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ABSTRACT

This book is an outgrowth of the New Frontiers for Catholic Schools project, a collaborative effort of the National Catholic Educational Association and the University of Dayton. The goal of the book is to support Catholic educators and schools to make technology a vital part of the future of Catholic education. The chapters are as follows: (1) "Seize the Day!" (Angela Ann Zukowski); (2) "A Pastoral Perspective: Theology and Communication" (Angela Ann Zukowski); (3) "2020 Visions for the Future of Education" (David D. Thornburg); (4) "Paradigms of Innovation and Criteria" (Angela Ann Zukowski); (5) "Leadership without Followers" (Christopher J. Dede); (6) "Producing a Technology Plan" (Regina Haney); (7) "Technology Partnerships" (Gail Morse); (8) "New Frontiers" (Regina Haney); (9) "Catholic School Libraries in the 21st Century" (Carol Ann K. Winkler); (10) "Media Literacy" (Frances M. Trampiets); (11) "Technology Coordinator: Who Do They Say I Am?" (Nancy Erhart); (12) "Ethical and Legal Challenges of Technology" (Angela Ann Shaughnessy); (13) "Planning from the Diocesan Perspective (and Sample Plan)" (Marian Stuckey); (14) "Technology Planning from the Elementary School Perspective: Beyond Chalk, Talk, and Textbooks" (Paul E. DeZarn); (15) "Emphasizing the Staff Development Perspective in Technology Integration" (Natalie Krupka); (16) "Planning from a Total Parish Perspective" (Dean V. Waggenspack); (17) "Artisans of Faith: A New Renaissance" (Angela Ann Zukowski); (18) "A Sabbatical View of Catholic Schools" (Margaret E. Curran); and (19) "Survey Research: The Effectiveness of the New Frontiers Program" (David A. Bouton). Appendices include a "Study Guide for 'Aetatis Novae' (The Dawning of a New Era)"; the Ursuline Academy of Dallas technology plan; resource materials on funding educational technology; classroom wiring standards from Ohio SchoolNet; and sample selection criteria for hardware and software acquisition. (MES)

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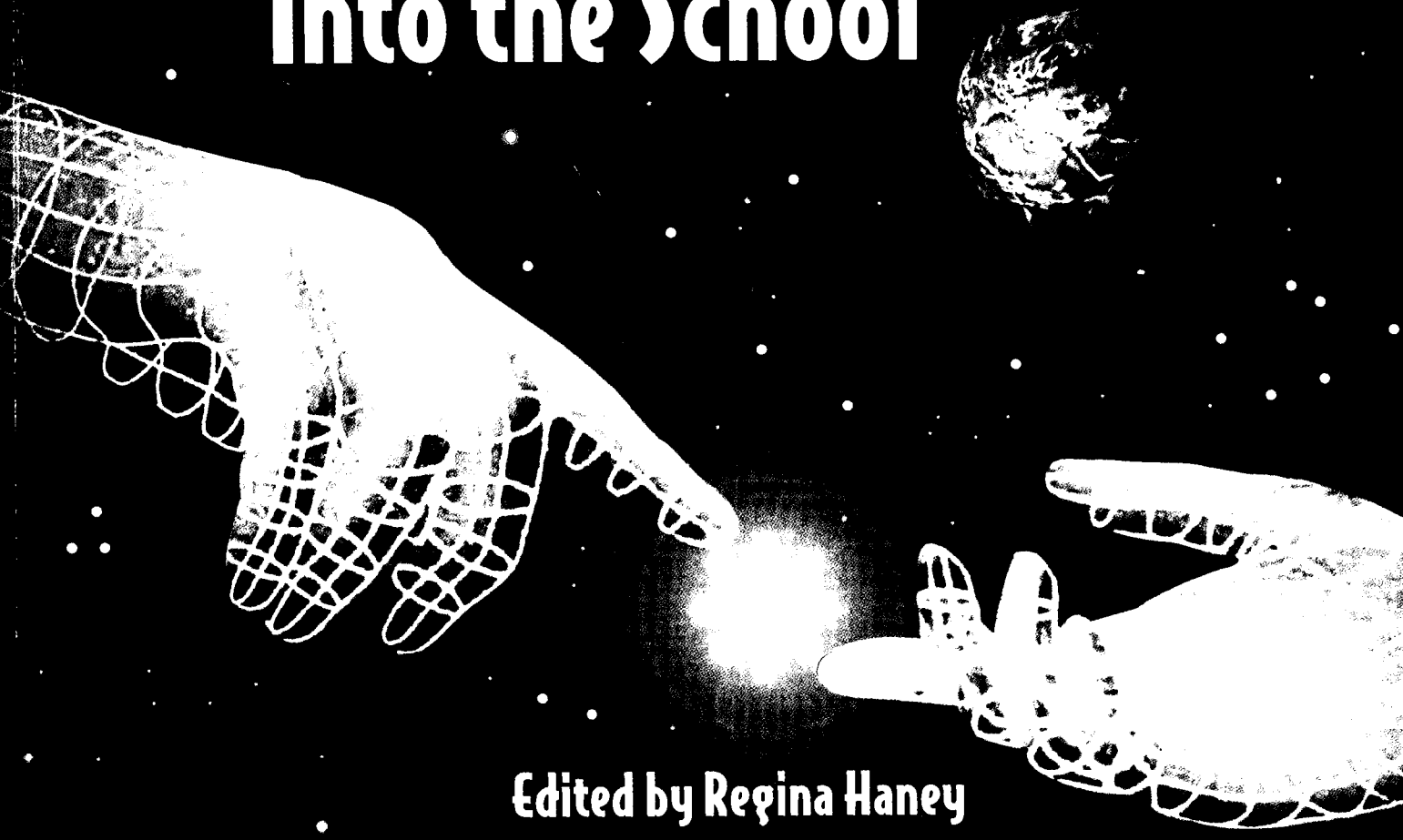

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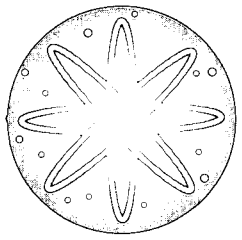

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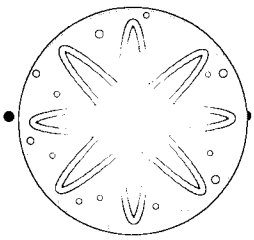

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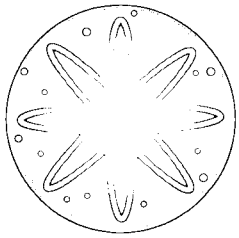

Preface

"One's mind, once it is expanded, cannot return to its original dimension," observed Oliver Wendell Holmes. What a compliment to catechetical and Catholic school educators if students had this or something similar to say about their learning experiences!

This book is an outgrowth of the New Frontiers for Catholic Schools project, a collaborative effort of the National Catholic Educational Association and The University of Dayton. The project was initiated by Regina Haney, Angela Ann Zukowski, MHSH, and Fred Brigham in the early 1990s. It continues until today. The goal is to support our Catholic educators and schools to make technology a vital part of the future of Catholic education. New Frontiers for Catholic Schools provides leadership, direction, and support for Catholic school teams as they search out ways to integrate technology across the curriculum, to push for educational excellence and to prepare Catholic school students for tomorrow.

In the past six years, ten to twelve Catholic school teams of three have gathered annually during the summer at the University of Dayton to explore possibilities, draft a vision, and establish a network of peers who, like themselves, dream of developing a plan that will successfully integrate technology into the teaching and learning of their schools.

The strength of the program is the support given to one another by codirectors, presenters, and teams. Teams are given the space and time to mull over ideas and to dialogue with one another and the rest of the group. Their respective experiences with technology and teaching and learning become their primary sources of information, understanding, and planning. Each participant has something to contribute to the crafting of each school's technology plan. Long after the Dayton experience, the communication continues. Teams participate in telephone conference calls and regular communication via the Internet to keep informed on new developments and to support one another in their new learning initiatives. This ongoing conversation among New Frontier alumni encourages and celebrates their daily new-pioneering experiences opening new paths of learning and teaching today.

This book highlights the new perspectives, insights, and developments of our New Frontiers schools along with some of our facilitators who have been mentoring our teams into the new frontiers of Catholic education.

The New Frontiers for Catholic Schools project recognizes that we are living in a new era. The Vatican documents, *Redemptoris Missio* and *Aetatis Novae,* emphasize that the new era is a new culture with a new psychology, new languages, and new techniques (cyberspace, converging communication technologies, etc.). Catholic education has a moral, religious, social, and educational responsibility to engage in the formation of this new culture. With or without Catholic educators this new culture is emerging. It is being woven into the fabric of our everyday lives. What is the impact of this new culture on Catholic education? Firstly, new creeds (beliefs, values), codes (behavior), and cults (rituals) are being manifested; secondly, a new self-awareness/awakening is unfolding as learners find themselves immersed in a sea of new and rapidly

revealing information; thirdly, new locations and styles of learning communities are emerging inviting learners to a deeper understanding of global and interdisciplinary collaboration for learning; finally, new leadership and administrative skills are challenging administrators to rethink both the physical and personal infrastructure of our learning environments for more effective learning to occur.

Technology is a powerful means of expanding the mind for it connects the learner to a constellation of information; encourages him or her to hypothesize, synthesize, and evaluate data to draw conclusions; and offers an array of techniques to communicate an idea or new knowledge.

The technology concept reflects its root meaning, which is derived from the Greek *techne,* denoting skill or technique. Technology provides educators and learners with diverse techniques through which they can not only explore but also plumb the DEPTH of education in order to assure optimum learning experiences.

Depth: Five Fundamental Outcomes of Quality Education

Using the letters of this word DEPTH, we ask you to consider five fundamental outcomes of quality education enhanced with diverse technology. Throughout our book you will find the praxis of these outcomes articulated.

Discover information and acquire new knowledge. Students provided with the tools of technology, including the computer, television, CD-ROM, radio, telephone, Internet, videocassettes, videodisc, film, and fax machine, craft hypotheses, gather facts, and reach conclusions; for example, a group of students uses videodiscs to compare and contrast James McNeill Whistler's philosophy of art with that of the realists. The students communicate via Internet with the National Gallery of Art to check their assumptions and then gather additional information from online authorities. Using Hyperstudio, a multimedia software, they report their findings to the class and show scanned photos of Whistler's art to demonstrate his purely aesthetic purpose, his "poetry of sight." A similar exercise might test the hypothesis that Michelangelo's art had a predominantly religious purpose.

Encourage inquiry and advancement. In a geometry class young mathematicians guess the room's dimensions. Using a probe attached to a computer, they verify their estimates. In a religion course learners are given opportunities to navigate through the Internet and find exciting religious conversations and resources. Whether it is in entering the home pages of the Vatican, Catholic dioceses around the world, or other religious traditions, our students are challenged to rich and diverse thought that supports a profound dialog of faith in cyberspace *(A Vision All Can Share* - USCC). Media education presents opportunities for students to become gospel value sentinels in the exploding media world with the ability to discuss the presence or absence of gospel values and the impact of such programming on their lifestyles and choices.

Ponder and poll possibilities. Students are taught to reflect on their day, current issues, and the impact of new knowledge/information on their lives and the lives of others. They are given quiet time to do so. They apply technological tools to poll other's opinions and perspectives. Exploring possibilities, rather than being comfortable with any one way, is a part of students' learning experiences.

Transmit new knowledge. From an array of technology learners choose the best way to share their newly discovered knowledge. A principle reiterated in catechist and teacher preparation programs is: Only when you teach it, do you fully understand it. This principle is appropriate for today's students as well as teachers.

Attain holistic application of the multiple intelligences. Howard Gardner's theory of multiple intelligences suggests that there are at least seven human intelligences, two of which,

verbal-linguistic and logical-mathematical, have dominated the traditional pedagogy of Western societies. The five nontraditional intelligences, i.e., spatial, musical, kinesthetic, interpersonal, and intrapersonal, have generally been overlooked in education. Our learning environments need to be created to support all seven intelligences. The techniques of the new media culture are one of these support systems.

Our New Frontiers coordinators have found that the skillful application of technology provides more than superficial learning experiences. Technology offers techniques for getting to the DEPTH, the optimum, of teaching and learning. This book is by no means the last word on weaving technology into our learning environments. We see our work as a contribution to the ongoing conversation about quality education. We, as Catholic educators, are always engaged. Catholic educators must be the facilitators who enable students to expand their minds, knowing that once expanded, these minds cannot return to their original dimension.

This preface, as well as chapters one and six, were adapted from articles printed in the October/November 1995 Momentum, the journal of the National Catholic Educational Association.

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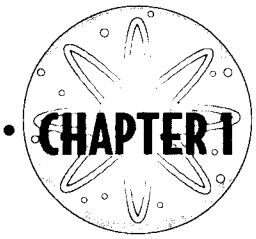

Seize the day!

Angela Ann Zukowski, MHSH

For Catholic education to thrive in this transforming age,
we must take an active part in shaping emerging technologies.

In 1971 I began producing adult religious education programs on Ohio's cable television stations. Since I had no television production background, I attempted to identify mentors among regional and national Catholic communicators and educators. I could find none. I was informed that cable TV had no future. I was wasting my time. Fortunately, I paid little attention to the advice I was given. I decided to seize the day — *Carpe diem!*"

I was reminded of this experience when I read *A Peacock in the Land of Penguins,* a fable that helps us to see what can happen when we try to express ourselves in an environment created by those who view the world differently. There are both perils and possibilities in being "different" in a society that values comfort, safety, and the predictability of conformity. Those of us who try to capture the educational imagination of our peers in the communication age often feel like peacocks among penguins.

The Challenge

Few periods in history deserve to be called a "transforming era;" ours is one. Science historian Thomas Kuhn, has pointed out that major change takes place only occasionally, in what he called "paradigm shifts." These shifts occur, said Kuhn, when the working assumptions on which people have depended become so inappropriate that they break down and are replaced by a more appropriate set of assumptions.

Those who recognize our entrance into this transforming era realize that it requires a leap of imagination and faith. We can, indeed, offer our colleagues no infallible forecasts or guarantees to prove that technology is no longer a luxury for the few, but is, instead, a necessity for the many.

As far as education is concerned, the information superhighway is the smallest part of this "new beginning," in which knowledge banks, virtual communities, and artificial environments will come to dominate much of society a generation from now. These will make the global village either a healthy or unhealthy place to be, depending on the kind of content that we put into these new channels.

I firmly believe that if Catholic communicators and Catholic educators would have embraced the dawning of cable TV in the 1970s, it would have a different function within our culture. We cannot be indifferent or take for granted any of today's new technologies and media resources. We need to be at the table in the design and development process of each.

If we are not, we will end up either as passive recipients of the information revolution or as committees of a countercultural revolution fighting for our access rights or protesting the penetration of negative human-value messages into our society.

The postmodern world is fast, complex, and uncertain. It is already presenting immense problems and challenges for our modernistic educational systems and the teachers and catechists who work within them.

The compression of time and space is creating accelerating change and innovation in the teacher's role, as well as overload and intensification in her or his work. Ideological uncertainty is challenging the Judeo-Christian tradition on which our education has been based. Our new mission, therefore, is jeopardized by identity crises and an ambiguity of purpose. Thus, the future of teaching will depend largely on how the challenges of postmodernity are resolved within our colleges, schools, and parish programs.

Developed 150 years ago, our present system of schooling pushed the limits of information processing in the 19th century. In fact, America's public school system was once itself a radical invention, a communication revolution in its own right. Building the Catholic system of parish elementary and secondary schools, colleges and universities, involved a real struggle on the part of Catholic educators to ensure that they kept pace with the revolutionary changes being made in 19th-century information processing, while at the same time preserving the distinctly religious nature of their education programs. In recent years the cultural context and medium for learning has been rapidly shifting and if Catholic education is to thrive in the 21st century, it is important to think anew about schooling, teaching, and learning, even more important is the need to lead the communication revolution rather than attempt to restrain it.

New Paradigms

The rapid advance of communication technologies and their impact on our educational environment require our full attention. New paradigms are emerging. What are we to look for? How do we as Catholic educators engage these shifts and determine our role within them? Here are a few shifts for our consideration: virtual communities, customized knowledge banks, and virtual experiences. For many of us, the language itself creates a barrier to understanding the concept.

Virtual communities are achieved through telepresence. This is the ability to cross any distance to form new relationships. High performance computing and communication technologies will make this possible. We will be able to look over the shoulders of experts who are engaged in research and share their discoveries and insights. We will be telecommuting and interacting with one another from within our own homes and classrooms.

The **customized knowledge bank** is a type of multimedia serving multiple learning styles. It shifts the balance between in-class and out-of-school work. One of the problems with classrooms now is that the teacher has to spend so much time presenting instead of interpreting information. Yet, if we can have rich presentational sources that are routinely available outside of class, we can make better use of our time in an interpretive, interactive role with our students. Furthermore, our growing sophistication about the nature of learning points inevitably to the virtues of individualized teaching. With the creation of customized learning environments, we can better accommodate the diverse learning styles of our students. In his book, *Frames of Mind: The Theory of Multiple Intelligences*, Harvard professor Howard Gardner suggests that there are at least seven human intelligences. Two of them — verbal-linguistic and logical-mathematical — have dominated the traditional pedagogy of Western societies. The five non-traditional intelligences — spatial, musical, kinesthetic, interpersonal, and intrapersonal —

have generally been overlooked in education. We can develop ways to teach and learn by engaging all seven intelligences through new communications.

Virtual experience is not simply a new communications medium. It also creates places to live and to be. This is sometimes expressed as "virtual reality," which uses computerized "clothing" to create the subjective impression of being inside a virtual world when, instead, you are looking through a window into an artificial reality. That subjective feeling is very powerful; it influences people emotionally as well as intellectually and is going to lead to some very interesting outcomes for society.

These are only a few of the new educational experiences that await us on the horizon of the 21st century. Although many of us are only now beginning to figure out how to use computers or multimedia packages for teaching and learning, we must be prepared for the next wave of change in communications technology. We do not have to do this alone. As a matter of fact, it is impossible to be a "lone ranger" today. New collaborative styles of teaching and learning are required if we are to live sanely within these paradigm shifts.

The Collaboration Key

Collaboration has come to be a major paradigm of educational change in the postmodern age. Historically, conditions of rapid and radical social change have typically given rise to such shifts, but the postmodern age, with its qualitative leaps in instantaneous development and dissemination of information, brings an acceleration and diversification of paradigm shifts themselves. A fundamental problem of postmodernity, therefore, is the need to generate paradigms of understanding, development, and change in order to interpret, analyze, synthesize, and respond to the more specific paradigm shifts in technology, organizational life, and intellectual thought that are occurring with increasing speed, both within and outside of education.

Elements of Collaboration

The principle of collaboration has emerged as a productive response to a world in which problems are unpredictable, solutions are unclear, and demands and expectations are intensifying. Specifically, what does collaboration offer us as we navigate through diversity and invention? In some of our most innovative Catholic educational settings where collaboration is given priority, a positive atmosphere of well-being, creativity, trust, and renewed initiative exists. The following six elements, which are not meant to be exclusive, emerge:

Moral support: Collaboration permits vulnerabilities to be shared and aired, and carries people through the failures and frustrations that accompany change.

Improved effectiveness: Collaboration encourages risk-taking, creates diversity in teaching strategies, and boosts positive responses and encouragement from peers.

Increased capacity for reflection: Collaboration provides sources for feedback and comparison that prompt teachers and catechists to reflect on their own practice. Indeed, others become mirrors for one's own practice, leading one to reflect on it and reformulate it more critically.

Organizational responsiveness: Collaboration polls the collective knowledge of colleagues, enabling them to respond swiftly to changing constraints and opportunities in the surrounding environment, to scan the environment proactively for upcoming changes, and to seek out the opportunities offered.

Opportunities to learn: Collaboration increases educators' opportunities to learn from

each other — between classrooms, between departments, and between parishes and schools.

Continuous improvement: Collaboration encourages catechists and teachers to see change not as a task to be completed, but as an unending process of improvement in the pursuit of greater excellence.

In order for collaboration to influence the re-engineering of Catholic education, administrators must take steps to remove roadblocks that might prevent collaboration, innovative thinking, and application. Some of these steps are:

- recognizing and celebrating the innovative achievements of our teachers and catechists;
- encouraging research and development, especially in regard to interdisciplinary teaching initiatives;
- enhancing communication and cross-fertilization by bringing teams of people together from different academic areas;
- eliminating barriers to accessing resources; and initiating participative decision-making in the design and implementation of technology plans.

Conclusion

One of my favorite films is *Dead Poets Society*. Two scenes in particular capture my notion of the role of Catholic educators today. In the first scene John Keating (Robin Williams) instructs his students to rip out the introduction to their poetry book. Perplexed, the students follow his directives. His ultimate goal is to introduce them to a richer understanding and appreciation of life. He says: "You are here. Life exists...The powerful play goes on, and you may contribute a verse. What would your verse be?"

In the other scene, Keating takes his students into the hallway and points out on the wall the photos of students who attended the school a couple of generations earlier. He indicates that they dreamed big dreams for their lives, but were all dead now; that very few of them realized their dreams because they were overwhelmed, as most people are, by the present and were never really able to take control of and reinvent their lives. Keating urges his students to do otherwise, saying, *"Carpe diem!"*

In our fast-paced world, there is little time for indecision. We must seize the day! We must not be passive bystanders in the evolution of a new communication culture. We must instead be active participants in its formation. The powerful play of new educational environments will go on, and we must contribute a verse. What will our verse be?

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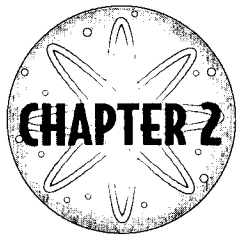

A Pastoral Perspective: Theology and Communication

Angela Ann Zukowski, MHSH

It is appropriate that we commence our book with a reflection on the relationship of theology and communication. We know that communications is the heart of what the Catholic Church and, in particular, Catholic education is all about. We know that the fundamental reality on which the church is founded is a mystery of communication. It is the story of the communication of divine life to humanity through the incarnate life of Jesus Christ. As we journey through the Scriptures, we find a rich variety of modes by which Jesus Himself communicated. The church, as an incarnational reality, must utilize all the possible means of communication at hand in a given culture to promulgate the "Good News". Thus, we read in *Aetatis Novae:*

> It becomes equally evident that the first Areopagus of the modern age is the world of communications that which unifying humanity and turning it into that which is known as a 'global village'.[1]

An in-depth understanding and appreciation of communication as central to the mission of the church can support our communications technology initiatives today. If Catholic educators only spend time reflecting on the technological dimension of this media age without incorporating the human or religious dimension, we will have lost an important dynamic contribution of Catholic education to the media age.

In writing our mission or philosophy statements, we engage in pastoral theological reflection on both the Scriptures and church statements to assist us in naming and communicating our Catholic identity to our students, faculty, school, parish, and local community. This same process needs to be engaged as we commence the design of our communications technology plans which are being woven into the fabric of our curriculums. Thus, not only should there be a pastoral plan for communications, but communications should be an integral part of every pastoral plan, for it has something to contribute to virtually every other apostolate, ministry,

and program.

Firstly, we need to spend quality time reflecting on a pastoral theological understanding and appreciation of communications. By exploring stories found in Scripture and our Catholic heritage we are able to discern the rich and diverse means peoples used to communicate the faith within their culture. Several key church documents have been given to us to further support us in this endeavor (*Inter Mirifica, Communio et Progressio, Evangelii Nuntiandi, Redemptoris, Missio and Aetatis Novae)*. Secondly, we need to clarify for ourselves the important relationship of church, communication, and culture. We are aware that transmission of culture in our time and place is dominated by print and electronic media, and they afford an "intensity" to the communications and an "ephemerality" to its content that change the form in which culture comes. The Gospel is not immune to the shifting of the paradigm. There are growing concerns regarding the impact of the rapidly evolving communications technology environment on the dignity of the human person, solidarity, truth, and religious experience. It is for this reason that Catholic educators must be sentinels as they and their students navigate through the new media culture and integrate the experiences of this new culture into the learning environment.

Some theologians are proclaiming that the vast cyberspace has begun to see the space vacated by traditional religions as increasingly inhabited by the religion of popular culture. Brenda E. Basher argues that people construct their own tailor-made "form of religion" from the image presentations of mass-mediated culture. The upshot is that the American religious marketplace includes "a plethora of distinct popular faiths."

The new media age challenges Catholic educators to ensure a deep rootedness in our Catholic faith and heritage for students to navigate through a cyberspace of "distinct popular faiths" today. Our students are not entering this new culture passive. They are actively engaging in "public dialogues of faith". This may be "the best of times or the worst of times" for educating our students in our Catholic faith. The reality is that with or without us this new media culture is going to continue to pick up momentum and inform and form the attitudes, values, and beliefs of the 21st century. How we enable our students to be 'great conversationalists' and 'evangelizers' within this new culture is the challenge we face today. It is imperative that we have a basic understanding of the correlation between theology and communications media.

Theological Foundation: The Trinity

While on retreat, I found myself meandering through the Taize gift shop. My eye caught a glimpse of Andrew Rublev's icon of the Trinity. Rublev's icon is one of the most famous portrayals of the Trinity. It was painted in the early fifteenth century in Russia. It depicts three angels seated around a table on which there is a Eucharistic cup. The three figures are arranged in a circle, yet the circle is not closed. Each figure is intent, not on themselves, but on the other. One has the distinct sensation that one is not solely invited into the communion but that, indeed, one already is part of it. There is a space for us in the icon. Catherine Mowry La Cugna states that "this icon expresses the fundamental insight of the doctrine of the Trinity, namely, that God is not far from us but lives among us in a communion of persons." Thus, to understand the theology of communication is to spend time meditating on the Trinity through Rublev's icon. Henry Nouwen's book, *Behold the Beauty of the Lord: Praying with Icons,* has an inspiring meditation on Rublev's Trinity. Creating a prayerful setting for the icon in your faculty room or classrooms can be the first step toward engaging in a theological reflection on the Trinity as the foundation for your theology of communication.

I know what you are thinking! Our theology of the Trinity has not been the easiest to understand or discuss. Most catechists and Catholic school religion teachers typically avoid this

teaching because of its abstract theory and complicated theological language. Yet, there have been some new theological breakthroughs for our reflection on the meaning and understanding of the Trinity since the Vatican Council. Since the whole of Christian theology is Trinitarian in origin and in content, it has become the primary focus for nurturing conversations about theology and communication. Richard McBrien tells us that "Christian theology is made possible by the self-communication of God the Father in the Word-made flesh, and our apprehension of God in Christ occurs only because we are drawn by the Holy Spirit who dwells within our hearts and elevates our whole consciousness.[2]

Catherine Mowry LaCugna is one of the leading Catholic theologians who has been guiding us toward a renewed appreciation and understanding of the Trinity. "The central theme of all Trinitarian theology", states LaCugna, "is *relationship*: God's relationship with us, and our relationships with one another." She helps us understand that the doctrine of the Trinity is not an abstract conceptual paradox about God's inner life, or a mathematical puzzle of the "one and three". She encourages us to understand that the doctrine of the Trinity is, in fact, the most practical of all doctrines. She believes it helps us to articulate our understanding of the Gospel's demands: how personal conversion is related to social transformation; what constitutes "right relationship" within the Christian community and in society at large; how best to praise and worship God; and what it means to confess faith in and be baptized into the life of the God of Jesus Christ.

I am finding that many of the questions and concerns Catholic educators ask about the impersonalism, individualism, and isolationism of the new media age can be counterbalanced by spending time reflecting on the meaning and message of the Trinity. Current theological reflection on the Trinity affirms personal and relational elements as descriptions of the Trinity. It is the foundation for a theology of the human person and for a theology of right relationship (La Cugna). Christian living is not about solitary salvation, introspection, self-absorption, but about ever-fuller participation in communion with God and with others. According to LaCugna, because the Trinity affirms that persons are made to exist in loving communion with one another, the doctrine of the Trinity is also the foundation for a vision of society and a vision of the church which is to be a sign to the world of the ultimate destiny of all creatures.[3]

LaCugna's stimulating new conversations on the Trinity is helping us to gain a renewed appreciation for the theological significance for our theology of communication. She enables us to cultivate a solid Catholic Christian foundation upon which we, as Catholic educators, are able to address the questions and concerns of the new media age.

Theological Foundation: Jesus

This mystery of God (Trinity) is disclosed to us through our ongoing experience of Jesus Christ (Incarnation) as God's Word/Image and through our ongoing divination by God's Spirit. Grace, as Karl Rahner has shown, is God's self communication. Our whole history and all human relationships exist within this original combination of God to us. Thus, the whole of history will be ordered to become God's Word and Image: this is its inmost meaning and direction. This Christian view of the mystery of God as God's self-communication to the world in Word and Spirit has enormous implications for understanding a theology of communication. The most appropriate way today of thinking about God and speaking of religion is not, first of all, in terms of sin and redemption. It is divination which should be the primary focus, the release of the creative energies of each human being and the world community as image of God. Because God is unique, creative, communitarian, and continually communicating life and love, each and every human being, as image of God (Genesis 1:26), is unique, creative, part of a community, and called to share resources with others.[4]

The New Testament sees in Jesus Christ the fulfillment of the prophetic and historical tradition of God's communication with the world and, at the same time, the taking of this tradition to a completely new and unique level. God was experienced as communication in a radically new way through Jesus.

> Through His "incarnation," He utterly identified Himself with those who were to receive His communication and He gave His message not only in words but in the whole manner of His life. He spoke from within, that is to say, from out of the press of His people. He preached the divine message without fear or compromise. He adjusted to His people's way of talking and to their pattern of thought. And He spoke out of the predicament of their time.[5]

Jesus' pattern of communication seems acutely relevant to our concerns today, as we enter the communications age. For His words and images are a call and a challenge, not first of all to our will power by which we choose to act in a certain way, but rather to our imagination through which we see the world differently. Just as Jesus told the stories of God through proclamation, conversation, parable, paradox, disputation, and symbolic actions, as in many other ways, Catholic educators need to find new ways in a new culture to capture the religious imagination of our students by retelling these stories of God in the communications media of today.

The Church is the community of those who believe in Christ as God's Communicator, as God's definitive Word and Image. The church is the people called together by God, gathered through God's Spirit, around Christ. Thus the Scriptures, in expressing Christ as God's Image, see Him as a "Beginning". "He is the image of the unseen God and the first-born of all creation, for in Him were created all things in heaven and on earth: everything visible and everything invisible...Now the church is His body, He is its head. (Colossians 1:15-16,18)

The church is called to be the visible sign (communication) of God's reign of universal love and wholeness which has begun in Christ. The many images of the Church which we find in the New Testament and in later tradition, i.e., the church as People of God, Body of Christ, Temple of God, and so on, are to be seen in terms of the reign of God. From the perspective of the media age we can see that the vocation of the church is to live out this ongoing, unlimited communication of God's love, reconciliation, and wholeness to the world. Christ remains the origin and the dynamic power of the church's communication as it proclaims the Gospel, teaches, heals, and continues the long journey out of the many forms of human enslavement into the reign of God. Since we are to do this through words of hope and through images of Christ's love, as well as through our own praxis or way of life, communication must then become the heart of the church community.[6] The demonstration of the effective application of personal, interpersonal, and media communication skills is an essential element for teaching and ministry in the church today. Communication must become the heart of what we are as Catholic educators.

Church, Communication, and then Culture

New and urgent questions face the church as she seeks to communicate her story in contemporary culture. We step today onto a new landscape filled with new technologies, mass media attractions and locations (space, e.g., cyberspace), only to find the people speaking a new language or having differing cultural experiences. They may no longer hear voices of religious tradition, or they may simply refuse to even listen to how (format and image) the stories are communicated. In preparing for the Fifth Centenary of Evangelization in the Americas, the American Bishops stated:

> The evangelizer is faced with the problem of indifference to matters of religion. Relativism makes many wonder why they should hold any truths as sacred. With those forces of our age has come the growth of an extreme form of individualism that sees no need for the faith community or for the necessity of comparing one's own insight with those offered by tradition.[7]

If communication is the heart of the church's life then Catholic educators must enter in a decisive way into this new age. The Catholic church has a long tradition of using media and the arts in its attempts at narrating her faith. It is up to us, therefore, to identify the new language and artistic expressions which can stimulate new approaches to the narrative and thus, stimulate a public dialogue of faith within the new media culture.

Through many of her publications Gregor Goethals has engaged in a theological reflection on the relationship of art, culture, and new media age for telling our faith stories. She believes along with Niebuhr that persons who critically reflect upon their symbolic world are called into a "permanent revolution of the mind and heart," an unguarded adventure of the spirit which opens them to endless new possibilities of communication.

A close review of technological innovations, such as writing, print, and electronic communication, can demonstrate how they have changed the way in which our stories/narratives have impacted how we think and organize ourselves. The introduction of writing, and later print, extended human memory and overcame its limitations. With the presence of a means to store information outside of collective memory, the heavy figures of myth and legend were no longer necessary and greater numbers of lighter heroes were made possible. As oral poetry and song were replaced by written history, the hero was grounded down to earth, and as much information could be storied about any given individual, heroes became more individualized.

As I understand Walter Ong, the essence of his position is that substantive and substantial technological changes of the kind that mark the transitions from writing to printing to electronic communication affect the social, cultural, and psychological fabric of our lives in the profoundest possible ways by influencing the way in which we think and the way in which we organize ourselves. In effect, it also influences how we communicate our stories of faith. Exploration of the relationship of communication technologies and stories of faith enables Catholic educators to determine the influence and impact that both religious and cultural stories have on the formation of local culture.

Redemptoris Missio elaborates on the concept that we live in a new culture that has a "new language, new psychology, and new techniques"; thus, we are to be tuned into this new culture. Television news, the soap opera, the Internet, and the ads are bare respecters of cultural difference, generating universal language, not for an educated elite this time, but for all of us. Television and the Internet are becoming the source of a "new global vernacular" at odds with national and international cultures and religion. In light of this fact, Catholic educators are challenged to define innovative ways to become skilled in this new vernacular and dialogue within the culture.

