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# Temporal variation of esterase activity associated with three amplified esterase genes in a field population of Culex quinquefasciatus

Janine Marie Milligan

# TECHNOLOGY IN SCHOOLS FOR THE TWENTY-FIRST CENTURY: BRINGING ONE SCHOOL CLOSER TO THE FUTURE

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A Project

Presented to the

Faculty of

California State University,

San Bernardino

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In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education: Middle Grades Option

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by

Christopher John Hauk

Scott Michael Houston

Carri Jean Walker

June 1996

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**ABSTRACT**

The following document contains research and information regarding the inclusion of technology into public schools. Within this paper the topics of discussion include why there is a need for increased technological equipment, the type of equipment that needs to be purchased, how to go about training a staff, and how to find the necessary funding for this project. The guiding purpose behind writing this is so our school, Southridge Middle School, will have a technology plan in place by the completion of this project.

## ACKNOWLEDGMENTS

This project is dedicated to Dr. Irvin Howard and Gary Soto. Dr. Howard has been a source of friendship and guidance throughout our educational career. He brought us through every deadline, burned the hoops that we were meant to jump through, and has made our teacher education program enjoyable to be in. He is the one that made our careers possible and is a constant source of inspiration to us all.

Gary Soto opened up our eyes to educational possibilities that we did not know existed. He has encouraged our creativity and given us the freedom to grow as teachers. He has been there to listen to our problems and has given us the professional encouragement to make us more than we ever thought we could be. We would like to thank him for his leadership, and more importantly, his friendship.

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## CHAPTER ONE:

## Introduction

There are many citizens who are extremely concerned over the state of education today. Many believe that school should be taught the same way as when they were children; through rote memorization, drill, and answering the questions in the back of the book. Yet, virtually all elements of human society today are touched by technology. Students who are not educated in modern technological advances will be ill-prepared for the world of work in the twenty-first century (Dagget, 1995). Schools must modify their curriculum to reflect advanced technology since today's students are irrevocably growing up in a world where television is an ancient invention and computers are ubiquitous. The companies that create these products design them to entertain, educate, and stimulate our populace. Yet, teachers are still expected to prepare these future workers with out-dated textbooks, discrete and disconnected fact-based learning, and podium style lectures.

Education and business leaders must begin to think of public education as a corporation using prudent, yet sober business sense. For example, suppose the government's defensive weapon systems were as antiquated as the equipment that exists in the typical American classroom. If this were the case the United States would be the target of many a

ruthless nation. However, since having an up to date technology curriculum in schools is not perceived as a matter of national security, the educational system's need for advancement is not a priority. One of the reasons that there is no hurry to improve education in this area is that the government operates all public schools which is a virtual monopoly. The only competitor public schools have is private schools and their focus is usually a religious one. Therefore, public schools have little external pressure on them to change. If schools were operated like a modern American company, with multi-national competitors vying for business in a global economy, the school system would do everything it could to stay on top otherwise it would go bankrupt.

One of the important things to remember is that technology is not the cure for our educational ills. Technology, without the knowledge of how to use it, is as useless as not having the technology at all. After researching the topic it is clear that the best way to inservice the staff is to train a small number of willing individuals how to hook up, use, and incorporate the technology into their classrooms (Kinnaman, 1994). These individuals will then take the knowledge back to the school site and pass it on to their colleagues. Some schools have made the mistake of forcing the technology onto their staff without giving them adequate time to become accustomed to the

equipment. The computers just sit unused in the classroom because the teacher does not feel comfortable with it. However, if the teacher had been given the support of knowledgeable peers this waste of equipment and money could have been avoided (Savenye, 1992). The goal of schools is to not only help improve the technological literacy of the staff but to get them comfortable enough to filter their computer information down to the students (Carey, 1993).

A computer is always an incredible hook when teaching. It automatically makes kids curious. The challenge is to give them tasks that will expand their computer knowledge without getting them frustrated (Malley, 1993). Once a person feels overwhelmed by technology it is difficult to rekindle their interest. At first, a teacher should model how to do the task and give students extremely simple jobs. This will get them familiar with the equipment. Once they have those basic skills the instructor can give assignments that will build on their experience. It is also a good suggestion to have students in the class that are trained to a higher degree than others. This way, when teachers are engaged with a student and others are calling for help, they can ask one of those students to go to their aid. Another bonus of doing this is that it brings about positive peer interaction in the classroom.

Unfortunately, there are very few working models of schools where the majority of the staff is well trained.

Usually only a handful of the teachers try to integrate technology and even then they only use one or two pieces of software. One way to combat this is to give teachers a piece of software that they can become an expert at, learn how to use it with the kids, and then show other teachers how to get the best out of that program. Another suggestion would be to have monthly meetings where new programs are introduced and from that have teachers pick programs that interest them. The most important thing is that the teachers need to learn how to play with the equipment and try new things so that they are constantly challenging and enjoying themselves (Carey, 1993).

One innovative consultant, Ian Jukes, has made a brilliant suggestion on how to do this. He has convinced some school districts in California and Washington to implement a program designed to make it easier for educators to purchase personal computers at an extremely low price without paying for the financing. At the beginning of the year, the educator signs a document stating that they are going to purchase a computer through the district. The district then gives them the computer and pulls the money out of their check over the course of the year. The district has already paid for the financing and by the end of the school year that teacher now owns their own computer. Also, in order to qualify for this program, a teacher must agree to attend a certain number of computer inservices, which they must pay three dollars for.

However, this training helps them get familiar with their new computer and gives them ideas on how to use the computer in the classroom. One of the disadvantages of this program is that some teachers take the computers home and don't use it within the confines of the classroom.

Another trap for administrators to avoid is to push technology for one or two years and then, feeling confident that their teachers will continue building knowledge on their own, discontinue inservices on this subject (Kinnaman, 1994). When this occurs many of the teachers lose the desire to expand their technological knowledge. They will get comfortable with their previously acquired information and no longer seek new innovative strategies. The administration needs to constantly be bringing in new ideas which will, at the very least, give some teachers new ideas to play with. It is suggested that the staff have at least two days a year where they give presentations of what they are doing in their classroom and how technology enhances their lesson.

If getting computers for each classroom is a financial impossibility then the administration should look into setting up a working computer lab. This computer lab would have enough computers in it for a class of 40 to pair up and use them. The lab would be open for one hour before and after school for student tutoring, student work time, and teacher planning. During this time the computers are being used on a first come-first serve basis. When school is in session there

is a sign up sheet for the lab. The system would work very similar to that of a school's library. The computer lab would be run by a technological advisor, who not only controls the lab but also gets into the classroom and helps teachers use technology within the classroom. When the technological advisor is out of the lab the regular classroom teacher becomes the authority. However, there should be two teacher's aides in this class that understand the computers and can help the working students with their assignments.

The technological advisor would have a variety of jobs. They would be in charge of running, maintaining, and ordering parts for the lab. When classes are in the lab he would guide the class through the lesson and also show the regular classroom teacher how to run the programs. He would be at school early and leave late in order to run the computer homework center. Naturally, he would be compensated for this time. Also, when requested by other teachers, he would leave the lab and go into regular classrooms, bringing with him a piece of technology that would enhance the regular teacher's lesson. Another duty that would be required of him would be to offer inservices on technology to the rest of the staff. It would be his job to coordinate the guest speakers and supply the equipment for these technological inservices. A final duty for them would be to consult any staff member that might need technological advice.

These are just some of the ways to introduce technology into the schools. What is also needed is a focus for this technology. Teachers need to be given a place to start. One suggestion for schools is to computerize the students' portfolios. Each student keeps records of their work in a three ring binder of all their classes. They use these portfolios when it comes time to meet with their parents during conferencing. The students go through their portfolio of work to date with their parents, explaining the nature of each assignment and the justification of their grade. As educators we think it would be wonderful for students to put their assignments and grades in a HyperStudio card presentation format. This would be an example of a performance based activity which would show others not only their normal school work but prove that they are technologically competent as well. Also, it is important to realize that they are just not going to copy their work from paper to computer but that, as they are transferring it, they improve and embellish their work using the various computer programs at their disposal. Using the electronic portfolio to begin implementing technology is an excellent example of effective cross-curricular involvement, since each subject (math, science, language arts, etc.) would be required to contribute materials for inclusion in the HyperStudio style final presentation. In addition to computer portfolios this

project will also provide other ways to incorporate technology within the classroom.

The other major concern that this project is going to focus on is getting the funding for these innovative programs. The most obvious way to get money for this technology is to find suitable grants. However, this is an extremely time consuming project with no guarantee that it will be your school that is funded. Another option would be for the goverment to find the funding for it, but with the state's current and projected budget as it is, the chances of that happening are extremely slim. Another more controversial way of getting the money would be to do what the Ray Crock Middle School in San Diego did. According to Mike Palm (personal communication, Nov. 11, 1995), the school completely reorganized their elective wheel by removing electives like sewing, commercial foods, wood shop, foreign languages, etc. They replaced those programs with a beginning computer class which teaches basic programming and keyboarding skills. After six weeks of this class they are moved into a more advanced computer class where they begin to work on different kinds of projects. Also, they are required to take a class on making videos and learn how to integrate video and computer technologies with one another. The only way to fund this program, however, was to eliminate the funding from the other electives.

The task now is to take all of this technological knowledge and incorporate it into our school. Southridge Middle School, located approximately forty miles east of Los Angeles and nestled in the foothills of the city of Fontana, is a modern, seven year old site. one of Fontana's newest and most innovative schools, Southridge has a staff of high-energy, risk taking, enthusiastic, caring people who thrive on innovation and hard work. According to William Spady (1994), a noted education reformer, Southridge Middle School is one of the few schools in the nation that can pride itself on having one of the nation's few currently existing nationally recognized performance based curriculum models.

Recently, Southridge Middle School had no real technology program since it opened in 1987 due to the fact that the school's funding had been allocated for staff development in the area of performance-based education training. The school is still a reflection of an almost technologically illiterate staff and an admittedly technophobic principal. If Southridge is to prepare students for working in the Information Age, implementation of technology into the curriculum is a necessity. Southridge's first priority would have to be putting a modern computer into the hands of each teacher and then provide training in the use of this tool. once teachers feel comfortable with the use of computers in general it will be much easier for them to pass on the knowledge to their students (Carey, 1993).

Southridge is a California State Demonstration Site for authentic assessment. Technology lends itself to authentic assessment and demonstration of the learning process (Malley, 1993). For Southridge to continue existing on the cutting edge of authentic assessment, technology must play an integral role in the program. As of this moment Southridge has the beginnings of a technology plan, a new vision, and some funding toward this direction. Our goal is to research, recommend, and plan a comprehensive modern technology program based on the current direction, including a review of other potential funding sources. It will be up to the staff and administration of Southridge Middle School to then implement the recommendations of this project.

The next sections of this project will include a review of the literature supporting the points made during the introduction and a detailed account and analysis of how to inservice teachers on technology, lesson plans on how to integrate the technology into the classroom, and a review of funding for equipment and program funding.

## CHAPTER TWO:

## Defining Technology

As difficult as it is to imagine, technology has been developing ever since the first man walked on this planet (Zargari and MacDonald, 1992). When most people hear the word technology their minds often automatically shift into thinking about computers or other such devices that are considered by many to be on the cutting edge of technological development. However, this point of view does not fully explain what technology is. Simply put, technology is the development of tools which simplify one's life. For example, the first hunter that made a club for catching food became one of our technological forerunners simply because he found a better way to gain sustenance. Since that day, society has continued to invent and create new ways of making life simpler. As societies develop these new tools it is up to the people who understand them to educate others in their use and application. If this instruction fails, then it is possible that a new invention will become obsolete before it is ever given a chance to become useful or important.

## Computers In The Workplace

A college degree almost certainly no longer carries with it the prestige it once did. Employers today search for people who are willing and able to adapt quickly to a constantly changing world. These people need to be ready to learn and use the newest technology so that their business can continue to succeed. Employers know that if their company cannot keep up with the times then they will not survive in this increasingly competitive world. It is a fact that this society's technological output doubles every 18 months.(Jukes, 1995) This basically means that the best computer on the market today will be horribly outdated in 18 months time. Unfortunately, not every business can keep up with such an incredible pace, thus leaving many corporations at a distinct disadvantage. In cases where this is true, it will take strong leadership and people who know how to use the technology they have to be successful. Keeping this knowledge in mind, employers often look for a special kind of worker. According to Ian Jukes, noted computer consultant and futurist, employers are looking for people with the following qualities; someone with strong communication skills, someone with computer experience, someone who can work effectively with other people, someone who is versatile enough to accomplish many different jobs, and someone who can

effectively solve problems. With this knowledge, society has to ask itself whether or not schools are providing children with these skills. A literature review featuring justification of technology use in the classroom including real case studies, teaching strategies conducive to technology, and the integration of technology with interdisciplinary subjects are just a few areas that will be explored in this chapter. In his 14 page paper, "What People Mean When They Say They Teach Technology Education," A.R. Putnam (1992) presented his research at the American Vocational Association Convention targeting the existence of technology education in America. The research was undertaken to determine whether technology education had moved from theory into practice in the United States. To make meaningful national comparisons, a comparative model was developed to determine the philosophy and implementation processes of technology education. The model was used as a table of specifications to develop a questionnaire. After a pilot project in nine midwestern states, questionnaires were mailed to state curriculum supervisors of industrial arts/technology education at state departments of education and to a technology teacher educator in each of the remaining 41 states. Data were combined for national comparisons, then grouped by geographical regions using the six Federal Vocational Curriculum Consortium regions, and compared to determine regional differences. Data analysis indicated that

technology education had made a clear impact on curriculum implementation. In the Eastern regions, teacher educators considered the impact to be greater than did state supervisors. In the rest of the country, general agreement existed that a change toward technology education had occurred.

