical and narrative summaries for data driven decisions. Information is collected on planning, budget, policies, resources, technical and instructional support, teacher and student skills, classroom use, and community involvement (Gates Foundation, 2002).

The intern analyzed the results of the TAGLIT survey and shared a summary of the most pronounced needs in instructional technology to a focus group of teachers and administrators. The panel was comprised of the technology teacher, the media specialist, the school superintendent, and the school principal. The focus group examined the findings and made recommendations as to where future professional development resources should be used.

Chapter 3

Design of the Study

General Description of the Research Design

The Intern surveyed the professional teaching staff at Volz Middle School to determine how technologies were being used to deliver instruction and to gain insight of the district's technology status. The data gathered gave valuable insight into how the professional teaching staff, administration, and students viewed technology at the Volz Middle School.

The Intern and school principal discussed this research plan June 2002. The principal wanted to use an administrative software design, TAGLIT, *Taking a Good Look at Instructional Technology*, TAGLIT is an administrative software program designed to provide school leaders with information about the current status of instructional technology use at their school. The questionnaire items are shown in Appendix A. TAGLIT was designed originally for use by North Carolina educators participating in their Principals Executive Program and was web-enabled by SAS Institute Inc., with support from the Bill and Melinda Gates Foundation. Its purpose is to gauge the staffs' use of technology instruction.

Development and Design of the Research Instrumentation

The TAGLIT survey was designed to gather information about how leaders, teachers and students view technology within their district. It is organized in five sections: Plan, Teachers, Students, Community, and Stuff. The five sections individually addressed the following:

1. The Plan section addressed technology planning, policies, and expenditures.

2. The Teachers section addressed teachers' technology skills, teachers' technology use in teaching and learning, technology-related professional development, and technology-related instructional support.
3. The Students section addressed students' technology skills, students' frequency of technology use for learning, and students' and teachers' perspectives about how technology affects their classroom environment.
4. The Community section addressed technology-related community connections.
5. The Stuff section addressed hardware, software, electronic/online resources, and technology support.

The administrative software, TAGLIT, organized the data gathered from the survey and delivered the scored results of the survey in a listing. The aspects of Runnemede's instructional technology program were scored on a 4-point scale. A low score suggested the participants viewed that aspect of our technology development to be underdeveloped. TAGLIT defined the stages of development as follows:

1 = Embarking: The school is just getting started with this aspect of technology for teaching and learning.

2 = Progressing: The school is making some effort and showing some progress with this aspect of using technology for teaching and learning.

3 = Emerging: The school is making considerable effort and showing considerable progress with this aspect of using technology for teaching and learning.

4 = Transforming: The school's use of technology is transforming the way teaching and learning take place.

The Intern used TAGLIT's Embarking and Progressing scores as indicators that an area was weak. Emerging or Transforming scores were used as indicators that an area was strong. Runnemede leaders desire to be either emerging or transforming in the area of technology instruction.

Description of the Sampling and Sampling Techniques

This study utilized a survey design and a focus group to investigate the use of technology in helping students learn. The Volz Middle School Teaching Staff completed the survey during a mandatory staff meeting. The Intern explained the importance of the survey with regards to this research project. The population targeted for this research was the professional teaching staff in the Runnemede Public School System's Volz Middle School. The participants sampled in the study were 33 middle school teachers and two administrators from the Volz Middle School. Additionally two teachers were randomly selected to have their homerooms participate in the survey to provide student data (Appendix A, Table 3). One hundred percent participation was achieved for students. The total number of student participants was 44. The students ranged from grade 6 to grade 8.

Description of Data Collection Approach

During a mandatory faculty meeting, the staff at Volz Middle School completed an online survey provided by TAGLIT. The Intern analyzed the results from this survey into categories of strengths and weaknesses based on the District's Technology Goals. The Intern then presented the findings to a focus group, comprised of school

administrators and teachers. The focus group reviewed the findings and the technology plan.