Today's mass media are the windows of our culture. They provide the myths, the stories, and images that explain to us who we are, what we can do, what we cannot do, who as nations we once were, and who we can be; in other words they provide the worldview that explains, unites, and guides our lives. Gregory Baum states that the mass media of communication are an exciting development at the heart of modern society. They embody human intelligence, artistic talent, and technological innovation. They exercise great power in shaping contemporary culture and the stories we remember and live by.[8]

The stories of our faith must be communicated in symbols, models, images, and words which are accessible to each culture and understood by it, or they do not get communicated at

all. People today are fascinated by the image, by what is visible and concrete rather than by reason or abstract knowledge. This means Catholic educators have to rediscover the image dimension of the Gospel for contemporary culture. Since the world which moves, attracts, and empowers people today is not one of abstract doctrine but instead of the word of story, metaphor, and image, we must recover the liberating word within all aspects of our religious experience.[9]

Paul VI's apostolic exhortation *Evangelli Nuntiandi,* aimed ten years after the Council at making "the church of the twentieth century better fitted for proclaiming the Gospel to the people of the twenty-first century."[10] The document begins its reflections with three questions that had been centerpieces for the discussion at the 1974 Synod of Bishops:

> In our day, what has happened to that hidden energy of the Good News, which is able to have a powerful effect in man's conscience?
>
> To what extent and in what way is the evangelical force capable of really transforming the people of this century?
>
> What methods should be followed in order that the power of the Gospel may have its effect?[11]

In Conclusion

Tracing the historical development of theology and communication from the oral tradition of the first generation of the Christian era through the era of the written word of manuscripts, to the Reformation age of print, and into the twentieth-century communications revolution of the electronic media, we see an intimate historical relationship between theology and communication. The communications revolution through which we are passing is fully as radical as that of the sixteenth century. The electronic media are modeling a new world and, perhaps, even a new breed of human being. The new electronic media are no more hostile to the Gospel than were the vehicles of manuscript and print (Dulles). We have already indicated that Jesus Himself used a variety of means for communicating through actions, stories, parables, and by His very everyday life. By appealing to the imagination and feelings of His hearers, He elicited a high degree of audience participation.

Where do we begin? Firstly, decide to articulate your theology of communication. This articulation will ground you in our rich Catholic heritage of communication. Secondly, decide to spend some quiet time once or twice a week reflecting on the Scriptures, especially as they are related to the three questions found in *Evangelii Nuntiandi* (above). I also encourage you to acquire a copy of Rublev's icon of the Trinity for your home study, class and/or faculty room. Allow yourselves, your students, and colleagues to spend some contemplative time together meditating on the icon. Contemplation is communication.

Monica Hellwig wrote that:

> The essence of a contemplative attitude seems to be vulnerability-allowing persons, things and events to be, to happen, allowing them their full resonance in one's own experience, looking at them without blinking, touching them and allowing them to touch us without flinching. It is a matter of engaging reality in action, allowing it to talk back to us and listening to what is said. It is a constant willingness to be taken by surprise.

The qualities of the contemplative spirit, then, can be named in many ways: silence, stillness, poverty of spirit, gratitude, openness to experience, and ability to be surprised. But the essential, defining characteristic, the source from which all other qualities flow and of which

they are derivative is "presence" and its immediate and continuing effect in psychic life.

Tillich says that in moments of solitude, "...something is done to us. The center of our being, the innermost self that is the ground of our aloneness, is elevated to the Divine center and taken into it." Parker Palmer stated that, "The ultimate lesson silence has to teach is that God and the world have not absented themselves from us...we have absented ourselves from them".

Contemplation is about God's communication with us. It is fundamental to understanding a theology of communication. "The conditions must be right", states Josef Pieper, if we are to touch, in contemplation, the core of all reality, the domain of the eternal archetypes. Thus, in our attempt to name our theology of communication which becomes the foundation for our integrated technology plans for our Catholic schools we need to go deep into the roots of our Catholic heritage. We need to recognize and celebrate what communication means for us. We realize that communication is the heart of the church. We come to understand that we have a leadership role in preparing our students to be Christians who are able to address the diverse and complex issues of the new media age. Finally, as Catholic educators, we realize that the new media age is not simply about the networking of technology but about the networking of humans and technology. It is not an age of smart machines but of humans who through networks can combine their intelligence, knowledge, and creativity for breakthroughs which can enhance the quality of human life, solidarity, and new avenues for the Good News. Again, religion in the Judeo-Christian tradition is revealed as a dynamic interplay of word, image, story, and drama. Christ as God's communicator and Word/Image frees us to see how other words, images, stories, and drama can reveal aspects of the reign of God as the transformation and liberation of our world or how these forms of communication can hold back the coming of God's reign and the new Earth.

Endnotes

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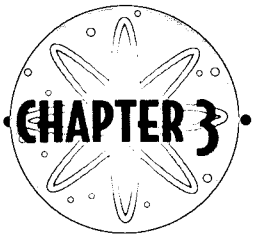

2020 Visions for the Future of Education

David D. Thornburg

Introduction

As Yogi Berra once observed, "It's tough to make predictions, especially about the future." Even so, there are some clear trends in American society today that are likely to have long-term consequences. Since one of the major roles of education is to prepare students for life in the next century, an awareness of these trends by educators and policy makers is essential if our educational system is to achieve its objectives.

Let's start by examining the current reality:

We live in a world in which the salary gap between the highest- and lowest-skilled workers in our society is increasing. Data from the U.S. Census Bureau and Department of Labor has shown that, for the period from 1969 to 1989, constant-dollar earnings for low-skilled male workers dropped by 24%, while the earnings for those in the top quintile increased by 13%. It has not been the case that a rising economic tide raises all boats. In fact, jobs at the bottom of the pay ladder are disappearing at a prodigious rate as they are being automated or shipped to other countries where salaries are even lower.

In the current information/communication age it is appropriate to explore the access Americans have to information technology. While it is the case that about 45% of our homes have computers in them (many connected to the Internet), studies by the Census Bureau have shown that computer access is strongly correlated to household income. As a rule of thumb, current computer penetration in homes can be estimated by taking family income in thousands of dollars per year and expressing the number as the percent of homes with computers in them. In other words, 70% of homes with a combined income of $70,000 or higher have computers in them; 10% of homes with a combined income of $10,000 have computers in them, and the numbers follow a nearly linear progression for intermediate income levels. Furthermore, these results hold pretty well independent of whether the communities are rural, urban or suburban.

The digital divide is real, and the financial have-nots are also the informational have-nots. Given the importance of information technologies in the future, this gap can produce a permanent underclass and further expand the gap between the haves and the have-nots. For

this reason alone, it is essential that access to powerful information technologies is provided in every classroom, library, and other places where people from all backgrounds gather.

Another aspect of current reality is the continued downsizing of large corporations, with the concomitant growth of small businesses. Large corporations are not only downsizing, they are disappearing. By 1994, 40% of the 1980 Fortune 500 had disappeared through acquisition, breakup, or bankruptcy.

There is good news, however: It has been estimated that, for every job lost in the Fortune 500, 2.5 jobs are created by small companies.

The skills needed to thrive in small dynamic companies are different from those typically associated with corporate giants. Again, it falls to our educational institutions to prepare students for this new world.

Emergent Trends

Against the stark background of today's realities, several strong trends stand out. Many of these trends are interlinked, and their combination has produced a positive feedback loop of tremendous proportions. Here are a few of the current trends and their consequences.

Rapid increase in the growth of information

It has been estimated that information, world-wide, is doubling every two years. To get a glimmer of the impact of this rapid rate of information doubling, imagine that the total amount of information available in the world today is represented by a line 1 cm in length. For a child starting school today, how long a line would be needed to represent the amount of information available in the world at graduation from high-school 13 years from now? 5 cm? 10 cm? By the time this child enters 12th grade, it would take a line 64 cm long to represent the amount of information then available.

One could argue that much of the information we have today is useless and, even worse, inaccurate. This only makes the challenge harder. In a world of rapidly growing information, how do we find the information we need and determine its accuracy and relevance? This is a pivotal skill that every member of our society needs to master, and master quickly.

Collapse of the information float

Not only is information growing quickly, the time lag between discovery and application — the information "float" — is rapidly shrinking. For example, it took many hundreds of years for the steam engine to move from being a curiosity to a commercial product. In contrast, recent discoveries in science and engineering show up in products virtually overnight.

Increasingly global marketplace

The communications revolution has shrunk the world to our desktops. International access to information, markets and services is commonplace today. This means that any venture with a presence on the World Wide Web is, in principle, capable of conducting business virtually around the world. This global marketplace exists as easily for the sole practitioner as it does for the giant corporation — provided that the practitioner is willing to learn a foreign language or two.

While advances in translation technology are occurring daily, the process of learning a new language also exposes the learner to the culture in which that language is used. This cultural component is essential for effectively conducting business on a worldwide basis.

Computers continue to increase in power while dropping in cost

At a dinner speech in Anchorage, Alaska, a few years ago I heard Alan Kay (then a Fellow at Apple Computer) talk about how wonderful it is for students he works with to have access to a Cray supercomputer. A teacher sitting next to me said, "I don't even know why I am here — I'll never have that much computing power in my classroom." I cautioned him: "Watch out for words like 'never'."

A 1980 model Cray supercomputer was the fastest machine of its day. It cost $12 million, weighed 10,000 lbs, consumed 150 kW of electricity — and had only 8 MB of RAM and operated at a speed of 80 MHz.

You can't find personal computers that poorly equipped on the market now. A typical personal computer today has about twice the raw power of this $12 million Cray, and can be purchased for $2,500. This trend of increased power at lower cost is likely to continue well into the next century. The driving force for this change is the continued advancement in silicon chip technology.

Computer chips continue to follow Moore's Law

To get a sense of the power of today's microprocessors, look at your thumbnail. A current state-of-the-art silicon chip that size contains the complexity of a complete road map of the United States — including every interstate, every street and alley in every city and it has the capacity to switch traffic on this highway system in a trillionth of a second.

Today's chips are more powerful than those made a few months ago, and those available next year will dwarf today's capacity. The raw power of silicon technology doubles every 18 months. This observation was first made by Gordon Moore, co- founder of Intel, and it is now known as "Moore's Law." Based on this law, we can safely predict that, by the year 2004, silicon ships will be in production containing over a billion transistors on them. A chip of this capacity is capable of meeting the switching needs for 42 central office telephone switches!

Bandwidth is becoming free

At the same time silicon technology is increasing in power, so are the capabilities of various communications media including glass fibers, copper wires, and wireless communication systems. For example, scientists at Fujitsu and elsewhere have demonstrated the capacity to send data over a single strand of glass the diameter of a human hair at a speed of one trillion bits per second. At this speed, every word from every issue of the *New York Times*, since it was published, could be sent in under one second.

While advances in bandwidth over existing copper lines has not been as dramatic, it now appears that much of the wire currently connecting homes, schools, and offices can be used to receive information at speeds in excess of six million bits per second using a technology called ADSL (for Asynchronous Digital Subscriber Line). Cable television providers are preparing to offer broadband services such as @home, which operate at speeds of up to 10 million bits per second.

As bandwidth increases, the cost of sending information drops. Some have argued that, in the future, communication costs will be too cheap to meter. Already some communities have taken an aggressive stance to ensure their participation in the communications revolution. Residents of Glasgow, Kentucky, for example, have access to the Internet at speeds of two million bits per second for a flat rate of $11.45 per month. This service is provided by Glasgow's power company — a municipal utility that has branched out from providing power to also providing cable TV and broadband digital communication services. America's power companies have

already installed so much fiber optic cable that they have the capacity to be the second largest provider of telecommunications if they wanted to.

Network power continues to obey Metcalfe's Law

Advances in the technologies of computers and bandwidth have combined to feed energy into a digital tornado of epic proportions: the Internet. The Internet is a global communications network that allows information to be sent and retrieved that travel through the infosphere like fragments of informational DNA.

The Internet is a network of networks — a dynamic communication system built from the bottom up. All participants on this network have agreed on a simple set of protocols that define how data is to be formatted and routed from one place to the next. As a result of these simple rules, the Internet is capable of displaying incredibly complex behavior, including its capacity to grow incredibly fast without collapsing under its own weight. The Internet is currently doubling in size every year. Homes, schools, businesses, libraries, and museums are connected to the Net, and each new connection adds value to the whole. This added value was first expressed by Bob Metcalfe, inventor of the Ethernet, who observed that the power of a network increases by the square of the number of users. This statement is now known as Metcalfe's Law and it, in combination with Moore's Law, form the foundations of the communication revolution we are now experiencing.

Consider, for example, the World Wide Web. The Web is a collection of multi-media-based informational sites that contain information of all kinds, all of it composed in a common format that allows the information to be sent across the Internet and displayed on virtually any computer in common use today. While educational institutions, museums, and corporations have Web sites, so do students and hobbyists. The Web has become a new platform for the presentation and communication of ideas worldwide. And the Web would have been impossible without the recent advances in silicon technology and the development of the Internet.

The Web has taken the world by storm. Unlike the Internet, which is doubling in size every year, the Web is doubling is size every 90 days. And even the use of the Web pales in comparison with electronic mail. In 1996, the USPS delivered 185 billion pieces of first-class mail. In that same year the Internet handled about one trillion e-mail messages. Given that much of this Internet traffic originated from homes, schools, and small businesses using ordinary voice-grade telephone lines, one can only imagine what will happen when broadband services become commonplace!

The impact of the Web on education is likely to be profound. It is already being used in novel ways to allow students access to the latest breakthroughs in scientific discovery years before they are likely to appear in textbooks. Furthermore, students can perform their own research on various topics and post their results on the Web for other students, teachers, and researchers to see and evaluate. The Web has democratized the publishing of information in ways unanticipated even a few years ago. As FCC Chairman Reed Hundt has said, "The communication age is connected to the greatest revolution in the history of education since the invention of the printing press."

Some have suggested that the Industrial Revolution increased productivity 50-fold. In the 25 years since the invention of the microprocessor, computer power has increased by a factor of more than 1,000. This is the equivalent of almost one Industrial Revolution per year!

Education must focus on new competencies

Changes of this magnitude require a complete rethinking of education, both in terms of the curriculum and in the development of pedagogies that ensure that every student acquires the high level of skills needed to thrive in the dynamic world of the 21st century.

In addition to the basic skills of literacy and numeracy, every learner must also master the "three C's:" Communication, Collaboration, and Creative Problem Solving. Beyond these are the equally important skills of knowing how to use numbers and data in real-world tasks, the ability to locate and process information relevant to the task at hand, technological fluency, and, most of all, the skills and attitudes needed to be a lifelong learner.

Technological fluency is a basic skill

The need for technological fluency is so great that it deserves special mention. Larry Irving, Assistant Secretary of Commerce, has suggested that 60% of the jobs available at the turn of the century will require skills currently held by only 20% of today's workforce. If anything, this may be an understatement.

We recently conducted a study of the 54 jobs identified by the U.S. Bureau of Labor Statistics as having the highest numerical growth between now and the year 2005. Of these 54 jobs, we could only find eight that do not require technological fluency — and none of these eight jobs currently pays more than twice the minimum wage.

Technological fluency is a step beyond technological literacy. To be fluent in technology use means that we can sit down at a computer and use it as easily as we can pick up and read a book in our native language. Of the challenges facing education today, preparing students to be fluent in the use of computational and communication technologies is one of our greatest. As of January 1997, only 14% of America's classrooms were wired to the Internet. Failure to address this issue immediately will perpetuate the widening gap between the information haves and have-nots.

The lack of technologically fluent workers is already a problem. A report by the Information Technology Association of America warns that one out of every 10 jobs requiring information technology skills is going unfilled due to a shortage of qualified workers. They surveyed 2,000 large and mid-sized companies and found at companies will opt to send more of their work overseas where they can find eligible job candidates.

Education must prepare students for jobs that have yet to be invented

If our challenge could be limited to preparing people for the kinds of jobs available today, we would still have a lot of work to do. Unfortunately, the challenge is even greater. Many of the jobs that will be available at the turn of the century have yet to be invented.

If you doubt this, consider the following. One of the job categories in great demand today is that of Webmaster — a person who designs, creates, and maintains sites on the World Wide Web. This job did not exist 10 years ago. In fact, it did not even exist five years ago! This means that the people who are working in this new field have acquired their skills largely on their own.

In order to thrive in such a fast-paced world of constant change, the skills needed to become lifelong learners must be imparted to all our students.

The collapse of the information float can be seen in the rapid rise of new businesses based on breakthroughs in the study of biochemistry. Companies like Affymetrix, for example, have created automated technologies to identify mutated genes in a few minutes. Tests that used to take several weeks can now be performed inexpensively in a very short period of time. This gives doctors the chance to identify life-threatening problems before they show up in a patient, and to recommend a course of action early on. Technologies in the emerging biotech arena will require lots of workers with a new skill set.

In the realm of marine biology, advances are taking place at breakneck pace. The Monterey Bay Aquarium Research Institute, for example, has two research vessels that use deep-

sea robots to search for new life forms. Scientists at MBARI are finding about one new species of life every week.

Moving from the depths of the ocean to the fringes of our solar system, it now appears that life may exist in some form under the icy layers on Jupiter's moon, Europa. If so, the demand for exobiologists (biologists studying alien life forms) will spring up overnight. Once again, we must create an educational system that prepares students to work in fields that do not even exist today — a tremendous task!

Compact portable technologies facilitate anywhere/anytime lifelong learning

For many of us, learning took place primarily in school. Today, inexpensive compact technology allows access to learning opportunities to take place anywhere many in the world of business, compact technologies will have a tremendous impact on students of all ages soon. To take just one example, Sharp Electronics of Japan has released a hand-held computer with a color display. Attachments to this device allow it to be a digital camera, a notebook, and even a wireless browser for the World Wide Web. This device is currently selling in Japan for about $1,200.

Many corporations are moving their staff development activities to the Web, allowing employees to acquire new skills when they need them (just-in-time learning). Furthermore, these employees can acquire these skills from the comfort of their office or home without having to fly across the country to attend workshops in another city. It is easy to imagine, when all learners have access to powerful technologies in their homes, that learning resources suitable for all ages can be made available for access from home, thus extending the learning day far beyond the time spent in school.

One of the stellar projects that has shown the tremendous benefit from this arrangement is the Buddy System in Indiana in which students at about 80 schools throughout the state have computers with modems at home. Over the nine years this project has been in existence, researchers watching this project have found that it has had the impact of adding about 30 days of instruction to the school year without keeping the school doors open one extra hour. Furthermore, the cost of the project is about as expensive as keeping the schools open one extra day. This 30:1 payoff is a result of student enthusiasm for learning using powerful tools in their homes. The Buddy System found these results for both urban and rural students and for those from high- and low-income families alike.

Once truly cheap technologies become commonplace with all students, the tools for lifelong learning will be in place. More important, however, is fostering the notion that lifelong learning is a survival skill. This is one task that must be addressed immediately, even as we are waiting for new technologies to come into existence.

Conclusions

There is no question that we are experiencing a fierce pace of change in an increasingly global economy. The challenge for schools was stated quite clearly by Jack Welch, the CEO of General Electric, when he said, "If the rate of change inside an institution is less than the rate of change outside, the end is in sight."

Schools that ignore the trends shaping tomorrow will cease to be relevant in the lives of their students and will quickly disappear. We must transform all formal institutions of learning, from pre-K through college, to ensure that we are preparing students for their future, not for our past.

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Paradigms of Innovation and Criteria

Angela Ann Zukowski, MHSH

Take a few moments and reflect on the following statements. Do you agree or disagree with each statement? By the year 2015...

- Virtual reality experiences will be integrated into all Catholic school environments.
- Parish, school and diocesan staffs will have a compatible base of operation with little or no paper trails.
- The diocesan infrastructure will support an INTRANET as the primary means of communication.
- Most Catholic school physical structures will be obsolete for the 21st century.
- Some of the most significant conversations concerning faith and culture will occur in cyberspace.
- All students will have laptop computers as a primary means for learning.
- Cyberspace will invite a diversity of insights challenging netizens and cyberzens to profound dialogues of faith requiring new intellectual skills.
- Media education will be woven into the fabric of our Catholic school curriculum at all levels.
- Radio will have become a dynamic new reality in the formation and information of education and culture.
- Eighty percent of all homes will have access to the Internet.

Futurists proclaim that all of the above will be a reality by the year 2015, if not before. If this is true, where is your school or parish today? What steps are you and your staffs assuming to be prepared for this new reality?

As I browsed through one of the new bookstores in the Atlanta International Airport, the title of David McNally's book, *Even Eagles Need A Push,* caught my attention. McNally states: *We can learn to soar only in direct proportion to our determination to rise above the doubts and transcend the limitations.* This book is packed with effective exercises to stimulate creativity and new attitudes related to the changing technology landscapes in education.

Many of our coworkers and organizations are like the eagles described in McNally's book. They need to be pushed in order to fly. How do we encourage one another's creativity? When is the appropriate time to push someone into the 21st century?

Research indicates that when technology implementation is mandated from the top down, it lacks momentum and inventiveness. However, if the administration inspires imagination, courage, and commitment, educators can transcend their doubts and fears to achieve extraordinary levels of personal and professional fulfillment within their learning environments. They begin to soar.

Schools, parishes, and dioceses are gradually sharing their success stories, their flights to new heights in technology planning and application. I expect that 80-90% of our Catholic Schools will have a well-integrated communication technology in place by the turn of the century. New diocesan and school infrastructures are being designed as you read these pages to support emerging new paradigms for learning.

Successful shifts advance from vision (plan) to formation through in-service programs to technology implementation. The essential ingredient in the mix appears to be ongoing teacher training. Both experienced and novice teachers need to acquire the skills necessary to integrate technology into their teaching. Consistent with many authors who address restructuring schools with technology, Knapp and Glenn (1996) conclude that teacher education programs must include consistent modeling and application of a range of technology tools across the curriculum. The shifting of the paradigm in education has not always been easy. Consider some of these famous quotes:

> Students today can't prepare bark to calculate their problems. They depend on their slates which are more expensive. What will they do when the slate is dropped and it breaks? They will be unable to write.
>
> (From a teacher's conference, 1703)

> Students today depend too much upon ink. They don't know how to use a pen knife to sharpen a pencil. Pen and ink will never replace the pencil.
>
> (From the National Association of Teachers Journal, 1907)

> Ball-point pens will be the ruin of education in our country. Students use these devices and then throw them away. The American values of thrift and frugality are being discarded. Businesses and banks will never allow such expensive luxuries.
>
> (From Federal Teacher, 1950)

As we move forward in engaging in the shifting to new paradigms of education in this new media culture, it might be wise for us to reflect on these two questions:

1) *How do we perceive that new communication technologies can enhance the teaching and learning in our school or parish?*

2) *What is impossible to do today, but if it could be done, would fundamentally change our schools and religious education programs for the better?*

I am finding that all too often the technology is driving the mission of our schools and not the mission driving the technology in our acquisition and application of it. Think for a moment how all the hype about the Information Superhighway (Internet) has captured the imagination of not just our western schools but of our culture. The line-up of people trying to get onto the ramp to navigate through this new world is astounding! How many of us would commence a major journey which could radically affect who are and who we might become without discerning the outcomes and mapping our journey well?

The most startling fact about this new reality is that it is radically a ***new culture*** . It is evolving with all the elements of what constitutes culture: a creed (beliefs), codes (ethics), and cult (rituals). This new culture has a new language, psychology, and techniques *(Redemptoris Missio* and *Aetatis Novae).* John Heywood states that the approach to technology education reflects "a simple and profound philosophy...the idea that technology education imparts a general culture and should provide the opportunity for understanding the influence of technology on culture." (Heywood 1993.p.4) This is demonstrated by how the Internet especially has become woven into the fabric of our everyday conversations, television, radio, newspapers, journals, and entertainment centers. The evolution of Web TV only further actualizes this new reality.

We are aware that this new culture is fast, complex, compressed, and uncertain.

> ... communications technology is a marvelous expression of human genius, and the media confer innumerable benefits upon society. But, as we have also pointed out, the application of communications technology has been a mixed blessing, and its use for good purposes requires sound values and wise choices on the part of individuals....[1]

I believe it is imperative that we identify the criteria we will use to discern when, where, and why we integrate a new technique (communications technology) into our learning environment. We must keep in mind that using technology is both influenced by and influences the user. The act of using technology transforms both the action and the actor. [2]

Each day I hear concerns from Catholic educators and religious educators about their fear that the over emphasis and/or application of new communications technologies will fundamentally destroy the human person, if not the quality of human interaction. I have found the following a sound platform on which to commence our discussion. The list is not meant to be exclusive.

Criteria for Application of New Technologies

I recommend we consider **conversation, collaboration, conversion, community, and contemplation**, as essential criteria for discerning if, where, and when we apply new technologies to our learning environment. Classroom technologies that realize these outcomes can be considered effective educational tools. An assessment of technology, whether in the parish, school, or diocese should yield affirmative answers to the following questions:

- Is the quality of ***conversations*** within the learning environment enhanced at all levels.?
- Are we demonstrating that ***collaboration*** and teamwork offer greater opportunities than individualism?

- Are our students and teachers experiencing radical ***conversion*** or transformation in their way of thinking and being in relation to one another and the world?

- Have new opportunities for ***community*** been created within the educational setting and on national and international levels?

- Has the experience of integrating the communications technology into our learning environments aided us in a greater awareness for the need and value of ***contemplation*** in a world deluged with information and interaction?

In the *Hidden Persuaders*, Vance Packard describes how people are becoming the victim of communication rather than communication being a means by which one finds themselves in relation with others in a community of mutual criticism and helpfulness. I believe that the many rich and diverse conversations concerning Catholic identity in our schools can find some guidance in these five questions. These five questions can also be a springboard for dialoguing and naming the theology of communication which will ground our communications technology plan.

One of the hottest topics in the educational literature today is restructuring. Robert K. Branson of Florida State University, an educational theorist, offered some interesting insights about restructuring in an article, "*Why the Schools Can't Improve: The Upper Limit Hypothesis.*" He describes the current American educational system as one that was never based on a conceptual design, but rather one that evolved from ancient practice designed to fit small, primitive settings. According to Branson, education is the only sector of the society which has not incorporated technology to meet the demands for improved output. He recommends that the entire educational establishment go through a redesign to define mission and system requirements and then build a system based on those factors. The process cannot be shortened for a quick fix. Continued Band-Aids applied to the educational system will invariably result in handwringing such as we now see because the flaw exists not in any one component, but in the design of the educational system as a whole.[3]

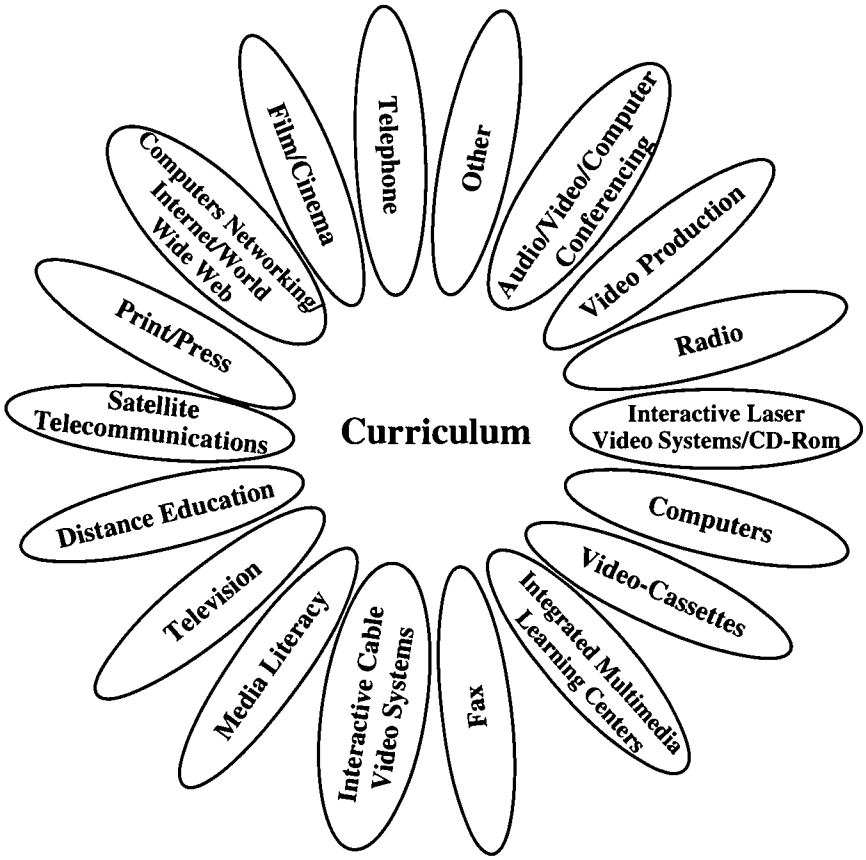
Branson contrasts three educational paradigms. In ancient times, which he calls the oral tradition model, the teacher was the center of focus as the one to impart knowledge and experience to students. It was a one-way flow: the teacher acquired information and transmitted it to the student. This model sufficed for education as long as the knowledge-base was limited and transmitted verbally. With the expansion of knowledge and the development of supplementary sources, such as books and other media, the current educational paradigm evolved. The teacher is still the major dispenser of knowledge, but there is a wider use of auxiliary sources and the model allows for some interaction among students depending on the specific techniques the teacher has been trained to use.

Branson proposes a new technology-based paradigm for the future in which the teacher's role is to manage a system in which there are multiple sources for student's learning...The teacher no longer needs to present information directly to students, but rather directs, plans, and monitors students learning in conjunction with other staff and also learns along with the students.[4]

I would like to recommend the following A-Z Wheel of Innovation as point of conversation for considering a new paradigm for our teaching-learning environments. This wheel is an attempt to avoid the "tyranny of the either/or" syndrome; that is, we do not limit our perspective to only one or the other communications technologies to be utilized within our learning environments.

> The overwhelming presence of mass media in the contemporary world by no means detracts from the importance of alternative media which are open to people's involvement and allow them to be active in production and even in designing the process of combinations itself. Then, too, grassroots and traditional media not only provide an important forum for local cultural expression but develop competency for active participation in shaping and using mass media.[5]

Each and every one of these technologies are valid and must be considered. This wheel is important because in the high pitch and hype of any single communications technology, other technologies which continue to be significant to the culture are being ignored in the educational sphere because of the "tyranny of the either/or" syndrome. This could have long-term detrimental effects on both our educational environments and culture in general.



A careful study of the Wheel of Innovation will accent the diverse technologies which should be considered to be integrated into learning today. As we commence or continue to design, evaluate, or expand our communications technology plan for our school, we need to ask ourselves the following questions:

1. Is this technology available to us today?
2. How can we access this technology?
3. Does the application of this technology enable one or more of the five C's listed above to be realized?
4. Could this technology enhance the quality of our teaching-learning? How?
5. Who in my school or community can aid us in developing the skills to utilize these technologies in a creative and innovative manner?

In designing our schools communications technology plan, we need to carefully discern the availability and adaptability of each of the technologies on the A-Z Wheel of Innovation. If you are interested in specific practical ideas of how some of these technologies, e.g. radio, cable TV, videocassettes, film, media literacy, etc. can be used in your learning environment, I recommend that you revisit my past columns in *Momentum* magazine entitled "Trend in Technology." I have consciously attempted to introduce Catholic educators and religious educators to the A-Z Wheel of Innovation throughout the years. Keep in mind that a new technology does not always replace an earlier technology but frequently compliments or adds to it. The following list is a good example:

- RADIO, CABLE
- TV, CABLE TV, WEBTV
- TELEPHONE, INTERNET, INTRANET
- COMPUTERS, CD ROM, MULTIMEDIA
- MANUSCRIPT, PRINT, PRESS, ELECTRONIC PRESS
- THE CONVERGENCE OF ***SEVERAL*** or ***ALL***

Until recently there was a lack of guidelines and standards that would direct the inclusion of needed technology experiences within teacher education programs. To address this need, ISTE's Accreditation and Professional Standards Committee developed and proposed standards for the National Council for Accreditation of Teacher Education (NCATE) accreditation process. According to ISTE's (1991) Curriculum Guidelines all candidates seeking initial endorsements in teacher preparation programs should receive foundations that prepare them to do the following:

1. Demonstrate ability to operate a computer system in order to successfully utilize software.

2. Evaluate and use computers and related technologies to support the instructional process.

3. Apply current instructional principles, research, and appropriate assessment practices to the use of computers and related technologies.

4. Explore, evaluate, and use computer/technology-based materials, including applications, educational software, and associated documentation.

5. Demonstrate knowledge of uses of computers for problem solving, data collection, information management, combinations, presentations, and decision making.

6. Design and develop student learning activities that integrate computing and technology for a variety of student grouping strategies and for diverse student populations.

7. Evaluate, select, and integrate computer- and technology-based instruction in the curriculum of one's subject area(s) and grade levels.

8. Demonstrate knowledge of uses of multimedia, hypermedia, and telecommunications to support instruction.

9. Demonstrate skill using productivity tools for professional and personal use, including word processing, database spreadsheet, and print and graphic utilities.

10. Demonstrate knowledge of equity, ethical, legal, and human issues of computing and technology use as they relate to society and model appropriate behaviors.

11. Identify resources for staying current in applications of computing and related technologies in education.

12. Use computer-based technologies to access information to enhance personal and professional productivity.

13. Apply computers and related technologies to facilitate emerging roles of the learner and the educators.[6]

Margaret Wheatley's books, *Leadership and the New Sciences (video also)* and *A Simpler Way*, can further stimulate our conversations about the enhancement of our learning environments by shifting our paradigm of thinking, organization, and design. She encourages us to explore and entertain unfamiliar paradigms for reorganization of our environments, a playful activity that can be a source of creative energy.

Wheatley writes: "There is no way to truly influence a process except to dive into its dynamics, those forces that give it life and that propel it to its present forms...In a world of emergence new systems appear out of nowhere. But the forms they assume originate from dynamic processes set in motion by information, relationships, and identity."[7]

Ironically, during Advent while I was meditating on Karl Rahner's Advent homilies I came across a wonderful section which I think applies to our endeavors as Catholic educators and religious educators in trying new ideas of innovation. Karl Rahner was speaking about our being *Advent People*.

> ...Advent demands that we look to the *future;* we are people of expectation and hope. Too quickly and too easily do we get immersed in what we call the present, although it is basically only the transition from a past which derails us, and to a future we do not yet possess. We are all too easily ones who forbid themselves dreams and distant hopes, and who are proud that they "soberly" (as they say) throw themselves "with both feet" into the immediately urgent tasks alone. But if we do not look toward the future, we basically do not know at all what the meaning and purpose of the present task is.[8]

Yes, we are *Advent People.* We are people of great hope and expectation. We know that Jesus used all the means of communication to reach out, to call and challenge both individuals and the community to a new and richer quality of life. As you and I continue to explore the expanding new worlds being opened to us through the new media age, we must never lose sight of our primary mission. "...we should really ask ourselves in complete intimacy and concreteness if the spirit and heart in us still have a little room for novelty and future beyond the present".[9]

Endnotes

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Leadership Without Followers

Christopher J. Dede

The concept of leadership is fraught with misconceptions. People often view leadership as a combination of meticulous management, adept political maneuvering, and the responsive facilitation of others' activities. While each of these is important in advancing the field of educational technology, I believe the true nature of leadership is exemplified by four attributes, which I attempt to summarize here.