## The Need For Change

If people who went to school twenty years ago returned to their old campus they would most likely see that things have not changed much since they were there. The desks would probably still be in rows, the teacher might be up front lecturing, a majority of the lessons may be textbook driven, and the learning going on might be little more than rote memorization and recall. This model of education was common throughout the United States 50 years ago and can still be found throughout American classrooms today. Of course, there have been many advances in educational tools that teachers have discovered which make teaching and learning easier and more effective. Some examples of these accepted tools are the VCR and television, the staff copy machine, and the electric pencil sharpener. All excellent tools, embraced, accepted and commonly used everyday in classrooms. Yet, these tools were not easily nor readily accepted by teachers and students in their inception. Pencil sharpeners were rejected by

teachers unions in the eighteen hundreds, yet have found their way into everyday use in classrooms today. Currently, a new wave of tools are becoming available. In order to prepare today's students for success in the twenty-first century, they have to be exposed to tools such as personal computers, CD ROM, hypermedia, internet capabilities, and any other innovations which will help them to access information more quickly and easily (Kinnaman, 1994). Students also need to be able to use these new and more powerful tools to solve real life problems. If learners are simply taught rudimentary operating skills, they will have difficulty applying what they learn in school to a future job that they will be required to do. In their book entitled, Computers into Classrooms: More Questions than Answers, John Beynon and Hughie Mackay (1993) address the nature of technological literacy and the importance of technology in American education. The book, includes an introduction, an epilogue, and 12 chapters, focusing on classrooms and microcomputers in teaching and learning. The 12 chapters are: (1) "Computers and Exploratory Learning in the Classroom" (Richard Ennals); (2) "Siuli's Math Lesson: Autonomy or Control?" (Alec Moore); (3) "A Case Study of Microcomputers in Art Education" (Robert Blomeyer); (4) "Appropriate Tools? IT in the Primary Classroom" (Les Watson); (5) "Word-Processors and Collaborative Writing" (Graham Peacock); (6) "What Can't Speak Can't Lie: Computer and Records of Achievement"

(Christopher Pole); (7) "The Training Materials Network" (Nicholas Peacey); (8) "Mapping the Offers: Databases of Special Educational Needs INSET" (Olga Liber); (9) "Computing: An Ideal Occupation for Women?" (Peggy Newton and Eevi Beck); (10) "Gender Equity and Computing in Secondary Schools: Issues and Strategies for Teachers" (Lorraine Culley); (11) "Computers, Dominant Boys and Invisible Girls: Or 'Hannah, it's not a toaster, it's a computer!" (John Beynon); (12) Micros in Action: Three Classroom Case Studies" (Mary Shooter, Patricia Lovering, and Sheila Bellamy). The epilogue is entitled "Technological Literacy: Where Do We All Go From Here?" by John Beynon. Each chapter presents arguments and data supporting the overwhelming need for technology literacy to adequately prepare students for the twenty-first century. By giving children strong technological skills teachers are providing them with an advantage over others who have not received such extensive preparation (Brown, 1992).

In order for this paradigm shift to be successful teachers must be willing to change their instructional habits. In the article, "Creating the Future: Strategic Planning and Organizational Change [and] ITEA Strategic Plan," Daniel Householder and others discuss the changes in the International Technology Education Association. The article also includes an outline of ITEA's strategic plan which emphasizes four goals: (1) position technology as a

basis for academic study; (2) provide leadership; (3) support teachers; and (4) enhance participation of minorities and women. Many professional educators have been taught that the best way to transfer information to their students is to go over the textbook chapter by chapter, answer questions at the end of these chapters, and take a test on the covered material. The benefits to this method is that it promotes reading, strengthens comprehension, improves independent thinking, and gives you an edge on Jeopardy. Sadly, these skills are overlooked by employers. They simply do not care if you know all 50 states, the chemical symbol for gold, or what an isosceles triangle is. They would prefer it if, instead of knowing these answers from rote memory, that their employee would know exactly where to go to get this information. Thus, businesses are asking schools to shift the learning emphasis from information transmission to information processing (McDaniel, 1993). In the article," A Framework for Technology Education Curricula which Emphasizes Intellectual Processes," Scott D. Johnson builds on the assumption that the most important skill for the future is the ability to think, an initial framework for an intellectual processes curriculum theory is described. Johnson provides a definition of intellectual processes as formulated first: Intellectual processes are those mental operations that enable one to acquire new knowledge, apply that knowledge in both familiar and unique situations, and

control the mental processing that is required for knowledge acquisition and use. Five dimensions of thinking can be used as the focus for an intellectual processes curriculum: thinking processes, core thinking skills, critical and creative thinking, metacognition, and the relationship of content to thinking. Intellectual processes, however, cannot be taught separately from subject knowledge. A framework for the development of an intellectual processes curriculum would: (1) identify goals; (2) develop an instructional model; (3) build on five instructional principles for developing intellectual processes (help students organize their knowledge; build on what students already know, facilitate information processing, facilitate deep thinking, and make thinking processes explicit); (4) enhance the role of the teacher as facilitator; and (5) develop an evaluation process. Constraints to developing an intellectual processes curriculum include criticism for the narrowness of the curriculum, charges of "playing school or scientist," and apparent neglect of content knowledge.

Another astonishing fact is that jobs currently filled by unskilled workers are fading fast, thus industrial computers have taken the place of many human workers. Computers are cheaper, more reliable, and more accurate than humans can ever hope to be. It is even predicted that the jobs found in fast food restaurants are going to be phased out (Jukes, 1995). Instead of having people there to take an

order and send that message to a cook people will record their order into a mechanical box which will transfer that information into a cooking processing center. Food will be prepared within 30 seconds using advanced heating devices. You will pay through your ATM card. Basically, the only people who will be necessary are the ones that put the food in the bag and push it out the window. Also, you would need someone on the premises who could fix the machines in case they break down. However, that is not a job that an unskilled worker could accomplish. This is scary considering that only 30 percent of high school graduates go on to a four year university (Pucel, 1992). Another cause for alarm would be that a majority of these college graduates are not computer literate. This is just one reason why college graduates are finding it increasingly more difficult to find satisfying employment (Jukes, 1995). The only way to have students succeed is by getting them ready for tomorrow's workplace today.

## Needed Technological Skills

First and foremost, students need to be familiar with the keyboard. In other words, they need to be able to type. However, it is not in their best interest to just learn the currently used keyboard. The keyboard that is primarily used today was developed over 80 years ago. The people who

designed this keyboard found that this was the slowest configuration of letters that could be put onto a typewriter. (Daggett, 1995) The inventors did this, because in the day of the manual typewriter, if someone typed too fast, the keys would stick together and the typist would spend most of his time untangling them. Almost a century later, in the era of super computers, society is still using the slowest of all keyboards. There are many people who do not know that there is another keyboard; a keyboard designed to reduce typing time by 40 percent (Daggett, 1995). It would be prudent if educators learned this new keyboard and began passing that knowledge to students.

Children also need to have basic electronic skills. They need to understand how currents work and how electricity affects the equipment they use. Without this information, children will become agitated every time they try to set up something electronically and because they do not know what they are doing. Luckily, with all the household equipment that children are exposed to everyday they have an advantage over many older people. Most kids are able to hook up their video games to the television and explain how they did it. It is up to educators to make sure that they can apply this skill to other areas of their life (Pucel, 1992).

As stated earlier, students must also be taught how to find and extract information from different computer sources.

In fact, there are many on-line computer services that cater to children. These services include games, tours of zoos and museums, chat rooms with kids from other places, and many other exciting activities. By getting kids to just explore the many different things that computers do, educators are sending them in the right direction. Once kids become fascinated by the programs that the computer has to offer a majority of them will start to investigate on their own. It is when this happens that significant learning takes place. During this period of exploration students are learning how to find information about many different subjects. If they have to do a report on elephants they can find a web page from any major zoo and use it to access information about their animal. If they do this for enough subjects they will learn how to find anything that they want. It is this edge that will bring success in this ultra-competitive society (Gallagher, 1993).

One skill that has remained grossly underdeveloped in public schools is the inventive process. Most students are not encouraged to dream up their own technological advances. They might have a fantastic idea and think that it is something that could never be accomplished. Educators must give children the opportunity to be creative with their work and support ingenuity. Students that are encouraged to invent things become better problem-solvers, are more open minded to possibilities, and feel in control of themselves

(Wright, 1994). Also, it is good for kids to know that by being inventive they can increase their future financial opportunities.

In addition to computers, students also need to learn how to use technology like the video camera, fax machine, audio equipment, and anything else that would improve their presenting skills. A majority of the students believe that speeches and presentations have to be boring because that is the only model they have had. However, if a child wanted to do something to make their presentation more appealing like filming a video or including powerful sound effects they would need to feel comfortable utilizing the necessary equipment. When children have not had experience with these devices they tend to shy away from them (Jukes, 1995). If educators can give children hands on training with these machines a whole new world opens up for them. An added bonus for giving them this information is that many of the tools that they will be using in the classroom will also be used in the business world.

## Staff Development In Technology

One of the biggest obstacles in preparing children for the technology age is that their educators are not skilled enough to give them that information. The reason for this is that most teachers did not grow up in the information age and

newer technology intimidates them (Carey, 1993). If left on their own a majority of teachers would never consider bringing computers or other forms of cutting edge technology into their classrooms. William R. Jordan and Joseph M. Follman (1992) address the concerns of many teachers, administrators and parents critical of technology in today's education. In their article, "Using Technology To Improve Teaching and Learning," Jordan and Follman suggest that computers have become one of the expected trapping of today's classroom. In addition, schools have exhibited an insatiable appetite for hardware; but systematic curricular integration of computers is still more of a promise than reality. The fact that resources have been allocated and spent, but many students and educators remain technologically illiterate is concern few in education are willing to address. Section 1 of the article discusses the need to restructure learning environments to support the active use of technology by teachers. Section 2 examines attitudes and roles that evolve among successful technology-using teachers, as well as the education and staff development they require. In Section 3, the need to develop technology-based activities that engage the student in the production, rather than the reproduction, of knowledge is discussed. Section 4 gives examples of specific student activities. Any expenditure for technology must be leveraged with greater investment in teacher training, both inservice and preservice. Throughout the

document Jordan and Follman present outstanding suggestions and ideas for educators interested in teaching technology School districts and administrators must seriously address this issue. If administrators try to move toward technology implementation too quickly, teachers may rebel against the change and are more likely to keep the technology out of the classroom (Savenye, 1992).

There are many excellent ways to introduce technology into some one's life without causing undue anxiety. One method is to show teachers how this technology could make their job easier (Savenye, 1992). For example, there are many people in the teaching profession who have difficulty organizing their grades. An intelligent technological sales person could identify that this is a problem and show the teacher how to use a computerized grade program. The technologist would demonstrate how easy the program is to use and would then have the teacher trainee play with the program a little bit to see what it could do. The teacher would then get comfortable with this piece of software learning how to use the computer and the program at the same time. Thus, the next time someone approaches them with a new piece of software they will be more susceptible to the sales pitch (Katz, 1992). In their article, "Implementing Technology in the School Curriculum: A Case Study Involving Six Secondary Schools," David F. Treaqust and Leonie J. Rennie (1993) bring a different perspective on technology education from

Australia. Treagust and Rennie survey coordinators, teachers, and students in six designated technology schools in Western Australia revealing varying degrees of success in implementing technology curriculum. Three crucial factors were identified for a successful implementation: (1) continuous coordination by someone with adequate time and resources; (2) thorough documentation; and (3) enough time for faculty to adapt and for changes to be implemented.

Another effective method of introducing educators to technology is the model method. The model method involves having the inexperienced technology users observing teachers who have successfully integrated technology into the curriculum (Savenye, 1992). Naturally, the first lesson they see must be a simple one. If they see another teacher doing something complicated they automatically think that they could never do that, thus damaging the technological movement.

An extremely effective way of getting teachers interested in technology is to provide them an opportunity to take it home and play with it. In Iowa there is a program known as the Iowa Technology Loan Program which was "developed to provide teacher updates on contemporary topics for technology education programs. The program consists of workshops on technology followed by an opportunity to borrow equipment for a four week period." Many teachers have found that having the equipment in their home made it much more

accessible than just seeing it at school. They could play with it at their leisure and didn't feel pressured by other teachers that might be waiting to use it (Johnson, 1991). Another version of this has been done in a few school districts across the nation where school districts have purchased computers at a very reasonable price and have given them to their teachers to take home. The teachers have a monthly deduction taken from their check and after a year they own the computer. Teachers like this program because they don't have to go out and shop for a computer and they don't have to pay any finance charges. Also, it is convenient for them because they don't make any payments to a company because it is deducted right from their salary. Of course, this is a voluntary option and teachers do not have to engage in this program if they do not want to (Jukes, 1995).

## Inservice Training

As stated earlier a good leader will introduce technology to his/her staff at a slow pace. The first step is to find an effective educator who knows about technology. It is important to have a professional educator because they understand effective teaching methods. If the principal hires a technologist there is a chance that he/she will be unable to communicate their knowledge to others (Wider,

1994). The first technological inservice day should deal with simple things like how the equipment operates. In the case of computers an obvious starting point would be how to turn it on and off. The next step would be to show how to access the different programs that exist on the computer and how to make folders. After, the simple operations have been introduced the instructor might them lead them into an easy and practical program like Microsoft Word. The rest of the day would be spent learning the basics of it and showing how knowledge of this program can aid them in their job. The teachers then leave the inservice feeling confident that they can use this device comfortably. This particular inservice should be given within the first month of a new school year to get the staff thinking about it.