The survey measured five areas. The Plan section addressed technology planning, policies, and expenditures. The Teachers section addressed teachers' technology skills, teachers' technology use in teaching and learning, technology-related professional development, and technology-related instructional support. The Students section addressed students' technology skills, students' frequency of technology use for learning, and students' and teachers' perspectives about how technology affects their classroom environment. The Community section addressed technology-related community connections. The Stuff section addressed hardware, software, and electronic/online resources, and technology support.

Description of the Data Analysis Plan

The survey results provided by TAGLIT were reviewed and organized by the Intern into two categories: strengths and weaknesses. An area was considered "weak" if it received a score of less than 3. An area was considered "strong" if it received a score greater than 3. The information further provided insight into the strengths and areas that needed improvement within the district. The research findings were presented to the focus group. The panel used the findings to target future professional development plans and assist in the development of a technology plan by examining the areas of weakness.

Chapter 4

Presentation of Research Findings

Introduction

The results of the TAGLIT survey are presented next. The survey items and responses are included in Appendix A. Means scores were computed for each survey item and for each section. Response scores range from 1 to 4 and correspond to the following:

1 = Embarking: The school is just getting started with this aspect of technology for teaching and learning.

2 = Progressing: The school is making some effort and showing some progress with this aspect of using technology for teaching and learning.

3 = Emerging: The school is making considerable effort and showing considerable progress with this aspect of using technology for teaching and learning.

4 = Transforming: The school's use of technology is transforming the way teaching and learning take place.

In general, the results suggest that Runnemede School District is making some effort and showing some progress with the use of technology for teaching and learning. Several areas needing improvement, however, were also noted.

Averages for the Plan Section are shown in Table 1. Overall, the mean scores indicated several strengths. Specifically, the leaders responses suggested that the district reviewed literature and studied innovation to continuously improve the technology plan. Further, the school leaders strongly considered the equitability of student accessibility to

technology. They addressed facilities, infrastructure and standards to ensure high quality. The leaders believed that they clearly articulated a vision to the staff members. A number of areas of weakness also emerged. In particular, the teachers indicated that their feedback was not fully acknowledged. They had not reviewed the school technology plan, nor do they completely support the plan. The leaders acknowledged they did not fully involve stakeholders in the planning process.

Table 5
Technology Planning-Process, Document and Support

Section	Mean Score
1a.1-The Planning Process (Leaders)	3.4
1a.2-The Planning Document (Leaders)	3.3
1a.3-Teachers' Knowledge and Support for the Plan (Teachers)	2.3
1b.1-Technology Policies (Leaders)	3.6
1b.2-Technology Policies (Leaders)	3.6

Averages for the Teachers Section are shown in Table 2. Overall, the mean scores suggested numerous strengths. For instance, the teachers regularly use a word processor to create documents. They appeared comfortable with the use of email as a personal form of communication. They used a search engine to find information on the World Wide Web. The teachers also participated in online discussions to gather information. A number of areas of weakness also emerged. In particular, the teachers do not appear to use spreadsheets effectively. They are not using databases to assist in storing information and generating reports. The teachers appeared not to know how to use video production as a learning experience for students. The teachers appeared to be uncomfortable with the use of presentation software to enhance student learning. Furthermore, they are not using

web-authoring tools to create a web page and they are only in the early stages of using graphic organizer/systems thinking software to solve problems. The teachers appeared to be uncomfortable with the use of spreadsheets and database for enhancing the learning experience for students. Furthermore, the results suggested that teachers are not using email, online discussions, or the World Wide Web as communication tools with their students.

Table 6
Teachers' Technology Skills

Section	Mean Score
2a.1-Teachers' Basic Tools Skills (Teachers)	2.2
2a.2-Teachers' Multimedia Tools Skills (Teachers)	1.9
2a.3-Teachers' Communication Tools Skills (Teachers)	2.6
2a.4-Teachers' Research/Problem Solving Tools Skills (Teachers)	2.6
2b.1-Teachers' Basic Tools (Teachers' use with students)	2.0
2b.2-Teachers' Multimedia Tools (Teachers' use with students)	1.7
2b.3-Teachers' Communication Tools (Teachers' use with students)	1.7
2b.4-Teachers' Research/Problem Solving Tools (Teachers' use with students)	2.3

Averages for the Students Section are shown in Table 3. Overall, the mean scores suggested the following strengths: The students appeared to use drawing or painting software to create pictures. They use email to send and receive messages independently. They appeared to be able to use search engines to find information on the World Wide Web. The teachers suggested that the students are engaged in activities that require higher level thinking skills. Also, teachers appeared to assess student achievement based on products, progress and effort. A number of areas of weakness also emerged. In particular,

the students do not appear to know how to use video-editing software to edit a video. Furthermore, they do not know how to use probes to collect and study information.