Leadership Requires Envisioning Opportunities

An important attribute distinguishing leaders from managers is "vision": the ability to communicate desirable, achievable futures quite different from where the present is drifting. Leaders create and convey compelling images of how our reach is much less than our potential grasp; they redefine our conceptions of what is possible. In contrast, competent managers are adept at organizing operations so that an institution's efficiency in accomplishing plans is optimized. This is a vital task often neglected by leaders who do not understand management. Good administration involves both envisioning and operationalizing.

Educational technology now offers many opportunities for leadership, since it exists in a rapidly shifting context. Information technologies are evolving quickly, merging, adding powerful capabilities, and decreasing in cost. The global economy is changing the skill requirements for American workers, emphasizing both technical excellence and cultural sensitivity to the worldwide market. Simultaneously, the U.S. population is itself becoming a more diverse and pluralistic salad bowl rather than a melting pot. Society's conception of the educational system's role is also in flux; at the heart of current movements for reform is a desire to move beyond fine-tuning present models and towards redefining the nature of schooling.

Over the next decade, these external forces will drive major shifts in the mission, curriculum, clients, and process of educational institutions (Dede, 1992a). Whether these changes actually improve learning outcomes will depend in large part on the quality of the visions we forge during the 1990s. Current challenges require a new and better paradigm for schooling; the power of emerging technologies makes possible models for teaching/learning unique in the history of civilization. That great American philosopher, Yogi Berra, once said that, "If you don't

know where you are going, you are likely to end up someplace else." The opportunities for leaders in educational technology to invent innovative visions are boundless.

The development of motivating images that capture the essence of needed changes is important, but insufficient to make educational technology a driveshaft for reform. Leadership also involves creating steppingstones that bridge to a desired future from the current gridlock typical of many American schools. In evolving from its present state to a distant objective, an educational institution must progress in stages. Each step of evolution requires a critical mass of resources and must create a stable, desirable situation.

Changes in the societal context can serve as the basis for steppingstones to the future. Some have a negative impact in the short-term, but open up possibilities for long-term educational evolution; for example, society's immediate response to economic crises is to cut back on instructional innovations, but in the long run financial hardship can drive needed changes by forcing schools to abandon ineffective approaches that have hardened into traditions.

Other developments, such as advances in educational technology, create new possibilities for improving teaching/learning; for instance, digital video technology allows the synthesis of computer graphics and video images, enabling the television generation to see and manipulate visual representations of abstract, intangible concepts (Dede, 1992b). Ultimately, digital video is not simply a more powerful tool for teachers' presentations, but also enables inexpensive multimedia authoring by students. By constructing their own knowledge structures, learners gain a much deeper understanding than by simply assimilating a pre-packaged multimedia experience.

We can act today to take advantage of these technological innovations, building on their impacts to actualize new models for schooling. Political, economic, demographic, and sociocultural forces will affect this process of attempted transformation, empowering some changes while repressing others. A credible, desirable vision requires both opportunities and challenges. Without levers for improvement, significant gains in educational effectiveness are unlikely; without troubles, society lacks the incentive to implement alternative paradigms for teaching/learning.

A balanced picture of where we are in history, both the good news and the bad news, demonstrates that a hopeful image of the future can emerge from turbulent, uncertain, even dangerous times. Attempt to synthesize technical, political, and economic trends in envisioning the educational future. In fostering a plausible, desirable vision, cultivate a balanced view of the present between hope and cynicism. Also, regarding the future of educational technology, avoid being either an unabashed technophile or a rabid technophobe. I have found cultivating this professional outlook to be challenging; slipping into optimism or pessimism, becoming a technophile or a "doubting Thomas" are constant, subtle traps. Maintaining a balanced perspective, however, conveys the reward of visions that are detailed, plausible roadmaps to desirable futures.

How does one develop and maintain this discipline of dispassionate, integrative envisioning?

- Seek out arguments that you find intellectually stimulating, especially if you instinctively disagree with their conclusions. Informed but opposing points-of-view enrich visions.

- Find sources that explain material outside of your professional area (e.g., if you don't understand artificial intelligence, read authors who synthesize/translate recent work for a lay audience).

- Reflect on the quality of recent events in your personal/professional life and compensate for that emotional bias in your images of the future.

- Keep an open mind about revising your prior visions as the world changes. Getting stuck in a particular flavor of futures is a seductive pitfall.

Above all, remember that the leader's goal in envisioning the future is not to construct intriguing speculations, but to incite transformative action in the present.

Leadership Requires Displacing Cherished Misconceptions

An important attribute of leaders is their ability to displace deeply held, cherished misconceptions with alternative visions that more accurately depict reality. Popular but mistaken beliefs about teaching and learning inhibit the improvement of American education; for example, many in our culture have a subconscious image of the secondary school that is based on the following assumptions:

- Despite coming from diverse cultural and socioeconomic backgrounds, and despite the distractions of puberty, teenagers secretly possess a strong work ethic and a fascination with intellectual pursuits.

- Regularly attending PTA meetings and sports events, paying taxes, and electing dedicated school board members constitutes sufficient parental support for education.

- Because they are deeply fulfilled by their impact on students' lives, highly qualified teachers will enter and stay in the profession despite low salaries, marginal working conditions, and little respect from the larger community.

- Schools should be settings isolated from the real world in which learners are grouped by age and taught the academic disciplines as formal subjects.

- Students are graduating into a future workplace in which mastery of the skills that multiple-choice tests can measure will guarantee them a fulfilling, prosperous career.

- Technology's role in education lies in automating routine activities that underlie this model of schooling and in motivating learners via instructional formats analogous to video games and television.

Unfortunately, all these assumptions are fundamentally inaccurate (Dede, 1990a). Thus, intensively applying technology to improve this model of education (e.g., integrated learning-systems and computer labs, multimedia-based teacher presentations and more elaborate testing) results in only small improvements in outcomes.

Shifting communities toward alternative visions for education based on more realistic, but less comfortable assumptions, is a major leadership challenge. In abandoning the old model of secondary education, parents, businesses, teachers, and students must confront some unpleasant truths: for schools to succeed, parents must provide time and effort, as well as money; an excellent teaching staff may cost more than most communities are willing to pay; many students do not have middle-class values and aspirations; and the skills for future occupational success

in the global economy conveyed via test-oriented, subject-centered, group instruction in classrooms remote from real-world settings will not be attained.

Leadership requires new roles for educational stakeholders. In my own work, I use scenarios as a means of undercutting "conventional wisdom." I try to highlight potential futures quite different from present models of schooling.

"Dr. Hari Grosvenor sat on the floor with his students in a circle. Three 6-year-olds were trying to talk simultaneously. Each was somewhat impeded in the discussion by having to use Spanish (this part of the day was devoted to practice in a second language), but their enthusiasm was unhindered. To Hari's relief, only his handicapped student's instructional device was currently in the room; he hated information technology."

Hari felt that intelligent tools had their uses, but not in his classes. The foundations for his pupils' discussion had been laid by technologies that trained them in the prerequisite knowledge, but only a human teacher could master the intricacies of teaching a seminar. His specialty was helping learners with low self-esteem feel capable, loved, motivated, and challenged. Hari reveled in the freedom he had: to teach anything he wanted in any way he chose, so long as his students' sense of personal worth increased. His ability to assess individual learning style better than the most sophisticated diagnostic devices was being studied, but he knew that a machine could never replace him.

From her vantage point at the far side of the circle, safely in the middle of her pressure pad, Ariel watched Hari deftly refocus the discussion. The scanner on top of her computer screen continually monitored Ariel's actions with her wooden blocks. Simultaneously, icons on the screen depicted her movements, text along the screen's bottom described her actions, and a synthesized voice in her earphones discussed what she was doing. Her congenital mental handicap was rapidly improving through this immersion in multiple representations of reality, from concrete manipulations to abstract symbols, plus the care of her teachers. Still, she liked her machine best of all right now; no person was as oblivious to her handicaps.

Having intervened to stop his seminar from coming to blows over who should serve as their representative on the school's governing board, Hari's thoughts wandered. He wondered how he should spend his merit bonus; once again, his innovation quotient had been the highest in the school. "Computers slow down those other teachers and stifle their creativity," he mused. "I'm glad the next stage in the master plan for our region calls for less reliance on instructional devices. Biotech prosthetic enhancers are definitely the best thing going."

Hari's merit bonus for innovation, his freedom to control content and methods as a way of building students' self-concept, and the participation of students in school governance exemplify the type of assumption-breaking innovations essential for successful restructuring. Ariel's sophisticated technological aids, serving as an external nervous system, argue against the efficacy of Hari's "anti-technological" stance.

Incorporating humor into vignettes puts discussion of the obsolescence of current approaches in a motivating, rather than discouraging context. These scenarios depict new roles educational stakeholders might play without bogging down in the specifics of how to bridge to them from present roles; the intent is to provide a sketch rather than a blueprint. In counterpoint to assumption-breaking scenarios, television sit-com classrooms convey images that reinforce cherished myths. Undercutting society's mistaken beliefs about teaching/learning requires both attacking these myths and advancing compelling alternative ideas.

Moving beyond the notion of educational technology as "silver-bullet" is difficult. In our field, leadership requires developing both instruction-oriented technologies and technology-intensive, learning-by-doing approaches. Applying this combination of pedagogical strategies necessitates numerous assumption-breaking changes in the organizational context of the class-

room and in the roles of teachers, parents, and students. Creating and conveying technological visions powerful enough to displace traditional educational models is one of the most challenging aspects of leadership.

How does one identify obsolete paradigms and forge visions that encourage alternative conceptions? An excellent resource on the intellectual processes underlying scenario building is Peter Schwartz's *The Art of the Long View* (1991). The following strategies have been particularly helpful for me:

- Start with the central change you wish to foster, then identify all the major factors (inside and outside the organization) shaping that issue. This process highlights the driving forces to include in alternative visions and frequently surfaces underlying, conventional assumptions that must be challenged.

- Rank key assumptions and driving trends in terms of both importance to the desired change and the degree of uncertainty surrounding their continuation. The most important and uncertain factors form the basis for differentiating alternative scenarios.

- Build each vignette around some type of story: a particular group responds to a major challenge to their way of life; the evolution of a technology reshapes an organization; how the assumptions underlying a traditional approach erode and are displaced by new ideas. The intent is to provide a "snapshot" of some future time, hinting at the "movie" that could provide a path from our present to that vision.

- Make sure that the scenario is constructive in its illustration of the change process: depict the advantages for every group involved; be positive about people's willingness to adapt; portray the challenges to be overcome in a realistic, but humorous manner. Invoking an attainable image involves constructing a vision that all major stakeholders find desirable.

The creative formulation of assumption-breaking visions can be one of the most enjoyable aspects of leadership; breaking the invisible chains that bind our minds is very stimulating.

Leadership Requires Inspiring Others to Act on Faith

Inspiring a group to work toward a shared vision necessitates the building of trust. Only then can a team of people overcome the obstacles to creating a future quite different from the present. We often speak of visions as "dreams" because we do not believe they are possible; we doubt that they can be made real. Actualizing a plan for the future involves harnessing people's emotions as well as their minds, developing both understanding and belief.

The psychological stability of the present impedes our ability to emotionally invest in a future divergent from established trends and traditions (Dede, 1990b). We know that the occurrence of earthquakes and assassinations, the winning of lotteries, and come-from-behind victories are all statistically inevitable. Yet, we are surprised when they happen because the commonplace nature of most events undercuts our belief in discontinuities. When someone can prove that a desired future is logical, rational, and inevitable, then any competent manager can persuade an institution to act. The challenge of leadership is to inspire individual and organizational faith in the seemingly impossible, developing a collective affective commitment that can move mountains of impediments.

By evolving so rapidly, information technology makes educational transformation seem achievable. The availability and affordability of tools powerful enough to reshape the learning environment encourages educators to risk innovation. Leaders build on the enthusiasm that sophisticated technologies induce to encourage an affective climate that rewards risk-taking and accepts occasional failures as an inevitable by-product of progress. Building shared trust in a vision requires a type of emotional charisma; good ideas are not enough. By accomplishing apparently unachievable outcomes themselves, leaders instill confidence in their collaborators. By never wavering in commitment and in certainty that the goal will be reached, leaders inspire similar faith in others. Would-be innovators who rely solely on intellectual persuasion reap applause, but not action.

This dimension of leadership keeps me humble about the impact of my speeches. Sowing motivating ideas about information technology's role in education is only the first step in achieving sustainable change. I view my writings and conference presentations as catalysts for innovation; because these activities reach a wide audience, they are among the most important things I do. I also recognize that the possibilities of lasting improvement are remote unless local leaders use my visions as part of an infrastructure to provide both intellectual and emotional support for reform. As an outsider to the local group, I can discuss unpleasant truths and build credibility for challenging policies (the "visiting fireman" syndrome, — an expert is always someone from more than fifty miles away).

Shooting a few silver bullets and riding out of town is a seductive role, but its limited impact is obvious. Leaders understand that their success depends on combining the wisdom of the sage with the emotional nurturance of the healer or priest. Building faith and trust is essential in converting a group to shared, sustained goals. This is particularly true with educational technology, since many hours of effort are required to realize the potential of sophisticated hardware and software. Despite the "plug and play" protestations of the vendors, developing technology-intensive educational strategies requires substantial emotional commitment and frequent leaps of faith into the unknown.

How does one inspire an organizational environment of shared risk-taking and trust? *The Fifth Discipline* by Peter Senge (1990) is a good resource for ideas. Recipes for success are hard to give though, because so much depends on one's particular interpersonal style. Approaches I have learned include:

- *Make the process of change personally rewarding to participants*. People like to learn new skills, to be part of a team, to feel successful by overcoming a challenge, to find the humor in shared adversity. Focusing on process enables the change effort to keep going even if a particular strategy fails; if outcomes are seen as the only measure of success, a group's first setback will destroy its effectiveness.

- *Help others to see that their personal identity extends beyond their current job*. We tend to place too much emphasis on individual work roles as a source of self-worth. Refocusing emotional perspective on new missions within the purpose of the overarching enterprise ("empowering society's next generation of human resources," rather than, "being a seventh grade social studies teacher") opens up new reservoirs of motivation and purpose.

Two final thoughts on this aspect of leadership: firstly, if everyone in your organization likes you, you are not fostering enough change. Secondly, if you never fail, you are not taking enough risks.

Leadership Requires Discouraging Followers

A destructive myth about leadership is that a visionary person gives directions to followers who execute his plan. Real leaders discourage followers, encouraging use of their vision as a foundation for other, better insights. True solutions to problems are always based on ideas from multiple perspectives; no individual, however capable, can incorporate the full range of knowledge and experience needed to invent an educational system that fulfills the needs of a diverse community.

When leaders who surround themselves with followers fall from grace or move on, the innovations they have inspired collapse or wither. Sustainable transformations require stakeholders who fully understand the what and how of the vision and who act together top-down, middle-out, bottom-up to evolve dreams into realities. Technologists have often erred in setting themselves up as wizards who understand the magic in the black box. Instead, a leader in educational technology should inculcate others' visions, knowledge, and commitment to the point that all are jointly leading. This requires moving beyond the role of team facilitator or coordinator, acting as an exemplar by deliberately following others instead of always leading.

Emotionally, shedding the power and rewards of authority is very difficult. We all secretly long to be the superstar in front of the worshipping audience, to inspire awe and reverence. Like any other social movement, educational technology has generated some leaders who degenerated into gurus. Worse, many potential leaders have abdicated their responsibilities to instead assume the comfortable mantle of discipleship, blindly following someone else's vision. Condemning leaders seduced by power is easy and fun; recognizing the times we ourselves avoided the difficult path of leadership to become a follower is hard and painful. Educational reform can achieve genuine, lasting success only when each stakeholder accepts the responsibility of leading.

Leadership is a role fraught with difficulties, requiring both wisdom and maturity. Yet, my goal in articulating the requirements of leadership is to encourage all to lead, always. If each of us were to act in the ways described above every day, however imperfectly, educational technology could be the fulcrum for restructuring education and shaping a bright future for our society.

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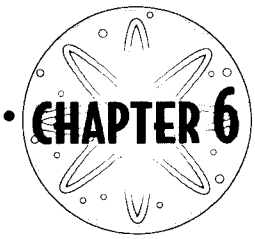

Producing a Technology Plan

Regina Haney

The purpose of this chapter is twofold: first, to suggest questions which will facilitate the creation of a vision for technology integration in your school's administration and curriculum; and secondly, to present a process that will assist you in crafting a plan to realize that vision.

Background

Planning is the key to successful and efficient technology integration in a school. When a person does not know for which harbor one is heading, no wind is the right wind (Seneca). Likewise, technology efforts that are unplanned will have little or no impact on teaching and learning. One New Frontiers alumna reported in *Momentum*, the National Catholic Educational Association's journal, that without a plan efforts to integrate technology are piecemeal, and the efforts lack ownership of the faculty, parents, and the broader community. A cartoon, printed in the Chicago Tribune, illustrates two children talking about their father who is sitting in his easy chair reading a book. They describe him as being on the "information cul-de-sac." If teachers and students are on a cul-de-sac, they are unable to access information beyond the school walls in order to interact with the broader community and with those around the world.

Planning for technology integration is essential in order to enhance teaching and learning and to effectively connect the school and broader community who will support this endeavor. Such planning can, more importantly, challenge one to rethink education by looking at technology's possibilities in today's and tomorrow's educational setting. In a recent research project conducted by Interactive Inc. most principals surveyed strongly agreed that computer-related technology is an important part of school reform.[1]

Success stories of the New Frontiers alumni provide anecdotal support for the importance of planning for technology integration. In May 1996 Catholic secondary schools came to Washington, DC to be recognized by the President for receiving the Blue Ribbon Schools Award. Two of these schools were New Frontiers alumni, St. Gertrude High School in Richmond, VA and Merion Mercy Academy, PA. Both blue ribbon schools recognized the significance of technology planning. In receiving this educational excellence award, two other New Frontiers Schools, Holy Cross, Kensington, MD and St. Catherine of Siena School in Horsham, PA found their technology plans invaluable for preparing for a successful Middle States re-accreditation. St. Jude School,

Indianapolis, IN and St. Raphael the Archangel School, Louisville, KY, two New Frontiers schools, were among the 21 Catholic elementary schools that received the US Department of Education's 1997 Blue Ribbon Schools Award. The administrators of these two schools recognized the role that technology planning played in enhancing the schools' effectiveness.

To borrow from a popular film in the early 1990s, "If you dream it, it will come". Technology planning paves the road to technology integration across the curriculum, pushes educational excellence, and presses students to prepare for tomorrow. If you plan it, the money will come also! The schools mentioned above can attest to that!

Formation of a Technology Committee

A preliminary planning task is to form a Technology Committee. Who are the stakeholders whom you will invite to sit around the table? Consider teachers, parents, business persons, TV station employees, university professors, telephone company employees, and board members. Technology consultant, Wendy Woody, advocates extensive end-user involvement. Include end-users in the development and implementation of th technology plan. Who are better to develop a plan that those who will be implementing it. By the same token, Ms. Woody advises to not exclude the opinions of anyone who wants to get involved. She cautions us to have an even balance of realists and dreamers on the committees.[2]

Steps in the Planning Process

The planning process presented has seven steps of which envisioning is an important first step.

Step One. Envision the school in the future.

Many psychologists say that if you can envision yourself doing something, you can do it; for example, before delivering a speech, envisioning oneself successfully speaking before a group will make you a success when you do it. The pages of history are dotted with examples of people who dreamed of inventions, reached for goals or achievements, and they did. Clara Barton dreamed of serving people in need. Today we have the Red Cross. The Wright brothers envisioned people being transported by a flying machine. Today we have the 747 airplane.

To assist you in creating a mental picture of your school five to ten years from now, consider these or similar questions:

1. What are the trends in society and the church today? How do or will they impact education?
2. What do you want your graduates to be able to do? How do you want them to act?
3. What technologies are available for education? (See A-Z Wheel of Innovation, p. 23)
4. How do you envision students using information or manipulating knowledge? learning?
5. How will this relate to the way students learn today?
6. How do you envision teachers engaging students in learning?
7. How does this relate to the way teachers teach today?
8. How do you picture learning going beyond the four walls?
9. How does your vision relate to the role of education today?
10. How do you envision your school integrating technology and operating?

Sample Vision Statements

After responding to similar questions, the technology committee of Merion Mercy Academy in Merion, PA wrote this vision statement.

> Merion Mercy Academy charts a new frontier. We envision preparing students for the future by providing them with the necessary skills to access, to use, and to communicate information in and from multimedia formats. Technologies, especially information appliances, are tools to empower students to take a more proactive role in the successful completion of goals. Our vision encourages students to work on more complex problems and to think more critically; it allows for greater individual attention by teachers to students; and it opens the classroom to more student-centered activities.

Another and shorter version is this one from St. Francis Xavier School, Phoenix, AZ.

> We envision the students of St. Francis Xavier School to be competent, confident, responsive users, creators, and communicators of information.

The vision is the hub of the plan. It gives direction and provides a glimpse of the future role of technology in the school.

Envisioning the future calls us to look at where our schools are, to examine possibilities, gather ideas, and dream of what can be.

Schools that had emphasized educational reform revealed that most technology was for its own sake. We are taught a valuable lesson about technology-supported educational reform: Time must be devoted to developing a school-wide vision, a consensus on instructional goals and shared philosophy about the kinds of technology-supported activities desired.

Components for Consideration

Consider incorporating these four aspects into the vision and ask questions relating to them:

1. Access - Will classrooms have telephone lines? Will the school and home be connected?
2. Professional development - Will staff be educated to the new role of the teacher, i.e., teacher as facilitator?
3. Content - Who is in charge of information and learning?
   The learning outcomes identified, how will technology support them?
4. Infrastructure/finances - What wiring is needed? How many outlets?

These components and various insights will dance in your head and eventually be articulated into a vision that will spawn a plan.

The vision must have AIR to get if off the ground and to keep it flying.

A - alignment to the mission of the school

I - technology integration into the learning outcomes

R - rewards built into the planning process, for example, celebrate the accomplishments

Step Two. State the committee's mission.

The more I reflect on the importance of this step, the more I can see from past experiences that it is crucial to the success of any committee. I've set committees in motion making it clear

verbally what the task was. Why was I surprised when one committee assigned to develop an outline for a handbook and to identify possible authors went beyond the task? To my surprise they were involved in negotiating peaceful relations with a group that they thought was at odds with NCEA.

To avoid getting involved in issues outside their mission, effective committees must have a well-defined mission and objectives. They must have a clear understanding of the purpose for which they were convened and this mission needs to be in writing. Thus, the rationale for step two.

Step Three. Set goals.

Included in this planning step is taking inventory of hardware and software. The inventory efforts of some New Frontiers school teams turned up unused video projection panels and laser disks.

Sue Hannan, assistant superintendent for the Archdiocese of Cincinnati, suggests that you do the following:

- Inventory computers, technology equipment, software, and A-V resources.
- Discard old and out-dated equipment and resources.
- Catalog current equipment and resources. Continually track their use.
- Survey parents and teachers about use of technology applications.
- Visit schools, vendors, businesses, and professional sites.
- Research various topics of interest. Review professional literature, talk to vendors, bring in speakers.
- Evaluate the curriculum, administrative tasks, and the role of technology.
- Initiate dialogue about technology by grade level/department, and total faculty.
- Check electrical outlets, phone lines, and networking possibilities.

Based on your team's vision of the school, what do you need to do to move possibilities into realities? State these in general terms or goals; for example, to provide start-up and on-going training for more effective use of technology, or to identify alternative learning strategies for student instruction to meet the needs and learning styles of all students.

Step Four. Design action steps.

Sample action steps to accomplish goals are:

- To provide on-site and individualized training and support
- To review and select learning strategies to meet the needs of students
- To review, elect, and acquire instructional materials that meet the needs of all students enrolled
- To acquire three computers for every 10 students
- To install cable

Step Five. Estimate costs.

This step should be taken prior to setting time lines. Availability of funds may determine when an action can be completed. For example, St. John Neumann School technology committee,

Philadelphia, PA, set a goal of staff development. In order to do this, they took their small purse of money to invest in a professional grant writer to obtain the money for a multi-year staff development program. A side-step was needed in order to fund the priority action step. The budget dictated reality.

Included in this step should be estimated costs and sources of funding. Putting a reasonable amount of technology into the school will cost thousands of dollars. Some schools plan to get 60% of the cost from businesses and/or other sources and 20% from the school and parents. One diocese requires that each school's budget have budget line items for hardware, software, Internet charges, and staff development.

Step Six. Set time frames and determine those who will be responsible for doing what.

People responsible for projects with deadlines get the job done. If they don't, others will remind them.

Step Seven. Evaluate.

How will you determine success? This should be spelled out for each goal, for example: faculty is trained in using Microsoft Word Hyperstudio and successfully uses it; the Academic Council makes it part of its regular agenda to receive a departmental report on the successful implementation of the ideas presented at the technology in-service.

The plan is on-going. The future is a moving target. Therefore, planning never stops. Review the plan frequently to keep it on track. Adjustments may be necessary in light of the introduction of technologies or complication with equipment installation. The plan is a living document always taking new shape and form.

These are the seven steps for the development of a plan for your school to integrate technology into the curriculum and administration. An illustration of the seven steps is found on page 40. To paraphrase Henry Thoreau, if you advance confidently in the direction of your dreams, and strive to accomplish what you imagine, you will meet with success unexpected. Dream and do! You will meet with success unexpected if you go after your vision.

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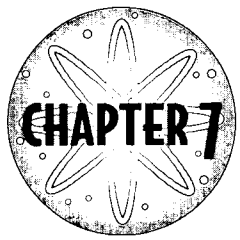
New Frontiers Planning Process

Adapted from *Teaching, Learning and Technology: A Planning Guide* [Workbook], Apple, Inc., 1991.



Technology Partnerships

Gail Morse

As the global economic structure changes and the flow of information redefines not only jobs but also the very nature of business, the employee who can access, analyze, and synthesize information will clearly be valued in any organization. Educators are charged with the task of providing students with these skills in order to prepare them for their changing world.

As a school draws up its technology plan and budget, however, it soon becomes apparent that the price tag is high! Establishing partnerships is a way not only to help the school but also to benefit the entire community by developing resources and preparing citizens for a technological future.

Establishing Partnerships

A partnership is not a one-time activity, but a long-term process in which collaboration is the key to success. Partnerships start with student needs and, through collaboration, match community resources with these needs. A successful partnership is a win/win situation, with the needs of a business or community group matched by school resources, and the needs of the school matched with community resources.

In typical partnership activities, representatives from businesses talk to students about technology-based careers; for instance, a design firm might send someone to a school to describe opportunities for graphic artists, or students and teachers might tour the facilities of their partners and accompany them to work-related seminars and lectures. The partner group might also set up internships and tutorial and mentorial programs for students.

A successful partnership maintains its focus on the students and the community. With this in mind, educators should carefully choose the best partner for a technology project. Establishing a partnership requires a strategic plan that includes the following elements.

Vision

Start with a clear idea of how you want to improve the educational opportunities of your students.

Needs Assessment

Determine the path that will take you from where you are now to where you want to be.

Outcomes

Establish specific evaluation and accountability measures.

Potential Collaborators.

Compile a list of potential partners who both meet your needs and benefit from the relationship. Position your best prospects first. For each partner you approach, prepare a proposal that clearly identifies student needs and measurable outcomes. This proposal contains your talking points and will be amended as the partnership process continues.

Partnership Communication.

Know your partner and view the partnership as a vehicle for systemic change, not simply an exercise in good corporate citizenship. Partnerships are becoming more "businesslike," with accountability and replicability as critical considerations. Projects are becoming both more complex and more manageable because companies handle them in the same manner as they would a new product or service.

Long-term Relationship.

Seek a long-term commitment and maintain it through consensus building, sharing successful activities, and collaborative problem solving.

Expanding Contacts.

The list of potential partners often begins and ends with the names of large corporations and foundations, but your students' technological needs can also be matched with the resources of talented individuals or local, state, and national organizations, such as the following:

Parents: Develop a database of the expertise that is available from the parents of the students at your school. Parents can serve as tutors, technology consultants and/or trainers, and technology assistants. They can also act as liaisons to other community organizations that may serve as partners. Organize a group of motivated parent volunteers to speak to groups to identify potential partners.

Small businesses: A small business can be an excellent partner and is frequently more receptive to a partnership than a large corporation. Even franchises, such as fast-food restaurants, may be good partners if they are given the autonomy by corporate headquarters to develop partnerships at a local level. Some local business groups may be willing to help with the implementation of your technology plan; for instance, a home builder's association could be asked to volunteer to make computer desks for your students.

Business trade organizations: Technology requires maintenance and support. Business trade organizations could provide expertise and time that will avoid costly repairs. You may want to contact:

- Business associations in local malls
- Business-related clubs, e.g., Kiwanis, Jaycees, Rotary, Knights of Columbus
- Associations of tradespeople, e.g., carpenters, electricians
- Associations of professionals, e.g., realty boards, accountants
- Better Business Bureau
- Chamber of Commerce
- Business Roundtable

Civic organizations: Civic organizations often have in-kind resources to share as well as a long history of volunteerism. Contact the governor's office in your state to obtain a list of private-sector initiatives and volunteer groups. Also review the newspaper for community meetings where you can present your case, or contact social, public concern, and youth groups.

Education partners: An often overlooked potential partner is another school. Since technology has a high price tag, it may be of mutual value to share resources and personnel with institutions of higher education.

Local government: Local government is using technology in a variety of ways, and you may be able to share personnel. Agencies to consider for partnerships include: fire and police departments, community agencies, nonprofit agencies, and health-related agencies.

Partnerships are a win-win situation for the school and the community. As your school develops its technology plan, share it with various community representatives. Together, you may find cost-effective ways to exchange personnel and resources that will provide access to technology not only to your students but also to the total community.

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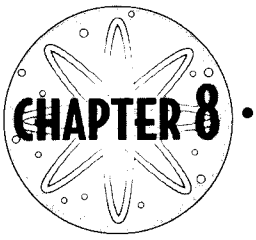

New Frontiers

Regina Haney

For space and technology enthusiasts, the spring of 1966 was an unforgettable time. The Star Trek television series was launched, creating throngs of "trekkies" bent on meandering vicariously through the universe. However, according to actress Michelle Nichols, who played the communications officer, Uhura, on the starship Enterprise, the ultimate purpose of the series was a serious one—to make viewers think.

Just as on "Star Trek," Nichelle Nichols is a part of a journey, along with a crew of program directors and presenters who have launched the *New Frontiers* programs.[1] Indeed, although present only via an EduQuest videotape, Nichelle motivates team members to consider technology beyond what is now available; she energizes teams and crews to think far into the future.

New Frontiers for Catholic Schools provides leadership, direction, and support for Catholic school teams as they search out ways to integrate technology across the curriculum and push for educational excellence in order to prepare Catholic school students for tomorrow.

Co-founded by the National Catholic Educational Association (NCEA) and The University of Dayton (UD) in July 1992, *New Frontiers'* founders and directors parallel Star Trek's Dr. Spock, Captain Kirk, and Uhura. They were NCEA's Frederick H. Brigham, Jr., UD's Angela Ann Zukowski, MHSH, and myself.

In the past six years, 10 to 12 teams of three have gathered annually during the summer at The University of Dayton to explore possibilities, draft a vision, and establish a network of peers who, like themselves, dream of developing a plan that will successfully integrate technology into the teaching and learning of their schools.

The strength of the program is the support given to one another by the co-directors, presenters, and teams. Indeed, teams are given the space and time to mull over ideas and to dialogue with one another and the rest of the group. Thus, their respective experiences with technology, teaching, and learning become their primary sources of information, understanding, and planning. Each participant, therefore, has something to contribute to the crafting of each school's technology plan.

Long after the Dayton experience, moreover, the communication continues. Teams participate in telephone conferences to share successes and setbacks, publish articles in *NCEA Notes* and *Momentum* to assist others planning for technology integration, and showcase their schools' achievements at the NCEA's annual convention. These opportunities to gather and to communicate lead the teams to a better understanding of the use and value of technology. In addition, the co-directors visit school sites whenever possible. Over the years, we have visited many of the *New Frontiers* teams. For me, this is the highlight of the program: seeing firsthand the ideas taking shape about which participants had talked and sometimes questioned as unrealistic.

New Frontiers boasts 67 alumni teams from as far west as Seattle, Washington; as far east as Philadelphia, Pennsylvania; as far north as Canada; and as far south as Beaux Bridge, Louisiana.

I have invited some *New Frontiers* participants to share their perceptions of the impact of the program on themselves and their schools. Below are the responses of a sampling of alumni to these two questions:

1) Prior to the *New Frontiers* program, what problems or challenges prevented you from moving ahead with integrating technology into the curriculum and administration of your school?
2) How did the *New Frontiers* program respond to these problems and challenges?

Holy Cross School

For several years at Holy Cross School, Garrett Park, Maryland, an attempt had been made to integrate technology throughout the curriculum. We had small coups, but not overall success. Looking back, we realized that the school's computer coordinator had a loosely organized plan, but it had never been presented to or been adopted by the faculty. Why? The computer coordinator would discover an integration project, find the teacher who could use the project, and work with that person until the project was implemented. Without an overall plan, technology was integrated into the curriculum on only an *ad hoc*, piecemeal basis.

I was one of two teachers who traveled with our school's computer coordinator to The University of Dayton to attend *New Frontiers I.*

What did we learn at the workshop? *New Frontiers* was the equivalent of a technology retreat. We were already excited about integrating technology into the curriculum, and *New Frontiers* provided us with the opportunity and impetus to write a plan, present it to the faculty, adopt it as a school, and implement it as a cohesive team. This allowed for much greater success.

With two teachers on the technology team, we had a grassroots effort taking place. Peers were modeling to peers. Subsequent NCEA visits to the school and regularly scheduled reports kept us on task. Three years after our initial experience, our entire faculty attended the National Computing Conference in Baltimore as a means of maintaining our focus on our technology integration.