At the beginning of the second quarter the principal should be organizing the next technological inservice and making sure that the new information builds on the previously taught material. The day should begin by asking the staff how they felt about the previous inservice and if they have been using the computers. Input from the staff provides valuable information on how to proceed with future inservices (Wider, 1994). At this point, there are a number of directions the instructor may go. Some possible ideas are showing how to hook up CD ROM to the computer in order to enhance lessons, continue going over the different relevant programs that the computer has to offer, introduce them to

different kinds of technology to have them broaden their horizons, or any other logical next step.

The most important thing to remember is to never stop giving inservices. There has to be at least two inservices a year dealing with technology because if there is not a majority of the teachers are not going to keep developing technological knowledge on their own. They need a springboard from which to work. Always keep fresh new ideas in their head. Administrators must encourage them to develop their own original programs using technology and ask them to share their ideas with him/her. Also, the principal might want teachers to show the lessons that they are doing in the classrooms to the staff at one of the inservices. If coworkers see that one of their own has taken this knowledge and developed it then they might be encouraged to do so themselves (Rude-Parkins, 1993). Through technology in curriculum, educators gain greater efficiency of using the following teaching strategies: problem solving, cooperative learning and team teaching.

For instance, V. William De Luca's (1992) article, "Survey of Technology Education Problem-Solving Activities" focuses on a study of 44 teachers who had experience in implementing problem-solving activities in technology education classes. De Luca's research concluded that problem-solving activities are becoming an integral and crucial part of technology education.

Paul Roberts and Donald Clark (1994) reached the same conclusion in their article, "Integrating Technology Education and Technology Preparation." Roberts and Clark identified factors that facilitate the integration of technology education and technology preparation. These factors include problem-solving emphasis, current mandates, and business/industry linkages.

In addition to problem solving, technology is conducive to other teaching strategies as well. Cooperative learning and active learning are two areas that technology can play a pivotal role in any curriculum.

In the article, "Cooperative Learning and Computer-Based Instruction," Simon Hooper (1992) examines the origins of small-group learning and distinguishes cooperative learning from other methods. Article highlights include assessing the effects of cooperative learning, including cognitive effects; designing effective software for cooperative groups, including accountability, interdependence, interaction, ability grouping, age, collaborative skills, and group processing.

According to Charles Backes (1994), suggestions for motivating technology students include hands-on activities: lesson applicable to aspirations, learner involvement in activity development, reasonable goals, enjoyable activities, teacher participation, sincere praise, and clear expectations.

## Interdisciplinary Integration of Technology

A review of the current literature suggests that successful technology integration and instruction of information technology can depend overwhelmingly on the role, training and attitude of the site or district technology coordinator. In a 1992 study conducted among several rural and urban middle and high schools, The International Society for Technology in Education found that switching from a focus on learning about the computer itself to a focus on learning environments that are enhanced or facilitated by computers and technology coordinators who act as coaches or facilitators, created learning situations which boasted greater success and confidence in students and educators alike. Site or district technologists or technology coordinators should then "work to facilitate the effective use of a wide range of computer related information technologies" within the current curriculum (Mournsund, 1992). Thus, the popular computer lab model, which features a technologist who maintains a lab of forty computers with peripherals and operates on a rotating schedule of various classes and grade levels utilizing the lab for computer skills training may not be the most effective model. First, the technologist in this common example, is often left to teach a class of forty "about" computers. Current effective

teaching strategies maintain that a perceptible clear and relevant purpose for learning is essential if students are to succeed and feel confident in any learning task. Herein lies the fault of teaching students "about" computers or about how they work. An English teacher for example, spends little to no time teaching students "about" a pen or pencil. Nor does he or she usually spend class time on the virtues of .05 versus .07 pencil lead. He or she teaches the students how to use this uncomplicated tool to create, explore, perform or demonstrate learning. Yet throughout the country, technologists find themselves in computer labs advocating the wonders of the Intel Pentium Microprocessor versus the Motorola Power PC RISC microprocessor to forty distant teen-aged students who simply want to "do something" with those computers. What relevancy do students find in this model? What about the difference in simms and dimms excites and drives students to do new, creative and stimulating things with these highly technological tools? All too often in this setting, the content area teacher, who brought these students to the lab, either leaves for the hour, takes a back-seat to the technologist or simply aides students. Powerful and meaningful learning can and should occur in this lab setting. First, keyboarding skills should be taught to all students until composing writing on the computer becomes faster than composing writing on paper. According to experienced technology teachers Mike Palm and Frank Flanagan (personal

communication, Nov. 11, 1995), with proper software such as Mavis Beacon Teaches Typing, typical students achieve this skill (approximately 12-14 words per minute) within a few weeks. Both technologist and content area specialist can team teach or act as coaches in the instruction of this important skill Next, thorough use of a simple word processing package should be taught, while integrated into current content areas. With these basic, yet vital skill areas mastered, students in a lab setting will be competent enough to branch out into many different, creative and exciting software options such as drawing, painting, and presentation programs, all linked to powerful mainstream curriculum objectives set by the content area teacher. In this example, students are using a computer lab to complete meaningful tasks using and learning about technology. Stephen Adams (1994) pinpoints goals for integrating technology and other subjects in his article, "Integrating Science and Technology: A Program in a Small Rural School," Adams explores Lopez Island Middle and High School which integrates science and technology courses into an activity-oriented curriculum. Adams notes teaching the design process and systems approach demystifies technology and fosters critical thinking and problem solving for students.

Bettina A. Lankard (1993) recognizes that female students tend to bypass technology courses, in such cases integration of technology in math and science provide an

opportunity to learn technology. In her article, "Integrating Science and Math in Vocational Education," Lankard indicates that although science and math are increasingly important in the workplace, many students, especially females, avoiding these subjects. One route to the achievement of National Educational Goal 3 -- increasing student competence in challenging subject matter -- is through integration of vocational education with science and math, enabling students to apply academic knowledge to specific occupational tasks. Among recent integration projects is "PHYS-MA-TECH," a collaborative effort of the Illinois Board of Education, Northern Illinois University, five industries, and five high schools. The project features an integrated curriculum developed and delivered by teams teaching and innovative delivery models. The Technology/Science/ Mathematics Integrated Project in Virginia Middle Schools focuses on applying science and math principles to real-world technological problems. In Washington State, a materials science and technology curriculum uses integrated and cooperative learning techniques to link knowledge of materials composition to workplace application. Team teaching is essential for integrated programs. Team teaching fosters mutual respect among disciplines, expands the repertoire of strategies and techniques, and increases enthusiasm and motivation for teaching. U.S. student performance in international comparisons highlights the

importance of opening doors to science and math to students through vocational education (Lankard, 1993).

Carol S. Holzberg (1994) describes learning activities for elementary and secondary school classes. Her article, "Teacher Tested Ideas: Hypermedia Projects That Really Work," these activities integrate hypermedia software and inter disciplines through the following hypermedia activities: language arts, book reviews and interactive fiction; science; social studies; communication among autistic preschoolers; problem solving with Lego blocks; and other interactive projects. Technology education when combined with teaching strategies and integrated with other subject matters can play an effective role in preparing young people toward broadening their academic foundation. By implementing effective technology schools can improve the quality of education for their students and better equip teachers to meet the challenges of educating tomorrow's citizens today.

## Creating a Technology Plan

Naturally, in order for all of this to work the school must have a clear goal. This goal must be specific and have a time limit put on it otherwise the administration has no way to gauge how close they are to achieving what they want (Jukes, 1995). The first step is to know how much money, per

year, the school is willing to spend on technology. Once the amount of funding has been decided upon, the next move is to decide what equipment to buy. The administrator wants to look for equipment that not only the teachers could use but that will aid the students as well. The administrator should also find a select group of teachers who are excited about developing technology in their classroom and use them to help choose the equipment. These teachers would form a committee dedicated to developing the technology program at school and find ways to implement this new technology within their classroom. They could visit other classrooms on their preparation period and help other teachers with their program. It is good to have at least five strong technology users among the staff so that the other teachers have a wide variety of coworkers to bring concerns to. One teacher would be overwhelmed if he/she had to do it alone. This technology team would also be responsible for reviewing the technology plan annually and set new goals for the coming year.

Along with the technology team it is in an administrator's best interest to hire people who are excited about technology and willing to do what they can to develop the program at the school. By having teachers on staff feeling positive about the changes going on the administrators are making their own life much easier. A principal can gauge how a teacher might react to technology by using the personality profile developed by Yaacov Katz.

According to Katz (1992) there are "distinct personality and attitudinal attributes that significantly relate to a teachers' positive computer-oriented attitude." Having the right staff will be a great advantage while implementing the technology plan. Betty Collis and Gerrit Career (1992) examine technology curriculum implementation and successful programs through case studies. Their article "Technology Enriched Schools: Nine Case Studies with Reflections," provides examples of technology enriched school projects in real school settings that try to reduce or remove problems and constraints that hamper the effective use of computers in the schools. The key to the success of these projects is the basis for their existence is not on technology, but on educational need and vision. They examine the atmosphere and functioning of a school that uses technology for change and stimulation. Collis and Career document the following case studies from technology enriched schools: (1) "Mount Newton: A Technology-Enriched Middle School" (Keven Elder); (2) "California Model Technology Schools: The Monterey Perspective" (Kam Matray); (3) "Apple Classroom of Tomorrow: West High School" (Robert Howard and Jane Pratt); (4) "Technology-Enriched Schools in the Netherlands" (Fef Moonen and Jos Beishuizen); (5) "An Information Technology School Project in Romania" (Ion Diamandi); (6) "Computerization of an Israeli School System: Project Comptown" (Elad Peled, Simra Peled, and Gad Alexander); (7)

"School of the Future Project a F.M. Black Middle School" (Richard A. Smith and Anthony Sassi); (8) "The Quinte Lighthouse Project" (Robert Holt); and (9) "Netherhall School: Building for the Future on the Experience of the Past" (Alastair J. Wells). By studying successful programs, schools interested in establishing a technology program can gain better insight into the structure and design of technological education in practice rather than theory.

If the administration is doing their job correctly they will know that for as long as their school exists that they will never stop developing their technology program. The school has to continue to be innovative throughout the years to make sure that they are keeping up with society. If a school is just starting out it will probably be five years before widespread change is felt (Jukes, 1995). Each year the staff must be given the opportunity to review the program and say exactly how they feel about it. This evaluation will help administrators understand why some individuals are using technology while others are not, find out what are the most used pieces of hardware and software, and to know what obstacles are in the way of teachers utilizing the equipment.

## Funding Sources

Due to the complex nature of public school funding, and the high cost of technology, finding funding sources for

technology purchase and successful implementation are challenging. A review of the current literature suggests that many options are available when schools remain persistent, creative, and have a good technology plan in place. According to Joe Heimlich and Dawn Puglisi (1993), who co-authored, "Finding Funding for Education Efforts," apart from school district budget priority realignment, grants and gifts, which are given by private foundations and government organizations, are the two most common supplemental funding sources available to schools. "For larger and more expensive projects, a grant is usually more appropriate," they write. The authors note that grants are offered by governments, foundations (usually affiliated with and industry or company) institutions, or organizations. It is also important to realize that "sometimes, grants are awarded based on the needs of the funder." rather than the needs of the school. In an article in Electronic Learning about her book, All about Grants , Gwen Solomon (1993) agrees with this view, describing various methods to identify these funding sources and how to write effective proposals for the available grants, knowing the intent and or needs of the funder. Solomon presents five excellent examples of schools that received grants and the impact that the resulting programs had in the schools and identifies important elements of grant proposal writing. Gene Gloeckner (1993), in "Key to Successful Proposal Writing," describes similar grant writing

suggestions. Gloeckner agrees with Heimlich, Puglisi, and Solomon that a school start with a good idea, have a clear understanding the values of the funding agencies, focus on the funder's needs, and know their own competition when applying for grants. Doris Epler, in her 1993 article "Funding Equipment Needs in School Districts," suggests that schools and school districts go further by researching funding sources, building a funding team which clarifies objectives and procedures to enhance proposal writing, and by keeping the funding source informed and involved throughout and beyond the grant. Outside of grants, gifts, and general funding, partnership programs, such as the one outlined by Peter Stoll (1991), in his article for Technology Applications Quarterly, remain a less common yet available option. In this article titled "SED/Apple Computer, Inc., Partnership Program," Stoll describes a partnership between Apple Computer and the New York State Education Department in which Apple provided significant amounts of hardware, software, training, and technical assistance, and regional meetings were held to review the plan; to develop plans for connecting teachers, students, and administrators to integrated technology in the classroom.

It is abundantly clear from a review of the current literature, that technology partnerships, and grants from local, state and federal sources as well as from foundations and corporations are available and can help schools and

school districts stretch budgets with a variety of alternative and supplemental funding sources for technology.

## CHAPTER THREE:

## Implementation

A year ago Southridge Middle School had an extremely limited amount of computer technology. In the staff lounge there were three old Apple Macintosh LC computer systems and an Apple laser printer which were obviously in constant demand. Many times teachers had to wait in line which became very irritating.

The students had an even worse situation. The library had only two computers of the same make that were in the teacher's lounge. These were the only two computers available for a student population of nearly 1,200. Though available, these computers were not sought after by the students with much vigor. One of the reasons that students were not asking for the computer very often may have been because they were not given an opportunity to learn how to use them.

The Special Education department on campus was slightly more fortunate. They were also provided with two Apple computers. The students in this program got more use out of these computers because there are only about 120 students in the entire program. The teachers were able to work with the students on a more individual level, so they felt more comfortable using the equipment. Two computers per 120 students is still an unacceptable ratio, though.

As for technology curriculum, there were only about five teachers that incorporated modern technology of any kind into their classrooms. Granted, if the technology is not readily available, it is difficult to use in daily lessons. Southridge did have some pioneers, however, who brought in their own equipment in order to share it with their students.