Table 7
Students' Technology Skills

Section	Mean Score
3a.1-Students' Basic Tools (Students)	2.2
3a.2-Students' Multimedia Tools Skills (Students)	2.5
3a.3-Students' Communication Tools Skills (Students)	2.7
3a.4-Students' Research/Problem Solving Tools Skills (Students)	2.5
3b.1-Technology and the way the Classroom Works Teachers' Perspective	3.0
3b.2-Technology and the way the Classroom Works Students' Perspective	2.3

The mean score for the Community Section was 1.8. Only one area of strength emerged: The Leaders informed the community about school technology initiatives and their uses. Three areas of weakness also emerged. First, the Leaders do not invite the community to participate in the decision-making process as it relates to technology. Second, they do not make the technology resources and/or services available to the community. Third, they only somewhat develop mutually beneficial school-business partnerships.

The mean score for the Access Related to Goals Section was 2.0. No strengths were identified in this section. The teachers' responses suggested that access to computers, projection devices, digital cameras, and scanners needed improvement.

Descriptive statistics for the Ratio of Students to Computers and Other Devices are shown in Table 4. Overall, the ratio projection scores suggested numerous strengths.

In particular, a student ratio of 3 to1 is maintained in regard to access to instructional computers. Runnemede is, however, below the NJ State Average of 5.2 to1 (NJ School Report Card, 2002). Furthermore, equipment includes computers with CD-ROM drivers and sound cards, network-connected computers, and computers with Internet access. A number of areas of weakness also emerged. Specifically, the ratios of digital cameras, printers, projection devices, and scanners could all be improved.

Table 8
The Ratio of Students to Computers and Other Devices (Leader's Perspective)

Equipment	Students	Devices
all instructional computers	3	1
computers with CD-ROM driver and sound card	3	1
network-connected computers	3	1
computers with internet access	3	1
digital cameras	480	1
all instructional printers	160	1
network-connected printers	160	1
projection devices	240	1
scanners	160	1

The Access Related to Goals-Software Section average was 2.7. Overall, the mean score suggested the following strength: The teachers' access to basic tool software was adequate. A number of areas of weakness also emerged. In particular, access to multimedia, communication, research and problem solving, and curriculum-focused tools were only perceived as somewhat adequate.

Chapter 5

Conclusions, Implications, and Further Study

Introduction

The results of the TAGLIT survey of the Volz Middle School teachers were presented to a focus group comprised of the School Superintendent, the Volz Middle School Principal, the Technology Teacher, the Media Specialist, and three teachers. The Intern interviewed the focus group to solicit their reactions to the findings of the TAGLIT survey and to assess the implications on the Runnemede School District. The conclusions reached as a result of the interview, the implications of the study on organizational change, and the implications of the study on leadership skills follow.

Conclusions

The most pronounced weaknesses and strengths indicated by the TAGLIT survey results were presented to the focus group. The Intern used a list of interview questions to guide the discussion to determine the implications of the study on the Runnemede School District, Appendix B. The interview questions focused on the areas of weakness since this is where a need for improvement was indicated.

The focus group first addressed the survey results which indicated that the stakeholders were not involved with the planning process. The focus group participants explained that there is a committee of teachers serving on the technology planning committee who are deeply involved in the technology planning process. The committee is comprised of five teachers from each of the three schools, the technology teacher, the media specialist, and one community member. They felt that the teachers might not be aware that there are representatives who assist in the planning process. Furthermore, the

committee conducted a needs assessment of all district teachers during the current school year. Teachers also were requested to complete feedback sheets after every professional development opportunity, where they could suggest future professional development interests. The focus group suggested that the teachers might not always recall their input into the district technology plan. To address the discrepancy between the TAGLIT survey results and the focus panel response, the Intern suggests that the technology committee representatives engage staff members outside of the committee for a broader discussion on technology uses and needs. Also, the committee should distribute abbreviated minutes from each of their meetings to the staff and the community in a technology news bulletin.