St. Margaret Mary School

Just prior to our participation in *New Frontiers,* St. Margaret Mary School in Slidell, Louisiana, had installed a computer lab. This step was taken only after parents strongly suggested it as a way to improve the school, and only after they agreed to pay for it.

A lack of awareness about the available technologies and their applications was probably the main reason that our school had not moved in this direction sooner. *New Frontiers* helped to propel our efforts to incorporate these technologies.

Our team's exposure to the various technologies and applications as well as our interaction with other Catholic educators at The University of Dayton enabled us to formulate a plan for incorporating some of these technologies into our curriculum. Within three years, we have changed from a school without computers to one with seven to ten networked computers in every classroom, grades two to eight, televisions and VCRs in every classroom, a closed-circuit television system, laserdisc players, and an application pending with the FCC for four wireless television channels.

St. Catherine of Siena School

While writing the school's mission statement in 1990, the faculty formulated a set of belief statements and goals for the 1990s. One of the goals addressed the current technological impact on education and learning. The objective was to investigate uses of technology in all areas of

the curriculum and to orient students to the implications of technology on their future.

This school goal paralleled the goal of *New Frontiers for Catholic Schools*: to enable administrators and teachers to formulate a plan for effective integration of emerging technologies into the curriculum.

The *New Frontiers* staff led our team—and all the teams—through a vision, mission and technology planning process from which we formulated a plan to be implemented at St. Catherine the following September. Our plan had three goals: 1) to form a technology team comprised of faculty, parents, and students; 2) to integrate technology into the curriculum; 3) to purchase and utilize equipment necessary for implementing the team plan.

Our school then moved through the following three steps: Firstly, teachers prepared lesson plans that called for integrating some form of technology into the curriculum. By comparing the results with previously taught technology-free lessons, teachers were able to assess improved interest and learning. Secondly, a middle states re-accreditation project, "Critical Thinking Strategies as Applied to Technology," was designed to address the needs of students in the age of technology. Thirdly, a parent/teacher technology team met to discuss funding sources to equip each classroom with a multimedia workstation, while a very competent student technology team familiarized itself and the faculty with school technology, i.e., computers, printers, CD-ROMs, VCR-TV units, laserdisks, educational and closed circuit cable.

Due to the impetus we received from participation in *New Frontiers*, St. Catherine of Sienna School has confidently logged onto the information superhighway and planned its middle states re-accreditation project.

Holy Saviour School

Prior to our participation in *New Frontiers for Catholic Schools*, our school had not even taken inventory of its technological resources. Upon inspection, we discovered Macintosh FEs that were used by students for the sole purpose of writing book reports, and Macintosh LCs in every classroom that half of the teachers were afraid to touch. The LCs were removed from the classrooms and put into a lab that became the foundation of the Holy Savior technology center.

We envisioned and formulated a plan for developing a technology center that would assist students and faculty in research, library cataloging, networking with area schools, and word processing skills.

Holy Savior is also piloting a program under the auspices of the Computer Curriculum Corporation, which provides programs in math and reading. Holy Savior hopes to integrate language arts, science, and social studies into its technological curriculum for students in the future.

Conclusion

For the trekkies, the spring of 1966 is that unforgettable time when Star Trek was launched. For the *New Frontiers'* teams, the summers of '92, '93, '94, '95, '96, and '97 are equally memorable, because during these times they launched a planning process of profound importance to their schools and to Catholic education. A continuing "bon voyage" to them.

Endnote

[1] Nichelle Nichols is a presenter on the videotape accompanying Education Technology Planning Guide for Grades K-12, an EduQuest tool produced by IBM Corporation, 1992.

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Catholic School Libraries in the 21st Century

Carol Ann K. Winkler

In this new Age of Communication, where the Internet gives us remote access to computer databases, many technophiles believe libraries are doomed to extinction. Nothing could be further from the truth. It is true, however, that Catholic schools will need to make careful decisions in support of libraries as we enter the new millennium. To understand why, it helps to consider several factors: the role of libraries, the assimilation process of new media, the relative strengths of various media, and the mission of education.

Libraries were, originally, about the preservation of thought, which enables communication to occur across the barrier of time. Prehistoric culture ended when human beings realized that thoughts could be preserved for future generations. Librarians have today moved beyond assembling collections of thoughts, to deliberately making available the wide selection of arguments that encompass the whole of human knowledge. In addition, libraries strive to make accessible new information, so that today's users may reason out arguments of their own. These functions, currently belonging to libraries, will continue to be necessary in the Age of Communication.

The twentieth century has much to teach us about how cultures assimilate new communications tools. Be it phonograph records, radios, movies, televisions, or VCRs, the pattern is apparent: no new medium obliterates those that preceded it. Even handwriting remains viable 500 years after the paradigm shift precipitated by the printing press. What the new inventions do is force all existing media to redefine their roles, to focus on their chief strengths.

The chief strength of libraries is the control they provide. Good libraries are assembled by librarians who take pains to verify the authority of the resources they select. Good libraries provide a balanced variety of communications media, so that learning may occur through all of the senses. Good libraries are well-organized to optimize time spent in research. The Internet cannot provide such control without losing the "free" nature that is integral to its appeal.

The communications tools developed during the twentieth century are well utilized in today's libraries. Typical resources in a school library include books, films, audio, and software. Libraries provide Internet access as well. A drawback to preserving thoughts in electronic form, however, is the rapid obsolescence of each format. Maintaining the message for successive generations can become extremely complex. Who today has a 78 rpm turntable to play a cache of phonograph records? Who will have such a machine 25 years from now? Digitizing audio and

video appears to be a marvelous preservation tool, until all the various software upgrades, hardware upgrades, and standardization issues are considered.

In pondering all of this, the book stands out as the one invention that is complete in itself. It is a format as viable today as it was hundreds of years ago. That strength makes the book a medium so formidable that nothing electronic can hope to eliminate it as a storage vehicle for human thought. Books have other advantages as well. They require no power source, which makes them represent the ultimate in portability. Their interface with the user is easiest on the human eye for situations involving lengthy interaction and notetaking. Books do not have a rigid pace for their presentation: readers progress quickly or slowly, just as they require for any given passage . Although the author of a book presents his information in a logical, linear sequence, the book is amenable to jumping ahead or rereading. All of these advantages combined make the book the best medium for developing deep understandings of the arguments of other minds.

The mission of schools is to produce educated people. Such people are better equipped than those who are merely "informed." They have considered the arguments of other minds, and have used information to construct arguments of their own. Further, they are able to communicate their thoughts so effectively as to influence society. Better off still are the wise people. These are the educated individuals who have thought through many arguments, some in total contradiction to each other, in order to reach a deep understanding of a chosen topic. Thus, the basic function of libraries, communication across generations, makes them crucial to the development of wise individuals, This is a task begun as early as elementary and secondary school.

In Catholic schools the mission is to produce educated disciples for the Church. Each time a pupil identifies with a character in a novel, she stretches her capacity to empathize with another person and so, too, her ability to follow the Golden Rule. Each time a pupil wonders his way through a picture book, he experiences communication through imagery, the effective technique Our Lord used in His parables. When students "look it up" in the library, they learn the rudiments of gathering facts that later can be used to support enlightened argument. When given a library's wide variety from which to choose, students learn to examine sources for authority and to make selections based upon the purpose of the research.

While libraries remain essential for Catholic schools, the new technologies demand changes. Chief among them is the need to teach students to search computer databases efficiently. It is not enough to teach students to locate information through alphabetized card catalogs and indexes. Alphabetizing is a linear form of organization, simple to understand. Computer databases have irrevocably superseded this linear form by being searchable from many dimensions simultaneously. The mathematical thinking behind this searching is called "set theory" or "Boolean logic", but the software products commonly call it "keyword searching."

In keeping with the tremendous increase of power this search mechanism provides is the increased complexity of learning to use it well. To teach the public to do so, most libraries have converted to computerized catalogs. Catholic schools will follow suit eventually, but must first negotiate cost barriers. Computerized catalogs are a costly search mechanism, ironic since the collections to be searched in school libraries were typically themselves gathered with great frugality. Nevertheless, there is no excuse for not teaching keyword searching.

This nonlinear searching can be taught if a school has one computer with a CD-ROM drive and, at least, one keyword-searchable CD-ROM. Another path of instruction is a single computer hooked up to a modem. Dialing into an on-line public or university library would then enable students to experience the power of keyword searching, even if they can not actually retrieve the books. Whether a CD-ROM or modem is used, one computer linked to a TV monitor would

serve to instruct the whole group. At the very least, teaching set theory as part of the math curriculum would help to prepare students for the keyword searching of databases.

Another mandate delivered to Catholic school libraries in the Age of Communication is to provide access to all forms of media. The disciples being trained in Catholic schools will be striving to reach the hearts of people who attend to many non-print messages beyond those in the print format. These young people need to learn to understand and utilize the finest points of each kind of media. Maintaining diverse media tools in the library's collection enables students and faculty to study what makes this one's visuals so effective, this audio track so moving, these words so memorable, and these motions so evocative. From recognizing quality in the use of these various elements, students will learn which form of communication is best suited for a particular purpose. Eventually, they will move on to develop their own communication styles, suitable to the audiences they hope to address in the next century.

Not every Catholic school student will communicate to the masses, but all will continue to receive messages from the mass media. Thus, media literacy should be taught. Part of the Catholic school library's role in teaching media literacy is to teach students to question the authority of their sources. "I found it on the Internet," is roughly as reassuring as saying "I heard it on the street." Due to the extraordinary hype that the Internet has received from the mass media, the need to validate Internet sources is not readily apparent to the populace. They approach the wild, anything-goes jungle of the Internet with the same naive confidence with which they approach a carefully-filtered library collection. Instead, tomorrow's disciples need to be taught to use many of the same evaluative techniques that librarians have always used, so that they can better exploit the many advantages of the Internet. One strength of a Catholic school is its independent interpretation of how their mission is to be accomplished. Each school community will find its own way to help its library rise to the task at hand. Some solutions will have to be dirt-cheap. It is comforting to think of Our Lord writing with His finger in the dust.

When dealing with limited resources, remember that the most important tools of communication are not the physical tools of delivery, but rather the knowledge of what is most essential, what must be transmitted. Therefore, to provide students with vital communications tools for the twenty-first century, Catholic school libraries need not contain the electronic resources of the Library of Congress; rather, they should make sure that they teach keyword searching, provide access to many forms of media, and promote the discerning evaluation of sources.

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Media Literacy

Frances M. Trampiets, S.C.

Robert Muller, former Assistant Secretary General of the United Nations and 1996 candidate for Secretary General, was interviewed on National Public Radio's *New Dimensions* program, October 27, 1996. His remarks were unusual for their optimism about the present world situation and their hopefulness for the future. Organizations and institutions around the world are preparing for the year 2000, he said, by asking "What can we do to prepare for the new millennium? What can we do to make the world a better place?"

Indeed, scientists, educators, church and civic leaders are working together as never before to address problems of poverty, ignorance, and injustice. The present level of global commitment to the betterment of the world is unprecedented in human history, according to Muller.

Educators are in the vanguard of those committed to making a positive contribution to life in the next millennium. Their unique contribution lies in the role they play in preparing youth to face the challenges of our evolving global village. Those challenges are perhaps greater today than ever before. That is because our students tend to look to technology for solutions to all its problems.

Still, one thing is certain in the realm of education: technological competency is necessary and computer literacy is an essential skill which is why schools nationwide are making the transition from the textbook-based instruction to the multimedia approach that includes access to Internet resources and interactive media. In fact, many students today are already using CD ROMS, laser discs, and HyperCard and HyperStudio software with as much familiarity and ease as they once used textbooks and worksheets. Every school, therefore, has the responsibility to provide, or at least to work toward providing, its students with the hardware, software, and qualified teachers necessary to prepare them to be comfortable and competent in the high-tech world.

Every school has this responsibility, but the Catholic school has an added role to play because Catholic educators have a broader vision of the challenges facing schools today. They know that preparing students to live in a high-tech world requires more than training students in the skillful use of technology. It requires as well that students learn how to use technology in wise, prudent, and beneficial ways. The challenge for Catholic educators, then, is two-fold: 1) to integrate educational technology into the teaching and learning process; and 2) to prepare students to live wisely and well in a high-tech world. That our students know how to use technology simply will not suffice, because technology can be used for both good and bad purposes. That is why we must teach our students how to live fully human lives, fully Christian

lives, in the midst of an ever-changing and increasingly complex high-tech environment. That is why educational technology and media education must go hand-in-hand and be seen as a necessary partnership, for nowhere are the rapid advances in technology more dramatic and far-reaching than in the area of communications technology and mass media. Nowhere does this technology explosion touch our lives and shape our culture more directly than in the proliferation of media technologies.

The purpose of this chapter, then, is to explain what media education is, why it is an essential part of the educational program, and how to integrate it into the curriculum.

Media Education

Media education should be seen not as a new course to be taught, but rather as the consistent integration of age-appropriate skills development into all parts of the curriculum.

That is, media education should develop literacy, namely, the ability to access, interpret, analyze, and evaluate media messages as well as the ability to communicate through a variety of media.

Indeed, to be media literate is to have critical awareness, a questioning attitude, and a curiosity about the sources and purposes of media messages. It is having an awareness of the techniques used to achieve these purposes and an ability to appreciate that which is skillful and artistic while rejecting that which is manipulative.

Media education also should teach students to be selective and reflective in their use of media. It should challenge students to recognize the role the media play in our culture, and to be aware of the extent to which media messages shape our world view, our values, and our behavior. Above all, media education should develop critical thinking. Its ultimate goal, after all, is critical autonomy. Thus, it should seek to foster a strong sense of personal responsibility for intelligent use of the media.

Media literacy, moreover, is an essential life skill in a nation in which, by the time they graduate from high school, students will have spent more time in front of a television set than in a classroom; a nation in which a growing number of children spend more time alone playing video games than with friends playing softball or soccer; a nation in which even the toys that fill our children's play time and capture their imagination are spin-offs of movies and television programs, products of the multi-million-dollar entertainment industry that shapes our cultural environment.

Media Influence

George Gerbner, former dean of the Annenburg School of Communication at the University of Pennsylvania, has spent much of his life conducting and directing research on the effects of television viewing on children. In an address to the World Association of Christian Communication he asserted, "By the time children can speak, they will have absorbed thousands of hours of living in a highly compelling world [of television images]. . .Our children learn and we ourselves learn and maintain certain assumptions about life that bear the impact and the imprint of this most early and continued daily ritual. In our age it is television mythology we grow up in and grow up with."

Yet, television alone does not create the mythology by which we live. Our total media environment creates, celebrates, and reinforces a worldview and value system that supports our free enterprise system and our socio-economic institutions. Indeed, the symbiotic relationship that exists between industry, advertising, and the media drives our economy. The media, in fact, have become the great sales machines of our society, by perpetuating a worldview which assumes

that the more Americans spend, the better off they will be.

To sum it up, in this Information Age, the media — newspapers and magazines, radio and television, computers and the Internet — provide access to the information that shapes our thinking, guides our decisions, and influences our behavior. The worldview that we get from the media colors how we think about the world and how we try to solve its problems. Thus, it is not surprising that a growing number of media researchers regard the mass media, especially television, as the primary agent of socialization in American society today.

The Power of Image, Myth, and Ritual

Television, movies, magazines, and videos derive their formative influence from the power of image, story, and ritual. After all, from infancy on we are fascinated by pictures and stories, fascinated by what they have to tell us about the world. That is because images touch the imagination, which is why most people retain the impressions left by dramatic images longer than they remember the spoken or written word. The media continually surround us with dramatic, captivating images.

Leslie Stahl, CBS News Correspondent, explained it this way in a PBS special entitled, "The Public Mind":

> "We just didn't get the enormity of the visual impact over the verbal. . . It was a White House official who finally told me that. I did a piece where I was quite negative about Reagan, and yet the pictures (supplied by the White House) were terrific. I thought they would be mad at me, but they weren't, they loved it." The official out-right said to me: 'They didn't hear what you said; they only saw the pictures.' What he really meant was it's visual impact that overrides the verbal."

Media professionals understand the power of images, which is one of the reasons information is shifting from the written word to imagery. Consider that most people get most of their information from network and cable television. Magazines and newspaper, too, have become more highly visual. Most of the images in our media environment, moreover, are designed to be attractive, pleasurable, often amusing. We tend, however, to receive these pleasant, entertaining images less thoughtfully and critically than we receive written information. Thus, we are surrounded by images that feed our imaginations and leave lasting impressions; yet, we seldom reflect on their meaning and implications.

Stories, likewise, capture the imagination. Those who tell the stories have the power to shape our understanding of the world. Socrates, for instance, taught that stories shape the minds of children; or, as eighteenth-century essayist Andrew Fletcher wrote, "If a man were permitted to make all the ballads, he need not care who should make the laws of a nation." Similarly, George Gerbner writes: "Those who tell stories hold the power in society. . . Television is that ritual myth builder — totally involving, compelling, and institutionalizing as the mainstream of the socialization process." Indeed, writes Gerbner, "Television is the central cultural instrument."

Stories derive their mythic power by providing a framework within which we interpret the events of our lives. In times past, parents and teachers told children stories to provide them with role models and to teach them the importance of qualities like honesty, fairness, and kindness. Today, television tells the stories that teach children about life, and does so for commercial purposes.

The stories and images of the media have become an integral part of the ritual of daily life. From early morning until late at night we turn to newspapers, books, magazines, radio, television, and computers, to feed our insatiable appetite for information and entertainment. Yet,

we seldom consider what is being said to us, by whom, and for what purposes. Instead, we allow ourselves to become surrounded by media messages which, for the most part, we accept unreflectively and uncritically.

In every age and every society, the cultural environment has been shaped by the dominant images, the collective stories, and the shared rituals of the people. Art historian Gregor Goethals has traced the way in which images, stories, and ritual have been utilized throughout the ages by religious and civic leaders to shape the thinking of the people and to provide them with a common understanding of life and a shared sense of identity and cohesiveness. In *The Expressive Face of Culture: Mass Media and the Shape of the Moral Environment,* she states:

> The high arts today no longer play a significant role in expressing shared public values and myths. . . Today, the mass media offer a bewildering array of symbolic worlds and myths which purport to explain and order experience. . . Traditional religious images in pre-modern cultures rendered visible invisible truths and thus performed a sacramental function. Similarly, in a secular society, television images can give concrete, vivid embodiment to some of the intangible beliefs of a culture and provide a basic framework for knowledge and action.[2]

When we consider the formative influence of myth, image, and ritual, we begin to understand the power of media. We can see more clearly why media have become the primary agents of socialization in our culture. We grow in our awareness that media must become not only an educational tool, but also a subject of study, analysis, and evaluation. Indeed, both educational technology and media education are essential components of education for the twenty-first century.

Media Education and Media Literacy

How do we teach media education and develop media-literate students? The following framework provides an overview:

One primary goal: critical autonomy
Two content areas: print and electronic media
Three approaches:
1) how the media work
2) how they affect our lives
3) how to use them wisely

Four skills to be developed: the abilities to access, analyze, and evaluate media messages, and to communicate through a variety of media.

Five basic principles to be taught and used for media analysis and evaluation:
1. Media construct reality.
2. Media use identifiable techniques.
3. Media are businesses with commercial interests.
4. Media messages contain underlying ideologies and values.
5. Audiences interpret the meaning of media messages in unique ways.

Some examples of how these principles can be taught will demonstrate the relationship between media education and current trends in school reform and educational transformation. For a number of years, education has been moving away from the traditional view of teacher and textbook as the primary sources of information to be learned by the student. In a large part, this is because of the Information Age; computers have dramatically escalated the amount of available data. Much of that data changes rapidly as frequent breakthroughs in science, medicine, and technology change the landscape of learning. In media education, as in all education today, it is not finding the right answers that is important; it is asking the right questions. It is knowing where to go for current information on any subject. It is analyzing and evaluating the information and being able to apply it to solve the problem under study.

Media education, then, teaches students to access, analyze, and evaluate information by engaging them in activities that require these skills. Teaching the five basic principles of media literacy might be done in the following ways:

1. Media Construct Reality. Comparative analysis of how different news sources cover the same news event helps students to see that in the process of constructing a news story, events may be embellished, sensationalized, or told from a particular, perhaps biased, point of view. They note differences in how stories are constructed: differences in newspaper and television coverage; differences between the reporting in newspaper and television coverage and differences in their local paper, the New York Times, and USA Today. They compare and contrast web pages with non-commercial web pages; commercial radio and television with public radio and television; et al.

2. Media Use Identifiable Techniques. Students learn that in today's crowded media markets audiences attend to those messages that quickly capture and hold their attention. They study techniques for doing this: newspaper headlines, photos, and opening paragraphs; magazine lay-out, photography, story content, and titles; a television sit-com's stereotyping, plot development, and conflict resolution.

They learn about the television industry's standard practice of measuring "jolts per minute" and become aware of the frequency of technical events: camera movements, rapid scene changes, use of computer-generated graphics, injection of a music, or laugh track. Students observe and analyze these techniques and how they are combined to attract and hold an audience and also motivate that audience to take the desired action, i.e., "Stay tuned. Buy our sponsors products. Tune in next week."

3. Media Are Businesses With Commercial Interests. Students need to be aware of the symbiotic relationship between the media and the advertising industry. A study of television's ratings system, or methods of studying demographics, reveals the extent to which the industry is market driven and profit motivated.

Students analyze the implications of the growing concentration of ownership within the media industries. Studying listings of the holdings of the largest media conglomerates can achieve two important goals:

a. It gives striking examples of the extent to which U.S. media conglomerates own and control large portions of the world's media production and distribution.

b. It demonstrates the power that results from vertical ownership of publishing companies, large movie studios, television networks, cable systems, video stores, and companies producing toys, clothing, and other artifacts from children's movies and television programs. "Trans-National Media Corporations: What They Own and How Much They Earn," in the Spring

1996 issue of *Mediacy*, lists the holdings of Time/Warner/Turner, Disney/ABC, and Viacom/Paramount.[3] It is quite an eye-opener.

4. Media Messages Contain Underlying Ideologies and Values. Most people think of the mass media as sources of information and entertainment. They are much more. Media are involved in the making of meaning and the production of culture. Media are consciousness industries, deliberately and skillfully crafting messages to meet the objectives of their sponsors. Of course, it is in the best interest of these sponsors to create a cultural environment in which happiness is having more and appearance is everything. Wearing the right jeans and running shoes, driving the right car, using the right make-up and shampoo are vitally important in our culture. Style supersedes substance. First impressions count. How do we know? The media tell us so. Students should be able to identify these beliefs and values, analyze and evaluate them, and decide whether to accept or reject them.

They should be equally attuned to the positive ideologies and values underlying the media messages and gradually become more selective in their choice of media. Opportunities for students to explore interesting Internet sites and to use new and challenging CD ROM games and educational programs can help facilitate development of this important skill. That is because such opportunities will enable students to begin to see the potential of media, not only for worthwhile fun but also for personal growth and lifelong learning as well.

Students should also have opportunities to express their own ideologies and values using a variety of media. Indeed, video production, creation of a homepage, and production of a class newsletter all teach valuable media literacy skills and create more discerning media users.

5. Audiences Interpret the Meaning of Media Messages in Unique Ways. Every individual receives media messages through a unique set of filters; for example, one's educational background and life experiences, attitudes and opinions, beliefs and values, all color the interpretation of media messages. Moreover, writers and editors, and photographers and cinematographers, carefully construct messages to achieve a specific goal, but each person will receive and interpret the message as he wishes. Thus, the end result of the communications process rests with the individual.

Integrating Media Literacy Into the Curriculum

How can these kinds of activities be integrated into the curriculum?

The Language Arts The language arts program is a natural place to introduce the concepts and practice the skills of media literacy. Indeed, language arts in grades one through twelve should steadily develop awareness that media construct reality and, therefore, these grades should develop students' skill in analyzing the techniques each medium uses.

In addition to studying literature and writing essays, high school students should study film and television production and learn to create Web pages because actual production experience is the best way to develop an understanding of the techniques the media use to construct representations of reality. It would, likewise, be helpful to give students opportunities to do still photography and some radio and video production in language arts classes.

Social Studies Social studies are another area rich in opportunities for developing media literacy. History, after all, is best studied not just from one source and one perspective, but from a variety of sources with different viewpoints. That is because with different perspectives on hand, students become cognizant of the fact that any single event can be represented in multiple ways and that a reader's interpretation of an historical event is influenced greatly by his own

personal and educational background; for example, files, videos, and CD ROMS often are used in geography classes. Students should consider the source and point of view presented. They should ask: "Is this the whole story? How differently might another source portray the country and its peoples?"

American Government Classes in American government should certainly consider the role played by mass media in a democratic society and explore as well the link between media literacy and responsible citizenship. That is because the study of the influence of media on local or national elections enables students to learn to study how carefully-constructed media messages are used to shape public opinion and move people to action. Put another way, an election offers opportunities to distinguish between, on the one hand, valid techniques of persuasion and, on the other hand, political distortion and manipulation. Indeed, a comparative analysis of media coverage of social issues develops awareness of the importance of seeking out a variety of viewpoints and selecting media that provide broad news coverage and in-depth analysis.

Mathematics The economics of television advertising or the comparative costs of computers and various software packages provide rich fields for investigation in math classes; for example, the rise and fall of media stock prices, the tabulation of television ratings, and the computation of the total wealth of media conglomerates are all opportunities to deal with the media environment in which our students live. Of course, they can also generate new interest in math.

Religion Classes in the school or parish should explore the underlying ideologies and values of media messages in light of the Gospel. Violence as a way of resolving conflict, advertising that exploits women, stereotyping and bias, should each be recognized as antithetical to the beliefs and values of the Christian tradition. It is important, however, that media literacy not become simply media bashing. Thus, in addition to castigating what is bad, examples of Gospel values should be recognized and affirmed. Make no mistake: students can find examples in the media of modern-day Good Samaritans; they can see how the spirit of the Beatitudes is lived out in modern times. There are images of heroism and stories of people working for peace and justice. The media, in fact, are filled with countless numbers of pro-social, Gospel-compatible messages. It is, unfortunately, the negative aspect of media that draws most of the attention and is the subject of much of the current discussion.

Health Education Media literacy also has an important role to play in health education and is an effective tool for substance-abuse prevention.

Health education has assumed new importance as concern about the health of our youth reaches national proportions. Diet and the amount of junk food consumed by children and adolescents is one of the primary problems. Advertising has been targeted as a major contributing factor. Anorexia and bulimia are rampant among pre-teen and teenage girls. Boys and young men take steroids to build the kind of body they see flaunted on television and in movies and magazines. The ability to deconstruct media messages enables students to analyze and "see through" advertising that associates junk food with fun and good times, thinness with glamour and sexiness.

Media literacy is also an effective tool for substance-abuse prevention. The U.S. Department of Health and Human Services hosted a White House conference in August 1996 to bring together media literacy specialists and those at the federal level working in the area of drug abuse prevention. Conference attendees found that young people who know how to analyze and evaluate media messages are less susceptible to cigarette and alcohol advertising. They recognize the persuasive techniques used and the attempts to manipulate employed by advertisers.

Multicultural Education Finally, media literacy is an important part of multi-cultural education. Many negative impressions of other ethnic and racial groups come from stereotypes

seen in the media. These stereotypes are typically incomplete and unfair portrayals of minority groups, but only when they recognize stereotypes as one of the identifiable techniques used by much of the media do students become fully cognizant of this reality.

Media Education Resources

The Center for Media Literacy in Los Angeles serves as a clearinghouse of information and resources for media education. Their catalogue provides an overview of books about media literacy and helpful teaching resources. The field of media literacy, however, is quite new. British, Canadian, and Australian educators have led the way in English-speaking countries in shaping our present understanding of the theory and practice of media education.

The internationally recognized definitive work in this field is from Great Britain. Len Masterman's *Teaching the Media*[4] is a comprehensive and scholarly treatment of media education, theory and practice. Most of his examples are, understandably, from the British press and television.

Canadian Chris M. Worsnop has provided teachers with a wonderfully practical, concise introduction to media literacy in the first half of his book, *Screening Images: Ideas for Media Education.*[5] The second half of Warsnop's book describes techniques and activities for developing the insights and skills needed to become media literate.

Visual Messages: Integrating Imagery into Instruction,[6] by David Considine and Gail Haley, is another primary resource for teachers. Considine, originally from Australia, is an internationally recognized leader in the field of media literacy; Haley is an award-winning illustrator of children's books. They have together produced a valuable guide for developing critical thinking and viewing skills.

Catholic educators and parents will find *Mass Media and Moral Imagination,* edited by Philip Rossi, S.J., and Paul Soukup, S.J., a valuable introduction to the role our media environment plays in the development of beliefs, values, and morality.

The Center for Media Literacy has produced several teaching kits to provide teachers with helpful background reading, lesson plans, worksheets, and handout masters. Titles include *Living in the Image Culture, Citizenship in a Media Age, Selling Addiction, TV Alert: A Wake-up Guide to Television Literacy,* and *Global Questions: Exploring World Media Issues.*

Catholic educators will find the multimedia kit, *Catholic Connections to Media Literacy*[8], especially helpful for both classroom and parish programs. This "starter kit" provides teachers with the background and teaching materials they need to introduce media literacy into learning programs for children, teens, and adults.

Another timely and helpful multimedia program is CML's *Beyond Blame: Challenging Violence in the Media.*[9] It contains five comprehensive units, from elementary through adult, and includes print, audio, and video teaching resources.

Canadian John Pungente, S.J., and Neil Andersen have published an exciting new video-based curriculum, *Scanning Television.*[10] Topics include "Seeing Ourselves: Media and Representation," "Selling Images and Values," "Our Constructed Worlds: Media Environments," "The Global Citizen" and "Converging Technologies."

Media Literacy: An Environmental Issue

The growing impact of mass media, and the rapidly emerging awareness within the U.S. of media influence can be likened to the growth of the environmental movement of the 1970s and 1980s. Awareness of and concern about the quality of air, water, and food had been confined initially to a relatively small and elite group of activists. Through their tireless and persistent

efforts, however, more and more Americans were awakened to the need to take personal responsibility for their physical environment. Thus, they began learning about environmental issues and became actively involved in helping to assure the safety of the air that they breathed, the water that they drank, and the food that they ate.

They recognize that our cultural environment requires as much vigilance and care as our physical environment. Indeed, media literacy is today's leading edge environmental issue. It is part of a worldwide movement to monitor and improve the quality of our cultural environment.

In several of his recent books Neil Postman endorses a "Media Ecology" movement. George Gerbner recently founded the "Cultural Environment Movement" to bring added visibility and financial resources to this effort. In *Fighting Media Illiteracy: What Every American Needs to Know and Why,* Everette Dennis, executive director of the Freedom Forum Media Studies Center, says: "Media illiteracy is potentially as poisonous to the human spirit as contaminated water and food are to our physical well-being."[11] With the help of educators media literacy can become, and should become, the environmental issue of the next decade.

Media literacy, then, is a basic competency in today's high-tech, media-saturated world. It provides students with the basic survival skills of critical thinking, analysis, interpretation, and communication. Given the impact of image and story on beliefs, values, and behavior and given the fact that the media have become part of the ritual of daily life and the primary agent of socialization in our society, it is Catholic educators who should lead the way in this new effort to educate media literate citizenry and transform our cultural environment.

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Technology Coordinator: Who Do They Say I Am?

Nancy Erhart

Three tall strangers dressed in dark black suits enter the front hall of the school and make their presence known in the front office. Before they can cross campus to the computer lab, the word is out among eight hundred and fifteen students. The rumor spreads, but no one can believe it's true. How could this sort of thing happen? Most importantly, how could it happen on a Catholic School campus? A whole new dimension of ethics and integrity had just entered into the mind set of all involved. Yes, everyone was involved.

The three tall strangers made it to the computer lab. As they knocked on the locked lab door, you could have heard a pin drop inside. It was actually happening. This was not an episode from a James Bond movie. These three tall F.B.I. agents were here on campus to investigate computer fraud.

As they entered the lab, all sixty eyes were focused on the men. The three tall strangers flipped out their badges, identified themselves, and then slowly and meticulously moved from computer to computer. It took only minutes for them to verify the rumor, illegal software was rampart on every Macintosh Performa 474, 635CD, LC 575,..... There were 30 computers with Writing Workshop on the hard drive and only one program, no site license, or even classroom package. There were 40 computers with HyperStudio and only 30 program disks. The list went on and on.

The school, its administration, its family, the student body, the parent association, and the school board were all involved and to be held accountable. White collar high-tech crime had entered the hallowed halls of St. Francis of Assisi through the front door. Everyone knew what they had been doing was wrong, but because of finances, they let the ends justify the means.

If the school had invested in a technology coordinator, their integrity, their tradition of good Catholic values and their computer lab would have been saved and would be intact.

Times are changing. Today's schools are becoming the playing field of big business and big business crime. Computers adorn every classroom, workroom, library, and faculty lounge. Notebooks are being replaced by laptops, pencils are being replaced by keyboards, and pen pals are now key pals. The ever present felt need to keep up with technology is driving, pushing, and forcing schools to feel the pressure of big business.

This playing field very much resembles the professional sports arena. Teachers are donning the hats of quarterbacks, students are the key players, and John Madden's screaming top plays are an actuality. The one area that education has strayed from the similarity of professional sports is that it is just beginning to realize the importance and necessity of the "coaches". Schools have been rolling along into this new era of technology entering into the classroom, but no consideration was even given to the concept of hiring a "technology coordinator". The truth is that no one even has a clear picture of what a technology coordinator really is, much less what the job description would look like.

All that St. Francis of Assisi Catholic School knows for certain is that, if they had employed a technology coordinator on staff, they would not be in the legal fix that they are in now. They would have had that all important "coach" on the side to call and design the plays. As the F.B.I. agents are on the campus, the principal is at the computer designing the job description for a school technology coordinator. The computer screen in the principal's office looks something like this:

The role of a technology coordinator includes the following:

1. knowing the big picture
2. calling the plays
3. keeping abreast of current trends
4. keeping all the equipment inventoried, up, and running
5. conducting training sessions
6. counseling the computer struck

Knowing the Big Picture

The principal begins typing....The technology coordinator is the one who is responsible for seeing the big picture, for knowing what the playing field should look like. The coordinator knows what the team will look like, what they will wear, how they will respond, and what it takes to get into the Super Bowl and WIN! The principal is really getting fired up as he envisions the technology coordinator as a real life coach, vital and absolutely necessary for the success of the team. It is at this point that he realizes how easy it will be to sell this idea to his faculty, his school board, and his parent association. He realizes, however, that he must now get down to the task of transferring these coaching ideas to actual technology tasks.