It was this situation that made the teachers at Southridge want to make a change. The writers of this project see this issue from three varied points of view. Chris Hauk is a seventh grade language arts/social studies teacher with an excellent working knowledge of computers. He is one of those teachers that brought in his own computer to teach the students things like geography and Mayan culture. Carri Walker, who has been an eighth grade science/math teacher for two years, has had students working on their portfolios using HyperStudio on one of the library's computers. She is one of the first two teachers at Southridge to utilize this kind of technology, and it has proven to be extremely effective. Scott Houston, who is also a second year science teacher, has been using laser disc programs and different computer games to develop his student's critical thinking skills. One thing that they all have in common is the desire to have working computers in their classrooms, in a lab setting, or both so that they can bring even more technology to their students.

## Improvements in Technology

During this past year Southridge has been fortunate enough to obtain much needed money. This money was used to purchase enough computers to put one in every sixth grade classroom, place six brand new computers in the library and three more in the staff lounge, and also add to the Special Education computer inventory. In addition to the computers, other types of necessary technology were purchased. These additions include a laser printer for the staff lounge, a video projector so that a computer screen can be enlarged and projected for full class instruction, and various types of software for teacher and student productivity. Getting this kind of equipment, finally, is a small but important step towards moving the school to the technological point that the authors of this project propose.

It is important to note that a school can never truly be finished improving its technology program because as fast as modern equipment can be supplied, the computer industry produces a new upgrade or different product which virtually antiquates the schools "new" equipment (Jukes, 1995). However, since most schools do not have improvident budgets, they must often settle for current or older technology while planning incremental but steady improvements to their program. In Southridge's case, in the area of hardware, this

project proposes a definite short term goal. The first priority is to get a modern computer in every classroom so that teachers will be able to learn how to use them at their own pace. This computer need not be a top-of-the-line multimedia ram-packed machine. A modern, mid-level Macintosh, which is upgradable, is sufficient. By getting teachers comfortable with technology which is easily accessible, useful and up-to-date, we will be allaying their fears about using it in the classroom. Teachers will be able to use the computer for minimal or myriad purposes. In either case, dispelling technophobia and computer anxiety is key, and an easily accessible, useful tool such as one computer in the classroom is an excellent start. For example, with just one computer in their classroom, it is possible for teachers to write, print and store lesson plans, create a grading system, or possibly learn new things about the subject they teach. Teachers may even show students animated or realistic pictures of what they are learning about. Granted, the use or neglect of this machine depends solely on the teacher, yet, without the presence of the technology, the opportunity for success is not even a possibility. Also, we propose that classrooms be provided their own liquid crystal display video projection unit which can be connected to a computer, projecting its picture onto a wall or screen for whole class instruction. This will give

students an equal opportunity to see the computer screen from any part of the room in which they are seated.

The next step in equipment acquisition is once again to purchase more computers, but in this case the purpose is to build a modern computer lab. This computer lab will most likely be housed in the room previously used at Southridge for keyboarding instruction. Since the keyboard is still the predominant form of data input on computers, typing instruction remains an important skill, and will be maintained on these new machines. Our goal for this lab is to acquire and install about 40 networked modern computers. The number 40 was chosen due to the fact that 40 is close to our maximum class size.

Once these two tasks have been accomplished it would now be time to add to that one computer in each classroom. Naturally, it would be ideal to have a computer on every desk of every student, but we know, for now, that this is not a realistic goal. In order to make that dream come true, classrooms would need to be rewired and expanded to handle increased power usage, cabling, network connections, etc. Also, these computers would take up a great deal of space. One solution to both of these problems would be if the computers being used were Powerbook style laptops, but then this scenario obviously unfolds a host of new problems. Laptops, unfortunately, would have to be charged up at all times so that the students don't run out of power. There is

certainly a real danger of students tripping over wires which could cause damage to both the student and the Powerbook. Also, laptops are often so small and fragile that one accidental fall could damage a unit irreparably. There are also going to be those students who will think it is fun to damage their computers. All of these considerations make it very difficult to recommend a computer on every desk. A more realistic goal for this project's purposes is to advocate the installation of a total of five desktop computers in every classroom. This configuration makes it much easier for the teacher to monitor computer use and allows for flexible computer use arrangements such as those based on cooperative learning groups, ability level, thematic centers rotation, etc.

Our final step for this phase of the plan would be to begin acquiring other kinds of useful technology. Each math class should have a class set of graphing calculators and a system set up so that learners can check out these calculators in order to complete assignments at home. Every student in the language arts classes will be issued their own Spell check at the beginning of the year. When the year ends they will return it in good working order or pay to have it replaced. The key to having these two programs work is to instill within the children a sense of responsibility and pride. The science department would need a lot of leeway in deciding what to do with the money they receive. They would

have to acquire equipment slowly over the years. This project recommends that some of the first purchases should be microscopes that can be hooked up to a television set so that every student can see what is going on in the chosen slide. Also, an upgrade of the current microscopic equipment Southridge has would prove useful.

## Training the Staff

As mentioned in chapters one and two it is essential that the staff be introduced to the equipment and possess relative comfort with its use before being expected to teach it to their students and use it as tools in their instruction. Our vice-principal Frank Donahue has already begun to enact the strategies offered herein for successful training the staff. For instance, as soon as the first new computers in seven years arrived on campus, slated for delivery to the sixth grade teachers, these teachers were given the opportunity to use them immediately in their own classrooms. Few to none did. Through no fault of their own, these teachers simply still did not know what to do with them. Luckily, within two weeks of receiving these computers our school had a student-free inservice day and in keeping with the inservice guidelines proposed in this project, the responsibility of the sixth grade teachers on that day was to spend the entire time working and playing with their new

technology - simply getting comfortable. Mr. Donahue, acting in the role of technologist and facilitator, took the teachers through several sessions of computer basics such as; mouse manipulation, power-up and shut-down, sound control, creation of new files and folders, opening and closing of the internal hard drive, and the opening and closing of installed software. All of these first experiences were essential in creating a positive, confident, and comfortable attitude in the teachers who would now be expected to use this powerful technology in their own classrooms.

Once this day was over Mr. Donahue knew that there was going to have to be a lot of follow up activities to this learning experience so that teachers didn't forget what they learned and go back to "business as usual" before the computers entered their classrooms and lives. Early morning sessions were organized in which teachers with questions or difficulties could come in and work with him or other knowledgeable users on the computer. Also, Mr. Donahue has instituted a positive, open door policy in which teachers who are experiencing difficulties with their computers can readily gain assistance. These are the beginnings of a successful training model, to be maintained and expanded in these directions. Unfortunately, there have not been any more inservice days this year in which to work with the entire staff at once. The current plan to schedule more next year. This will be invaluable to the seventh grade teachers

since it is in this plan to provide all of them with a computer in the same manner as the sixth grade experienced, next year.

Since the three writers of this paper are highly motivated to see success in this area, and the purpose of this project is to provide Southridge with a rationale and guideline for implementing a successful technology program, much effort has and will be made to meet with administrators and make suggestions about how to go about training the staff and implementing a successful program further. The first suggestion deals with the training of the seventh grade teachers. When more technology is delivered to the school next year, an inservice day identical to the one Mr. Donahue presented for the sixth grade teachers will be quickly given to the instructors of the seventh grade. However, there will be a slight but powerful difference. The sixth grade teachers will be present to work one-on-one with their peers. This will enhance working relationships between the grades, give the sixth grade instructors practice at teaching technology, and give the seventh grade staff a specific person to go to if they are having difficulties. This will also reduce the amount of people who will be going exclusively to Mr. Donahue when they are having problems. The training will operate as a mentor program. Another nice aspect about this plan is that it reinforces ideas learned earlier by the sixth grade teachers so that they do not

forget the purpose and important use of this technology. There have been those at Southridge who question the decision of giving the computers to the sixth grade team before the other two grades. Actually, the logic behind this makes good sense. The goal of the technological program at Southridge is to get all students proficient in the use of technology. The best way of doing this is by starting them on computers as soon as they arrive at the school. By giving the computers, first to the sixth grade team, second to the seventh grade team, and then finally to the eighth grade team, the school will be providing the students we have now with a technological education that will continue with them throughout their entire time at Southridge. If the school were to give the computers to the eighth grade teachers first it is very likely that those teachers who are spending the time just getting to know the equipment would be giving last year students only a passing introduction to technology. It is true that the same argument could be made for the sixth grade teachers only giving students a passing introduction to technology. However, if each year these students receive only a passing knowledge of computers, then, at the end of three years, they will have acquired far more than that student graduating the eighth grade would have.

Once the teachers feel comfortable with the basic operations of the computer then the teachers will be given ideas on how to use it to enhance their teaching. There will

be inservices provided where some of the schools technological pioneers will present and share their ideas with their peers. Lessons from all disciplines will be featured so that no one feels as if what they see is inapplicable to their classroom. Samples of already developed lessons can be found in the appendices of this project. These lessons are not going to solely be based on computer education. Teachers will see how the laser disc, microscope, and video projector are being used as well.

The third step in preparing teachers for working with technology is to give them sound professional ideas that will help them impart knowledge to their students. Due to the fact that in the near future there will probably be only one computer in the classroom, it will be time consuming to give each student a chance to work exclusively on it. There are many techniques that teachers can use in order to compensate for this computer deficit. One of the suggestions that will be made to the teachers will be to personally train some students to act as computer tutors. This strategy requires that the teacher spend time before and after school preparing the chosen students in computer proficiency, leadership and teaching skills. Then, once the teachers feel comfortable with the ability of these students, the instructors will set aside class time a few times a week to send a small group of students to the technological tutors. Naturally, there are a few drawbacks to this program. If the teacher is trying to

give the class instruction then it is possible that the tutors voices will disrupt the class. Also, the tutors will miss out on some educational time. That is why it is important to choose students who are going to be responsible enough to get the work and information they miss.

Suggestions for sixth grade student computer outcomes are to have the students learn how to utilize the internet to access information, and use a simple word processing program fluently. Simply teaching sixth grade students mastery of these skills at a high proficiency level may take half the year. The second half of the year could be spent giving the students assignments at which they must use these skills incorporated into many projects and assignments.

Another viable idea is to devote one of the learning periods to working with the computer up in front of the class. Each day the teacher will present an easy lesson to the students using the LCD projection unit with their computer. The students will be expected to go up in front of the class and demonstrate what the teacher shows them. Also, a weekly assignment will be given to the students which will require them to use a computer. They will need to either go to their class, the library, or the computer lab to complete this work. Once again, it is essential that the teacher present this in an exciting and basic manner so that the students do not get frustrated and develop a negative attitude toward computers. As stated before, the essential

learnings for technology at this level are to get them to the point where they can independently "surf the net", bring up valuable research information, and effectively use a word processing program.

Naturally, the teachers will have the freedom to choose the techniques that work best for them. The only intention of these inservices and suggestions is to get the staff familiar with basic operations and spark their own creative interests. Once this has been accomplished the teachers will need to develop their own individual plans to best suit their needs. The only requirement will be that they adhere to the school's technological outcomes.

## Creating A Technology Lab

Each school site should have a resident expert to assist in the implementation of a program such as the one this project develops. Southridge is fortunate enough to have Mr. Brian Connor. Mr. Connor has been teaching for over 15 years and has been at Southridge since it opened. For the last eight years he has educated students in both science and math. During this time he has been very creative in incorporating new technology into both of these subjects. Also, Mr. Connor earned his masters degree in technological advancement which makes him one of the best candidates to run

the new technology lab that Southridge will be creating in following this project's proposals.

Using this project's recommendations, in conjunction with his own creative and innovative ideas, Mr. Connor is going to put together an extremely interactive program which will feature the computer as a daily tool instead of equipment to be learned and used as an end in itself. Naturally, the first step in his program will be to go over the safe usage of this equipment with the students. Middle school students seem to have the propensity to start playing with things that they do not fully understand which could cause irreparable damage to some of the computers. He will discuss how to properly turn the machine on and off, what to do if the computer's hard drive freezes, and how to hook up the computer to external peripherals. If a student knowingly defies these rules or even if they are just ignorant because they are not paying attention, then at the instructor's request they may be moved to a different elective class. Mr. Connor desires computer use and technology integration to be available to all students, but will not tolerate those that abuse the privileges that this program has to offer.

The computer lab instructor, known as a technologist, may teach up to four periods a day of approximately 36 students per class, depending on Southridge's changing scheduling needs. The fifth period will be available for the technologist to be a mentor to teachers, roving the campus

troubleshooting problems, teaching or helping with lessons in other teacher's classrooms, or offering extended lab time for individual classes. The technologist will take much of what the classroom teachers are offering in the way of technology education and develop it to a higher level. For example, in the normal teacher's classroom only a handful of students can be working on computers at any given time. When this occurs many of the less motivated students may not feel the desire to come early or stay late at school to finish the assignment that they started in class. However, if they are given a similar assignment in their technology lab class, they will have a computer readily available them so they do not have any excuses not to complete the assignment and become successful. Also, if students have more advanced technology questions that their regular teacher is unable to answer, they can turn to the technologist for the answer.

## Creating a Technology Elective

In the technology elective class, taught by the technologist in the newly created computer lab, assignments will be given just like any other class. Students will be expected to type out their assignments on a word processing program or to create a spreadsheet of data collected in science class. The technologist should emphasize that the assignments given to the learners have real life applications

so that the students can use this knowledge "in real life" predictable and unpredictable situations and not just at school. Also, the standard pencil and paper test will be abandoned for performance based demonstrations of learning in which the instructor evaluates students based on how well they know and can perform assigned tasks on the computer. Some of the assignments the students will receive can include; making their school portfolio on a HyperStudio stack, assignments showing their knowledge of the Microsoft Word, or Claris Works program, how to identify, avoid and repair problems caused by computer viruses, and a host of other interesting activities which should all have strong interdisciplinary content ties.