The next area of weakness addressed was poor access to the technology plan. The focus group explained, however, that each building principal has a copy of the technology plan. According to the group, the technology plan is not a document that teachers have a desire to read. They believed it is more important to inform the teachers of the highlights and district goals as it pertains to technology. The group believed that the technology mission of the district was clearly articulated to the professional staff members. Again, such information could be reiterated and/or emphasized in a technology news bulletin to facilitate better communication.

The next area the focus group addressed pertained to policies. Specifically, discussion focused on the policy to mandate the assessment of teachers' technology competencies. The TAGLIT survey recorded a low response score to this question. The focus group explained that NJ provides an assessment tool to determine the proficiency of the professional teaching staff. The technology planning committee is required by the NJ Department of Education to rate the teaching staff's technology competencies each

year. However, this is not a direct assessment of teacher proficiency. The leaders also include a section to evaluate the professional staff members' use of technology and teaching in their Professional Improvement Plan that is based upon an annual portfolio assessment. The focus group believed the policies regarding technology assessment warrant no revision. The Intern, however, suggests communication pertaining to the technology assessment policy could be improved by providing teachers with the results of the assessment process.

The focus group then addressed the low scores in regard to the teachers' basic technology skills. The focus group believed that the low scores were not representative of the district. The mathematics and science teachers use spreadsheets, databases, graphing calculators, probes, and graphic organizers extensively with their students. The group suggested that there is not a need for all teachers to use such software. The focus group further suggested that the teachers utilize similar software in the district's grading system. *Making the Grade* uses spreadsheets and databases to assist in generating reports. The focus group also described numerous professional development opportunities provided after school in the Runnemede School District to enhance basic technology skills that had extremely low attendance. The focus group felt that there was a lack of desire by many individuals to attend such workshops. The Intern suggests conducting a professional development survey to better determine the cause of the low participation. This survey can explore factors such as topic, presenter, and time of day. Furthermore, future surveys could segregate data based on teachers' discipline to see if teachers' responses vary significantly from responses by teachers in other fields.

In regard to web-authoring tools, the group expressed that the cost of the licenses associated with such software is highly prohibitive. The focus group expressed an alternative plan to allow teachers to post a web-link on the school web page. This link will be easier to monitor for appropriate content. They described a plan, currently in the early stages, to have an Intranet system to improve administrative efficiency. One of the many benefits of an Intranet system, according to the focus group, is that access from outside parties would be blocked. Inappropriate materials such as pop-up advertisements would be filtered. Further, it would allow the administration and staff members an opportunity to communicate electronically, thus conserving paper.

Next, the group addressed the suggested need to develop a video-editing program. The focus group expressed their concern that the cost of such equipment would hinder the development of this program. They described how a few teachers have begun using simple video recorders with their students to create documentaries and presentations as a cost-effective alternative. The focus group expressed their desire to develop a more extensive video-production program to provide opportunities for the students. They explained that the cost, however, would be a major factor in the development of such a program. The Intern suggests the development of a business partnership to defer a portion of the cost of such equipment.

The focus group addressed the need to better involve the community members in the decision-making process. The focus group explained they have one community member who serves on the technology planning committee. To improve community involvement, the Intern suggests increasing the number of community representatives serving on the technology committee. The District does provide community members

with the opportunity to use school technology resources through outreach programs. For example, they provide a senior computer camp that offers instruction to local senior citizens. Additionally, the survey data suggested a need to improve business partnerships within the district. The focus group, however, explained that they have received computer equipment from local companies. One such company, Intel, recently donated forty-five computers to the district. NJ Elite provided the school district with a digital camera. Although this is commendable, given the needs of the district, more effort is needed to establish new partnerships. The focus group expressed their desire to continue developing new partnerships that would also be mutually beneficial. The Intern suggests that more publicity is needed to inform the community about such donations and to encourage future business partnerships in the technology area.