Once again he begins... The technology coordinator is the one who is responsible for designing the five-year plan along with the help of other faculty members. Stop...the principal realizes that the technology coordinator must first establish a technology department consisting of the following:

the computer lab instructors

the librarian

the multimedia instructor

the lab assistants

the public relations coordinator

the development director

This team can have input into the designing of a five-year plan, a budget, and a general philosophy. The technology coordinator, will oversee, guide, and direct the working of this

department. The coordinator will be responsible for calling a meeting at least once a six-week period to continuously design and redesign the big picture, making sure that everyone is aware and abreast of the technology vision, and at the same time getting information out to the rest of the school faculty and staff, parents, and the community.

The technology coordinator must not only have eyes of 20/20 vision, but future vision to see the big picture coming down the "coaxial cable". It is this vision that must be in tandem with technology, but also with our Catholic school vision. Remembering that the man born blind was made so in order that God might be made visible through him (John 9:1-40), as it is with technology which will enhance our vision of what is to come.

Calling the Plays

After the technology coordinator, along with the help of the rest of the technology staff, creates the big picture, then come the exciting tasks of getting into the game and calling the plays. On the technology playing field things are constantly changing, not just every day, but every single minute. The view of technology is always in a state of flux. Calling and designing plays is integral to the success of the program. The principal realizes that a key attribute for a technology coordinator is that the person be one who is flexible, creative, and visionary, but a creative person who is and will be able to keep abreast of current trends and innovations in the field.

Calling the plays involves getting into the action: what steps will we take, when will we take them, who will be involved, how much will it cost, where will we put this new technology...This will probably be one, if not the number one, most difficult responsibility.

Will all the computers go in one place, let's say a lab, or will we design a teaching lab and then place small portable mobile units on each teaching floor? These mobile units could be designed simply on a rolling cart type of structure with a television, a VCR, a laser disks player, a computer, and an LCD panel. This would be very easy to convert the already existing rolling carts with the television and VCR that are already on each floor. In addition, the teachers are in the habit of signing up for and utilizing the audio visual equipment, and realize how these elements truly enhance their lessons...

Or do we want a big lab networked, where every student in a classroom has a computer on which to work and learn the basics. This lab could then be complemented with a small multimedia type of lab which has computers equipped with HyperStudio, Multi Media Workshop, etc. Here in this setting students in small groups could work on more in-depth projects utilizing videos, slides, sound. The list is endless...

Or do we want three computers in every room where the classroom teacher will design lessons to utilize the computers that go along with her actual classroom lesson. The teacher could design a schedule for a time that each student was on the computer, individual projects could be assigned, and the computers could be in use every minute of the day...

Or...and then the principal realizes that these are the types of plays that the technology coordinator will have to create and that he has been thinking in only one dimension. He hasn't even thought of the other key players in the technology department: what plays will be necessary for the library as well as the public relations, and development offices. Now, he is really getting excited. Just think of the possibilities of networking the library to the computer lab...to all the classrooms...to all the student's homes (through Internet). The possibilities are absolutely unlimited. We could be in touch with Rome everyday, the Pope, Notre Dame. We could, maybe, through the luck of the draw and the grace of God, and the assistance of technology, get tickets to a Notre Dame game! The principal is sitting in the lab smiling from ear to ear, when he realizes he must come back down to earth...

Then once back on earth, where will we spend our precious and few dollars? What type of equipment will best meet our needs? Should we consider the mobile systems like powerbooks and personal digital assistants like Newton? What should be priority when it comes to the actual computers? How much memory is enough? How fast do we want out modems? The answer to all of these questions is always the "max", but we know we can't afford the "max". So, what do we need to do to have our budget best meet our student and school needs. This technology coordinator will need a big play book.

Keeping Abreast of Current Trends

In conjunction with the above mentioned steps, the technology coordinator must have a burning drive to read, read, read...Much like John the Beloved who had a burning desire to know more about Jesus. (John was always there by Jesus to do what Jesus wanted and needed him to do. He never left his side.) The technology coordinator makes a side note to get a subscription to *Mac World, Technology and Learning,* and any others that the school librarian finds helpful. Then he adds to his list, books like *The Road Ahead* by Bill Gates and then he is struck with the true picture of where a coach stands, that is, on the sidelines.

Keeping current is a given to just stay in the game not to mention, scoring! Yes, if he is going to put this new technology coordinator into this new coaching position, he, too, needs to stand on the sidelines. He doesn't have to know all the books and magazines to order, he only needs to use his technology resources. The items up for consideration to purchase can be found by browsing for books online. Book titles can be found on Bookwire (http:/www.bookwire.com). From here there are indices of publishers and their links to their web sites, book reviews, and even links to discussion groups and online text. There's also the On-Line Books Page (http:/www.cs.cmu.edu/web/books.html). With a sigh of relief, the principal is beginning to feel more confident in his ability to be, as the technology coordinator, the guide on the side rather than the sage on the stage.

Technology has also a new trend that Jesus started — discipleship. Volunteers go out to educate and make known the teachings as Jesus sent out his disciples two by two to tell about the Kingdom. Jesus told them not to worry about what they were to say for the Holy Spirit would enlighten them. He simply said, "Go and make disciples of all nations." The Tech Corps, a non-profit organization, is designed to do just that, to bring technology-literate volunteers from the business community into K-12 classrooms to enlighten them.

This humanitarian concept of helping one another is evident in Luke, Chapter 19, when Zacchaeus, a chief tax collector and wealthy man, promised to give back half of his possessions. This is also seen in the fact that Bill Gates is pledging to use proceeds from the sale of his new book, *The Road Ahead,* to fund school technology programs in 22 communities during the next two years.

Keeping All the Equipment Inventoried, Up, and Running

Besides resourcefulness skills, the technology coordinator is going to need to possess a great deal of organizational and mechanical abilities. All of this new and old equipment will have to be inventoried and cataloged. This will be a new era of incorporating librarian type record keeping skills into the computer lab. The acquisition of all this equipment will mean designing a physical layout in which that staff members and students can easily access necessary resources.

To find a person who is comfortable with taking the computers apart, twisting wires, dropping cables, networking, and being comfortable with "system errors" will be an absolute. A

great deal of time will be saved and, therefore, more time on the computers for all, since the school will not be on hold. Being on hold has in the past involved calling companies in California, waiting for outside consultants or 1-800 numbers to fix our problems. This will be like being in heaven where Jesus will be showing us the way...."I am the way, the truth, and the life." (John 14:6) Having a technology coordinator will put the whole school on the right path and show us the way.

Conducting Training Sessions

The principal knows from all of his years of coaching that the only way to have a winning team is to practice, practice, practice. The technology coordinator will need to plan on conducting numerous and varied training sessions for the staff. These sessions cannot be simply a single shot in the dark. They will need to be planned with sufficient amount of time so that the staff will feel confident and comfortable with the technology. The comfort level will be so high that they will be fighting for the computers, for that is the real purpose of having computers, to have staff and students working on them at all times.

A great deal of thought will need to go into when these sessions will be conducted. What type of follow-up will be provided. What type of outside resources are available. If training is not done properly, the technology will not be integrated into the classroom curriculum.

Teachers will need to "buy in" to the idea that students learn best by doing. Students and staff need to interact with this technology to have a meaningful learning experience. That means a single pair of hands on each computer. We can no longer afford to have two or three students sitting at a single computer. It is essential to individualize these training sessions and teacher development sessions. Ongoing staff development means building relationships among participants.

The technology coordinator will also need to be willing to share his knowledge with others outside of the school by speaking at conferences, writing articles and curriculum, and going on the air to speak out about the "good news". Research and studies find one of the greatest barriers to infusing technology with schools is giving the educators the knowledge to use the products effectively.

A major benefit of these staff development sessions will result in energizing the classroom curriculum. By providing current and up-to-date information, teachers will no longer be accessing outdated info, but rather day to day and minute-to-minute world and local happenings. The World Wide Web will link the classrooms to the community, the universities, and beyond. The existing curriculum will be enriched, extended, and transformed. By integrating the curriculum, teachers will be teaching cross curriculum and cross cultural concepts from the insides of their classroom. Every day will become a truly on-line adventure for life, living, and learning.

Counseling the Computer Struck

When Jesus lost His cool as He walked into the temple and said, "You've made my Father's house a den of thieves," it was because this was not what Jesus had planned for the temple. Any good coach knows that even the best laid plans can go astray. Once all of these teachers and students "buy in" to this technology, they are going to have to face some really hard obstacles. There are going to be power surges, information is going to be lost, systems are going to crash, and back ups are not going to be made. In other words, crisis will enter the technology playing field.

This is when the technology coordinator will turn from coach to technology counselor. These teachers and students are going to want someone to really listen to their problems, to

empathize, and sympathize with them. Face it, technology can drive some people to the brink. Losing your stack of homework papers doesn't sound like too big of a deal, but if the system crashes, the mother board is burned, or any one of many types of accident occurs, a teacher can be devastated. Someone is going to need to be there, to stand behind their chair by their computer and just talk them through. Talk them through and remind them that this, too, will pass and that we only learn from our mistakes. Yes, I believe I told you to always save. In fact, save every ten to fifteen minutes. We never know when Mother Nature will decide to test us with a stroke of lightning, a power surge, ... or treat us to a good cry.

This role of a counselor will include incorporating the Catholic values and morals into the technology curriculum. Integrity and ethics will need to prevail in the lab from henceforth. All of the students and staff will need to sign an ethics contract. We will have to face many issues and establish an acceptable use policy. The total school will have to change its focus from one of eternal control to one of total internal control. That transfers from keeping the negative out to bringing the positive in, making good decisions, making choices when it comes to Internet and other on-line options, following and obeying copyrights, and being willing to accept that the consequences are now upon us.

In a sense, our school will never forget when the three tall Wise Men came on our campus entering from the front office and looking for the computer lab. They gave back the gifts of our Catholic values. Gifts we had once had, but lost along the way. The three Wise Men dressed in dark black suits reminded us of the importance of suiting up and playing the game with integrity and pride and holding our heads proud. These three Wise Men will never fully know the impact of their visit upon our lives and our future.

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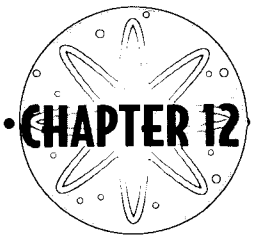

Ethical and Legal Challenges of Technology

Angela Ann Shaughnessy, SCN

In pursuing the "great right" of educational technology, educators must avoid doing "a little wrong."

Ten years ago, most educators, certainly most Catholic educators, had limited access to computer technology. Now, as the new millennium approaches, it is difficult to imagine life without computers and related Information Age technologies. Accessing volumes of information, a consuming chore just a few years ago, can now be done in a few moments with the aid of a PC, modem, and a database. These developments, wonderful as they are, present challenges for the educator who seeks to act in a morally, ethically, and legally correct manner. This chapter will discuss three areas of concern:

(1) issues of accessibility and equality;
(2) appropriateness of materials available to young persons on the Internet and other networks; and
(3) matters relating to copyright and licensing of software.

Accessibility and Equality

One of the hard realities of technology is its cost. Schools in affluent neighborhoods often possess greater resources than those in poorer areas. The sheer cost of technology can put much of it well beyond the buying power of many institutions, including many Catholic schools.

Recently proposed legislative reforms seek to make the telecommunications industry more market-driven. One effort would require telecommunications companies, primarily telephone

and cable TV, to connect schools to fiber-optic lines as systems are being upgraded. This would remove the cost barriers to access for educational institutions. Deregulation, then, could ensure that all schools are wired for the Information Age. Catholic school educators should, of course, bear witness to the sharing of resources; the Gospel requires that those who have more share with those who have less.

Appropriateness of Materials Available

Headlines reveal that several young people have run away from home as a result of propositions received from others on the Internet. Since there is currently no truly effective means of monitoring and/or censoring material on the Internet and other networks, there is nothing to prevent unsupervised young people from engaging in electronic conversation with inappropriate persons about sexual matters, drugs, crime, and other unsuitable topics. The growing popularity of "chat rooms" presents particular ethical/moral dilemmas. Since there are no privacy police, people who log into a chat room can write anything they wish to others who are "in the room" at the same time. E-mail provides a means for people with no prior knowledge of each other to share intimate conversation. Chat rooms and E-mail present moral dilemmas not unlike those previously posed by television and movies.

The television industry polices itself, at least to a degree; for example, one does not generally find pornography running on the major networks during networks prime time. Although adult channels are available on cable TV, parents and other supervisors can purchase devices that allow them to block access to them. Hotels and motels allow parents to call the front desk and block access to movie channels in their rooms.

The movie industry now provides a rating system that indicates the appropriateness of content for certain age groups. The dearth of PG movies, however, indicates that movies without sex and violence do not generally sell as well as those with them.

With no comparable monitoring system in place in the world of computers, parents and other educators must maintain constant vigilance. Consumers need to lobby the computer industry to provide some means of evaluating content and limiting access. Some experts recommend the development of computer programs or microchips that will limit the availability of certain services.

Voters need to lobby lawmakers to develop legislation that will provide protection for young people. While the First Amendment to the Constitution does permit much leeway in terms of expression, it, does not require that children and teenagers be given unlimited access to the self-expression of others. Even if everyone else in the neighborhood is "surfing the net," adults must stand firm and monitor computer usage by the young people under their charge.

Matters Relating to Copyright and Licensing of Software Users

Most educators are aware that copyright law exists to safeguard the rights of authors. Those who create materials are entitled by law to the fruits of their labors, and those who use an author's creations without paying royalties, buying copies, or seeking permission are guilty of stealing. Many realize that there are rules to be followed when making copies of articles, videotapes, and computer programs. Yet, for some, the rarity of prosecution for breaking the law becomes a license to violate it. For others, the motive of helping students learn is a sufficient excuse for failing to comply with the law. Clearly, such behavior fails the moral, ethical, and legal standards we should seek to uphold. Nowhere is the tension more evident for today's educator than in the area of copying computer programs. Are there rules? If so, should the same standards that apply to copying print material apply to the duplicating of computer programs?

The Copyright Law of 1976, Section 102, expressly provides that for media other than print: "Copyright protection subsists...in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."

Section 107 deals with "fair use," which is not an infringement of copyright. The difficult part is defining the term "fair use." Four factors are to be included in any determination of fair use:

(1) purpose and character of the use;
(2) nature of the copyrighted work;
(3) amount and substantiality of the portion used in relation to the copyrighted work as a whole;
(4) effect of the use upon the potential market for, or value of, the copyrighted work.

A teacher whose "purpose" in using a software package is to display the results on a screen for class viewing is using the software fairly. Since the law recognizes the right of an individual to make one copy of a piece of software in case the original fails, making the copy in the manner described above also would be fair use.

Making twenty copies of the software so that every student can have a copy is probably not fair usage, unless the licensing agreement clearly conveys that permission. Reproducing computer software without permission violates copyright law and is a federal offense. Violators are subject to both criminal and civil penalties.

"The nature of the copyrighted work" can prove a bit more problematic than "character and purpose." Who determines what the nature of the work is—the creator and/or copyright holder, the teacher, the judge and/or jury? It seems reasonable to assume that, in determining "nature," a court would look to the ordinary use of the work and to the author's intent in creating the work.

The "amount and substantiality" of the work copied is especially troublesome in the use of computer programs. Copying a complete computer program without the appropriate permission, however, clearly violates this principle. The last of the four factors, "effect on the market," is also difficult to apply in the educational setting. Arguments can be advanced that students could not or would not purchase commercially available software, even if the copies were not available in school. It appears, though, that use of an author's work without appropriate payment for the privilege is a form of economic harm. Good faith generally will not operate as an acceptable defense in educational copyright infringement cases.

In the case of Roy vs. Columbia Broadcasting System, 503 F.Supp. 1137 (S.D.N.Y. 1980), the court stated: "The federal copyright statute protects copyrighted works against mere copying, even when done in good faith and even when not done to obtain a competitive advantage over the owners of the copyright in the infringed works." Thus, educators are responsible for the use they make of software. Users must abide by the license agreements that accompany software.

Conclusion

Educators may be tempted to believe the oft-quoted lines from The Merchant of Venice: "To do a great right, do a little wrong." Ethical, moral, and legal imperatives do not, however, allow for such rationalization. Students, regardless of their economic or social status, have a right to experience the richness of technology. At the same time, they have a right to expect that adults will protect them from harm and exercise vigilance over their behavior, technological and otherwise. Lastly, educators themselves must be models of integrity, observing the laws that grant authors and other creators the right to the fruits of their labors. Obviously, the Internet

was not part of Jesus' lived experience, but it is important to reflect on how He would want us to meet the challenges which technology presents in today's world. Catholic educators must surely model their behavior on that of Jesus, who scrupulously paid the temple tax, rendered Caesar his due, and exhorted landowners to pay workers a generous wage.

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Planning from the Diocesan Perspective

Marian Stuckey

This is a unique moment in history. More than ever, the computer is revolutionizing the way we do business, the way we communicate, the way we spend leisure time, and, perhaps most importantly, the way we teach and learn.

The merging of the telephone, the TV, and the computer gives us technological power like never before. It is a power much greater than what the three technologies possess independently. Anyone who wants to participate in the present and help mold the future must harness this technological might. In August, 1994, former U.S. Secretary of Labor Robert Reich said,

> ...The forces unleashed by technology must be mastered...As increasingly capable machines join Americans at the workplace - join them as both co-workers and competitors - the payoff to education and training has soared, and the penalty for lacking skills has stiffened...while the information highway promises to speed some people to desirable destinations, it may leave others stranded in the technological version of inner-city ghettos.

All children deserve the opportunity to achieve technological prowess. Though our students will use technology without us, it is we who must bring the full potential of the new technologies into the classroom. We, who teach, must determine how to integrate technology into the learning experience.

Many administrators and teachers have been pioneers in bringing the new technologies into their schools. They often supply the vision and the effort necessary to bring this technological revolution into the classrooms. We need, however, to be concerned with those schools and teachers who still remain unconvinced of the need to integrate this tool into their teaching. As Robert Reich foresaw, the gap is already widening between those who understand and use technology and those who do not.

The issues raised by integration are complex. We are not talking about purchasing desks or chalkboards. Integration of technology forces us to rethink how we teach and how students learn. There are many issues to consider: curriculum integration, staff development, networking,

Internet access, multi-media use, hardware purchasing, selection and evaluation of software, teacher and student proficiencies, budgeting, fundraising, maintenance, security, ethics, etc. In order to master the forces unleashed by technology and to thoughtfully consider the above issues, long- and short-range planning are necessary.

Even a cursory look at these issues suggests that the task would be daunting for an individual school. Because of the size and complexity of technology integration, planning should be done and responsibilities assumed at every level of the educational community: the state and region, the archdioceses/diocese, the school community, and individual teachers and staff. This chapter will focus only on the area of diocesan planning, specifically the process that occurred in the Diocese of San Jose, California in 1994.

Reasons for Diocesan Planning

Why do diocesan planning? Why should a diocese bring together representatives of the K-12 educational community to plan for technology integration into the schools? There are several reasons:

- ***Creative energy is unleased.*** Creativity was contagious when twenty-three enthusiastic educators came together to talk about their vision for all students in the diocese. It is hard to imagine that a school faculty, no matter how creative, could match the vision and energy of this task force.
- ***Collaboration builds a community of schools.*** Schools are not always aware of how much they have in common, how much they have to share in the area of technology. In fact, during our planning process, each person on the planning team contributed valuable experience and offered assistance to help others achieve common goals. A stronger bond exists among our schools due to this collaboration.
- ***Expertise is gained.*** A meeting of the most talented technological minds in a diocese is a very effective way to share knowledge and to avoid sometimes costly mistakes.
- ***Costs are shared or reduced.*** Joint planning can result in group purchase of district licenses for software and hardware. While it is possible to do group purchasing outside of a planning process, it is much more difficult.
- ***Efficiency is achieved.*** It is a waste of time and money for every school to do every task. It is simply unnecessary for each school to develop an ethical use contract, a planning guide, student competencies, and staff inservice programs. Everyone benefits from sharing.

Goals of Diocesan Planning

Before beginning the planning process goals must be made clear.

- ***A product will result:*** The task force will develop a **Masterplan** and, probably, some type of handbook that includes resources, guidelines and recommendations for student and teacher competencies, inservice ideas, security and maintenance solutions, and, above all, ways to integrate technology into the curriculum. This **Masterplan** can then be shared with all members of the diocese.
- ***A process is initiated:*** The development of a planning process begins with this specific project, which brings people together to imagine what is possible, encourage one another to continue pursuing technology goals, brainstorm new ideas and become resources for one another. The task force formed to create the initial plan should continue meeting once or twice a year to implement and modify the plan. Coming

together for the focused task of completing a plan will help the group get far beyond the initial production of the plan.

Remember that schools within a diocese are multiple kingdoms, separately financed in most cases. Therefore, certain responsibilities should be reserved as school site decisions. The group needs to determine what is appropriate to be done at the diocesan level and what is appropriate for the school level. Each has a significant role to play.

In the Diocese of San Jose, we produced a three to five year **Masterplan**. It resulted from the efforts of twenty-three people from the K-12 schools, the surrounding community, and the department of education. They formulated goals and strategies in the following areas: Facilities Preparation and Planning; Hardware Acquisition; Curriculum Applications; Software Selection and Evaluation Standards; Inservice; Guidelines and Recommendations for Teacher and Student Competencies; Administrative Uses; Security/Maintenance; Ethical Use Standards; and Budgeting and Funding.

Six-Step Planning Process

The task force followed a six-step planning process which began in October and ended the following July with the publication of the **Masterplan**. The steps we took to complete the plan follow.

1. Step One: Gathering Information

I assumed the responsibility for the first step, which should be handled by someone at the department of education. My activities included:

- attending technology meetings and conventions
- visiting all school campuses
- inventorying current hardware acquisitions
- interviewing principals and technology coordinators
- conducting surveys with principals and technology coordinators
- compiling data
- sharing the results of the data with all segments of the community

The result of this two-month process was an assessment of the needs of the schools and a listing of the assumptions that would guide our process. A key assumption was that the principal was the key to progress and change. During this time, I also attempted to keep our constituencies aware of the progress of our planning.

2. Step Two: Inaugurating the Formal Planning Process

Three activities were included in this step:

- establishing a task force
- writing a mission statement
- deciding on the overall structure of the plan

In December, I assembled a task force. Initially, I invited ten people to join. Among them were a consultant, principals, technology specialists and classroom teachers from the elementary and secondary schools. I knew these people were involved in various aspects of technology. All

of them accepted our invitation. I then invited anyone from the schools to join. I was prepared to establish additional working committees, if necessary, to accommodate whatever number of people responded. Ten more people did join, mainly elementary classroom teachers and technology coordinators. With the addition of three staff members from the department of education, the completed task force contained 23 members.

I scheduled three long meetings, one each in February, March, and April. I made myself responsible for minimizing the work of the task force outside of the meetings. That way I could keep very busy, competent people on the task force. What I needed from them were their ideas and their ability to judge each other's work. They needed to be sure that working principals and school communities could implement the goals and strategies we were developing.

Our next task was to write a Mission Statement. I furnished the task force with a first draft. They made numerous changes, resulting in the following:

Mission Statement

The emergence and availability of modern technologies, and the merging of these technologies (TV, the computer, the modem, the laser disc, and the CD-ROM) have the potential of reinvigorating the ways in which teachers teach and learners learn. These technologies have the power to give all students the same opportunities to learn, to bring the entire world of research and beauty within a keystroke, and to unleash creativity and excitement in all our students.

The department of education of the Diocese of San Jose enthusiastically supports the efforts of planning for the effective implementation of these technologies in the classrooms, the libraries, the labs, and the office of all elementary and secondary schools. The department realizes that there is a role for the department as a whole, and for each school individually, incorporating technology into every aspect of our educational system. We respect and support creative and individual approaches to the integration of technology into the curricula of the schools. At the same time, the department commits itself to taking a leadership role in assisting with planning and implementation in the future use of technology in our educational system.

The challenge before us is to envision what is possible, to assist our teachers in understanding the power of the technologies in revolutionizing all aspects of education, to plan carefully and realistically in order to avoid costly mistakes, to enlist the help of parents, administrators, businesses and boards, and to discover sources of funding to support constant upgrading and progress.

Specifically, the technology task force commits itself to developing a comprehensive plan with goals and strategies which will guide our efforts over the next three years in the areas of facilities preparation, hardware acquisition, curriculum application, software selection, inservice opportunities, guidelines for student and faculty competency, administrative uses, maintenance, security, and funding.

The goal of all of these efforts is to offer the best educational opportunities for all students to reach their potential and to allow them to learn with excitement, a sense of discovery, and a sense of wonder.

At this point, we also decided that the plan would consist of four major sections:

I. Computer Hardware, Multimedia Resources, Facilities Preparation, and Planning for Networking
II. Curriculum Applications; Software Selection and Evaluation

III. Staff Development; Recommendations for Teacher and Student Competencies
IV. Administrative Uses; Funding; Security; Maintenance; Ethical Use

3. Step Three: Form Committees, Write Goals

- Develop goal statements.
- Determine priorities.
- Discuss the draft goals with the entire task force and revise goals as appropriate.

Four committees were formed to correspond to the four areas described above. Their task was to write goals for each area of concern. Individual committees developed initial goals statements. These statements were then read and discussed with the entire task force. Recommendations were made to the committees who made necessary amendments to their goal statements. This last step required one four-hour meeting.

4. Step Four: Developing the Plan

- Review and/or modify goals.
- Write several strategies for each goal.
- Detail who, what, when for each strategy.

This step called for the task force committees to write specifics for each goal. Usually, there were two or three strategies per goal. The strategies were to detail an action, name the person responsible for its accomplishment, and state when it was to be completed. One of four parties was to take primary responsibility for each strategy: The department of education, the Principal, the task force, or the teachers. Each party was assigned a set of goals and strategies for the year.

5. Step Five: Making the Plan Happen

- Present plan to appropriate publics.
- Begin the implementation of the plan.

Once the plan was finished and appropriate approval granted, it was time to present the plan to the school principals. This was done at a regularly scheduled principals' meeting. Indeed, the implementation of the **Masterplan** was a regular item on every principals' agenda throughout the year. The same format was used at tech coordinators' meeting. We also strove for media coverage at least from the diocesan newspaper.

6. Step Six: Evaluating and Adjusting the Plan

- Monitor the implementation.
- Make appropriate adjustments, including adding additional goals/strategies.

This is a very important step. Earlier in the chapter, I said the task force should stay together beyond the writing of the **Masterplan**. It is the task force that is best positioned to hold each group accountable for completing its portion of the plan. We require that the department of education, the principals, and the task force produce an annual written report, which

details the degree of implementation of each strategy. The task force reviews those reports, then makes further recommendations or adjustments to the plan. This past year, the task force added an entire section to the **Masterplan** dealing with recommendations for accessing the Internet on each campus and for networking the local campuses.

There are a number of goals and strategies that are appropriately done at a diocesan level. The following section of the **Masterplan** details those goals and strategies that are the responsibility of the Department of Education.

Department of Education: Goals and Strategies

I. COMPUTER HARDWARE/MULTI-MEDIA; FACILITIES PLANNING

GOAL #1: The technology task force recommends that all schools develop a three to five year technology plan and, to facilitate its completion, enlist the services of a consultant or technical specialist.

Strategy #4

The department of education will collect computer planning documents and facility plans from the schools and make them part of a diocesan-wide technology sharing project.

GOAL #2: The department of education will facilitate the sharing of hardware information among schools, especially technology projects undertaken at the various school sites.

Strategy #3

The department of education will insure that information about hardware, including new products on the market, will be exchanged at technology coordinator meetings.

GOAL #3: The department of education will investigate with CTN (Catholic Television Network) and other providers the feasibility and practicality of networking teachers, administrators, and students throughout the system.

Strategy #1:

The superintendent and assistant superintendent will continue to meet with the staff at CTN and other providers to discuss the feasibility and viability of having an agency provide networking capability throughout the diocese. They will communicate the outcome to the task force.

GOAL #5: The technology task force will recommend to the principal of each elementary and high school, minimum standards for the acquisition of hardware for classroom and multimedia use, and will publish their recommendations.

Strategy #2

The department of education will review annually the minimum technology standard for elementary and secondary schools, and update it as necessary.

GOAL #6: The technology task force recommends that all involved in planning, including administrators and technology resource personnel, develop a basic understanding of the technical issues related to networking.

Strategy #3
The department of education will include an overview of networking issues in technology inservices, including the requisite hardware.

II. CURRICULUM APPLICATIONS; SOFTWARE SELECTION AND EVALUATION STANDARDS

GOAL #2: The task force will develop creative ways to involve teachers in the planning of technology integration into specific areas of the curriculum.

Strategy #1:
The department of education will consider appropriate funding options (e.g., grants, school subsidies) or other ways (e.g., CEU's) of compensating teachers for developing models/units for integrating technology into the curriculum.

GOAL #3: The technology task force recommends that all teachers integrate the use of technology into the curriculum on a regular basis, beginning with the 1994-1995 school year.

Strategy #4
The task force recommends that the department of education and principals together explore ways of providing teachers with more time for learning how to integrate technologies.

III. INSERVICE; GUIDELINES AND RECOMMENDATIONS FOR TEACHER AND STUDENT COMPETENCIES

GOAL #1: The task force recommends that all teachers stay informed about current computer/technology trends in education by participating regularly in training and inservice programs.

Strategy #3
The department of education will support and encourage continuing growth in computer/technology competency by sponsoring whole diocese technology inservice days, training at cluster levels, technology video conferences in conjunction with CTN, and demonstrations and training sessions by vendors.

Strategy #4
The department of education will sponsor and give direction to a Technology Coordinators' Committee, and require attendance at its meetings by a representative from each school.

IV. ADMINISTRATIVE USES; MAINTENANCE; SECURITY; FUNDING

GOAL #2: The technology task force recommends that all users sign an ethical technology use agreement, which the task force will develop during the 1994-1995 school year. It will include the following topics:

Adherence to Licensure Agreements
Restriction of Use of Privately-Owned Hardware and Software
Safeguards Against Computer Viruses
Purchase of Computer-Related Supplies

Security Measures: Maintenance of Confidentially
School Ownership of Information
Safeguarding of Data
Storage of Data

Strategy #1:

Technology users — staff, volunteers, and students — will sign an ethical use agreement before gaining access to the system.

GOAL #4: The task force recommends that principals obtain the services of trained personnel to maintain equipment. Generally, three levels of support are needed: onsite, contract service, and expert advice.

Strategy #1:

The department of education will research the feasibility of a technical training course during the 1994-1995 school year to develop technology resource people capable of performing onsite first level technology support. The cost of the training will be the responsibility of the school sites.

Teachers, principals, and the task force are also assigned goals and strategies. Each group reports annually on their implementation.

The **Masterplan** was completed in June, 1994. The task force monitored the implementation of the **Masterplan** these past two school years, noting much progress. A few strategies which were completed by the task force and others are: a planning guide for the use of all schools, technology standards for purchasing, a hardware evaluation document that will go on-line, curriculum guidelines for technology in the classroom, ethical use agreements for faculty and students, and evaluation of math software for K-6.

"A goal without a plan is a dream," wrote Patricia Schandler in the CUE Newsletter in the Summer of 1994. Clearly, planning must be a priority. Our plan turned into reality for all the students in our schools. Working together made that planning easier and more productive. Several positive results from the **Masterplan** in our diocese are the following joint projects.

Connecting to the Internet

One of the goals in the **Masterplan** was for each principal to set up a workstation with access to the Internet for teachers. The diocese and Catholic Television Network arranged for a provider (Silicon Valley Public Access Link) and offered three days of inservice for the technology coordinator of each school. The coordinator then trained the faculty in accessing the on-line services. The question now asked by teachers is: How can we use this resource to enhance learning, to make it more exciting, to open new vistas for students and teachers alike?

Some of our schools are already integrating the resources on the Internet into classroom projects, paving new avenues for international networking and exploration. Two of our most advanced schools in full Internet access are Presentation and St. Francis High Schools. With the networking accomplished, and using the services of Internet, the teachers and students can take advantage of many opportunities available on-line from any computer in the school. St. Francis's High School is a website and has a server large enough to offer space to some of the other schools in the Diocese for their web pages. Presentation High School is networked throughout the school in classrooms, offices and labs. According to Principal Mary Miller, the school is on the brink of offering dial-in/dial-out access to e-mail and individual files on the network, from home and back again. The first successful test has been completed and everyone is eager for the project to be ready for all students and faculty. At the elementary level, St. Christopher School

has been using SCRUZ.NET, which allows five students to simultaneously access the Internet and its resources, under the supervision of Technology Coordinator Joan Pine. Catholic Television Network is supporting the efforts of teachers and coordinators by offering inservices and training in the use of the Internet.

Most of our schools are now in the midst of networking their schools. With the assistance of Pacific Bell's Education First initiative, many are installing ISDN lines to make Internet access faster and simultaneously available to many students. This Diocese participated in Netday '96, announced by President Clinton on a trip to the Bay Area. The goal of this day was to network every school in California — public, private, and religious — through partnerships between businesses and schools. Volunteers from the technology companies assisted schools in making a networking plan and by donating wire and the time of installation efforts. Technology company employees who were willing to assist a school on this day, contacted the appropriate division in their company. This volunteering can even take place on-line. Netday '96 was celebrated on March 9th, but will continue long after that date. One-third of our schools were involved in Netday activities. Another third are already networked or are in the planning stages of wiring their schools.

Through technology, the world is becoming a smaller and smaller global village, bringing people from many lands together to share ideas and resources. We want to give our students the guidance needed to take full advantage of this resource.

Integrating Math Software Into the K-6 Classrooms

Another collaborative project resulting from the **Masterplan** was a diocesan adoption of math software for the K-6 classrooms.

One of the goals in the **Masterplan** was the piloting of math texts and software in the Diocesan elementary schools in order to achieve consensus on the best math programs for the schools. Since integration of technology into the curriculum is our goal, it was essential to pilot math software along with the textbooks. Teachers from grade K-6, in seven different schools participated in the project. Frequent evaluation took place throughout the year.

By May it had been decided that the schools would adopt *Mathkeys,* a program that could be used with any of the selected textbooks. *MathKeys,* a K-6 Macintosh-based software series, dramatically links manipulatives, symbolic notation, and writing tools in a learning environment that encourages students to think and communicate mathematically. It is the result of a joint effort by Houghton-Mifflin and MECC. In addition to the positive evaluation of the pilot teachers, the software won a prestigious award as one of the top six programs of the year from *Technology and Learning* on October 4, 1994. Additionally, *MathKeys* was reviewed in the March/April 1995 education of *CUE Newsletter*, where it received the highest rating in every area reviewed: support materials, ease of use, content, educational value, and instructional technique.