The computer lab will not be open during the normal class hours only. The lab will be open for a half an hour before school and a full hour after school, with variations each year depending on school schedule. It would be too much to ask one teacher supervise this lab time alone, so other teachers would be employed on a rotating schedule to keep the labs open at these times. A stipend, such as the one currently offered at Southridge for after school Homework Center should be offered and budgeted for if this recommendation is to be successful. The teachers helping in the lab would have to be competent enough in technology, though, to deal with any problems that might arise among the students. These teachers would have to meet with the

technologist on a biweekly basis to compare notes about what assignments are being given, the condition of the equipment, and to brainstorm ways of improving and supervising the program for students.

Another important aspect of technologist's job would be to go into regular classrooms and give technology lessons, or supplement the teacher's current lesson with technology, as mentioned earlier. This would be at the request of the content area teacher, and they would have to give at least a week's worth of notice to the technology instructor, so that thorough preparations can be made. For example, some of the strategies, techniques and technology that could be brought in are: Multimedia CD ROM programs that would enhance classroom instruction, laser discs that could provide visual depiction's of what they are hearing about, and any other technological need that could be reasonably met. Of course Mr. Connor realizes that the first year is going to be difficult. There are going to be mistakes made by everyone and he is prepared and expecting to deal with them. The technologist must be ready to adapt the program for success according to what works and what does not after implementation and evaluation this project's recommendations. The overall goal is to schedule every student at Southridge into his class for at least one quarter per year. This does mean that the technology lab instructor will have to prepare lesson plans for each separate grade level so that the sixth

grade students won't have to go through the same program all three years.

## Using Technology as a Teaching Tool

The project thus far has discussed strategies by which to teach students technology use. The focus of this section will be how to use the technology to help the teachers make their lessons more creative, and instructional, with technology imbedded invisibly into the curriculum. A good way for teachers to begin is to use a technological program that they are already comfortable with. For example, one of the lessons that Mr. Chris Hauk teaches in his current language arts and social studies class deals with geography. A more traditional way of teaching geography is to ask students pour over world maps and memorize their names and locations. For some students this proves effective, but for many this style of learning can be - simply put - boring and certainly not motivating. As a matter of fact, geography is one subject that a great majority of the American populace are poorly educated in. In order to make this a more fascinating subject Mr. Hauk purchased two interactive CD ROM programs. The title of the first CD is Small Blue Planet, by NowWhat? Software, and the second geography program is named World Discovery Deluxe, by Great Wave Software. Small Blue Planet contains real satellite pictures of what the world

looks like from outer space, taken by NASA's Space Shuttle. Students are able to manipulate the program so that they can magnify these pictures. It is possible to magnify these pictures so closely that actual cities come into view. World Discovery Deluxe is even more interactive. Students are able to play different kinds of games with geography to assist their learning. One of the more popular scenarios offered is a game in which an actual human voice says the name of the area, region, continent or country, and then the student must use a cursor to point to where it belongs. The students are timed to see how fast they can identify all of the geographical areas. One problem with using either of these programs was that it was difficult for the students to see the computer screen well enough to learn anything from the lesson. In response, Mr. Hauk located an old video projector buried deep within the recesses of the school library and hooked that up to the computer. Use of this projector, or one like it, gives his class a five foot by five foot screen on which to view the interactive and exciting lesson. The students love to try to beat the score set by Mr. Hauk so that they can tease him. Luckily for Mr. Hauk he is practically unbeatable at the game so the students hardly ever do get bragging rights. Mr. Hauk's results show that after playing this game a few times his students are able to remember both the names and locations of emphasized geographic locations.

Another sample lesson involving technology deals with student portfolios. At Southridge each student is required to create a portfolio of their work so that they can show their progress to their teachers and parents. These portfolios contain work from language arts, social studies, math, science, PE., and their elective class. Both parents and teachers greatly enjoy seeing their children presenting their work. It is now time to take this concept to the next level.

Mrs. Carri Walker, one of this project's authors, and Mr. Connor this year acted as pioneers piloting a new approach. They began using the multimedia program HyperStudio in which to build electronic portfolios of student work. They only chose a handful of students to try it this year, but it proved to be very successful. One small drawback encountered was that during the presentation process, students who presented their portfolios in a Hyperstudio format attached many sounds and interactive features to their portfolios. Some parents complained that these sounds were distracting to students who were presenting traditional portfolios of work. The other problem regarding computer portfolios is that current available equipment is inadequate for all of Southridge's students. As for what was accomplished in the pilot program, the students proved to be very creative, and successful. It is obvious that with acquisition of technology according to the recommendations of

this project, within three years, all students should have the ability to create electronic portfolios in conjunction with their traditional paper hard copies.

The seventh grade science curriculum currently includes a sample technology unit called The Changing Earth which deals with geology. Last year Mr. Scott Houston, one of this project's authors, taught geology with a textbook and a box of minerals. This year he employs a laser disc program known as The Great Ocean Rescue which incorporates the sciences of geology, oceanography, marine biology, and environmental science. Each child becomes an expert at one of these above sciences and uses their knowledge to make their team successful. The laser disc has both an interactive side and an information side. Before the learners get to interact with the laser disc they have to read the provided packet and watch the laser disc information that pertains to their area of expertise. Naturally, not all children are engaged by this kind of program, but Mr. Houston has seen that there is a definite increase of interest on this curriculum over how it was taught last year.

The interactive section of the laser disc is extremely enjoyable. First, the students watch a laser disc excerpt which outlines the different areas where the problem could be occurring. During this out take the laser disc gives clues that the students interpret to find the location. Each student shares their acquired knowledge with their teammates

in the search for the correct geographic area. Once they have given their prediction on where the problem is they then have to figure out the cause of the problem. This second part is a little tougher so the students have a chance to run some tests which can narrow down the cause of the problem. For example, the one his class is working on currently is called, "Grief on the Reef." The students learn about the diversity of life that occurs in and around the world's coral reefs. The four locations given to the students are Okinawa, the Great Barrier Reef, Samoa, and Jamaica. The clues contained within the video include the mention of frequent monsoons in the area, an atmospheric cooling trend, little coral diversity, massive coral damage, and a frequent number of earthquakes. Once the students make their choice they get to see the consequences of their choice and then move on to the next step. In this case it is their job to find out what is damaging the reef. The choices are human activity, blast fishing, sewage pollution, and deforestation. Once again clues are provided to help the students make the correct choice. This is a really effective critical thinking exercise. The authors of this project have included many samples of other teachers who have been using technology as an effective tool and their work can be seen in the pages of the appendix.

## Southridge's Current Technology Plan

Since this project was undertaken, Southridge Middle School has made important first steps in the direction of the recommendations of this project by way of technology acquisition and implementation. Many positive steps forward have been made, mainly in the area of funding for technology acquisition. Areas of funding available outside of the current funding plan were offered in chapter two. As mentioned earlier, the first wave of computers has made its way into the classroom of every sixth grade teacher. This project seeks to work in conjunction these current funding developments, and Southridge's newly written technology plan (see below) to offer long-term implementation and program guidelines, support this direction with a sound review of current research, and offer support through effective evaluation tools and procedures.

Recently, Southridge applied for a California Distinguished School award. In order to win this an application was prepared and submitted. The following technology plan comes directly from this application and deals with the Southridge's current and developing plan for technology integration.

"Southridge has only recently embarked on developing a plan for integrating technology into the demonstration of

learner outcomes. A school-wide plan, linked with a district five-year plan and aligned with state curricular frameworks, is under construction that will enable students, staff and parents to access, analyze, manipulate and present information as they develop and demonstrate skills for tomorrow's workplace. This plan is being developed by a committee of teachers, parents and community members committed to the school's mission and eager to utilize technological resources to enhance that goal. The committee has attended several inservices and conferences this year, and consulted on the purchase of hardware and software appropriate to their objectives. Ian Jukes, a consultant and technological visionary from British Columbia, has lent assistance to the group and was brought to Southridge for a day of inservice and consultation. He will be visiting again on an extended basis in January 1996 when he returns as a contracted district consultant. A hardware and networking expert is available on a consultation basis, and will assist in network design. The district provides technical assistance through data processing and communication services to assist in network maintenance and cabling. The long-range goal is a campus-wide network with internet access, computers in each classroom with clusters in each interdisciplinary family, a computer lab and a research cluster in the library. It is anticipated this configuration can be in place by the close of the 1998 school year.

Currently the administration and counseling offices have direct links to the district mainframe for attendance, scheduling, record-keeping, grade and test reporting, and personal calendar and e-mail functions. A direct 56kbs link to internet resources exists on campus, and is actively linked to computers in the office, staff room and library. The library book list and checkout system is computerized with a bar-code system, and CD-ROM resources are available for research and printout. Existing computers in classrooms are utilized for word processing and some skill development.

During 1995-1996, expansion of the internet linkage is planned for the sixth grade classrooms, with computers budgeted and on order through a lease-purchase agreement. Included in that order is additional equipment for out service learning program, our Junior Academy classroom, our special education department, and our band class. The above-mentioned staffroom and library link is in this year's plan, the computers have arrived, and is expected to be complete before December fifteenth. Full classroom linkup is planned for June of 1997 or sooner, as resources permit. $20,000 is budgeted for preliminary wiring this year, with additional resources committed for 1996-1997. Following additional planning sessions in December, $20,000 of additional funds will be directed at equipment purchase. Overall fiscal resources committed to technology this year exceed $75,000, including inservice, conference attendance, consultation

expense and equipment. An ongoing commitment of $50,000 each year is anticipated to reach and maintain our goal.

Despite a lack of a current 'installed base' of significant technological resources, there are pockets of excellence developing. Providing computer access in the staffroom and informal inservice by resident experts has increased staff use of technology in preparing lessons and keeping records. Utilizing the limited resources available to date, students are being trained in the use of HyperStudio and are developing electronic portfolios to augment their extensive 'hard-copy' portfolios used in student led conferencing and exit interviews. Using a scanner and digital cameras, students are (in very limited number) creating hypermedia presentations for demonstrations of learner outcomes. A program of training 'techie tutors' is underway to make use of limited resources through a 'kids-teaching-kids' approach. Teachers are beginning to use computer based presentations to augment their teaching strategies, and using laser disc and CD-ROM materials to present/enrich curriculum. Southridge is 'on-line' and developing skills while exploring the resources available. As resources are directed at providing the training and equipment necessary, Southridge looks forward to providing the access and skills that are essential in a future increasingly driven by technology." Again, this project seeks to further assist Southridge Middle School's effective

implementation and expansion of this plan by means of research support, program guidelines, and effective evaluation tools and procedures.

## Technology Acquisition Timeline Summary

In the 1995-1996 school year Southridge Middle School finished the season with 13 multimedia Macintosh computers in the sixth grade classroom. Also, the library and Special Education resource room received 10 identical computers for student use. Both the library and the staff lounge are hooked up to the internet which more and more people are exploring. Other types of technology purchased this year include a scanner, which takes hard copy and puts it on to the hard drive, a laser disc for the science department, and a portable LCD video projector for classroom presentations.

The 1996-1997 year will bring 20 new computers to be used in the technology lab. The science department will be looking for microscopes that can be connected to a video monitor. Also, the school will purchase another video projector and keep it on a cart hooked up to a computer so that it will be ready for any teacher who wants to use it.

Before the year 2000 the school is hoping to have the entire school wired to a LAN (local area network) linked to the school district's existing network. Every single classroom will have a computer in it that is able to access

the internet. Every student will have a graphing calculator for doing their math. All of these computers will be equipped with video conferencing technology so that teachers can communicate classroom to classroom and school to school.

## CHAPTER FOUR:

## Evaluation

The evaluation of the technology program will include both staff and student responses. Evaluations will be given to staff members and students several times a year to gauge their attitudes and opinions about technology. Also, it will determine how those attitudes change during the year. The evaluations will incorporate the lichert system of responses. The surveys given to both staff and students will incorporate qualitative evaluations: the opinions and attitudes of the person responding. As technology becomes an integral part of the curriculum at Southridge, students and staff members will gain a better understanding of how to apply technology to solve problems and accomplish tasks. Each evaluation will serve as a litmus paper, recording any trends in attitude changes and willingness to learn more about technology.

The staff and administration at Southridge will have an ongoing system of documenting the perceptions of students and teachers prior to any technology education and training. Supportive personnel, including both students and teachers, are available to assist anyone on campus willing to risk learning something new, they will play a vital role in bringing technology to Southridge. Like any new idea or proposal, motivated and enthusiastic staff and students will make this vision a reality at Southridge. This dream-shaping

phenomenon is the inspiration of a risk-taking, reformist administration. Staff members have the confidence in knowing that each new project undertaken is a work in progress and that perfection is not prerequisite to a project. As the technology program proposed and described in this master's project comes to fruition, any identified areas of improvement will be examined and tackled with the knowledge that perfection is a goal, but it being a work in progress is the reality.

## Staff Evaluations

The evaluation of the technology program will cover two populations. The first population, staff members, will receive two separate evaluations. One set of staff evaluations will be administered three times a year. These will be named the Staff Trimester Technology Evaluations.

## Staff Trimester Technology Evaluations

The staff will be asked to complete a qualitative evaluation form in order to gauge the on-going opinions and attitudes of technology. The evaluation form will be given during inservices at the beginning, middle, and end of the year. Each of the three evaluation forms will include statements for teachers to circle responses on a number scale

of one to five. In addition to the lichert scale questions, the evaluation form will cover three open response questions. Staff members may provide suggestions for areas of improvement, curriculum ideas, money allocations, teaching strategies, etc. The first and third evaluations will be complete anonymous. However, the second trimester survey will include the staff member's name to enable the technology committee to gain a basic awareness of where staff members would be on a comfort scale. This survey would not be used to the detriment of any staff member's career. The second survey will provide a sense of ownership for a respondent's answers. The type of questions asked and specific wording will have to be taken into consideration when the survey is made.