The focus group strongly believed the areas of weakness determined by TAGLIT are not completely accurate in regards to the current technology status of the district. The budget concerns hinder the improvement of the equipment and software. Therefore, there is a need to develop stronger business partnerships in this area. The focus group further expressed their belief that the positive elements of the district's technology program are evidence of the diligent work being accomplished by the technology planning committee. The focus group expressed support for this assertion by citing that the district's 8th grade students meet the NJ Department of Education Technology standards for 12th grade proficiencies. Prior to leaving Volz Middle School the 4th through 8th grade students at Volz Middle School attend technology courses throughout each year that are aligned with the state standards. According to the focus group, some other examples of their accomplishments include distance learning equipment and sixty laptop computers with

wireless capabilities. There are two large computer labs and each classroom is connected to the Internet. Additionally, there are teachers who guide their students through virtual learning experiences. One example, the Webquest Program, allows students the opportunity to interact via the Internet with a team of explorers in distant places. A survey could determine the percentage of teachers who actually use this type of learning experience with their students. Overall, the Intern feels that better communication is needed to convey the success and hard work of the technology planning committee to fellow teachers and the community.

Implications of Study on Organizational Change

The findings of this study provide a snapshot of the district's current technology status. The technology planning committee will take the results under consideration as they develop future technology plans. The focus group expressed that although they do not think the survey is completely representative of the district's technology status, the survey did provide insight as to how teachers perceive the technology program. The focus group stated that they would like to improve communication about the technology program and increase participation during technology professional development workshops. The district is strongly considering additional surveys to determine technology development needs. Furthermore, they will provide abbreviated minutes and hold articulation meetings to inform staff members about what is being done in regards to technology planning to improve communication.

Implications of Study on Leadership Skills

The Intern gained valuable experience during the many leadership opportunities available during this study. The Interstate School Leaders Licensure Consortium

Standards served as a framework to guide the Intern's leadership development. The Intern facilitated the development, implementation, and stewardship of a research study in instructional technology guided by the Runnemede School District's vision to maintain high technology instructional standards. This study is an example of how the district uses data to assess needs.

Through this research, the Intern supported the instructional technology program and attempted to improve both student learning and staff professional development. The Intern believed student learning to be the fundamental goal of education. The Intern understood the important role of technology in promoting student learning. To this end, the Intern assessed the student exposure to technology opportunities within the Runnemede School District.

The literature review in this study outlined emerging trends and issues in technology instruction, which was shared with the school district. Furthermore, the Intern clearly communicated potential problems within the district to a focus group to assist in data driven decision-making. The Intern made suggestions to assist the technology planning committee's endeavors toward continuous improvement. Ultimately, the Intern discovered how it takes a team of committed individuals to make lasting impressions on the organization to improve education for all students.

Further Study

In conclusion, the findings of this study illustrate the difference in perceptions between the focus group and the survey participants. There is clearly a need to understand why there is low attendance during technology workshops. The Intern recommends conducting a survey designed to address this question and related logistical

issues, such as time, topic, and incentive. Based on the results of the professional development survey, the Intern believes that the district can increase participation in technology workshops. Additionally, little emphasis was placed on examining *specific* professional technology development opportunities. While insight into the current status of the district's technology development was provided, there is a need to more fully understand what specific professional development opportunities could enhance the technology skills of the staff, thus improving the quality of education for students in the Runnemede School District.

The technology committee is strongly considering the development of technology articulation committees at each school to share the minutes of their meetings and solicit their input. Study should also include further research to assess effective technology methodologies currently utilized to deliver instruction to students in other similar districts. Such an investigation may provide new ideas for technology delivery.

Finally, the Intern recommends repeating the TAGLIT survey after changes have been implemented to look for improvements in scores. In addition, the Intern recommends adding a second focus group comprised of students. Soliciting student reactions to the survey results and the technology program offered in the Runnemede School District should provide an additional perspective on the district's technological needs.

References

Anderson, Joseph, (2002). District initiative keys in on classroom. *Journal of Staff Development*, 23, 36-38.

Dwyer, David C, (2002). Since computers came to school. *Educational Technology*, July August 2002.