There are many advantages to working together on the adoption of a software program that can be used in all the K-6 classrooms in the diocese. Houghton-Mifflin offered to work with the Department of Education in structuring seven inservice days to train three teachers from each school on the use and integration of the program. The opportunity also exists for us to bring together teachers of every grade level to work together on the most appropriate ways to use the series to enhance the learning of mathematics. Procuring a district license for the use of the software saves each school a considerable amount of money. Once again, we believe that great benefits accrue from planning together and working together on the implementation of that plan. We look forward to continued work with our elementary math teachers.

Planning as a diocese is at the heart of the progress we have made over the last two years.

The goal of this progress has always been clear. It is clearly expressed in the mission statement from the **Masterplan**:

"The goal of all these efforts is to offer the best educational opportunities for all students to reach their potential, and to allow them to learn with excitement, a sense of discovery, and a sense of wonder."

Marian Stuckey is assistant superintendent for the Diocese of San Jose, California.

Technology Planning from the Elementary School Perspective: Beyond Chalk, Talk, and Textbooks

Paul DeZarn

The saying, "If we don't know where we are going, how will we ever know when we have arrived?," comes to mind when talk of integrating technology into the school environment surfaces. The reality is: if we don't have a plan, written collaboratively with faculty, parents, and the school's policy decision making organization, we have little direction, isolated support, and weak funding.

Questions

- Why integrate?
- Will integration of technology support our school's mission statement, around which all activities including curriculum, staffing, pedagogy, and the formation and education of the students must flow?
- Will the Church's mission of spreading the Good News, providing service, and forming community be enhanced by the integration of technology?

National Congress on Catholic Schools and Technology

Address these questions and we also accept the challenge presented by the National Congress on Catholic Schools. The National Congress supports the integration of technology. Its project, The National Congress on Catholic Schools for the 21st Century, defined five areas, one of which is "The Catholic School and Society." Within that area is the directional statement, which reads "We will educate students to meet the intellectual, social and ethical challenges of living in a technological and global society." (p. 22 Executive Summary). Sample strategies are also offered. They are:

a. developing community resources that create access to state-of-the-art technology
b. cooperating with local colleges and universities to develop training programs for teachers
c. creating an inter-disciplinary curriculum incorporating the issues raised by new technologies

The challenge is before us. The task has been defined. All we need is a plan.

New Frontiers Project

Where to begin? Responding to the questions listed, our faculty and school board rewrote the school's mission statement to read, "The Catholic community of St. Raphael the Archangel is committed to preparing its students to live out their Catholic faith in a global, technological society." Additional questions soon surfaced. The words "global" and "technological" guided us in formulating a plan. At this juncture we completed an application to NCEA to participate in the New Frontiers Schools project cosponsored by the NCEA and the University of Dayton. We were accepted and in July of 1993 we sent a team of three to the University of Dayton (teacher, computer teacher, and principal). For four days, along with teams from ten other schools throughout the nation, we concentrated on writing a plan to integrate technology into our school environment. The New Frontiers Schools project provided two critical factors for the development of a technology plan: (1)Time; (2) the Process.

We left Dayton with a plan to share with the faculty, school board, and parents. It is included here, in its revised form to guide others in formulating a technology plan.

TECHNOLOGY PLAN FOR ST. RAPHAEL SCHOOL

VISION STATEMENT: We see a school in which all educational programs are designed to meet the intellectual, social, and ethical challenges of living in a technological and global society.

MISSION STATEMENT (How the vision is to be realized): Facilitate the use of contemporary technologies in the process of lifelong formation and education for the students, faculty, and staff.

GOALS:

Learner outcome # 1: Students shall use basic communication and math skills for purposes similar to those they will encounter in life.

Action Plan: Update hardware and software for use in language arts and mathematics by all classes. Establish and empower school and student technology teams. Institute use of technological tools for everyday tasks, such as attendance.

Use of technology: Know how to use word processor, database, spreadsheet, desktop publishing, multi-media, closed-circuit TV, VCR, etc.

Learner outcome #2: Students shall develop their abilities to apply core concepts and principles from Religious Studies, Mathematics, Arts and Humanities, and Social Studies.

Action Plan: Update hardware and software for use in all core subjects. Build library of software for all subjects. Make technological tools readily available to all teachers and students for accessing and presenting information.

Use of technology:

Use technology as above, with emphasis on CD ROM's, laserdisks, informational networks.

ACTION STEPS:

1. **Establish and empower a school technology team.**
   - 1.1 Invite representatives from school, parish, and area community.
   - 1.2 Set guidelines for team.
   - 1.3 Meet regularly to evaluate and revise technology plan.

2. **Institute the use of technological tools for everyday tasks where their use would be advantageous to teachers or students.**
   - 2.1 Use the computer for recording attendance, lunch count, lesson plans, and report cards.
   - 2.2 Use the closed-circuit TV system for morning announcements created by the students.
   - 2.3 Network classrooms to the office for administrative tasks, communication, and information retrieval.
   - 2.4 Provide programs to each classroom that best support the curriculum: word processor, database, spreadsheet, desktop publishing, HyperCard, etc.

3. **Establish and empower a student technology team to:**
   - 3.1 Participate in peer tutoring with new programs.
   - 3.2 Provide input to school technology team regarding programs under evaluation.
   - 3.3 Prepare morning bulletin on closed-circuit TV.
   - 3.4 Assist staff development efforts: act as test subjects when teachers practice a program or tool.
   - 3.5 Provide technical support for classroom printers (trouble shooting, changing ribbon/ cartridge, and paper).
   - 3.6 Serve as tour guides for families visiting the school; discuss and demonstrate various components of school's technology program.

4. **Make technological tools readily available to all teachers and students.**
   - 4.1 Provide a computer for each teacher's desk.
   - 4.2 Update lab: rewire; purchase additional computers with CD-ROM; install network; purchase laserdisk players, library of software, CD's, scanner, bar code reader, and camcorder.
   - 4.3 Automate library/media center, with access from classrooms once building is networked.
   - 4.4 Provide for each classroom: four computers with CD-ROM, TV, VCR, camera, tape recorder, overhead projector, and calculators as needed.
   - 4.5 Get on-line, by subscribing to a network such as IRIS, Prodigy, America On Line.

5. **Provide professional staff development to broaden the concept of technology and encourage its appropriate use in our school.**
   - 5.1 Each year, conduct a minimum of two days of staff development on use of computers for recording attendance, lunch count, lesson plans, report cards, and computer-assisted instruction.
   - 5.2 Alternate faculty meetings with demonstration and practice in the use of a technological tool or program.
   - 5.3 Require teachers to include a goal involving technology in their annual professional growth plan.
   - 5.4 Have teachers indicate technology being used in the lesson plan.
   - 5.5 Assist teachers in testing new technologies in their classrooms.
   - 5.6 Provide the necessary technical support on-site as well as individuals who can be contacted by phone to provide troubleshooting and repair work.

FUNDING

1. Institute a technology fee (twenty dollars per student) to be added to the book bill which may be earned back if parents participate in buying groceries with Kroger or Winn-Dixie receipts.
2. Have school fund-raisers (magazine, sweatshirt, wrapping paper sales) earmarked for the technology plan.
3. Continue to apply for grants.
4. Seek donations through the school gift catalog.
5. Contact area businesses to seek sponsorship.
6. Complete and submit action plan, so in order that the archdiocese may can seek funding.

EVALUATION

An evaluation process will be conducted each year by the St. Raphael School Tech Team, with input solicited from students, teachers, parents, principal, technology coordinator, school board, and pastor. Survey forms will be developed by the St. Raphael School Tech Team. The surveys will assess the satisfaction of teachers, parents, students, etc. with the proposed plan and its implementation to date. Surveys will also ask how well the plan supports the curriculum and solicit advice on prioritizing expenditures.

If We Plan It

Two of my favorite movies are, "Field of Dreams" and "Dead Poet's Society". In "Field of Dreams," farmer Ray Kinsella, played by Kevin Costner, is driven to build a baseball field. "If you build it, they will come," echoes the voice of his conscience. Once completed, baseball legends of the past appear on the field. In "Dead Poet's Society" English teacher John Keating, played by Robin Williams, tells his students to "seize the day" *(Carpe Diem).* I believe that if we have a technology plan and communicate that plan not just to our faculty, but to our school families, the parish-at-large, local businesses, and the media, we will get new ideas, support, and funding. Just believe: "If we plan it, they will come." The "they" are parents volunteering to serve on the technology committee. These are individuals with technological expertise in networking, Internet services, troubleshooting, systems analysis, and programming as well as contacts for obtaining hardware and software products. Most importantly, they want to support our efforts to integrate technology. Truly in the spirit of stewardship, much time, talent, and treasure has been donated since our technology plan was made public.

Seize the Moments

Seize opportunities in your newsletters and at meetings to inform others of what is happening with technology in your school. We print a weekly newsletter, "Principally Speaking", which informs the readers that St. Raphael School is a New Frontiers School, selected by the NCEA and the University of Dayton for its technology applications. Every issue focuses upon our Catholic identity and some aspect of our technology program. The newsletter may include student and staff birthday pictures taken with a Quick Take camera accessible to both students and teachers. Once taken, pictures can be immediately digitized by the students and copies printed.

Business cards are handed out when new families inquire about the school. They are also passed out to realtors and vendors. We constantly remind the public that we are a school integrating technology.

Gains

Since the formation and day-to-day application of our technology plan, St. Raphael School has realized significant gain in enrollment and funding.

Year	Enrollment	Funding
1993	511	$0
1994	530	$10,000
1995	572	$25,000
1996	594	$42,000

We have also attracted a faculty, all of whom have become technology literate through our continuing staff development program, who want to journey with us into the 21st century.

Staff Development

A technology plan must provide for professional staff development. We realized very early in the planning stages that until our faculty and staff were comfortable using technology, we would continue spinning our wheels on the road to progress. Use of technology not only excites students about learning, but it also challenges teachers to evaluate their methodology, organize, complete administrative tasks quickly and professionally. It also provides opportunities for self-directed, lifelong learning. Staff development is, however, necessary. We began by placing a computer in the hands of each teacher prior to summer vacation. We provided a manual, written by one of our teachers, which explained how to hook it up and turn it on. The manual also showed them how to use the word processing program to type a letter, written in very simple language. The teachers were given the "homework" of using the computer and manual and returning to school in August able to operate the mouse, type a document using various styles and fonts, and save it. The manual writer's phone number was included, allowing teachers to request needed assistance. Having the computer at home relaxed the teachers. There was no one standing behind them giving instructions. It was strictly a self-paced, take-your-time approach. At the end of the summer we provided two days of in-service, where the teachers produced a database of information about their homeroom students, created a computerized attendance and lunch count form for their class to use during morning check-in, and learned to use a printer. During the next two school years, mini-inservices were conducted twice monthly. Topics included the use

of a productivity tool for making signs, banners, and cards; a grade manager; the computerized report card; a slide program for presentations; and various strategies for incorporating technology into the curriculum. As part of their on-going professional growth plan, each teacher writes one technology-application goal for each school year. All written communication to students (tests, progress reports, field trip permission forms, announcements, etc.) and parents (announcements, progress reports, etc.) is also handled via computer.

A Technologically-Enriched Environment

Currently, there is at least one workstation in each instructional area for student use as well as for teacher productivity. Students "log in" upon entering their homeroom each morning at which time they indicate their presence and their daily lunch choice. With the classrooms networked, attendance and lunch count are immediately processed and families contacted when children have not "logged-in." A building-wide E-mail server and a BBS (bulletin board system) links teachers together through electronic mail and private conferencing. Communication with the administration regarding any announcements, lesson plans, grades, reports, letters of intent, etc. is expedited with the building-wide E-mail system. Immediate messages can be sent from parents to teachers or students. Imagine the satisfaction of the parent when a call is made to the school office to get a message to their child. Instead of writing the message on a note pad, leaving the office, or catching someone walking by to deliver the message before the end of the day, or being so distracted the message is never sent, the secretary types the message as it is received, sending it immediately to the child's homeroom. If the school were a business, parents' reaction would be called, "customer satisfaction" and a feeling of "justification of the purchase decision." What they will be thinking: "Here is a school that is organized. My child is in good hands. It's worth whatever I am paying." Another scenario: a parent requests a conference with the principal or assistant principal on his child's academic progress. With the student information system networked, not only can the student's permanent record folder be called up and past years' performance be studied, but immediate access to the student's current grades can be made. Technology provides the means for such efficient, time-saving responses.

Keyboarding Skills

Beginning in the third grade, students are taught keyboarding skills. We chose this grade level to begin correct positioning of the fingers before "bad" habits set in. Fine motor skills are developed and students find the task challenging. Graduates from our school can be expected to demonstrate keyboard skills of seventy (70) words per minute. Ambitious? Yes. But it can be accomplished, if time on the computer is provided at a minimum of three, 20-minute sessions per week. More and more families are purchasing computers, and we are seeing more students complete assignments on them at home. Ample opportunities exist for children to practice and sharpen their skills throughout their elementary years. Computers will be their future. It is imperative that there be a plan to develop these necessary skills in the most efficient manner possible.

Integrated Learning System

All K-8 students are scheduled on an Integrated Learning System that customizes instruction in mathematics and the language arts. Our system addresses the needs of all students. In ten-minute lessons, a student's proficiency in mathematics or language arts can be determined. Those requiring remediation are quickly diagnosed. Specific weaknesses are iden-

tified and target dates set for mastery. Finally, an individualized program is presented. Graphics and high-interest interaction with the student make the program highly attractive. For those students who might be gifted in mathematics or language arts, the integrated learning system offers challenging activities. Several students are exploring topics well above their grade level. Again, the message sent to families is that this school can meet the needs of their child. We foresee the day when our families will have the opportunity to "dial up" their child's performance on the Integrated Learning System and provide additional time at home in its applications. We plan to share such technology with our school families in the near future.

Unlimited opportunities await the school that integrates technology into its curriculum, and not just in the core subjects. The software available for teaching art and art appreciation is outstanding as is a technology-assisted music program that utilizes keyboards connected to a computer on the teacher's desk. It allows the teacher and every student direct and instantaneous access to instructional and evaluation activities. Students learn to read, write, and perform music in a nonthreatening environment. Headphones enable students to play so that only the teacher can hear their practice attempts.

Networking

Students in grades 3-8 use a software program that offers extensive word processing, database, spreadsheet, drawing, and painting capabilities along with slide show functions. Multimedia applications/software are now being utilized by the faculty for presentations and by the students for projects. With a building-wide LAN (local area network), students can access information from our automated library management system, printers, CDs, and the Internet all through the network modem. Students can be given the opportunity to correspond among themselves or with Internet pen-pals. Each homeroom has a specific country which is studied throughout the school year and the students follow the current events of that country. We have a plan to connect, via the Internet, each homeroom with a classroom at the same grade level in the country selected. Thus, a fifth grade homeroom will have Internet penpals in a fifth grade in Japan; a third grade homeroom with a third grade in Italy, and so on. Our technology plan is consistent with the school's mission of preparing its students to live in a global, technological society. What fantastic opportunities await these students! Add a software program like CU-See Me, and the students will be communicating visually as well. Allowing network-wide support for all devices (printers, CDs etc.), as well as other services, including the network modem, personal file sharing, and the E-mail server, is essential to any technology plan. It facilitates communication and information exchange. Networking is also more cost effective. Network access to a CD tower located in the library or media center is less expensive than providing a CD player and CDs in every classroom.

Funding

How expensive is a technology plan? How is it funded? The answer to these questions depend on the plan, the target date for implementation, and the marketing approach. Before requesting $10,000 from the budget committee to put technology into your school, know how the technology will be used. Parents will support new technology if they know they will get return on their investment measured by the frequency with which their child has hands-on experience with new products. Thus, the more computer time allocated, the more enthusiastic the support.

Any technology plan must have a budget. Establishing a budget for your technology plan brings it to life. Once you know how much your plan will cost, you can begin to look at ways to fund it.

Ways to Fund

- **Technology fee** Institute a technology fee per student and collect it with the general registration fees. Specify how this money will support the technology plan.

- **Fund raiser(s)** Designate revenue from the fund raiser(s) to be used. It is critical the families know why the money is being raised and how their child will benefit.

- **Grocery certificates** We learned of this through a principal in California. The parish purchases grocery certificates in bulk, receiving a five-percent discount. Families, in turn, purchase the certificates from the parish at face value. Thus, on $100 worth of grocery certificates, the parish receives $5.00. The program appears to exist nationwide. We are purchasing certificates from three market retailers. Thousands of dollars are being collected by schools in the archdiocese, and the program is helping to fund their technology plans.

- **Direct solicitation** Ask and you shall receive. Give it a try. We did, and received $5000 for a server to network sixteen computers.

- **Wish list** Publish a wish list in your newsletter and parish bulletins.

- **After-school and evening** Open your lab/classrooms to additional computer classes after school hours. During this school year alone, we have raised $4,000 this way.

- **Summer camps** These are an amazing source of income. We ran three 3-week sessions during the summer months. We charged $5 per hour, and generated a total of over $16,000.

- **Instructional materials** Software can substitute for reference books, in whatever subject is being taught. Consider designating this budget line to the purchase of software. Encyclopedias for the classrooms? Dictionaries? Why spend hundreds of dollars when you can purchase a CD that has current information, gives students time on the computer, and can be downloaded for reports?

- **Grant opportunities** Keep writing. "The squeaky wheel gets the grease."

What to Fund

Capital costs (start-up and at intervals of about every five years)

- New equipment: a basic workstation for student use as well as for teacher productivity. Based on today's technology, this would mean a computer with at least 1 gigabyte of hard disk space, 16 megabytes of RAM, a built-in CD-ROM, drive and a color monitor. Add an ink-jet printer and an integrated software package that includes word processor, spreadsheet, database, graphics, drawing, and telecommunications applications and you are in business.

Recurring costs (annual)

- Software, upgrades, Internet services, maintenance expenditures, and staff development. In his book, *"Education in the Communication Age,"* David Thornburg stresses

the importance of staff development: "Budget 30% or more of all technology expenditures for staff development (Any less and you risk seeing the technology used not at all, or, worse yet, used to replicate an outdated curriculum.)."

A Beginning

Thornburg contends that technology will reinvent education. What a challenge! The technology exists to meet the challenge of the National Congress on Catholic Schools for the Twenty-First Century. To educate our students to meet the intellectual, social, and ethical challenges of living in a technological and global society, we must look seriously at integrating technology into the school environment. We need to educate our students for their future. Each day that we delay acquiring the needed hardware and software steals precious time from those who will most benefit: students and teachers. Prepare a plan, market the plan, provide serious staff development, then sit back and enjoy the trip. Remember: if we plan it, they will come.

Endnote

Thornburg, David, *"Education in the Communication Age", Surfing though Cyberspace Guidebook*, Washington, DC, 1994, p. 130.

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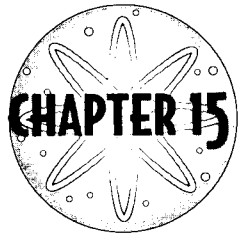


Emphasizing the Staff Development Perspective in Technology Integration

Natalie Krupka

Technologies emerge. Teachers are taught. Creative ideas are suggested and implemented. Success! This sounds wonderful and it works, but only for a while. One key ingredient is missing — a plan. Without a plan, successes can happen and they do, but can they be sustained? Through the New Frontiers program and the middle states accreditation process, a story can be told concerning Holy Cross School that solidifies a direction that can be taken while integrating technology into the curriculum.

Background

As a way to examine the successful use of technology at Holy Cross, let's briefly examine the history of the school. It must firstly be said that this is a process that takes time. It evolves. In 1984 the current administrator, Sister Miriam R. Brosnan, CSC, had recently been selected to be Principal at Holy Cross School. She was asked by the Home and School Association if she would like them to purchase televisions or computers for the school? Without hesitation, the answer was "computers". Thus was the inception of technology use at Holy Cross. The next year a consultant/coordinator was hired to teach BASIC programming one hour per week to the eighth grade. During the following year parent volunteers, under the direction of the coordinator, worked with students using drill and practice software. Within three years it became evident that the main direction of the computer in education was shifting to its use as a tool. At that

time the consultant/coordinator became a computer teacher for the school. Holy Cross technology program expanded from programming only, to drill and practice, to use of the computer as a tool. Growth continued with only a loosely designed plan.

New Frontiers Program

In 1992 Holy Cross applied and was selected as a New Frontiers school. Three teachers set out to the University of Dayton. It was similar to a technology retreat that raised the level of excitement among the team. A plan was written and brought back to the faculty. In the words of Art Sheppard, a Canadian member of the New Frontiers program, the team's job was to "excite and incite" the faculty about technology. The technology program evolved with the computer coordinator at the helm and the team as leaders to model the plan. The program was underway. A variety of technology was used. Some teachers and classes participated in on-line activities. Students felt the excitement. The faculty slowly moved forward. Most staff performed at least at the cursory level. The accountability built in by New Frontiers program kept the plan forward moving.

The technology coordinator and administrator were anxious for the excitement to continue, for the staff to become independent users of technology, and for more in-depth use of technology. The growth was continuing, but at a very slow pace. Additional means needed to be taken to further develop teachers' knowledge of equipment. As part of a requirement for a master's thesis, a faculty member arranged a peer-teaching technology workshop. Each teacher selected a piece of equipment with which she was comfortable and demonstrated its benefits and use as a tool for the teacher. She wrote a description, operating instructions, diagram, etc., which was compiled in a master reference manual. Each classroom possesses a copy of this book, which is regularly updated.

Middle States Accreditation

In the winter of 1994 Holy Cross began the process to update the school's middle states accreditation. As a means of evaluation, the "project" approach was selected. The evaluation of the school would occur through the eyes of a project. As a natural continuation of the technology emphasis, "The Integration of Technology into the Curriculum" with a shift in emphasis from the technology coordinator to the classroom teacher was selected. For this project, the entire faculty examined the philosophy behind the project, planned staff development requirements, accountability demands, and assessment methods.

Philosophy

Faculty brainstorming resulted in the following concepts:

- Curriculum should drive the technology.
- Technology should be invisibly integrated throughout the curriculum. Technology should be invisible to the learner. It should not be the focal point of the lesson.
- Technology should not add time to the class day, but rather it should support the existing curriculum. (An addendum to this item points out that a substantial learning curve is present with technology. As a teacher is learning the equipment and software, time is added to that teacher. Eventually as a comfort level occurs and the computer is used as a teacher tool, writing tests, sending notes home to parents, etc, overall time for repetitive chores is actually reduced.)
- In order to keep curriculum as the focal point, the teachers must be so comfortable

with the technology that it is second nature to them.

- The technology program must have the support and direction of the administration, including the principal and the pastor. Assignment of ample school funds, such as a per student technology fee, is required to watch the dream materialize.
- The program must have the support and understanding of the parents and students.
- The program should not depend on only one person.
- Each person on the staff should own the project.

Again, a technology plan was written, but this time the entire faculty contributed.

Staff Development

Current literature indicates that 30% of a school's technology budget should be directed towards teacher training. Equipment remains idle in many classrooms throughout the country where teacher training has not taken place. Training at Holy Cross occurred through a variety of means. It became obvious that the role of the technology coordinator must change to accommodate the necessary staff training. It no longer was possible to spend 100% of her in-school time as a teacher to the students. The role was changed to reflect that 50% of in-school time would be spent teaching students, while the other 50% of the in-school time would be split between directing and providing staff development, being a resource person for the students and teachers, and being a technician to purchase, repair, and install hardware and software. More formal approaches to staff development, such as attendance at a national convention, formal courses, and in-house training sessions were planned.

Technology Coordinator

A central figure in the educational process of the staff is the technology coordinator. This person should come to the position with proper credentials to manage a technology program with knowledge of emerging technologies. The coordinator at Holy Cross manages a lab which trains students in basic application software and technology concepts to be used in classroom projects. Subscriptions to relevant technology magazines including *Technology and Learning* and *Classroom Connect* keep the coordinator in touch with current software, equipment, and educational philosophies surrounding technology. Attendance at workshops, and local, state, and national conventions provides constant updating of the coordinator's knowledge base. Occasional work release times must be provided for the coordinator for this to happen.

Workshops

Tom Snyder Associates, software publishers, were invited to present a one-day workshop to the faculty during the in-service week in August, 1994. The representative presented software and creative ideas to integrate technology into the curriculum. The second half of the day was spent in a hands-on session as teachers discovered software to enhance their curriculum. Several teachers suggested the purchase of specific software for their class as a result of that one-day session. The Home and School Association, at the request of the principal, graciously funded this workshop.

Convention

The full time faculty attended the National Educational Computer Convention in June, 1995. The Home and School Association paid the admission fees for the faculty to attend the

national convention held in nearby Baltimore, Maryland. A tremendous amount of information was obtained from the vendor area. Mini-workshops were available to learn about highlights in software and hardware. Software giveaways highlighted the convention. Formal presentations were given by nationally-recognized educators providing the faculty with innovative ideas to integrate their curriculum. An electronic messaging system set up at the convention provided a means for the faculty to experience e-mail (many for the first time).

Formal Courses

The faculty participated in two in-house courses published in the *Technology and Learning* magazine.

- The first course attended by interested faculty members, was entitled, "Tapping the Power of Today's Technology". According to the magazine, the purpose of the course was to "empower teachers and administrators to plan effectively for using computers and related technologies in providing unique and effective educational experiences for all learners."
- The second course offered during 1994-95 was entitled, " What Every Teacher Needs to Know About Technology". This course was attended by the entire faculty. The editors of the magazine explained that the purpose of this course "was to help you take a fresh look at the impact of technology in your classroom." The courses cost a flat fee per teacher and give continuing education credits. The courses are repeated each year.
- Currently, a third course, entitled "Gaining the Online Edge", is "designed to prepare educators for the next millennium by showing them how to use the worldwide Internet."

Take Home Computers

Each teacher was encouraged to "borrow" for the summer of 1995 her classroom Macintosh, which was loaded with software appropriate for her grade's use. A note was signed by the teacher in which she accepted full responsibility for any damage done to equipment while in her possession. A few calls for help were made during the summer, but it was interesting to watch the level of competence increase. Each teacher returned to school ready to begin the year with an added confidence.

In-House Training Sessions

In early planning sessions, teachers prioritized topics they wished to learn. Thursday afternoons at regular intervals were set aside for staff development sessions. These sessions occurred approximately every third Thursday. Topics presented by the technology coordinator to the faculty included HyperStudio, Kid Pix, and multimedia telecommunications, among others.

These activities may have been the key ingredient to the success of the Plan. As each teacher became proficient in one or more applications, software, or hardware, she began to offer help to others and others began to seek her help. The trickle down effect had begun. The training no longer was the sole responsibility of the technology coordinator. The tree of information now had many strong branches who were able to carry the weight of the plan.

Individual Training Sessions

Some topics were better presented one-on-one. Teachers requested specific topics to be presented by the technology coordinator in an individual session during class time. To free the teacher for the two-hour session, a substitute was obtained. Specific examples included a teacher new to the school needing to learn about available software and hardware to complement a science lesson about simple working machines. Through the course of the one-on-one session it was discovered how well Macaulay's CD-ROM *How Things Work* and the *Lego Dacta* building sets complement the fifth-grade science curriculum. Better yet, the school already owned the software and hardware. As many sessions as necessary are scheduled to give the teacher the level of comfort that is needed before introducing the equipment into the classroom.

Accountability of Teachers

Teachers as well as the administration realized that to accomplish a successful end to the goal of integrating technology, a list of self-prescribed requirements needed to be made. A technology log book was maintained with a section for each full-time teacher. This book included a monthly log of personal new technology happenings, eight technology lesson plans for the 1995-96 school year, a three-year plan for each teacher, a technology goal, and questionnaires to determine comfort levels at the beginning and the end of the assessment period.

Monthly Log

Each teacher maintained a written log of technology activities which were new to the teacher. These activities varied from discovering how to use a CD-ROM, to how to reconnect a wire which had become loose. At the end of each month, the log was printed and inserted in her personal section of the log book. Teachers found it interesting to look back and have a documented story of their progress.

Technology Lesson Plans

In order to create a project that would have longevity complete with documentation, it was decided to write one lesson plan per month during the 1995-96 school year that could either be used during that year or in future years. Teachers used a wide variety of techniques in writing the plans, ranging from clever letterhead papers to simple direct plans. Some included charts, background source data, and student handouts. Many were ready to implement the plans as written. The plans became more complex using a wide variety of software and hardware as the teacher confidence grew.

Three-Year Plan

The school had already developed a three-year plan, which looked at overall future hardware and software purchases, teacher training, budgets, and student projects. The faculty discovered that before a teacher could move forward, she had to analyze what she knew and what she wanted to learn. She also had to determine the scope of classroom projects involving technology that would be integrated into her classroom. In order to complete this task, what did she have to learn and how did the children have to progress? Each person was at a different point on the learning curve, so each plan was very individual. The three-year plan, therefore, would portray, year by year, the knowledge that the teacher would strive to acquire and the scope of student projects within the classroom.

Yearly Evaluation by Principal

Since 1992, during the yearly teacher observation/evaluation by the principal, she has required teachers to use technology. Accountability is necessary to keep on track. No requirement is too mundane to assure progress. It has been said by the New Frontiers directors that it is the baby steps that count.

Assessment

No project should be considered complete until it is evaluated. Questionnaires were developed for teachers, students, and parents. Student work was examined closely to see differences. Students were asked to write an essay about how the use of technology in the school affected the way they learned or did their work. A seventh grader commented that the "a CD-ROM gives us information on various topics. It allows us to look around and learn information randomly..." Another student writes, "Computers catch my attention more than text books." "It's fun." "It's exciting." These are common statements made by the students. One student was overheard saying that technology was like learning a foreign language. The earlier you start your learning process, the more proficient you become.

Questionnaires

In order to properly evaluate the growth of the faculty and the school in using technology comfortably during a set time frame, questionnaires for parents, upper and lower level students, and teachers were developed. The questionnaires given to parents recorded their child's personal use of computers at home and the parents' impression of use of computers at school. Students were given a questionnaire which focused on their personal ability and comfort level at using the hardware and software in the school. Questions were also asked about their perception of how the use of technology influenced their class work. Teachers' questionnaires focused on their knowledge of equipment and types of software. It also questioned their use of software in the classroom. Results of the questionnaires were compiled and "focus plans" were written in an attempt to improve areas of concern. Identical questionnaires will be distributed to each of the groups within a one-year period to assess the growth in knowledge, use, skills, etc. during the scheduled time frame.

Student Work and Attitudes

Teachers are aware that their students are taking a greater pride in the final product. Computers and advanced technology are not always used in a product, but more care is taken even with hand-written projects. Students are not too busy to edit their work, since word processing allows a student to easily rewrite a report. Students are seen arriving at school earlier in the morning and staying later in the afternoon to continue working on an assignment. A recent in-school computer class assignment for the eighth grade required them to select a topic of their choice and present a final product which incorporated the use of the following applications:

- word processing
- data base
- spreadsheet
- telecommunications
- electronic research tool
- graphics (application software or scanner)

Students beamed with pride as they handed in a cohesive product demonstrating their knowledge of such a variety of applications. It is evident that they are on their way to being prepared for the future.

Independent Design of Projects by the Teachers

A key measure of teachers becoming successful in independently designing and implementing a classroom project utilizing technology is the technology coordinator hearing about a project after it is has occurred. Success! It is also becoming second nature to the faculty. No longer is it a major effort to design a lesson, decipher the hardware or software, or use it in a classroom lesson. The little baby steps have carried this plan on a successful path.

Future of the Program

We do not know what the future will bring with technology. Each day a new product becomes available. We do know that continuation of training sessions will be necessary just to keep pace with the new and innovative software and hardware. Teachers will look at lessons already integrated with technology and ask if they can be implemented in more depth. How will technology make the topic more interesting, more relevant, more connected to the real world? Can critical thinking become an underlying factor in the integration? It is a fact that today's world is a world of technology. This is our students' world. Holy Cross teachers are preparing students for the 21st century.

Natalie Krupka is the technology coordinator/computer teacher at Holy Cross Elementary School in Garrett Park, Maryland, and a New Frontier alumna.

Planning from a Total Parish Perspective

Dean V. Waggenspack

Introduction

Strategy, tactics, charter, and measurement...those sound like the terms of modern commercial enterprises. A strategic plan is a relatively new phenomenon in the world of business. Is the need for direction and goals all that critical?

Yes, it is, and a parish is no different. The complexity of the issues faced by a parish grows each day, often overwhelming its resources of money, priests, nuns, and volunteers. Parishes see the need to do more and more for the community with less and less. Setting priorities for the scarce resources is the best way to meet the most essential needs. A strategic plan allows you to set the priorities, equally important, it allows you to set goals and measure your progress against those goals.

St. Albert the Great Parish faced increasing needs at a time of decreasing resources. When the parish decided to embark on a renewal campaign to rebuild our facilities, our parish community, and our Faith, new and complex issues had to be considered. We turned to a strategic plan to assist us in one of the most important issues, parish education. What follows is a discussion of strategic planning with the process we used as the basis for review.

The key to a strategic plan can be summarized by the "Three C's" — Communication, Commitment, and Consensus, and the "Two P's" — Parish and Prioritization. The foundation of the plan is to constantly *communicate* the answers to the typical questions: Who? What? When? Where? Why? and How? By communicating, we create a well-informed parish. An informed parish is much more likely to *commit* to supporting the strategic plan. A *consensus* is the way to get the best input and agreement from a very diverse population.

Before embarking on the plan, you must understand the internal and external environment of your *parish*. What other events are going on in the parish? What external factors have a very strong influence on how people are acting and reacting? What is your current spiritual and financial position? How do the parish members prefer to be engaged in the plan? What is the best way to inform them and to get them to help? If you follow the steps below with a lot of faith, the plan will end up with many great ideas. Indeed, you will have more great ideas than you could possibly employ in the foreseeable future. That is when the strength of *prioritizing* what you want to get done becomes important.

A strategic plan is a process for determining and achieving your parish's long-term direction. A strategic plan tries to answer a few key questions:

- Where are we today, and where do we want to be in the future?
- What is the best way to get to where we want to be?
- How do we plan to get to where we want to be?