The second type of survey given will focus on staff members attending a once a month, one hour session featuring new software program or technological teaching strategies. Staff members who attend any one of the Technology Monthly mini sessions will also receive an evaluation to complete. A sample of a fall trimester survey can be located in Appendix A.

## Technology Monthly Mini Evaluations

The technology teacher on campus will provide a one hour monthly staff inservice in the technology classroom. This would be best on a Wednesday morning or afternoon, during the

minimum day. This schedule would be an ideal time for teachers to spend time becoming better acquainted with teaching strategies and software programs.

The evaluation consists of ten lichert scale questions in addition to two free response questions. The survey would be given as a anonymous instrument. Questions would be written specifically for each month's session. The example survey found in the Appendix A, focuses on the program Easy Grade Pro. This particular program is a computerized grade book with several convenient features. Each survey would need to be written specifically for each session. The technology teacher would include this task as part of the job description in lew of any interdisciplinary family responsibilities.

## Student Evaluations

The second population to be surveyed consists of the student body at Southridge. Sixth, seventh and eighth grade students will be given an anonymous evaluation twice a year. The Student Technology Semester Evaluation will be administered to all first period classes during the first week of school.

## Student Technology Semester Evaluation

This survey will provide both specific and general information about the student population of Southridge. The questions are designed to probe the disposition of students toward technology and whether students have access to technology at home or at a neighbor's home. Questions focus on the willingness of students to learn about technology and then apply that knowledge toward a school project. Another important aspect of the survey would measure whether or not students value technological education as a requirement to succeed in the twenty-first century.

In addition to the ten lichert scale questions, the survey would also include two open response questions. The technology committee would compile the data from the surveys in order to prepare a document with the results. The free response questions would give students the opportunity to provide input and suggestions about the technology education they receive. They would also be given the opportunity to give areas of improvement they would like to see occur at Southridge. An example of a possible Student Technology Semester Evaluation -- Fall Survey can be found in Appendix A.

A second survey will be given some time during the second semester. Another evaluation tool given to students is the Technology Elective Evaluation.

## Technology Elective Evaluation

This survey is designed to monitor the change in attitudes and technological education before and after taking the technology elective. Students will complete the survey the first day of class and will receive another survey during the last week of that elective. This particular survey will include questions about specific technological knowledge in addition to qualitative questions that focus on attitudes and perceptions. The sample evaluation consists of ten lichert scale questions and two free response questions. The evaluation shall be developed by the technology teacher, however, for the purpose of this master's project, a sample survey is available under Appendix A. The technology elective teacher will be responsible for writing the surveys. The information taken from the surveys will not only help the technology teacher track student input. The technology committee will also have access to the evaluations. The committee will be able to examine the effects of intensive technology education on students and whether students recognize the importance and relevance of that education.

In summary, the evaluation of the technology program will focus on the perception of staff and students prior to receiving any technology inservice training or education. The surveys will provide needs identified by the questions asked in each of the four evaluation tools. An ongoing assessment tool like the evaluations described earlier will play a vital role in determining the effectiveness of the technology program. The technology program may change dramatically as a result of the evaluations. The program described in this master's project is only a suggestion to the staff and administration of Southridge. Currently, Southridge has already implemented many aspects of this proposal. The evaluation process will provide a tool for continually refining technology training and education at Southridge.

## Technology Committee

The Southridge technology committee shall be responsible for writing three of the four evaluations. In addition to writing the surveys, the committee will also schedule when the surveys will be given. Committee members will record the results and compile a brief report summarizing the results. The committee will then report to the entire staff explaining possible trends and perceptions and attitudes of the staff and student population. Any staff member that is willing to serve on the committee will be welcomed to join. obviously,

the committee will volunteer many hours in order to meet, plan, write, record and compile information for the benefit of the entire school. The technology committee will be responsible for suggesting possible reassessment of the effectiveness of the technology program. The committee will need to meet with the entire Southridge staff and administration before making any drastic decisions. The data gathered will be an important part of finding funding through grants available for middle schools. The technology committee will be able gather at the same time when the department meetings are scheduled.

## Project Summary

This project has identified the need for a technology program at Southridge Middle School. By examining the reformist, cutting-edge, risk taking, enthusiastic nature of the staff and administration, it is obvious that Southridge is an environment where new ideas and curriculum are welcomed. The review of related literature indicate that computer technology is a prerequisite for students to succeed in the twenty-first century. The literature establishes the need for teacher support and training. Further research yielded numerous teaching strategies for incorporating technology in all areas of the curriculum.

The project will attempt to prevent the possibility of Southridge students suffering from a "techno-peasant" scenario. Many students do not have a basic understanding of technology simply because they do not own a computer. Southridge must fill in the gaps for these students to survive and ultimately succeed. The Southridge staff and administration share the same motto that "What is best for kids" governs what students are taught. Teachers must concentrate on acquiring ways to integrate technology into their existing curriculum, possibly through incorporating technology into one culminating project each year.

By establishing a technology committee, teachers and administrators can guide and assess the role technology plays on campus. Commitment and responsibility are requirements for each committee member. Developing survey tools, making critical decisions and continuing to research innovative technology strategies are just a few of the tasks awaiting technology committee members. The most critical job awaiting any committee member will be the role of staff and student supporter while Southridge attempts to acquire the knowledge and understanding of technology.

The technology teacher will face a challenging role as curriculum and staff inservices must be developed over the upcoming year. With the help of training student experts or "techie tutors," the technology teacher may be able to teach and provide support for students and colleagues. ongoing

training will be another area that the technology teacher must be willing to concentrate and devote time and efforts.

The main emphasis for the project is to implement a technology program at Southridge Middle School. By accomplishing this goal, the teachers and students at Southridge will have a foundation for future technology education to build upon. Teachers through inservices and training will be more equipped to provide an education that will prepare tomorrow's leaders today. In addition, the teachers will have gained the teaching strategies that incorporate technology to help motivate students to learn and excel. Students will be more eager to attempt new projects with the help of technology. Technology will enable students to solve difficult problems and accomplish a variety of goals. The most impressive and important reason for implementing a technology program at Southridge is that it will prepare students to compete in an ever-changing world where work will require more technical skills than ever before. The staff and administration at Southridge eagerly await that challenge and are prepared to take what ever steps are necessary in order to insure that all students succeed.

## APPENDIX A
### Sample Evaluations
### Staff Trimester Technology Evaluation -- Fall Survey

Circle the number that represents your response.

| | No Way! | Not Sure | Possibly | Willing | Eager |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 1) How comfortable would you feel having students use a computer in your room? | 1 | 2 | 3 | 4 | 5 |
| 2) Would you consider attending an hour long class, once a month featuring instruction in computer technology (during min. day staff development time)? | 1 | 2 | 3 | 4 | 5 |
| 3) Would you be willing to purchase a personal computer via a special district buy program? | 1 | 2 | 3 | 4 | 5 |
| 4) Would you consider allowing students who have received specialized instruction to become a "Techie Tutor" within your classroom? | 1 | 2 | 3 | 4 | 5 |
| 5) Assuming that a laser disc system was available, how inclined would you be towards incorporating such a system into your curriculum? | 1 | 2 | 3 | 4 | 5 |
| 6) How predisposed are you towards using a computerized grade book program? | 1 | 2 | 3 | 4 | 5 |
| 7) Would you be willing to apply technology to one culminating project this year? | 1 | 2 | 3 | 4 | 5 |
| 8) For a free staff lunch pass, would you consider evaluating a computer software package? | 1 | 2 | 3 | 4 | 5 |

Staff Trimester Technology Evaluation -- Fall Survey

| | No Way! | Not Sure | Possibly | Willing | Eager |
|---|---|---|---|---|---|
| Circle the number that represents your response. | 1 | 2 | 3 | 4 | 5 |
| 9) Would you accept if offered the chance to learn the basics of computer programming? | 1 | 2 | 3 | 4 | 5 |
| 10) How willing are you to get "on line" and use the internet? | 1 | 2 | 3 | 4 | 5 |

11) List the topics you would like covered during one of the Technology Monthly Mini sessions.

12) List possible areas of improvement you see yourself facing this year applying technology in your room.

# Technology Monthly Mini Evaluation -- 9/96 Grade Pro Survey

| | No Way! | Not Sure | Possibly | Willing | Eager |
|---|---|---|---|---|---|
| Circle the number that represents your response. | 1 | 2 | 3 | 4 | 5 |
| 1) Would you use Grade Pro as a grading tool? | 1 | 2 | 3 | 4 | 5 |
| 2) Would you be able to set up a class list of students? | 1 | 2 | 3 | 4 | 5 |
| 3) Would you be able to input grades without alphabetizing names? | 1 | 2 | 3 | 4 | 5 |
| 4) Would you be able to set up a seating chart for each period? | 1 | 2 | 3 | 4 | 5 |
| 5) Would you be able to print a copy of your gradesheets? | 1 | 2 | 3 | 4 | 5 |
| 6) Would you be able to personalize a grade report for each student? | 1 | 2 | 3 | 4 | 5 |
| 7) Would you be able to change the grade scale on a particular assignment? | 1 | 2 | 3 | 4 | 5 |
| 8) Would you be able to add or delete a student from your class list? | 1 | 2 | 3 | 4 | 5 |
| 9) Would you use the attendance records as part of your Grade Pro options? | 1 | 2 | 3 | 4 | 5 |
| 10) Would you recommend this program to a fellow teacher? | 1 | 2 | 3 | 4 | 5 |

11) What would you like to see covered during a Monthly Mini session this year?

12) What would you change about this session for future teachers?

Student Technology Semester Evaluation -- Fall Survey

| | No Way! | Not Sure | Possibly | Willing | Eager |
|---|---|---|---|---|---|
| Circle the number that represents your response. | 1 | 2 | 3 | 4 | 5 |
| 1) Would you be able to start a computer and open a program? | 1 | 2 | 3 | 4 | 5 |
| 2) Can you use a word processing program to type a paragraph? | 1 | 2 | 3 | 4 | 5 |
| 3) If the printer ran out of paper, could you fix the problem using the proper techniques? | 1 | 2 | 3 | 4 | 5 |
| 4) Have you ever used the internet for research? | 1 | 2 | 3 | 4 | 5 |
| 5) Could you properly install a program onto a computer? | 1 | 2 | 3 | 4 | 5 |
| 6) Can you use a key board properly, typing with all ten fingers? | 1 | 2 | 3 | 4 | 5 |
| 7) Can you copy a document from a disc to the hard drive? | 1 | 2 | 3 | 4 | 5 |
| 8) Can you make a basic 5 card stack on HyperStudio? | 1 | 2 | 3 | 4 | 5 |
| 9) Have you ever used a video camera to record a project for school? | 1 | 2 | 3 | 4 | 5 |
| 10) Would you be interested in taking technology as an elective this year? | 1 | 2 | 3 | 4 | 5 |

11) What types of technology projects would you like to do this year?

12) How could a computer help you to succeed this year?

Technology Elective Evaluation -- Fall Semester

| Circle the number that represents your response. | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
|---|---|---|---|---|---|
| 1) Would you be able to run the Basic System Software operations on a Macintosh computer? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 2) A new student has been seated next to you. Would you be able to explain how to use ClarisWorks to create a spreadsheet? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 3) Would you ever use the internet to gather research for a school project? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 4) Would you be able to create a HyperStudio stack to teach your classmates about volcanoes? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 5) If another student needed help connecting the laser disc player to the computer, would be be willing to help that student? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 6) Would you be able to install new software from a CD Rom to a computer? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 7)If given the choice, would you use technology to create a student project? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 8) Would you be able to type 12 words a minute on the computer key board if you were timed? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |
| 9) Would you be able to volunteer as a video camera person to record another student's project? | No Way! 1 | Not Sure 2 | Possibly 3 | Willing 4 | Eager 5 |

Technology Elective Evaluation -- Fall Semester

10) What suggestions do you recommend that would improve the technology elective class?

11) What skills or tools have you gained from this class that you could use in the future to be a success in school and in life?

## APPENDIX B

## Sample Social Studies Lesson Plan

## Mongol /China Conquest Jigsaw

AUDIENCE:7th Grade Social Studies

OBJECTIVE:

To read about the Mongol warriors and their conquest of China
To work cooperatively in pairs
To demonstrate paraphrasing skills
To demonstrate computer skills by making a slide show
To demonstrate speaking skills while presenting information to the class
To practice listening and note taking skills as an audience

MATERIALS:

History textbook
Computer and Video machine
ClarisWorks word processing and graphics programs
PROCEDURE:
Assign each student a partner
Assign the short section of the textbook that they will be responsible for
Member one paraphrases the textbook information on paper in five to six sentences
Member two chooses graphics and write captions to enhance their presentation
Each pair creates two panels of a slide show (one with text and one with graphics)
Pairs present their slide show to the class
Audience takes notes, focusing on pertinent information

EVALUATION:

Students write this assay:
"Describe a day in the life of a Mongol Warrior"
Points will be given for each correct detail you mention.
They are as follows:
'The Khan's name
The approx. year
Weather conditions
Type of weapons
Type of transportation
Type of shelter

Type of surroundings (land, vegetation, etc.)

Spreadsheet A

Audience: Grade 7 Social Studies students

Objective:

Students will demonstrate competency on Claris Works spreadsheet program by creating a World Muslim Population spreadsheet.