Florida Leaders.net. A technology leadership training program for Florida's school Administrators. (n.d). Retrieved September 1, 2002, from (http://www.itrc.ucf.edu/techsummit/resources/fln.pdf).

Fulton, Kathleen, & Honey, Margaret, (2002). Emerging technologies in education. *Educational Technology*, July-August 2002.

Goldenberg, Lauren B., & Outsen, Nicole, (2002). Missed connections can be instructive. *Journal of Staff Development*, 23, 28-31.

Killion, Joellen P., (2002). Loading the e-learning shopping cart. *Journal of Staff Development*, 23, 12-16.

McKenzie, James, (2002). Beyond toolishness: the best ways for teachers to learn and put new technologies to good use. *Multimedia Schools*, 9, 34-39.

New Jersey Department of Education (www.state.nj./education/). View report cards. (n.d). Retrieved September 1, 2002, from (http://nj.evalsoft.com/).

New Jersey Elite (http://www.njelite.org/). Participant site link to taglit. (n.d.) Retrieved September 1, 2002, from (http://www.taglit.org/taglit/).

Reigeluth, Charles M., & Joseph, Roberto, (2002). Beyond technology integration: the case for technology transformation. *Educational Technology*, July-August 2002.

Shelly, Janine Onffroy, & Smith, Sylvia R. Cadena, (2002). A Vision of education in the year 2010. *Educational Technology*, July-August 2002.

Taking a Good Look at Instructional Technology. (http://www.taglit.org/taglit/). Taglit for middle school teachers. (n.d) Retrieved July 1, 2002, from (http://www.taglit.org/taglit/Assessment/PreviewAssessment.asp).

Trotter, Andrew, (2002). Digital dilemma: can computers sub for teachers? *Education Week*, 22, 7.

Appendix A

TAGLIT Survey Results

Table 1
Technology Planning-Process, Document and Support

1a.1-The Planning Process (Leaders)

Item	Mean Score
involving stakeholders in the technology planning process	2.0
discipline for technology-related offenses	4.0
analyzing the current situation	3.0
assessing the environment	4.0
assessing the environment	4.0
gaining support for the technology plan	3.0
implementing the technology plan	3.0
continuously improving the technology plan	4.0
Section Average	3.4

1a.2-The Planning Document (Leaders)

Item	Mean Score
articulating a vision	4.0
describing a mission	3.0
discussing the research	3.0
describing the current situation	3.0
defining goals and objectives	3.0
presenting action items	3.0
addressing facilities	4.0
addressing infrastructure and standards	4.0
identifying technical support and maintenance needs	3.0
assuring high-quality professional development	4.0
addressing funding	3.0
addressing assessment and evaluation	3.0
aligning the plan with other initiatives	3.0
addressing environmental strengths and limitations	3.0
Section Average	3.3

1a.3-Teachers' Knowledge and Support for the Plan (Teachers)

Item	Mean Score
have you reviewed the school technology plan?	2.0
do you support the school technology plan?	2.9
are all implementation action items progressing as planned	2.3
is your feedback elicited?	1.9
Section Average	2.3

1b.1-Technology Policies (Leaders)

Item	Mean Score
What is the current status of your school policy with regard to:	
the equitability of student accessibility to technology?	4.0
acceptable uses of technology by students?	4.0
acceptable uses of technology by staff?	4.0
discipline for technology-related offenses?	4.0
assessment of technology competencies of students?	4.0
assessment of technology competencies of staff?	2.0
hardware and software standards?	3.0
Section Average	3.6

1b.2-Technology Policies (Leaders)

Item	Mean Score
What is the current status of your school policy with regard to:	
the equitability of student accessibility?	4.0
acceptable uses of technology by students?	4.0
acceptable uses of technology by staff?	4.0
discipline for technology-related offenses?	4.0
assessment of technology competencies of students	4.0
assessment of technology competencies of staff?	2.0
hardware and software standards?	3.0
Section Average	3.6

Table 2
Teachers' Technology Skills

2a.1 Teachers' Basic Tools Skills (Teachers)