Elements of a Strategic Plan:

Many books have been written about strategic plans. In most cases, they refer to a few key elements. The elements of a strategic plan typically are:

- *Mission (or Charter):* statement of the boundaries in which you will operate
- *Vision:* the desired end-state you want to achieve
- *Objectives:* statements of the planned, measurable results the parish expects to achieve by the end of a period
- *Strategies:* statements of how you will accomplish your vision and objectives
- *Measurements:* specific goals or targets to achieve at specific time frames
- *Tactics* or *Action Plans:* the projects and programs undertaken to achieve the strategies

Not all of these elements must be included in your strategic plan. You can modify the specific elements of your plan to fit your own needs. St. Albert's added *Belief Statements* and *Boundaries.* What is critical is to include a sense of where you want to go, how you will get there, and how you will measure your progress.

The Start of Strategic Plan Development

The genesis of an idea must start somewhere. Some small group, usually started by an individual, generates some discussion about setting direction. In the case of St. Albert the Great Parish the group was the Education Commission. The Education Commission, consisting of parish-elected members serving three-year terms, recognized that we needed a plan to mesh with our parish's year of renewal. This core group of fewer than ten people began a three-year long journey that is still underway.

It is beneficial to start with the expertise of people who understand strategic planning. You will be creating a plan for a multi-year approach to build a strategic vision with practical action plans. You need to recognize that success would come from a few key sources. Firstly, you need parish support and involvement. Secondly, you need a process for creating and nurturing the strategic plan. Thirdly, you need communication. Finally, you'll require opportunities to gather information, concerns, and feedback from all parties in order to sustain the plan.

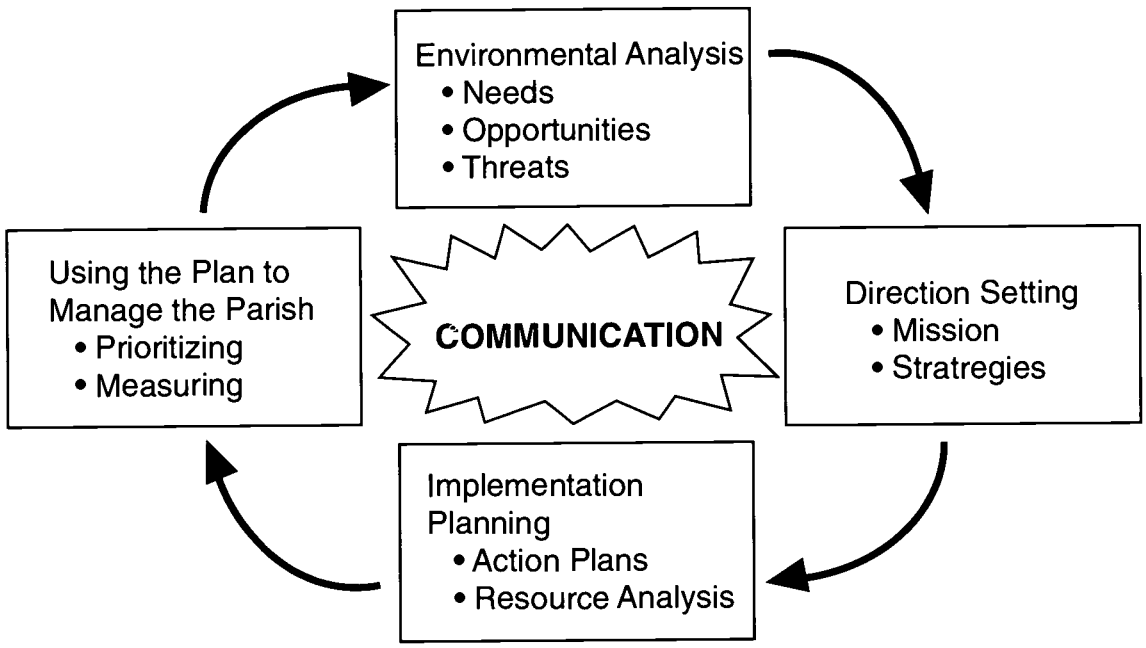
No strategic plan approach is "right" or "wrong" as long as it has the correct elements. Develop a process that fits your specific circumstances. After developing an approach to plan development, present it to others. The willingness of other parish groups to support a strategic plan is critical. Presenting the approach, its rationale, and its goals will not only get you some very valuable feedback, but it also develops, equally importantly, "buy-in" to the concept. Fulfillment of a strategic plan will require a great many resources. If the plan is important, other groups need to understand that volunteers will not be as readily available as usual to do other things. The presentation to other parish groups, such as the Parish Council, builds acceptance, recognition, and support.

An important requirement in getting the plan started is a meeting with the pastor. In the end, the pastor holds the key decision-making authority. His support and understanding is critical. You must make it clear that you need him to evangelize this program to the parish. His

example, both spiritual and managerial, is necessary to convince others of the importance of a strategic plan.

The Process of Strategic Plan Development

Creation of a strategic plan requires rigorous adherence to a process. Our process was as follows:



Simply stated, the process consists of understanding where you are, where you want to be, and how you will get there. The last stop is implementation. The process is always sustained by communication.

Environmental Review Phase

The first step is an environmental review. This entails gaining an understanding of the environment in which your parish operates. A series of "town hall" meetings can be used to solicit input from all parish constituencies. At these meetings, someone leads the discussion by describing what it is you are trying to accomplish. A moderator breaks the group into smaller groups for discussion of a few key questions. The small groups are asked to talk about four things:

- What are we currently doing well?
- What are we currently doing less than well?
- What are the key challenges (threats) we will be facing?
- What are the things you would like to see us doing in the future (needs and opportunities)?

The moderator writes down the responses as they are given. From this discussion, you ought to get a very good understanding of the parish environment. Collect the responses from all of the small groups at all of the town hall meetings.

Strategy Definition Phase

Use information gathered in the town hall meetings to define the strategies which will form the strategic plan. This is the second step in the process. St. Albert the Great chose a retreat, gathering 25 people from the parish. The retreat was a two-day event conducted from Friday evening to Sunday afternoon. The purpose of the retreat was to create a strategic education plan for the parish. Our structured program of events began with an overview of the ground rules under which we would operate. The creation of a plan is best accomplished by a relatively small but diverse group of people. In selecting the names from among volunteers, be conscious of including people with diverse backgrounds; for example, we felt it crucial to our success to expand the notion of education strategy beyond the school classroom. It is a core belief of ours that education is a life-long Faith journey. No one person is the owner of education of the parish, and no one is excluded from enhancing their education. The opportunity to combine together learning experiences for children and adults was important for us. It was seen as an ideal opportunity to bring the parish together. This idea was generated by having people of different backgrounds sharing together.

The most important ground rules are to never throw away an idea until it has been thoroughly discussed, and to eventually reach a consensus on every idea. Reaching consensus can be time-consuming and frustrating, but it assures that universal support for a concept exists. You must strive not to allow majority rule.

The methodology used to execute a strategic plan process will vary. St. Albert's chose to modify an approach used in a local public school district. Success comes from use of the basic elements: setting expectations, brainstorming, using group presentations, looking for areas of common ground, prioritizing in small groups, and reaching consensus. Development of each of the key elements of the strategic plan (vision, mission, strategies, etc.) should follow these same steps; for example, our moderator led us through a brief description of what a strategy is. We broke up into pre-arranged teams of six people, with a management team member as our guide. The small groups picked a scribe and a presenter. Each small group was given around 30 minutes to brainstorm potential strategies. The small groups got back together with the whole group and presented their potential strategies. After the presentations we tried to group common thoughts together to lessen the number of possible strategies.

The small groups then met again to reach consensus on the three most vital strategies based on everything they had heard. When we met again in the larger group, we narrowed our strategies to about a dozen. Finally, a team of three or four people from different small groups was convened to narrow the strategies to six or seven. This team left the room and crafted the final wording of the strategies. The final sub-team presented their findings to the larger group. Consensus was reached, and all voted to approve and support the strategies.

This same basic process was followed for all of the elements of the strategic plan. The result was a crisp set of statements representing the consensus of a group of 25 people, a consensus of which we could all be proud.

The key to the process of developing the plan was the concept of reaching consensus. Anytime you bring together a group of 25 people, there will be people with conflicting ideas, agendas, and areas of interest. By letting everyone see and hear a broader perspective than their own, the team concept worked. We acknowledged that everyone else's issues were important and came to see our own prejudices in a new light.

Communicating the Results of the Strategic Plan Retreat

In order to keep momentum going and to engage the thoughts of a wider audience, the strategic plan team had a plan for presenting the results of the retreat. The communication was done in at least four ways:

1. The parish bulletin included an insert that outlined our strategic plan.
2. On a selected Sunday, the pastor and a member of the team presented the results of the retreat. The affirmation by the pastor that the strategic plan was a key priority of our parish was a strong statement. In addition, we announced that another set of town hall meetings would be held where people could review the plans in detail, ask questions, and volunteer to be in the next phase.
3. More town hall meetings were conducted. The purpose of these meetings was to inform the parish to garner input, to receive affirmation that we were on the right track, and to solicit volunteers for the next phase. The town hall meetings were an opportunity to show the parish community tangible evidence of our progress and commitment.
4. All students in the school and in the religious education program received a copy of the plan to take home to their parents. This was an acknowledgement that parental support would be key in executing the action plans.
5. The plan was reviewed with the teachers. At our school the teachers are very well respected and admired by parents. We felt it was crucial to get teachers to embrace the plan and act as its evangelists. We wanted teachers to also participate on the action teams, since they would be implementing at least some of the plans.

The goal of all this communication, is to obtain approval from the parish. You want to achieve a consensus on your direction. A major struggle at this time is making the plan tangible to the people. You may have a document on paper, but you do not yet have a commitment of resources. All of the ideas brought forth in the plan may be agreed upon and you may have achieved consensus. Yet, no one has really looked hard at the strategies to see if they conflict with broader parish activities. Equally importantly, you have not considered the order of importance of the strategies.

Action Planning Phase

The third step in the process is to create action plans entailing the specific tactics and actions to be taken to implement the strategies and achieve the objectives. In our case each of the original seven strategies were assigned to a single action team.

An action plan team was created. Membership on the team was again based on volunteers. The team was led by two people. One was a representative from the parish administration who would serve as a liaison back to the parish management team and the original strategic planning team. The second person was a representative from the original retreat group. This person served as a continuity bridge back to the discussions, methodology, and consensus of the group that created the plan. This person also served as a group leader.

The action plan teams should be given about two months to create an action plan for their assigned strategy. Their work should result in a plan that states:

- what specific action is to be undertaken;
- what steps are required to successfully complete the action plan;
- who is responsible for completing each step;
- when the steps are to be initiated and completed;
- how much each step will cost in both dollars and volunteer time.

The figure below shows an example of such a plan. Note that it states the original strategy at the top (We will develop...). For each strategy, try to limit the number of action plans you would undertake to no more than ten (this example is number two out of six.). Under each action plan will be a series of tactical events, or action steps, that need to occur in order to achieve the action plan. Limiting the number of action plans allows you to focus on what is truly important, and on what your resources will allow. Remember: many of the actions will need to be implemented by the same people.

ST. ALBERT THE GREAT PARISH

Strategy

We will develop and implement means for guiding appropriate behavior for all those involved in parish related activities.

Specific Action Plan #2: We will define Christian behavioral guidelines for all those associated with the St. Albert community and its activities.

Step No.	Action Steps	Assigned to	Start Date	Due Date	Completed Date
1	Establish a committee using the action team	M. Johnson	3-25	4-1	
2	Committee prepare a survey of parish's behavioral concerns and gather input	M. Johnson	4-7	7-1	
3	Committee use input to write the Christian behavioral guidelines and get approval to implement	M. Johnson	7-6	9-1	
4	Devise a method to implement the behavioral guidelines	R. Jones	9-1	11-1	
5	Review the guidelines at regular intervals - yearly	R. Jones		by 8-31	

Prior to convening the action teams, bring the leaders of the teams together to discuss expectations, time frames, and the overall schedule. Assign team members based on their stated interests. Keep the teams small (probably fewer than ten volunteers) to facilitate active discussion.

It is essential to decide if you want your teams to be constrained by the resources (people and money) available. If you allow the teams to be constrained, you will limit the number of great ideas developed. Not limiting the scope of resources to be considered will, however, lead to some very unrealistic plans. Everyone will want to hire new management, new teachers, new administration, etc. This is a very critical decision that must be carefully considered and communicated to your team leaders.

Each of the action planning teams should be encouraged to meet according to their own schedule. We found that the more successful teams had a schedule of events with designated milestones in order to measure their progress. The less successful teams lacked such a structured approach.

After the action teams have developed their plans, get approval of those plans. It is important to continue the communication, commitment, and consensus that were the cornerstones of the process; for example, we initially reviewed the plans orally with the original group from the retreat for approval and discussion. We wanted to ensure that we had kept the spirit of the original plan. The action plan team leader presented the plan with the rest of the team in the audience to help answer questions. Some teams showed the retreat group a letter signed by the whole action team pledging their support for the plan. After that meeting the plan was reviewed in succession by the parish council, finance commission, and parish management. These reviews were essential to obtain approval and to generate a consensus that we were headed in the right direction.

Make sure that you communicate what you expect from these reviews. The reviews can be conducted to get broad approval and consensus, or to get authorization to proceed immediately with a particular action plan. The discussion easily can turn into an assessment of the unavailability of funds or resources, which immediately renders the action plan unworkable. You must be careful at this point in time because nothing is yet prepared for discussion of resources. Decide what you want and make sure the reviewers understand.

Prioritization Phase

In the case of St. Albert the Great Parish, after getting approval of the action plans, we were left with seven strategies, four objectives, 55 action plans, and over 350 specific actions! We had invested, obviously, a great deal of intellectual capital. We had conducted numerous reviews. We had achieved a workable level of commitment and consensus within the parish community. We had also totally overwhelmed the few people that had to implement the plans. We were now ready for the fourth step of the process, in managing our parish through the strategic plan. This step entailed prioritization.

Prioritizing when you have too many good ideas is a difficult step. The specific tactical actions are very different in nature. They require different levels of resources. Some cost a lot of money, some have no cost. Many do not require anyone's attention after a few simple steps are taken; for example, to remind everyone of the parish's mission by including the mission statement in the parish weekly bulletin is a very simple action to take. Most actions are more involved. Thus, we had to find a way to prioritize our 350 items.

Before discussing how to prioritize, the consequences of not prioritizing need to be understood. Without direction, the action steps take on a life of their own. The box below shows four quadrants that evolve when you leave the prioritizing up to management and a few strong individuals. Tasks are either very hard to do, or they are easy to do. In addition, they either have a strong advocate, someone who will continually push to get the task done, or they do not. The advocate may or may not be in a position to ensure implementation. Even a strong advocate might not be able to take action because of formidable pressures against them, management indifference, lack of time, or lack of means.

Feasibility of Action Steps

1: Hard to Do Has a Very Strong Advocate who can do something about it	**2: Hard to Do** Does not Have a Very Strong Advocate who can do something about it
3: Easy to Do Has a Very Strong Advocate who can do something about it	**4: Easy to Do** Does not Have a Very Strong Advocate who can do something about it

Most of the activities that get *worked* on fit into quadrants 1 and 3 above. The strong advocate, be it the implementor or the designee, will usually ensure that that about which he or she has strong feelings will get done first. Those tasks with ineffective implementors or champions flounder. Such prioritization by personality is not desirable.

A further complication inhibiting prioritization is that some tactics require a substantial resources. Many end up requiring a new person to be hired. Others require a substantial amount of money. Others need standing committees to be established that will become part of the ongoing parish operation. These action plans tend to get pushed back in time before anyone thinks about their importance or priority. It is human nature to set aside the issues related to money or people by invoking convenient excuses: "We need the pastor's approval," We can't hire someone," "Let's take care of some other tactic because it is easier to accomplish," etc.

Facing these excuses is critical, otherwise, you may have well-meaning people doing good things which are not relevant to your plan. Resources will be expended on things not critical to your success. You face the prospect of volunteer burn-out or disappointment. Those individuals who have supported an initiative from the start and have finally gotten approval on an action plan necessarily expect to see action taken to implement the tactical steps. When they do not see action being taken, there can be resentment and the feeling that there was never any intent to implement. You will be perceived to have violated two of the fundamental principles, communication, and commitment.

Finally, you may be dismissing or acting on an action plan based on false premises regarding the amount of resources required. Without looking at the action steps in detail, you may be making decisions based on too little information; for example, some action steps may not seem to take many resources, but when actually implemented, they may prove to have numerous consequences that tie up resources. On the other hand, some action steps that seem to command many resources can be broken into smaller pieces, demanding fewer resources.

Thus, how do you prioritize the action steps?

Prioritization is a matter of breaking down a large number of opportunities and grouping them into piles that make sense for your operation. It requires a distinct set of approvals for deciding on how to proceed with the different kinds of action steps, but most importantly, you will need some small group that makes the final decisions and ensures there is follow up.

Prioritization Activities

The best approach to prioritization includes the following activities:

1. Break the actions steps into categories.
    - action steps that are very easy to do
    - action steps that you want to wait to work on
    - all others

2. Review your objectives.
    - Look back at your objectives and see which action steps will have the most measurable impact. Step back and remember that you are trying to reach a goal. It is very easy to get caught up in doing something that seems like the right thing, but is not necessarily the best thing to do at the point in time.
    - Consider the action steps that can have relatively higher visibility in the parish. You want to be able to show tangible, meaningful progress quickly.

3. Get management to sit down and really decide what is important.
   - You need to make the hard choices based on what the pastor and a few key advisors think is the right thing to do.
   - Balance the need to do some things now with the need to have some of your volunteers and administration team study longer-term action steps. Do not lose sight of the fact that you have asked some people to study important issues. You cannot expect those people to be actively involved in implementing many day-to-day action steps.

4. Establish a procedure for approving and implementing any action step.
   - In our case, we put in a three-tiered process. The table below outlines the general parameters under which we have worked.

Tiers of Projects and the Required Activities

Action Steps	Description	Required Approval/Implementation
Tier 1	Requires relatively few resources. No cash outlay. Can be completed easily and quickly. Falls within one person's jurisdiction.	Allow someone in your management team to implement without any further review.
Tier 2	Requires relatively few resources. Little cash outlay. Will require coordination of efforts of more than one organization. Falls within more than one person's jurisdiction.	Require a simple implementation plan that at least describes: what is the step, who will carry it out, how it affects others, and its benefit. Implement after agreement is reached.
Tier 3	Requires substantial resources, generally cash. May be the establishment of a new officer or office; adult education coordinator, office of development, computer center, etc. Major impact and visibility. Will have a very profound effect.	Require a detailed implementation plan to be reviewed by groups such as parish council and finance. Must have a cost/benefit analysis as well as options for obtaining funding. Get agreement from your finance or development office to work on providing the necessary funding. Appoint a leader to implement and report back regularly to the pastor.

   - The major distinguishing point was the need for funds (or a new officer) to be established. We had relatively few of these in our plan, but they all required substantial money and resources (mainly people's time). They were also the items that would touch the most areas of the parish, and would provide us with the greatest opportunity for success. We deliberately wanted to keep the number of projects that fit into this third tier to a relatively small number because of the amount of resources required to study and to implement them.

5. Measure progress periodically and regularly.
   - You must keep track of all the action steps that you planned. At the same time, track progress against a set of milestones. Are we completing those things we set out to do in the time frame we hoped to do them? Otherwise, the results will include numerous cases where someone was the owner of an action step, but they were not taking action. Awareness of what is and is not being accomplished is important.
   - In some cases, you may decide to delay taking any action on a tactic; for example, we decided that implementation of library computerization was something that we were going to delay for at least two years. It is important to make sure that an action step does not slip off your radar screen in the future. At the same time, ensure that someone is not doing work on a particular tactic on which you decided to delay working.

6. Communicate what you are going to do and when you are going to do it.
   - Many of the implementors will not be parish management. Thus, the regular discussion that happens among a management team will not happen unless you force it. Whenever volunteers are involved, it is critical to help them understand progress.
   - Let the parish know what is happening. Periodic reports which highlight the specific things that have been implemented builds credibility and draws in additional volunteers.

Measurement Phase

The purpose of the strategic plan is to achieve an end state. Objectives need to be set that have very well-defined measures and time frames; for example, we had an objective to "Achieve 100% satisfaction with our education programs by 1998". The measure was stated clearly—100% satisfaction. The time frame of 1998 was clear.

All of the action plans should, ideally, relate back to at least one of your objectives. This relationship should be clear enough that you can answer the question: "Which of the objectives does this action step impact?" The inability to answer that question means that the action step is not a good one, or that your objectives are not complete. Put another way, if you are doing something, but it is not helping you achieve one of the goals which you set, why are you doing it? In addition, each step ought to be able to answer the question: "What is the impact of this action step?" This issue is addressed a little later.

Before working on your action steps, you need to assess the clarity of your objectives. In addition, you will need to establish a measurement device and a timetable for achieving progress. An example is displayed below.

	MEASURE - % OF PEOPLE SATISFIED			
Objective	**1996**	**1997**	**1998**	**ongoing**
Parental satisfaction with education programs	65%	75%	80%	100%
% of students achieving academic potential	55%	65%	80%	100%
% of parish actively engaged in educational programs	75%	85%	99%	100%

In the example above, the second objective, "academic potential," is a very hard thing to define. Yet, if you have determined that it is critical to achieving your mission, it must be defined. If you do not define it very clearly, the action plans will probably not be linked to it.

Somewhere in your process, a separate small team needs to be created to provide greater definition to your objectives and their measures. Clarifying what you mean by "academic potential" is absolutely critical. It is certain that this will have a different definition for different constituencies if you do not take the time to discuss it. Clearly articulating what the objective means and what it is trying to measure provides a sound foundation for looking at progress in the future.

This small team dedicated to objectives also needs to put in place periodic reporting mechanisms to track progress toward objectives. The most common periodic methods are to conduct yearly surveys and to hold focus groups. What this allows you to do is to gain an understanding of your progress at regular intervals.

Be careful not to ask the same people the same questions over and over again. Make sure that the questions you ask are appropriate. It is probably best to find someone who is experienced in writing and interpreting survey results to assist you or you may create leading questions that elicit misleading answers.

Setting objectives and measures and collecting periodic feedback on those objectives are the easiest things to overlook. People are inclined to stop once they have done something, and move on to the next thing to do. If you cannot or do not measure how far you have gone, or how well you are doing, how can you ever be certain of your success? Very few people can argue with the logic of measuring yourself. Most people agree that large, visible, tangible actions are easier to measure. The addition of computers, the addition of Bible study groups, or the creation of a Youth Group Coordinator to bring young people back to the Church can be measured, but how and when do you do it and how often?

It is VERY difficult to measure the impact of some activities. An action may be so small that it can not really have an impact by itself; for example, one of our action steps was to include in our parish student directory all students, whether they attended the parish school or not. That activity was clearly designed to improve parish communication and to build a greater sense of family. To ask people how much more that one action improved communication is probably not realistic. The natural inclination is to dismiss tracking the impact of this specific step because it is hard to track. Yet, when the logic of not tracking a tactic is carried over to dozens of actions steps, you run the risk of having too much activity occurring without any understanding of its impact. As a team, decide what you want to measure, how, and when. If someone is very interested in getting feedback on a particular action step, let them be included in a larger survey or focus group.

It is also very hard to gain consensus on what you are trying to accomplish once you move from the abstract (Let's "satisfy" people.) to the concrete (What is our definition of "satisfaction?"). We used a very small group of people to define what we felt satisfaction means and how to measure it. We then met with the principal and the director of religious education to get their input on these concepts. We were driven by the realization that we needed a baseline, a set of observations to be used for comparison. Once you collect some information on what you think are the right measures of satisfaction, you can judge whether those observations were correct. Collecting some information that was substantially accurate was the best starting point.

In summary, measurement can be very successful if it is:

- *Periodic:* Gather information at important times, e.g., the end of a sacramental

program, prior to start of school, or after a major mailing.

- *Consistent:* Gather some of the same information every time you ask about a particular program. Not every question needs to be the same, but some need to be the same so you can track progress.
- *Focused on your objectives:* Make sure you are asking questions that will allow you to compare the answers to your objectives.
- *Relatively short:* No one likes to spend a lot of time filling out surveys or joining focus groups.
- *Reported back to the parish constituencies:* Make sure that if feedback is solicited, it is analyzed and presented to the parish. Quite often, you have a good story to tell, but do not take the time to tell it.

Lesson Learned

The best learning can often be obtained by looking back at what occurred. If you are fortunate enough to have a strong, supportive pastor, a few key individuals who will lead the process for several years, very strong parish support, and a legion of volunteers, you will be successful.

However, to accept the fact that, "we created a plan and are doing something about it," as your basis for success is cheating yourself. The biggest fault that anyone ever has with a strategic plan is not the time it takes to develop it, or the resources it devours, or the pain that is required to achieve consensus; rather, it is that once a plan is completed, it sits on a shelf, gathering dust. The exhaustion of your volunteers leads them to stop working on achieving the plan. These people move on to other activities. The number of action steps overwhelms the parish management team into not taking action. The same barriers that are in place today that have prevented the parish from taking action are still there even though you have created a plan, e.g., money is still lacking. The sensitivity to stopping or altering someone else's program is just as strong. The economist, John Maynard Keynes, once said, "The real difficulty in changing any enterprise lies not in developing new ideas, but in escaping from the old ones." A strategic plan develops new ideas, it does not escape the old ones.

Final Observations

Here are some of the final observations from our strategic plan exercise.

Volunteers can't be fired... but they can be redirected or reassigned. The individuals on whom you rely to create and implement the strategic plan are generally not paid to do the work they do. They come to help out of a sense of duty to the parish family, but they also come with a set of their own priorities, working principles, and personal prejudices. You will have to live with inconsistencies in the way things are conducted and implemented. You cannot, however, cede ownership of the implementation of your plan to your volunteers. In the end, the pastor, his parish management teams, and the strategic plan team will be held accountable by the parish.

Many volunteers are not good natural leaders. The strength of their faith or convictions drives them to want to be involved. You must find a way to educate your volunteers on how you want them to operate (All of a sudden this education is a new action step in your strategic plan!).

Parish management must be prepared to step in to move the project along. In our case, we had a strategy to address discipline throughout the parish. This strategy was born out of the conviction that we could provide a strong set of family values to defend our parish against the decline of values within our greater community. We were very concerned that the action steps

of this discipline strategy address parishioners of all ages. We wanted also to be aware of the diverse nature of our parish members' opinions as to what constitutes unacceptable behavior. This was, obviously, a very sensitive and controversial subject. As the action planning team began to work on this objective, it became clear to parish management that this team was falling behind. Reaching consensus on the way to operate the group was lacking. A strong leader did not come forward. Many strong agendas were present among a very earnest, well-meaning group of volunteers. The success (or lack of success) of this group would send a very visible signal to the parish. Our parish management team took several steps to right this team. Additional management time was spent with this group. A structured approach to meetings was adopted from some of the other action teams. An area of common ground was eventually carved out.

Prioritizing is hard to do. This was covered earlier. St Albert the Great is still struggling with this one. It results from a combination of too many needs, too many good programs, too few resources, and too little time to step back and reflect on what is important.

Things will move slower than you want in the implementation stage. The number of people who are expected to implement actions is very small, but the number of actions is very large. Our principal was probably responsible for implementing over 100 separate action plans of varying sizes and time frames. The number of action plan team members who drafted the plans was probably 25. Thus, the 25 planners each see only five or ten actions that need to be done, but the principal sees 100, and these are all on top of running a school every day!

One way to significantly aid implementation is to train your management staff, including the pastor. Educators have traditionally been trained to work individually in accomplishing tasks. An action plan to provide parish management training on stress management, delegation, prioritizing, and teamwork is critical! Our pastor attended such a training program at a local business. As the only non-commercial enterprise person there, he found that he faced many of the same problems as business men. His time was increasingly being taken away from his real mission to the Church, ministering to the parish. When he came back from the workshop, he immediately set about creating a new operating structure for the parish to meet its goals. He found ways to get the same activities completed, yet spend more time ministering.

Be continuously critical of your strategic plan. It can be very damaging to your effort to stop at a point in time and engage in self-congratulation. It is appropriate to periodically look back with pride at what you have accomplished. The planning, creating, measuring, and implementing of a strategic plan is an amazing effort. It evolves from many man-hours of labor, but you must be driven by a need to continuously improve.

An appropriate time to evaluate your plan is one year after the approval of the plan. You might want to consider reviewing this progress with the original retreat team. Whomever you pick to review progress on the plan, make sure it includes a diverse group of people. Include people who are very involved in parish affairs, and some who are not. Include all age ranges and interests in order to make sure you receive a balanced assessment.

In preparing for the review, spend time with the major creators of the action and with the implementors. After focusing on what has been accomplished, really consider if you have moved closer to achieving the objectives. If you cannot show concrete progress towards the objectives, only abstract generalities, ask yourself, "Why not?" The natural inclination will be to celebrate your success. Don't let this happen.

Conclusion

The amount of time spent developing a strategic plan is enormous. A significant number of your best volunteers and management team must be involved. The impact on your parish can

be as dramatic as you want it to be. The rewards can be enormous.

St. Albert the Great Parish is in its third year of working on the strategic plan. We are now implementing it. We have seen a commitment on behalf of the parish to see that the plan is implemented. We do communicate progress regularly. The pastor has implemented a new management structure as a result of this plan. We have an approach for making decisions on action plans. Yet, we still have a long way to go to achieve our objectives.

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Artisans of Faith: A New Renaissance

Angela Ann Zukowski, MHSH

How many of us suffer from the Rip Van Winkle Syndrome? One day we awake to discover that the world has changed. There is a new culture with a new languages, a new psychology, and new tools for communication. What we traditionally understood by mouse, menu, navigation, cruising, surfing, and networking has been replaced with new definitions. The language is even further shifted by new concepts such as netizens, cyberzens, gigabits, cyberspace, Java, virtual reality, virtual communities, and telepresence.

We find that the meaning of "place" has changed. The classroom is no longer confined to four walls. In her book *Life on the* Screen, Sherry Turkel shares how opportunities are being created to build new kinds of communities, virtual communities, in which we participate with people from all over the world, people with whom we converse daily, people with whom we may have fairly intimate relationships, but whom we may never physically meet. Thus, the perception of what we traditionally have understood by Christian communities or faith communities is undergoing a paradigm shift in cyberspace. Not only are the type and format of our stories shifting, but so also is the place and location of where stories are communicated and reformulated for a new generation of believers.

Religious education can now occur anywhere at any time because of new communications technologies. The idea of global communities of learning, decision making, and political, social, and religious discourse in cyberspace is becoming the common reality. In our attempt to create a sense of equilibrium within this new culture, we discover it will not stand still for us. Its characteristics are fast, complex, compressed, multimedia, uncertain, and interactive. As soon as we seem to understand it, it has shifted.

Some religious educators attempt to hide, ignore, or reject the technological evolution; there are others who surrender, embrace, and become advocates for the dawning of the new era. They understand that the new reality will not disappear. They realize that we must accept our moral, religious, and educational responsibilities to engage in the design and formation of this new culture. They become the new artisans of Faith within contemporary culture.

In *To Teach As Jesus Did* we read: "Technology is one of the most marvelous expressions...but it is not an unmixed blessing...it can enrich life...or make a tragedy of life. The choice is ours and education has a powerful role in shaping that choice." The challenge that is set before us

today is to be active participants in the *formation* of this new audio-visual, multi-media culture. This is a ***new culture!***

We are today witnessing the early, turbulent days of a revolution in human communications as significant as any other in human history. A new medium is emerging, one that may prove to surpass that of all previous revolutions — the printing press, the telephone, the television — in its impact on our social, moral, and religious life. The computer is expanding from a tool for information management to a tool for communication. Pervasive evidence exists that indicates our basic social fabric is beginning to disintegrate. Old laws, structures, norms, and approaches are proving to be completely inadequate for life in the new communications age. Everywhere people are beginning to ask, "Will this smaller world that our children will inherit be a better one?" This is an age of networking, not only of technology but also of humans, organizations, and societies. Bear in mind that with or without the Church, this new culture will evolve weaving itself into the fabric of our lives. The Church has a rich tradition of embracing new techniques for communicating the Gospel via the arts throughout history. There have been times, however, when the Church has lost opportunities because of fear, reluctance, or lack of experimentation and vision. Cable television is one such example. In the early 1970s cable television was a new technology. Access and production were free if not relatively inexpensive; however, because few people believed this new technology would have a place within our culture, it was dramatically ignored by the Church and Catholic education.

Entrepreneurs, consumers, and fundamentalist groups saw in due time, however, the potential and embraced it. Today, we find ourselves reactive to the images and messages communicated into our homes through the medium. As we stand on the threshold of the twenty-first century, we must be bold. Cyberspace is the new frontier. Are we willing to become pioneers of Faith within the new frontier? What new mindsets and skills are required? What techniques (tools) are available for us within our parish, school, or local community? What new steps are required for us to move forward?

Einstein once said: "Absolute madness is doing the same thing over and over and over again expecting different results." Recognizing the importance and need for change is a mark of a healthy renewing parish or religious education program. In most circumstances, people only begin to think about change when they are in trouble, see trouble on the horizon, or see new creative opportunities before them. The reality is that new paradigms show up sooner than they are needed or wanted. As pioneers, we need to be ready for them. To be prepared, we must do the following: get outside our borders, break our own rules of past success, develop new reading habits, converse with pioneers in the new culture, and have a good sense of humor with a ***lot of flexibility.*** In *Communio et Progressio* we read: "The People of God walk in history. As they...advance with their times, they look forward with confidence and even with enthusiasm to whatever the development of the communications space age may offer."

During the past year I have been focusing on discovering a new paradigm for religious education in view of the new media age. Since the early 1970s I have found myself on the margins of the religious education culture in my attempt to stimulate religious educators' imagination for utilizing the new communications technology. It has been and continues to be a very slow process. I also engaged in a study of what software materials exist for religious educators and whether or not they are using what is available to them today; if not, what is the problem. I think we need to come to terms with these issues before we go any further in this chapter.

Factors Relating to Religious Education's Lag

Although there is significant movement within our contemporary culture toward the

integration of new communications technologies into the learning environment, religious education has not kept pace with the evolving media revolution. There are a number of factors which verify this reality:

1. There is traditional methodological understanding, appreciation, and preference for religious education at all levels.

2. The application of new technologies to the religious education environment historically has been a very slow process of initiation.

3. The struggle and tension for integrating creative methodology (technologies) with theology or religious content has been held in suspicion.