Cooperative group learning using computer

Materials:

Apple Macintosh computer
Claris Works (any version)
Student's personal data disk
List of current Muslim population per continent

Procedure:

1) Hand out World Muslim Population list per continent.

2) Group students by ability into pairs around Mac computers equipped with Claris Works instruct students, and model spreadsheet use and creation.

3) Students create their own 7 continent/ Muslim population spreadsheet.

4) Teach students formula process in order to add all 7 continents/Muslim populations together for a total World Muslim Population.

Evaluation:Teacher will assess final spreadsheets for proper creation/use and correct total Muslim populations.

## Spreadsheet B

Audience:

7th Grade Social Studies

Objective:

To work cooperatively in pairs

To demonstrate their ability to conduct a survey by collecting data

To demonstrate their ability to create a spreadsheet on a computer

To use math formulas to solve problems

To integrate social studies and math

Materials:

Mac computer with ClarisWorks spreadsheet capabilities

Procedure:

• Explain that the theme of our social studies lessons will be "beliefs."

• Brainstorm on the board different things people believe in.

• Have students get into pairs and discuss the beliefs, and decide which belief they would like to survey. (Example: Do you believe you can get AIDS from insects?)

• Each pair then asks ten boys, ten girls, and ten adults it they believe in their proposed belief.

• Once data is collected from all the pairs they will then share the information with the class.

• I will instruct the students on how to create spreadsheets.

• Each pair will create a spreadsheet of all the data, including the totals.

• Once the spreadsheets are created and mail merged, students will distribute their findings to all the classrooms.

## Still Video and Scanner A

AUDIENCE: 7th to 12th Grade Social Studies

OBJECTIVE: Students will learn how to use a scanner and a still video camera to create a 5 to 10 page (or more if desired) story about a historical person, place, event, war, movement, era, period, style, or other topic of historical importance. When the student has completed the work, they will have become an expert on this small piece of history and will present their work through an oral presentation to their peers. Additionally, students will write a cover letter to their parents, explaining what they learned about their subject and why it is important to history. This cover letter will also include a picture of themselves, that was taken with the still camera. To accomplish this, the students will need to do brief research about their topic, finding key facts, that can be illustrated with pictures which they will also find and scan into the computer, to be used in their paper/ presentation. Students are to be as creative as possible and make use of as much material as they can. If space and administration allows, some or all of these projects could be placed on display at the school site for all to enjoy. This could also be done as schools move through months honoring specific themes, such as African-American week or month. In this case, if there were papers or things like African Culture or people like Marcus Garvey or Martin Luther King Jr., they could be used to highlight the subject. These would also look impressive, displayed around the room at back to school night, even possibly being at each students' desk, if possible.

Materials:1) Any Macintosh running ClarisWorks 3.0 or better.

2) Resource materials for pictures and historical information.

3) B & W and/or color scanner. More than one is better.

4) Still video camera, if you are going to include student photo, not needed if photo portion is left out.

5) Printer,color if possible.

Still Video and Scanner B

Procedure:

1) Pass out scanner and still camera sheet and explain how to use or teacher may want to do scanning and camera work themselves, so this would not be needed.

2) Have students choose topic, do research (may involve library time), find and secure pictures for their topic.

3) Scan in photos and have students add appropriate text and manipulate into desired positions.

4) Put finishing touches on project, print, and present to class.

5) Take student photos with still camera.

6) Have students place into either word processor or drawing document and write their letter to their parents, explaining what they researched and why it is important and what they learned about it.

7) Have students take home to parents to see. Also display for school if desired.

Evaluation: Students show they have acquired the knowledge used by making the project and then presenting their work to the class and /or displaying their work for the whole school to see. They further show this to their parents, by making a letter and taking it home, giving them something to be proud of and to show others.

# Database

Audience:Grade 6 - G.A.T.E, (Group of 4-5)
Topic:Ancient Greek Gods - Database and Mail Merge

1. Statement of Objective
   Students will:
   a.)create a computer database using the model provided,
   b.)organize collected data on Greek gods and goddesses in the database, and
   c.)use a mail merge program unit to complete a form letter (provided) with the data from one card.

2. Materials:
   a.)Macintosh computer loaded with ClarisWorks,
   b.)printer,
   c.)database model (see attached),
   d.)mail merge letter (see attached), and
   c.)collected data on Greek gods and goddesses.

3. Procedure:
   a.) Allow students to choose among themselves for which gods they will be responsible. Provide them with a list of categories that will be required for each god. Let them collect data for 2-3 days (the amount of time required will be proportional to the # of entries desired).
   b.) Give each student a copy of the database model and the mail merge letter,
   c.) Provide students with step-by-step instructions for creating the database. (1-2 days)
   d.) Allow 1-2 days for students to enter previously collected data into their databases.
   c.) Provide students with step-by-step instructions for creating the mail merge letter. (1 day)
   f.) Complete the mail merge.

4.Evaluation:
   Students will have a performance based evaluation. The completed mail merge documents will be the basis of the next classroom activity, so they must be complete. If students complete the mail merge, they have succeeded. (This lesson is intended to be an introduction to The computer programs, and mastery is not expected.)

Telecommunications

Audience: 6th Grade Social Studies and Word Processing

Objective: Students will become familiar with several Current Event topics.

Students will be involved in discussion and debate concerning several current event topics.

Students will be involved in word processing a letter.

Students will become accomplished in using the internet.

Materials: Apple Computer, Internet software, Clarisworks, printer, current event homework assignments.

Procedure:

1. Students will be assigned a current event homework assignment, concerning something with two sides to the topic.

2. Teacher will collect the assignments and review to select a few current events for the students to chose from.

3. Students will select one current event for the class to discuss and debate.

4. Individual students will compose a letter to a government official stating their perspective on the issue.

5. During computer lab time, students will send the letter via the internet.

Evaluation:
Students should receive a reply to their letter. They will present this letter and its ideas to the class.

APPENDIX C

Sample Math Lesson Plans

Spreadsheet A

Audience:Grades 6 and up

Objective:Students will demonstrate their ability to use basic spreadsheet functions by creating a list of collection investments'listing purchase price, current value,change in value and totals for each category.

Materials:-Student generated list of 'collection items'(see below)
-Macintosh computer (System 7 or higher)
-ClarisWorks (v.2.0 or higher)
-Access to printer

Procedure:

For illustration I will use a baseball card collection. This exercise may not be practical for all students as they may not have an 'investment'collection. In this case it is acceptable to guide students in creating an imaginary collection of items they may want to collect using realistic, but fictitious dollar values. Many kinds of items can be used, including dolls, figurines, sports cards, etc...

Using data the students provide they will develop a spreadsheet with the following:

A heading with these labels:
'description','purchase price, current value','change in value (either positive or negative) Under description they will list a description of each item (at least 10 items). Under purchase price they list the price paid.Under current value they list the items current market value.Under change in value they list the difference betwen the two.
Next, students list a 'totals' category for each list.

When complete, students will print their results, verify them on paper (see'evaluation'below)

This activity will cover at least three class periods. In the first the lesson topic is

introduced and sample lists are generated by the class and students working together using the board to illustrate how the data should be collected and organized. In the second,students will create a sample spreadsheet in order to learn the functions and the procedure of creating a working spreadsheet. During the third session the actual projects will be created and printed. A possible fourth class period may be necessary for slower students, in which case students with a firmer grasp on the project can assist them.

Evaluation: Students will print their lists and verify the results by turning in hand calculated results along with the printouts to provide verification.

# Spreadsheet B

Audience:
6th, 7th, and 8th graders

Objectives:
In groups of 3 or 4 students will:
- create a spreadsheet
- enter data
- find averages for the data entered
- print out the final spreadsheet

Materials:

Computer
Spreadsheet software
Printer

Procedure:

In groups of 3 or 4 students will do the following:
1.On a piece of paper each student will write down their name, height in inches, weight, shoe size,length of their hand in inches, circumference of their head in inches, and circumference of their waist in inches.
2.Students will then create a spreadsheet with the column headings as follows: name, height, weight, shoe, hand, head, and waist.
3.Students will enter data for each person in the group.
4.Using formulas available in the program, students will average each column at the bottom of each column.
5,Students will print out results and turn them in.
* these steps will vary in time depending on whether or not students are familiar with the spread-sheet program - a pre-lesson in how to run the program may be needed.

Evaluation:
After students hand in spreadsheet, they might hand in a copy showing the formulas too, the instructor needs to check the numbers and reteach as necessary. This lesson maybe followed by another in which students create graphs(on the computer) with the data they have already entered.

## Spreadsheet C

AUDIENCE: Six Grade students

ACTIVITY:Making an allowance spreadsheet

Objective:

Students will ...

1. Develop awareness of balancing the budget of their allowance
2. Learn to work cooperatively in group by organizing and assigning tasks.
3. Learn how to use Clarisworks to create a spreadsheet and display.
4. Become familiar with special function of the software.

Materials:

1. Students will bring in their own information of daily cost.
2. Computers within the ClarisWorks spreadsheet program.
3. Floppy disks for students data storage.

PROCEDURE:

1. Teacher orally presents overview of activity.
2. Teacher will lecture on the meaning of ranges and cells, the formulas that contain functions, and how to use the mouse to enter names and ranges into cells.
3. Students will be given 30 minutes to enter data into appropriate cells and use the formula to calculate their daily cost.

Evaluation:

Students will demonstrate their understanding of Clarisworks spreadsheet program by entering their own information into the appropriate cells and by using the formula. Students will be evaluated by their participation, and the in-class spreadsheet works.

Design Your Own Living Room
Speadsheet

Audience: Sixth Grade Math

Objective:

- Students will become familiar with working within a budget.
- Students will practice decision-making skills.
- Students will develop the knowledge necessary to prepare a spreadsheet on the computer.
- Students will practice figuring tax .

Materials: Computer, spreadsheet software, catalogs, glue, paper

Procedure:

1. Teacher will introduce the project to students following the direction sheet passed out, answering student questions as necessary (Showing samples).
2. Teacher will demonstrate ( from catalogue selections) how to figure tax and total prices. Homework--student practice worksheet (1 day for # 1 &2)
3. Allow students I week to collect and select purchases for their project.
4. Teacher present and students practice preparation of a sample spreadsheet.(1 day in computer lab) Teacher using computer hooked to large TV so students can see the procedure.
5. Students take project to computer lab and prepare a spreadsheet to go with their Living room of a lifetime project. (allow two days in computer lab)

Evaluation: Students will demonstrate their learning by preparing spreadsheet in the computer lab.

## Living Room of a Lifetime Spreadsheet

You have been given a budget of $5,000 to spend on your "Living Room of a Lifetime".'You are to spend as much of this amount as you can, without going over it. You may purchase any items that could reasonably be found and used in a living room.

GUIDELINES

1. Choose between 15-25 different items to order. (3 pillows and 7 posters would be considered 2 items.)

2. Cut out a picture and the printed price of each item(from catalogue, newspapers, magazines, etc.) and glue them neatly in your project. Make sure to decorate your page with color.

3. List your purchases like this:

| PURCHASE | PRICE | TAX | TOTAL |
|---|---|---|---|
| 1. Sofa | $499.99 | $38.75 | $538.74 |
| 2. Chair | 329.99 | 21.45 | 355.57 |
| 3. Carpet (15'x 18') | 360.00 | 27.90 | 387.90 |
| 4. Wallpaper(8 rolls) | 64.00 | 4.96 | 68.96 |

   (a) Figure 7.75% Sales Tax on each item.
   (b) Have totals at the bottom of each of the three columns
   (c) Show both dollars and cents in all your prices and costs

4. Number the items you purchase (both the pictures and the list).

5. Your finished project should have a cover, a title page, a list of purchases with totals, and pages of pictures and prices.

6. Your project should be done neatly, either in pen or typed.

GRADING

1. All projects must be under the $5,000 budget.

2. A = within $5.00 of the budget.
   B = within $10.00 of the budget.
   C = within $15.00 of the budget.

## APPENDIX D

## Sample Language Arts Lesson Plans

### Database

Audience: 7th Grade Language Arts

Objective:

Students will demonstrate their knowledge of the Mac database by organizing information on various novels and the authors.

Materials:

Mac computer
Database application
Disks

Procedures:

Explain to students how to create a database by using an overhead as a visual aid students will choose five authors and their novels to use as information for their database. Students will include author's name, book title, year the novel was written, protagonist's name and antagonist's name. Students will create a database of their gathered information.

Evaluation:

Collect databases to assess the students' knowledge of the procedure, as well as their fact gathering abilities.

# Hyperstudio

Audience: 7th grade Language Arts and Social Studies students

Activity: Produce seven Hyperstudio cards based on district outcomes

Objective: Students will ...

1. Demonstrate application of Hyperstudio

2. Demonstrate knowledge of district outcomes

3. Demonstrate application of outcome definitions on HyperStudio cards

Materials:

Macintosh computer

Hyperstudio 2.0 or 3.0

District outcome sheet
Printer (color if available)

Procedure:

Introduce students to Hyperstudio and the practice of making cards. Students are given individual disks with a stack of 7 card templates.

On card one, students import a scanned picture of themselves and write a quick overview summary of their likes, dislikes, etc. Cards two through seven are already set up in a template format which emphasizes each district outcome. On card two, for example, students may draw, import a graphic or write a short description of what is to be or become a Quality Producer, one of our district outcomes. Students repeat this process until all cards are complete.

Evaluation:

Students will print out their seven cards (4 to a page) and submit them for grading. Also, students will turn their seven cards into a timed slide show, which they may either print to video tape or present to the class.

# Internet

AUDIENCE: 7th Grade Language Arts/Social Studies Students

OBJECTIVE:

- Use of WWW Browser program to demonstrate Internet log-on and information browsing capabilities.
- Demonstrate appropriate cooperative pair work
- Demonstrate information access skills using Crayon.net Web site
- Present summary and printout of a news or weather article downloaded from an information provider (such as a foreign newspaper or weather service) located in any country except the United States.