Item	Mean Score
How far along are you in learning to:	
use a word processor to create documents?	3.1
use a spreadsheet to enter and calculate numbers?	2.2
use a spreadsheet to create graphs?	1.8
use a database to enter information?	2.1
use a database to search for and sort information and create reports?	2.1
Section Average	2.2

2a.2-Teachers' Multimedia Tools Skills (Teachers)

Item	Mean Score
How far along are you in learning to:	
use drawing or painting software to create pictures?	2.4
use video camera to make a video?	2.3
use video editing software to edit a video?	1.4
use a digital camera and/or scanner to get pictures into a computer?	2.0
use image-editing software to enhance pictures?	1.7
use presentation software to create a presentation?	1.7
use multimedia software to create a product?	1.6
Section Average	1.9

2a.3-Teachers' Communication Tools Skills (Teachers)

Item	Mean Score
How far along are you in learning to:	
use email to send and receive messages?	3.5
use online discussions to gather information?	3.0
use a web authoring tool to create a web page?	1.5
Section Average	2.6

2a.4-Teachers' Research/Problem Solving Tools Skills (Teachers)

Item	Mean Score
How far along are you in learning to:	
use CD-ROMs to gather information?	2.9
use online reference software to gather information?	3.0
use a search engine to find information on the World Wide Web?	3.4
narrow World Wide Web searches using Boolean operators?	2.3

use graphing calculators to solve mathematical problems?		2.1
use probes to collect and study information?		1.4
use graphic organizer/systems thinking software to solve problems?		1.7
	Section Average	2.6

2b.1-Teachers' Basic Tools (Teachers' use with students)

Item	Mean Score
How far along are you in enhancing teaching and learning using:	
word processing?	2.7
spreadsheets?	1.6
databases?	1.6
Section Average	2.0

2b.2-Teachers' Multimedia Tools (Teachers' use with students)

Item	Mean Score
How far along are you in enhancing teaching and learning using:	
drawing or painting software?	1.6
video production?	1.3
digital cameras and/or scanners?	1.7
presentation software?	1.7
multimedia software?	1.7
Section Average	1.6

2b.3-Teachers' Communication Tools (Teachers' use with students)

Item	Mean Score
How far along are you in enhancing teaching and learning using:	
email with your students?	1.8
online discussions?	1.6
the World Wide Web for publishing?	1.8
Section Average	1.7

2b.4-Teachers' Research/Problem Solving Tools (Teachers' use with students)

Item	Mean Score
How far along are you in enhancing teaching and learning using:	
electronic or online references to gather information?	2.6
the World Wide Web for research?	3.2
graphing calculators?	1.3
probes?	1.1
graphic organizer and/or systems thinking software? Section Average	2.3

Table 3
Students' Technology Skills

3a.1-Students' Basic Tools (Students)

Item	Mean Score
How far along are you in learning to:	
use a word processor to create documents?	2.7
use a spreadsheet to enter and calculate numbers?	2.1
use a spreadsheet to create graphs?	2.0
use a database to enter information?	2.2
use a database to search for and sort information and create reports?	2.2
Section Average	2.2

3a.2-Students' Multimedia Tools Skills (Students)

Item	Mean Score
How far along are you in learning to:	
use drawing or painting software to create pictures?	3.3
use video camera to make a video?	2.7
use video editing software to edit a video?	1.8
use a digital camera and/or scanner to get pictures into a computer?	2.3
use image-editing software to enhance pictures?	2.5
use presentation software to create a presentation?	2.1
use multimedia software to create a product?	2.4
Section Average	2.5

3a.3-Students' Communication Tools Skills (Students)

Item	Mean Score
How far along are you in learning to:	
use email to send and receive messages?	3.1
use online discussions to gather information?	3.1
use a web authoring tool to create a web page?	2.0
Section Average	2.7

3a.4-Students' Research/Problem Solving Tools Skills (Students)

Item	Mean Score
How far along are you in learning to:	
use CD-ROMs to gather information?	2.7
use online reference software to gather information?	2.5
use a search engine to find information on the World Wide Web?	3.2

narrow World Wide Web searches using Boolean operators?	2.2
use graphing calculators to solve mathematical problems?	2.7
use probes to collect and study information?	1.7
use graphic organizer/systems thinking software to solve problems?	2.0
Section Average	2.5

3b.1-Technology and the way the Classroom Works-Teachers' Perspective

Item	Mean Score
As a result of your use of technology in teaching and leaning are you more inclined to:	
involve students in cooperative, not competitive, learning?	2.9
involve students in activities that require higher level thinking skills?	3.2
involve students in interactions with the world outside of school?	2.7
involve students in interdisciplinary activities?	2.9
involve students in activities that they find engaging?	3.2
find time to work with students who need extra time?	3.0
serve as coach, not lecturer or whole-group discussion leader?	3.1
Section Average	3.0

3b.2-Technology and the way the Classroom Works-Students' Perspective

Item	Mean Score
In your class where technology is used most, do students:	
interact with each other, learning from and with each other?	2.5
solve complex problems?	2.2
learn by interacting with the world outside of school?	2.0
learn things from more than one subject at the same time?	2.4
show interest in schoolwork?	2.1
get extra help from the teacher when they need it?	2.4
take an active role in learning	2.2
get graded on the quality of products created, progress mad and effort put forth?	2.9
Section Average	2.3

Table 4
Technology-Related Community Connections(Leaders)

Does your school involve the community in your instructional technology program by:

Item	Mean Score
inviting them to participate in the decision-making process as it relates to technology?	1.0
making your school technology resources and/or services available to them?	1.0
developing mutually beneficial school-business partnerships?	2.0
informing them about school technology initiatives and use?	3.0
Section Average	1.8

Table 5
Access Related to Goals-Hardware (Teachers)

Item	Mean Score
In light of your school's technology goals, how adequate is access to:	
computers	2.6
printers	2.0
projection devices	1.7
digital cameras/scanners	1.8
Section Average	2.0

Table 6
The Ratio of Students to Computers and Other Devices (Leaders)

Equipment	Students	Devices
all instructional computers	3	1
computers with CD-ROM driver and sound card	3	1
network-connected computers	3	1
computers with internet access	3	1
digital cameras	480	1
all instructional printers	160	1
network-connected printers	160	1
projection devices	240	1
scanners	160	1

Table 7
Access Related to Goals-Software (Teachers)

Item	Mean Score
In light of your school's technology goals, how would you characterize Access to:	
basic tools	3.0
multimedia tools	2.6
communication tools	2.3
research and problem solving tools	2.9
curriculum-focused tools that support specific subjects	2.5
Section Average	2.7

Appendix B

Interview Questions for Focus Group

Interview Questions for Focus Group
Conclusions, Implications, and Further Study

1. Describe the current process for planning technology for your district?

2. How might you involve stakeholders more?

3. How could teachers access the technology plan?

4. How do the leaders gather teacher feedback in regards to technology?

5. Do you have a school policy in regard to the assessment of technology competencies for teachers? If so, describe it. If not, are there any plans in the future to create one?

6. Have professional development opportunities been offered to enhance the use of spreadsheets, databases, multimedia tools, Boolean operators, graphing calculators, probes, graphic organizer systems, and web-authoring tools? Please describe the professional development opportunities offered in regard to technology. Have these opportunities targeted teacher's personal use and/or using technology to enhance learning in the classroom?

7. Are teachers required to maintain a personal web page? Any future plans to encourage this?

8. Some research suggests that there are benefits to allowing teachers to email their lesson plans to supervisors rather than hand writing them, do any teachers currently do this? Any future plans to do this?

9. Are students instructed to use create a web page, create presentations using presentation software, use spreadsheets, databases and multimedia tools?

10. What is the current video editing status of the district, equipment, and software? Do students have the opportunity to create video productions, such as closed circuit productions? Any future plans to do so?

11. How do you involve community members in the technology planning process?

12. Are community members able to use school resources (e.g. community technology nights)?

13. Are there currently business partnerships that enhance the school's technology plan?

14. How might access to technology hardware be improved, in particular access to printers, projection devices, digital cameras and scanners?

15. How do projected budgetary concerns impact the technology plan?

16. What other concerns or comments do you want to add to the discussion of these findings?

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