MATERIALS:
Mac Computer with Internet access (modem or network)
Netscape Browser
Printer
List of countries (Handout)

PROCEDURE:

I will demonstrate use of Netscape, and provide CRAYON.NET address to cooperative pairs of students.
Each cooperative pair has access to one computer.
I will give students a basic overview of CRAYON.NET capabilities. Students are given 15 minutes to freely explore CRAYON.NET.
Students are given a list of 7 countries, each located on a different continent, and are required to look on CRAYON.NET for a news service or provider from each country (such as a newspaper).
Each student is required to pick one country to report on; find a news/current events, or weather article from an actual primary news source from that country and print it out to share with the class.
Students may also, if the article is too long, summarize the article.
Students present their article and identify the continent and country on wall map.

EVALUATION:
Assessment will be based on primary source printouts and proper identification of country and continent during student presentation.

# Still Video/Scanner

Audience: 6th grade Introduction at beginning of school year.

Objective:

Students will become better acquainted with other students and themselves. Students will be introduced to the use of the still video camera and the scanner. Students will practice word processing skills.

Materials:

Apple computer, ClarisWorks software, scanner, still video camera, paper, film.

Procedure: This lesson will take three class periods.

1. Introduce the activity by discussing some of my favorite things.
2. Introduce proper procedures on using still video camera.
3. While students are writing their favorite things onto the shield, other students will be taking the pictures of their buddies with the still video camera. Each person takes one picture and has their picture taken by someone else.
4. Second day: print out the pictures in the computer lab. Students may wish to work with the size and shape of their picture. Attach this picture to the shield with your writing on it. Students may word process their likes for the shield.
5. Third day: students will return to computer lab with their shields. They will scan their shields and print the finished product.

Evaluation:

The finished product shield will demonstrate student proficiency with the still video camera and the scanner.

## APPENDIX E

### Sample Science Lesson Plans

### Slide Show

Audience: Grade 6

Objective: Students will demonstrate their knowledge of vertebrates by identifying various types through their characteristics as presented through examples selected for their slide show.

Materials:
- Apple-Macintosh computer
- Clarisworks
- Floppy disks (for student data storage)
- Clipart samples (on floppy disk)
- Science book

Procedure: Using ClarisWorks students will create a slide show illustrating various types of vertebrates (fish/ birds/ amphibians/ reptiles/ mammals). For each example students will identify the animal and its category along with at least one characteristic pertaining to that animal (e.g. Bird: feathers, wings).

Evaluation: Students will orally present their slide shows and explain/elaborate on the information they provided for each sample.

## Slide Show

Audience: Grade 7

Objective:

Students will demonstrate their knowledge of vertebrates by identifying various types through their characteristics as presented through examples selected for their slide show.

Materials:-Apple-Macintosh computer
-Clarisworks
-Floppy disks (for student data storage)
-Clipart samples (on floppy disk)
-Science book

Procedure:

Using ClarisWorks students will create a slide show illustrating various types of vertebrates (fish/ birds/ amphibians/ reptiles/ mammals). For each example students will identify the animal and its category along with at least one characteristic pertaining to that animal (e.g. Bird: feathers, wings).

Evaluation:

Students will orally present their slide shows and explain/elaborate on the information they provided for each sample.

## APPENDIX F

### Sample History Lesson Plans

### Database

AUDIENCE: This lesson plan is designed for an Eighth grade U.S.History class.

OBJECTIVE: They will learn seven important facts about the presidents of the eighteenth century. They will use a seven field database file to store their information in chronological order.

MATERIALS: A computer able to run a database program. They will also need resources such as a textbook, encyclopedia, or CD-ROM to gather information an the presidents.

PROCEDURE: This is scheduled to last five days. The first two days will be spent teaching the steps in creating fields in a database file. Day two will be spent helping those with problems while the others can begin creating their fields. Days three through five will be used by the students to gather and enter information for the following seven database fields.

1. Name of President
2. Years in office
3. Political Party
4. State of residence
5. Date of Birth
6. Date of Death
7. Vice-President

EVALUATION:

Students will demonstrate understanding through the completion of a portfolio containing a database printout and pictures of the presidents. They will later create a slide-show using the information from their database file.

Database

AUDIENCE: 7th grade World History

OBJECTIVES: The students will...

1. Create a database which contains information about the Aztecs, Olmecs, Incas, and Maya.

2. Utilize the information from the database to make charts comparing and contrasting the different groups.

3. Write a three page paper which compares and contrasts the different Indian groups.

MATERIALS: Computer lab, poster board, markers, glue, and the ClarisWorks program.

PROCEDURE:

1. Students will go to the library to research information about the different Indian groups and will create a database which will contain information about the different groups. Students will choose the categories they want for their database. They will get three days to do this.

2. Students will then get a poster board and will make charts and graphs comparing and contrasting the different groups by use of the database. Two days will be given for this.

3. Students will then write a paper comparing and contrasting the different Indian groups.

EVALUATION:

Students will be evaluated by correcting the poster board and the paper. I will also evaluate them by looking at their database.

## Still Video/Scanner

AUDIENCE: This lesson plan is made for middle school U.S. or World History classes.

OBJECTIVE: They will learn the facts around key moments in history by re-enacting these events. Students will act out these events in costume and will photograph important scenes in their skits.

MATERIALS: A Still Video Camera and a computer able to process the photos. Students will need to supply their own costumes.

PROCEDURE:

This activity is scheduled to last three class periods.

• The first day will be spent learning how to use the camera and rehearsing their skits.

•The second and third days will be used to give presentations and to take still photos. Each group will pose for two still photos which depict a key moment of their presentation. (Example: Washington crossing the Delaware/ Joan of Arc being executed.)

EVALUATION: Students will demonstrate understanding through their presentations and a written report turned in at a later date. The written report will include the still photos taken during their re-enactment.

## APPENDIX G

## Sample Software Evaluations

### Software Evaluation Format

Software Title *Title*

Publisher *Publisher* Price *Price* Target Audience *(Audience)* Computer Type Computer

Minimum Requirements *Requirements (RAM, Hard disk space, System #,etc)*

Rating *Rating*

Description *(Describe the program--- what it does, layout, use of graphics, sound, color, animation, etc.)*

Evaluation

Manual *(completeness, ease of reading, organization, screen shots, etc.)*

Ease of Use *(User-friendly, error recovery, standard commands and interface, intuitive, etc.)*

Effectiveness *(Does it do what it says it can do? Is ft worth the money? Can the target audience use the program effectively?)*

Overall *(What is your overall feeling about this software? Is ft worth buying? Who would you recommend buy ft? etc.)*

## Maya Quest

Software Title: Maya Quest

Publisher: MECC

Price: $35.00

Target Audience: Young adult

Computer Type: Mac

Minimum requirements: 4 mb RAM, 8 mb Hard drive space 68020 microprocessor or higher, System 7.x.

Rating:3.5 points out of 5.

Description:

Students explore ancient Mayan ruins in order to find enough clues about the vanished Mayan culture to save the planet earth from being hit by an errant asteroid. Photos of actual ruins are used, and students navigate through their environment on bicycles, traveling from site to site collecting clues. Digitized speech and excellent graphics are used, including some Quick Time movies.

Evaluation

Manual: Very poor. It is reduced to compact disc size and is only 6 pages long. It focuses on installation and rudimentary program use. It is obvious that Mecc feels that the program is self explanatory.

Ease of Use: Excellent. Icons and all navigational features are big, clear and intuitive. Students pick up the use of this program in minutes.

Effectiveness: Average-Good.
As long as students don't get too caught up in the game aspects of this program, they really do learn a lot about many aspects of Mayan culture such as art, music, tools, astronomy etc.

Overall: Good-Excellent
It is worth the $35.00 despite the manual and gaming limitations, but what in the heck does Mayan culture have to do with an errant asteroid?!

# World Discovery Deluxe

Software Title: World Discovery Deluxe

Publisher: Great Wave Software

Price: $32.00

Target Audience: Students and Teachers

Computer type: Dual platform: IBM and Macintosh

Minimum Requirements:
Mac:68020 microprocessor minimum, 4mb ram, 8mb free hard disk.

Rating: 10 out of 10

Description:

Previously, I reviewed a geography software program called Small Blue Planet, and gave it a 10 out of 10 rating. It seems that this evaluations should be annotated, since WDD is a far superior product. Not only does WDD use actual satellite, images, instead of political or topographic drawn maps, it actually includes all three types. The program operates on a game based interface, which is endless in variation. For instance, it you want to have a match ram sets you up with an automatic timer, complete score card. Perhaps you get really good at this, can you about without their borders drawn in? Want to hear that state's anthem? No problem! WDD has a full orchestra play it for you! State flower? You bet. How about countries of the world, you ask. Yes, complete anthem, local speech (14~20 common phrases or words spoken by native speakers of the language) and same great gaming interface. In fact, I have been playing with WDD for two weeks now and have not utilized all the options yet! World Discovery Deluxe gets a 10+!

Evaluation:

Manual: None. Simple installation procedures provided only. Soft-manual provided with excellent on-line help.

Ease of Use:

Excellent. Pull down menus remain consistent and handy. Easy to understand.

Effectiveness:

This program is truly excellent! I thought the gaming features would get old or boring, yet there are so many variations that this has not become the case! I learned countries I had never heard of.

Overall:

Students don't want this program to end. They love to explore the game's rich information about countries and love to compete in the gaming features. This program is a must, and well worth twice its price.

Score: 11 out of 10

## Small Blue Planet and The Real World Atlas

Software Title:
Small Blue Planet The Real World Atlas

Publisher:
Now What Software

Price:
$34.00

Target Audience:
General reference

Computer type:
Dual platform: IBM and Macintosh

Minimum Requirements:
Mac:
68020 microprocessor minimum, 4mb ram, 8mb free hard disk.
IBM:
386 Intel microprocessor minimum, 4mb ram, 10 mb free hard disk

Rating: 10 out of 10

Description:
Small Blue Planet is an excellent program to use for teaching geography because it uses actual satellite images of each continent. You can use the magnify glass tool to zoom in and out of each map. Also, the program uses excellent maps which can be accessed at the same time as the satellite images, creating an overlay which is very clever and instructionally useful.

Evaluation:

Manual:
None. Simple installation procedures provided only.

Ease of Use:
Excellent. A user-friendly tool bar is present at all times, and is simple to understand and manipulate,

Effectiveness:
This program is definitely worth the money. When used to teach geography, this program is very effective! Students are very interested in seeing actual pictures of the continents from space, which totally motivates them.

Overall:

This program is a must for any Social Studies teacher, Geography teacher or anyone who is interested in the world!
Score:9.5 out of 10

APPENDIX H

Sample Elective Lesson Plans

Service Learning Still Video

Audience:7th grade Service Learning Class

Objects:
• To go out into the community and put their Service Learning projects into action.

• To create badges with their photos using a still video scanner.

• To work cooperatively by collaborating on the picture taking.

Materials:

1) Mac computer

2) ClarisWorks draw document

3) Quicktake 150 camera

Procedure:

1)Students will have previously contacted elementary school principals in our community to determine what type of service our middle schoolers could do to help the elementary school. It was determined that the nearby elementary needed after school crossing guards. The principal will provide the orange safety vests. Our 7th and 8th graders will make the name tags with accompanying photo images of our student crossing guards for identification purposes.

2)Students are instructed on how to operate the camera and draw program.

3)Students take head shot pictures of each other.

4)Students choose the draw program and insert their photos.

5)Photos are printed out and students insert them into the plastic name tag sleeves.

6)Once name tags are completed the students will be available for their volunteer work as crossing guards.

Evaluation:Teacher checks each name tag.

# Portfolio Still Video

Audience:
7-8th grade students

Objective:
Students will create portfolio covers using Claris Works and an Apple Quick Take 150 camera. Students will design their own covers, including a digitized picture of themselves.

Materials:
Any Apple Macintosh which supports an Apple Quick Take 150 camera, a color printer, paper, colored pencils and Claris Works.

Procedure:
Begin by having students take pictures of each other using the Quick Take 150 camera groups. Download each picture onto the Macintosh. Using Claris Works, insert their picture into a drawing template. Students then design their own using the Claris Works drawing tools. Print the cover out and decorate using pencils and any other art materials.

Evaluation:
Evaluation of quality portfolio covers will include a digitized picture, and at least 3-5 graphics used from Claris Works. Color is required.

APPENDIX I

Keyboard Short Cuts

Special Characters and Symbols

| Character | Macintosh | PS |
|---|---|---|
| ® | Option-r | Ctrl-Shift-R |
| © | Option -g | Ctrl-Shift-C |
| ™ | Option-2 | |
| £ | Option-3 | Ctrl-Shift-alt-Delete |
| ¢ | Option-4 | Alt-01 62 |
| ¥ | Option-y | Alt-01 65 SS |
| § | Option-6 | Ctrl-Shift-M |
| ¶ | Option-7 | Ctrl-Shift-7 |
| • | Option-8 | Ctrl-Shift-8 |
| ° | Option-Shift-8 | |
| ∞ | Option-5 | |
| ÷ | Option-/ | |
| √ | Option-v | |
| ´ | Option-e then type letter | |
| ` | Option-Tilde then type the letter | |
| ¨ | Option-u then type letter | |
| ^ | Option-i then type letter | |
| ~ | Option-n then type letter | |
| ç | Option-c | |
| Ç | Option-Shift-C | |
| ¿ | Option-Shift-/ | |
| ¡ | Option-1 | |
| … | Option-; | |
| -- | Option-dash key | |
| —π | Option-Shift-Dash key | |

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