4. The perception has been that new methodologies and/or technologies are *extras or irrelevant* to what the teaching of religious education is all about today.

5. The cost for acquiring hardware and new software inhibits any consideration for redesigning religious education learning environments.

6. Catechetical formation and training programs seldom include the formation needed to introduce, raise consciousness, demonstrate practical applications, identify resources and curriculum design for the integration of new communications technologies to the religious education learning environments.

7. The idea that we live in a *"new era"* which is a new culture, with a new language, psychology, and techniques has not been affirmed or seriously addressed within our religious education learning environments.

8. Hardware, software, and finances for creating the religious education paradigm shift to the new media culture does not exist; thus, there is little or no motivation for religious educators.

9. The lack of a comprehensive infrastructure within the religious education learning environments has inhibited the design, development, and use of new communications software to support them.

10. Little or no conversation and collaboration among producers/publishers, communications technology specialists, and religious educators (at all levels) result in duplication of software topics/resources and/or unrelated material to the current praxis or interest at the local levels.

11. The fact that the new media culture is fast, complex, uncertain, and multimedia threatens or bewilders the ordinary catechist or religious educator who has limited time and resources to shift their teaching paradigm.

The above factors demand critical reflection if the Gospel is to be communicated in an effective and meaningful manner in the 21st century. I believe the Catholic Church needs to map out a new paradigm for integrating new communications technologies into our religious education learning environments as recommended in *Aetatis Novae:*

> Catholic media work is not simply one more program alongside all the rest of the Church's activities: social communications have a role to play in every aspect of the Church's mission. Thus, not only should there be a pastoral plan for communications, but communications should be an integral part of every pastoral plan, for it has something to contribute to virtually every other apostolate, ministry and program. [1]

Further we read:

> Generally, preference has been given to other means of preaching the Gospel and of Christian education, while the mass media are left to the initiative of individuals or small groups and enter into pastoral planning only in a secondary way. This situation needs correcting. [2]

At the risk of dampening enthusiasm, we would sound a note of caution about new technology and religious education. The integration of technology into the learning environment is never as easy as it appears. If that were so, I believe many of our catechetical and religious education learning environments would not resemble their 19th century counterparts nearly so much as they do. It is true that many of our religious education classrooms lack the technological amenities (overhead projectors, VCRs, television, computers, CD-ROMs, access to the Internet, etc.) that are almost always found in public schools and a growing number of Catholic schools for liberal arts. Making these available, however, does not mean they would be fully exploited for the benefit of religious education. We are still dealing with some traditional understandings of how religious education is to be communicated today.

Although only eight to ten percent of the population has access to the Internet, it is quickly becoming an important means for distance education and the public forum through which rich dialogues of Faith are occurring today. Instead of ignoring these rapidly evolving realities, religious educators should be active participants (1) in the *formation* of the new media culture, (2) the *redesigning* of religious education learning environments, and (3) *the distribution of information* via these new communications technologies to capture the religious imagination of contemporary culture. The primary need today is to re-think and to acquire new understanding and skills for initiating new communications technologies into religious education environments for the 21st century.

We must be aware of the tyranny of the either/or. We must have a comprehensive view of "all" communications technologies to fulfill our artistic mission. It is not solely cyberspace, or radio, or television, or print, or traditional arts, but "all" of these that must be woven into the fabric of our learning environments. Therefore, we encourage each and every religious educator to be attentive to the various tools listed on the A-Z Wheel of Innovation and Religious Education earlier described in this publication. In *Evangelii Nuntiandi* we read, "...the Church would feel guilty before the Lord if she did not utilize these powerful means that human skill is daily rendering more perfect". In *Aetatis Novae*, we also read, "Education and training in communications should be an integral part of the formation of pastoral workers and priests." Therefore, we need to reevaluate our catechetical formation programs and identify specific ways to introduce and enhance our knowledge and application of all the communications technology so that the Gospel may be proclaimed in meaningful and artistic ways.

We are not speaking of using new tools or new techniques for their own sake. There are specific criteria which must be applied when considering utilization of a new technology: 1) Does it enhance the *quality of our conversations?* 2) Does it evoke a greater sense of *collaboration*, thus initiating new paradigms of faith communities? 3) Does it stimulate *conversion or transformation* toward new methodologies for facilitating learning and proclamation of the Gospel?

4) Does it motivate *commitment* to a deeper understanding of our Faith and for a study researching new styles for communicating Faith within the new culture? and 5) Does it encourage and support the need for *contemplation* and reflection in this fast, complex, and uncertain new world? Effective integration and application of any technology should manifest each of these elements.

The concept of an *artist* in contemporary culture is a fascinating image for me. It breaks down the packaged program idea for which religious education is so well known. It calls for the discipline of seeing our ministry in a new way. The world is in great need of *imaginars* of the Gospel, that is, individuals who see the new techniques (technologies) as tools of an artist to capture the religious imagination of the culture. If you still wonder what I mean, I encourage you to view the video series, *Faith Shapes Art Shapes Faith.* This two-part series demonstrates how artists have communicated profound experiences of Faith and expressed them through diverse art forms throughout history.

So, where do you begin? Start "tinkering around!" Tinkers make do with the materials at hand. They open us to new possibilities by experimenting and playing around with ideas. They respect and accept the traditional means of communication but are receptive to new avenues and visions. The biggest challenge that faces religious educators today is that of investing more time and attention in our own experimentation with the wonderful tools of technology for proclaiming and positioning the Gospel within our contemporary culture.

History suggests that a new communication medium tends to complement rather than replace other media. Although the Internet is currently the latest, hottest medium (largely because of the World Wide Web), it will probably coexist with other media for many years to come. The continued need for print materials about the Internet is suggested by the many print newsletters and magazines fueled by the growth of the Internet - *Internet World, Web Developer, Wired*, and countless others. It is also notable that the fastest growing section in our local bookstore consists of books about the World Wide Web and Internet. An excellent book is *Catholicism on the Web* by Thomas Fox (Sheed & Ward).

The research of Howard Gardner which has been interpreted by Ron Nuzzi in *Gifts of the Spirit: Multiple Intelligences in Religious Education* (NCEA Publication) indicates that a new psychology does exist in our understanding of how individuals learn today. Individuals are multimedia learners in the new media culture. Using today's multimedia communications technologies to serve multiple learning styles provides ways to bridge visual learners into the world of symbols, auditory learners into the world of visual, and allow people to cross-reference ideas. Knowledge utilities, virtual communities, and artificial environments will dominate much of society a generation from now and will make the global village either a healthy or an unhealthy place to be, depending on the kind of content that we put into these new channels. Thus, we in religious education need to be at the table in the design and development process of this new media culture because, otherwise, what we are going to get, as we have gotten with every other media, is a bunch of hand-me-downs from business and entertainment that are not going to do the job for religious education.

There are very few more important times to be alive than when civilization is wrestling with a new medium. Sink or swim, we must try to dive and master immersion in order to make what may be the single greatest contribution that religious educators can make to the new media culture.

Thus, today's religious educators are ***real pioneers!*** During the time of writing this chapter I have found very few software resource materials available for the teaching of religious education. There are religious educators who have access to a computer and have found ways to create some of their own new learning experiences. One example is Sr. Laura Sullivan, St.

Rocco School, Johnston, RI. She wrote to me: "I have a display area outside of my classroom that highlights the *Saints of the Month.* I use Microsoft Art Gallery (CD-ROM) and my color printer for beautiful pictures of the saints. If I can't find what I want on the CD, I search the Internet for other images. There are web sites for Our Lady of Guadalupe and Our Lady of Lourdes that allow one to download some very beautiful images. I also visit the Catholic Saints Online Homepage for further info on the saints of the month."

Most of the CD software is directed to Bible study and appears to be too advanced for most elementary and secondary religious education environments. Of course, one finds the *New Catechism* on CD. The cost of producing effective multi-media CD-ROMs is very expensive. The number of religious educators who have access to computers either in their classroom or at home are few. Thus, many publishers indicate that it is cost prohibitive at the present time to produce and distribute religious education CD-ROMs. This may shift in the near future as more and more Catholic schools design their infrastructure to make available the hardware for religious education classes.

The Internet offers copious opportunities for access information and for designing interactive learning experiences, although the religious educators must look for them. Jenny Ritzel at Holy Rosary School in Dayton, Ohio has been an innovator in this field. She began *Fish Quest* which is a religion Jeopardy game. A number of schools around the country are engaged with Ritzel's project. On the Internet religious educators can connect with other religious educators and explore and define new learning experiences. Bear in mind few pre-packaged programs exist; yet, more and more teachers are eager to begin pioneering in this field. I believe more experiences can be created via the Internet today than we will find on CD-ROMs for the immediate future.

I am currently working on the design of multimedia distance education courses for the University of Dayton's graduate pastoral ministry and theology courses. We will be utilizing CD-ROM, videocassettes, and computer video (CU-SEEMe), and audio and text conferencing (Internet). CU-SEEMe allows students with a computer and the appropriate TCP software to send and receive video and sound to and from other CU-SeeMe users. The connections are made directly through the computers or through host computers running reflector software. A student's monitor can simultaneously show up to seven video windows connected to the same reflector site. Anyone connected to a given site can hear or send audio messages. CU-SeeMe provides video connectivity to the world and offers educational experiences that only interactive video conferencing can provide.

In the immediate future I would hope that we would see more innovative teaching through the support of both traditional and new communications technology. Therefore, besides teaching religious educators how to use these traditional and new media in their classrooms, we must create experiences which motivate religious educators to enhance their own learning and planning through the support of the new media. Keep in mind that religious educators teach as they have been taught. Beginning teachers need to see instruction modeled with technology integrated throughout the curriculum. Once again we must keep the full spectrum of the A-Z Wheel of Innovation before our minds as we plan our religious education curriculum for the year.

As I continue to engage in in-depth conversations with new culture learning partners around the world, I am continually amazed and encouraged with the new limitless possibilities that are before us. There is no doubt in my mind that the formation of religious educators requires a knowledge bank of skills to know how to access, navigate, and apply new technologies for designing new learning environments behind the traditional classroom. Research demonstrates that as more and more homes have access to computers and modems, more time is spent with computers than television. The question of the technology rich and the technology poor will always haunt us; however, new innovations of accessing the Internet via WEBTV are already

being installed around the country.

Cyberspace will continue to accelerate in attracting a diversity of insights challenging netizens and cyberzens to profound dialogue of Faith. The traditional classroom or religious education center is only "one" of many "places" where religious dialogue will continue to occur. Recently, while I was navigating through the Internet, I came across *The Torah On the Information Highway.* It is a web site of the Jewish education community. I read that over 5,000 individuals were engaged in their religious education courses on the Internet! Think of the copious possibilities that exist for us as Catholics!

Where do religious educators begin?

- Tune into the new culture/environment.
- Begin kaleidoscope thinking. (Be open to new paradigms and possibilities.)
- Keep focused on your mission. Do not allow the technology/techniques to override your purpose.
- Define your theology of communication. (See earlier chapter.)
- Nurture quantum praxis. (Build partnerships with other religious educators who want to pioneer in the field.)
- Practice kaizening. (Each day learn something new about the new media culture.)
- Pioneer and innovate.
- Keep a sense of humor!

As you and I stand on the threshold of the 21st century, we need to consider ourselves as artists! Yes, we are artists of faith in contemporary culture. We have new tools which offer us creative opportunities to pioneer within the new frontier. This is no time for lone rangers. This is the time for collaboration and innovation. Breaking out of our traditional paradigms of learning, and navigating into new learning environments is our new quest.

We are discovering that we can stimulate the religious imagination of our students through the new technologies (tools) and motivate them to enter into a dynamic dialogue of Faith, not only among themselves but also within the whole world! Thus, we come to understand that *Catholic* truly means *universal.*

Endnotes

1. *Aetatis Novae*, Vatican City, Art. # 17, 1992.
2. Ibid., #20.

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A Sabbatical View of Catholic Schools

Margaret E. Curran

In the fall of my seventh year as principal of a small suburban school in the Diocese of Orlando, my pastor suggested I consider taking a short sabbatical during a few months of the following school year. Father said that the parish was very grateful for all I had been doing for our children and would like to express its gratitude by giving me some time for myself. I laughed and said the idea seemed great but doubted we would ever follow through on the conversation. We were in the process of preparing for reaccreditation; we had just added four new classrooms to the campus; our student enrollment had increased once more resulting in additional staffing; we were excited about further developing the concept of "a school within a school" for our middle school students; and our technology committee was just rolling up its sleeves and getting down to hard work. In short, I was too busy and too happy with what I was doing to consider going on sabbatical.

But Father persisted.

During the course of the year, he would periodically bring up the subject. His two main points were always the same: the parish wanted to show appreciation, and sabbaticals should be taken when people are still energetic and excited about what they are doing and not when they are burned out and in need of respite care. I finally became convinced. I decided to make educational technology the focus of my sabbatical, and started making plans. I wanted to travel throughout the country, visit other schools, and learn from what they were doing. Limited funding and other priorities had resulted in our school being considerably behind in the area of technology. Why reinvent the wheel now? Why not learn from the many exciting things already being tried and proven by other schools? My school would benefit from my sabbatical and so would I.

With the help of a member of our technology committee, I put a notice out on the Internet: Principal of small Catholic school interested in visiting other schools to see what they are doing in educational technology. This, my first venture out into cyberspace, was a great success! I

received 16 invitations to visit schools from Maryland to California. I grouped the schools by region, eliminated schools that could not be grouped, added New Frontiers schools from a list provided by NCEA, and set off on my journey.

In the course of ten weeks, I visited 24 schools in ten states, attended three major conferences and saw my family very little. It will probably take me a couple of years to process all that I had learned, but I would like to share some of the insights I received and some of the knowledge I acquired.

Variety of Programs Visited

There was wide variety in what I saw being done with technology. Schools had taken different approaches to meet their local needs. As I tried to ascertain basic trends and categorize what I was observing, the difference between educational technology and technology education became clear to me.

Most of the elementary schools I visited were attempting to use technology to enhance their already existing educational programs. They were utilizing technology as an educational tool and means of support. Few schools were engaging in technology education—teaching **about** technology: how it works; how it can be manipulated; and how it influences our lives. Because of this restricted view, most schools had also concentrated their economic resources on computers, although a few had realized that "technology" was not limited to computers and were integrating laser discs, phone systems, flex cams, still cameras, and video cameras very effectively into the learning process.

Almost all of the schools I visited had been through discussions of which computer platform to adopt. I was surprised to see that a large percentage were using Apples or Macs as their computer of choice. While most schools were gradually acquiring faster, more powerful computers, I was pleased to see that a few of the schools with the most limited economic resources were still utilizing their Apple IIe machines; I had not known that that was even possible! In almost all of the schools I visited, the basic philosophy in regard to older, more limited-use computers was, "They will always do what we bought them to do. If money becomes available, we will buy newer machines with different purposes in mind." In true Catholic school spirit, they were not frustrated by what they did not have, but were striving to make the best use of what they **did** have.

Many more schools had network capabilities than I had imagined. From these schools I received an education about the need to run fiber optic cables *between* buildings yet found out that category five (CAT 5) was sufficient *within* buildings. I was surprised to find that the cost of this wiring, and the way Catholic schools had obtained it, varied widely throughout the country. In southern Ohio, many schools had networked their computers through generous grants from Ameritech. One high school, in particular, obtained sufficient funds to install a T1 line which would enable it to do distance learning and participate in programs such as *CU-SEE Me*. In the San Francisco area, Catholic Television Network (the rough equivalent of a diocesan educational television network) had provided the labor for retrofitting (rewiring the school to provide the ability to network computers) at a very reasonable cost. In Indiana one Catholic school I visited had entered a creative partnership with the local public school and the town library to share the cost of bringing broadband cable within reach of all three institutions. A few schools in other parts of the country had done the interior wiring themselves over the summer with the help of skilled parent labor.

I was delighted to see that students in Catholic schools throughout the country were going on-line to enhance their education. At the high school I visited in Ohio, students in Spanish class

routinely corresponded via Internet with students in Mexico. Schools I visited in Oklahoma, Texas, Kentucky, and California were successfully integrating commercial on-line services, such as Scholastic, to add new dimensions to their literature and social studies courses. It seemed that even if a school had only one modem, some teacher was effectively using it to broaden students' horizons. At a school in Indiana I learned that modems could also be networked! In my ignorance I had previously thought that each student had to be at a computer with its own modem for any type of group project involving the Internet.

Most of the Catholic schools I visited still had their computers centrally located in labs. However, many were placing additional computer in classrooms. A few had moved older machines into classrooms and placed banks of more powerful, faster computers in the Media Center.

Media Centers themselves had been the focus of extensive revamping in some of the schools I visited. Many Media Centers had automated to the point where the entire collection was catalogued electronically. The software used for this automation varied widely throughout the country but appeared to be more uniform within regions; the West Coast, for example, appeared to favor Follett, but Alexandria, which was popular in the East, was almost unheard of out there.

Most of the schools which had updated Media Centers had CD ROM towers with multiple sources of information (encyclopedias, periodical abstracts, and various other reference materials) available to students at all times. A few Media Center's had on-line services such as *The New York Times* and America On Line available as well. One school I visited encouraged students to employ user groups on the Internet as a source for gathering information; students, for example, had gone on-line to interview a group of senior citizens about their experiences during World War II. Their contacts with the seniors added a new dimension to the class's project on the impact of the war on the lives of ordinary people. Another school, this one in Kentucky, had a global education program which connected each class with a different foreign country. School-wide projects were done by collecting data from each of the countries.

A few schools I visited cautioned me about not networking **all** computers in the Media Center. Their experience was that some multi-media programs did not work as well networked as they did in a stand-alone environment. They suggested leaving at least two computers in the Media Center off network, to facilitate the use of these programs.

While traveling in Indiana, I saw a centralized media retrieval system for the first time. Instead of having VCRs and laser disk players in each room, a school outside of Indianapolis had invested in a centralized system, housed in the Media Center. Less than a dozen pieces of equipment served all the needs of the school. From computers in the classrooms (or on slips of paper sent to the media office), teachers requested that a video or disk program be projected on the television monitor in a specific room or rooms. Student volunteers placed the tape or disk in the equipment in the Media Center, and it was displayed in the location specified by the teacher. The system, while costly in some ways, was very economical in others. It allowed a large school to purchase far fewer pieces of equipment, eliminated the moving of equipment from one room to another, and allowed for the simultaneous showing of one program in several classrooms. It also allowed for live video announcements to be made by the Student Council each morning.

The use of technology for administrative purposes varied greatly from school to school. Several were using Parish Data Systems for administrative purposes. They delighted in knowing it could, with very little effort, produce the statistical data for our annual reports to NCEA, do tuition billing, track attendance, and provide a general ledger of accounts. MAC School was equally popular with some Apple-based schools since it could do everything from attendance to grade books and lesson plans. The most innovative program I saw was written by students and teachers in an elementary school in Kentucky. The program allowed children to log on and record

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their own attendance in the morning, and order their lunch as well. Since the school was networked, this information was immediately available in the office and the school cafeteria with just one command.

Key Ingredients of Successful Programs

While the programs I viewed varied greatly from school to school, there were certain key elements contained in almost all of the truly successful programs.

As far as I could observe, the single most important factor was *inspired leadership.* Schools that had at least one full-time staff member who was truly excited about incorporating technology were usually successful at doing so. This leader was often the principal. Where the principal was excited about the use of technology, things appeared to get done quicker and more effectively. In some of the schools that were successful, the principal had limited knowledge of technology but had made it a priority for the school. In these instances the principal had often hired a full-time staff member whose job included trouble shooting hardware and networks, keeping abreast of the latest developments in educational software, training faculty in the applications and use of everything on site, and lots of hand holding. The existence of this person on staff appeared to be the most important factor in ensuring a truly successful integration of technology into the full learning process of the school. While having such a person on staff might appear to be a strain on most budgets, the return on the investment seemed well worth it in schools that were serious about the inclusion of technology in the daily life of students. In these schools, technological resources were being used to their potential. Hardware and software that were purchased were not sitting around underutilized.

Having a *written technology plan* was also of major importance. In schools where a group of teachers, administrators, parents, and others had collaborated in the formation of a technology plan, progress was focused and steady. Technology plans which focused on educational outcomes and pedagogical objectives, rather than the mere purchase of equipment, appeared to be most successful. In these schools technology was utilized to present specific parts of the curriculum, expand concepts, and enhance high order thinking skills. Furthermore, software which appears to do nothing but drill was noticeably absent when the technology plan focused on educational outcomes.

Another common demoninator for successful programs was *appropriate teacher training.* In the best programs, training was not only done on site, but was also on-going. Training with newly acquired equipment and software was not done once at the beginning of the year by some person who disappeared a few hours later, but was conducted by a staff member (the full-time staffer or "inspired leader" referred to above) who was always there when problems arose. These "trouble shooters" usually had a seemingly limitless supply of patience and dedication. They told me invariably that part of their job was to convince their colleagues that a particular piece of equipment or software would make their lives easier by helping them do what they were already doing in a better way. They were dedicated to teaching the concept that technology was not just another burden placed upon teachers, but a tool which helped even veteran teachers be more effective and freed them for other things. The best technology coordinators I met never appeared to rescue teachers in trouble by doing things for them; rather, they explained things to them over and over again if necessary.

It cannot be denied that the very best programs I saw had invested a substantial amount of *economic resources* in technology. In some cases the money had come from the parish community. Technology was a priority for these parishes and they had invested in it accordingly. Other things (e.g., playground equipment, new carpeting, or library books) had often been de-emphasized in the budget in order to purchase equipment. On the other hand, many schools I

visited had funded their technology programs through grants and suffered no losses to other line items. In more than one school, the technology coordinator was responsible for seeking grants and, therefore, generated a total revenue which more than justified his or her salary.

Equipment and Commercial Programs

There is no doubt that each school I visited was unique. The direction that each had taken with educational technology reflected a local response to local conditions. Many of the components of programs I saw on my visits to schools throughout the country can, nevertheless, be replicated fairly easily, since they involved commercially available products or programs.

One of the things which impressed me most was the concept of teacher work stations. Several schools I visited on the West Coast provided each teacher with a work station instead of the traditional desk. This work station was comprised of any combination of various elements (computer, laser disc player, VCR, overhead projector, laser printer, etc.) and was to be used routinely for basic instruction throughout the course of the day. Teachers who had totally bought into the concept were producing phenomenal multi-media lessons as part of their daily routine. Students in one high school I visited were utilizing the equipment in the teacher work station to produce some of the finest student reports that I have ever seen.

Presentation software was far more commonly in use than I had realized. Many teachers with computers connected to television monitors as part of their work stations were using either Aldus Persuasion (for MACs) or Power Point (for DOS-based computer) in presenting lessons to their students. Basic facts, outlines, highlight of lessons, etc., were presented in colorful, exciting ways never before possible. Teachers who routinely used this technology stated that students were more attentive to lessons presented in this way. Connecting the computer to the TV monitor was very simple. A cable connection was necessary to change from digital imaging (in the computer) to analog imaging (on the TV monitor), but several companies produce relatively inexpensive devices to do this. The devices I saw in use most often were Focus LTV and TVator.

I learned that, in addition to projecting to a TV monitor or high intensity LCD panel, which only has a limited viewing capacity for a limited audience, computers can be connected to a recently marketed liquid crystal projector. It utilizes technology similar to the LCD panel, but is intended for a much larger audience. These projectors allow the use of presentation software with text, graphics, pictures, or charts in groups of several hundred without losing the sharpness of the image. InFocus Lite Pro, N View, and Sharp liquid crystal projectors were in use in schools I visited. Some models allow for a VCR as well as a computer to be connected to the projector.

I learned that the centralized media retrieval system I had seen first in Indiana was available from many companies throughout the country. AMX, Dukane, TechNet, and Rauland Borg all produce similar products. Schools interested in the concept, therefore, might want to examine not only the cost but the service record of the provider in their area.

At NCEA conventions for the past couple of years I had seen a flex cam but was reluctant to purchase it because of our school's limited budget. After seeing its multiple uses in schools I visited, I was convinced the investment would be worthwhile. A flex cam is a goose neck device which magnifies the source on which it is focused and projects that image to a device, such as a television monitor. It produces an exceptionally sharp and clear image and can magnify details as fine as the ridges on fingers which produce fingerprints. I saw it used to focus an entire group's attention on a specific spot of the globe, on a part of a leaf, and on an illustration in an art book. It can also be easily connected to the teacher's microscope to ensure that students are focusing

on the correct part of a slide. In certain situations, such as with very young children, using a flex cam would even replace the need for each student to view a specimen through separate microscope. The flex cam is a very versatile piece of educational equipment and its uses appear to be myriad in the hands of good educators.

In the area of science, I was also impressed with the variety of commercially-produced laser disk programs on the market. Many schools had been introduced to science laser disk programs when they attended New Frontiers. Others had discovered them on their own. From Ohio to California the schools I visited were very pleased with the programs and their ability to add previously unavailable visual dimensions to the science programs. Some of the specific programs with which teachers were happy were Windows on Science, produced by Optical Data, and Video Discovery.

The use of distance learning was being discussed throughout the country, but none of the schools I visited was yet using it with students. In Ohio I was, however, introduced to CU See Me for the first time. Cornell University (CU) has a program whereby classrooms around the world can communicate and engage in discussions and projects together. Cornell coordinates the program with experts and scholars in certain fields becoming available to students in many different countries. School with Internet connections of at least a 56K bandwidth can log on with visual and auditory images (See Me). A T1 line would be even better for such programs, but it is not absolutely necessary.

The concept of bandwidth was completely new to me, and I am still not sure I understand it properly, yet I did learn that increased width improves the type of communication possible across a cable. T1 appeared to be the widest in use in the schools I visited.

Students in a few of the schools I visited were quite proficient in the use of HyperStudio, a commercially-produced software program. With this program middle school students were preparing their own interactive software program; in one school in Indiana, for example, seventh grade students had designed and created a program to be used by fourth graders prior to their annual field trip to Conner Prairie to learn about Indiana state history. The program which the seventh graders created allowed the younger students to view a map of Conner Prairie and click on various parts of the map to get a more detailed view of that particular spot. The seventh graders had included in various parts of the program pictures they had taken, music they had taped, and interviews with employees at Conner Prairie. In designing the program, they had learned not only about Indiana history but also about technology and its applications as well.

As far as courseware was concerned, I saw two effective, though somewhat costly, programs being utilized. Success Maker is an integrated learning system which allows for individualized instruction in mathematics and language arts. At least one file server is required, and the school I saw using it in Kentucky used it in a lab-type setting. Groups of students, accompanied by their class teacher, visited the lab once a week to work on specific objectives which could vary from student to student. This particular school had 16 Macintosh computers available for using Success Maker.

DOS-based courseware is also available from IBM. TLC (Teaching and Learning with Computers) is a total curriculum with components in mathematics, language arts, and reading. Although I did not get an opportunity to see it in a school setting, I previewed it at one of the technology conferences I attended during my sabbatical and was very impressed with the scope and quality of programs. Statistics given by schools utilizing TLC were most impressive.

I was thrilled to see that courseware and curriculum enhancing programs were not limited to math, science, and language arts. Yamaha has a fine program called Music in Education which utilizes networked keyboards to teach everything from notation to pitch and rhythm. They provide comprehensive teacher training to those who either purchase or lease the

program and have an 800 number for technical assistance. Music in Education requires no special wiring and is managed through a teacher work station with one Macintosh computer. The program includes everything from a seating chart component which automatically records students' responses to a grading program. The students I saw being instructed with Music in Education had a very high level of participation and enthusiasm.

Accelerated Reader is a comprehensive reading program used by many schools throughout the country. It is a computer-based tool that encourages students to read more and better books.

Creating a Model Program from What I Learned

Given all my experiences during the sabbatical and all the information I was given by generous administrators from Louisville to Seattle, I now have a definite idea of the type of program I want for my school. It would be a combination of the best things I saw. It would include educational technology as well as technology education.

For starters, I would hire a technology coordinator. I have learned that this position is necessary if resources are to be used to their best advantage. The technology coordinator's job would include:

a. keeping abreast of the latest developments in educational technology and working with the administrator to see that the school keeps current;
b. providing inservice training for all staff members (faculty, administration, and office staff) on an ongoing basis;
c. trouble shooting problems which arise with hardware and software;
d. working with small groups of students in technology education;
e. coordinating community volunteers with technological expertise who would like to offer services to the school;
f. chairing the technology committee of the school and guiding this group in formulating and revising a technology plan for the school; and
g. aggressively seeking funding for the school's technology budget.

A technology plan would be essential for the school. It would be a working document, to be revised and modified annually by a technology committee comprised of teachers, parents, members of the School Board, and student representatives. Educational objectives would be the backbone of the technology plan, and every part of it would be tied to educational outcomes. The goal of the technology plan would be to facilitate the acquisition of knowledge, not the acquisition of equipment.

My model school would not have a computer lab, nor would it have computer classes. Technology would be as much a part of daily routine as the use of marker boards and textbooks. We have classes in neither; why do we need classes in computers?

Each classroom would have five computers, which would be used by small groups of students throughout the day. In this computer center within the classroom, students would not be limited solely to practice and drill. They would use specific courseware to be introduced to concepts. They would not be limited to all working on the same level; the teacher would manage the courseware to provide for the varied ability levels within the class. Students would use the computers to access the Internet for research purposes. Using HyperStudio and similar programs, students would be able to create multimedia portfolios and presentations for their own use and that of other students. Since all the computers in the school would be networked, students would access information in the Media Center without leaving the classroom.

Utilizing computers in this way requires a shift in focus and additional training for many teachers. My model school would, therefore, provide time within a teacher's regular schedule for

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exploration of hardware and software. I am firmly convinced that we must provide this time for teachers or technology will never be integrated into the curriculum in ways most advantageous for students.

Instead of a desk, each teacher in my model school would have a teacher work station like the ones I described. Since teachers would need to model the effective use of technology, very little paper would be generated for routine administrative purposes. Lesson plans would be done on computer and sent via the network to the administrator. Grade books would be electronic and parents would have dial-up access to them over special phone lines. Teachers would no longer have to send home weekly progress reports for students with a tendency to fall behind in assignments; parents could dial in and know the results of all assignments and tests as soon as they are posted by the teacher. (Phone Master has already made this technology available by working with Excelsior Grade 2, an excellent grade book program.) Homework assignments, of course, would be available with dial-in access as well.

A system of internal e-mail would be used throughout the entire school. All written communication within the school would be by computer only. Requests for repairs would be sent to the janitor via e-mail, and lunch would be ordered by students and staff alike utilizing the network. Weekly staff communications would be posted on the network, rather than being placed in mailboxes. There would be no need to send attendance information to the office by messenger. Time and trees would both be saved through effective use of a comprehensive e-mail system. Staff would have access to the school's network from their home computers via modem.

The media center would be highly technological. All services would be fully automated. The traditional card catalog would cease to exist. Computers in the media center would connect to the local public library as well as the state university system. The school would subscribe to automated guides to periodic literature and to electronic news services. The centralized media retrieval system would be prominently housed here as well, and students would help in its programming and operation.

Great care would be take that students still develop a love for books. Quiet corners and a reading room with soft chairs and couches would be an essential part of the media center, so that students would be encouraged to take a book, settle down, and read for pleasure.

Since technology is changing the daily lives of our students and changing our view of the world, I believe we have a moral obligation to address the impact of technology and media from a Catholic perspective. There is a definite need for media literacy throughout the curriculum in all schools, but the need is more acute in a school which emphasizes technology. In my model school, therefore, media literacy is a concept that would be woven throughout curricula for social studies, health, literature, science, and religion.

As part of the total program, students would have many opportunities to produce various forms of communication. Management of various media leads to a more complete understanding of how it can be purposefully and intentionally manipulated. A small video production studio which ties into a closed circuit television network would, therefore, be ideal.

The same technology used to manage the closed circuit television would control the intercom system, the bells, and the clocks. Every clock in the school would actually have the same time!

Part of the television network would be utilized for distance learning; foreign language instruction, for example, could be coordinated with teachers that are not physically on campus. Why hire a Spanish teacher and require all students to limit themselves to this one language when another high school in the same diocese already has a Spanish, French, German, Italian, Latin, and maybe even a Japanese teacher. Advanced mathematics and science courses could be coordinated in a similar fashion.

The technology already exists for my model school. What might have seemed far-fetched for a Catholic school even five years ago is now within reach. It is up to us to make it happen.

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Survey Research: The Effectiveness of the New Frontiers Program

David A. Bouton

During the summer of 1996 we conducted a survey of New Frontiers graduates. The purpose of the survey was to determine the effectiveness of New Frontiers over its first four years and to identify initiatives taken in technology by graduates in hopes of networking the information. Survey results provided a ringing endorsement for New Frontiers as a mechanism for Catholic schools to explore the possibilities which technology can serve in support of the learning process.

Two surveys were prepared and distributed. One was intended for administrators, counselors, and librarians. The other was constructed for teachers. Packets were sent to each of the 44 elementary and secondary schools from around the country which had sent representatives to the conferences between 1992 and 1995. Most attending schools were represented by their principal, technology coordinator (if they had one), librarian, and a faculty member. We received completed surveys from 15 principals/librarians and from 28 teachers. Of the 44 schools, 23 (or 52%) responded. The 43 responses comprised 32% of the 134 total school representatives who had attended New Frontiers through 1995.

As in many major endeavors, most respondents reported that their greatest challenge was simply to "get started." Whereas only one-third of the schools had a technology plan before attending New Frontiers, 93% reported that they had developed a technology plan since attending New Frontiers. Over 69% of attendees also reported employing a technology coordinator since New Frontiers, compared to only 31% having a technology coordinator beforehand.

One of the most significant challenges that is encountered with the introduction of technology is teacher training. Part of the dilemma is caused by the resistance of some school employees to change. The other part is due to the failure or reluctance of educational leaders to recognize the importance of such training in preparing teachers to incorporate technology into their pedagogical tool kits. Respondents reported that New Frontiers had "some effect" (47%) or "great effect" (40%) on the importance of training teachers in technology at their schools. In

fact, in two-thirds of the schools over 60% of the teaching staff had received training in technology since attending New Frontiers. Over two-thirds of the schools listed in-house resources as the primary means of conducting faculty development in technology. Almost half of the schools reported spending less than five hours per year on technology training.

New Frontiers, a Catalyst

There is no doubt that a workshop like New Frontiers can serve as a catalyst for the possibilities that technology can provide to the learning process. Eighty-seven percent of responding schools reported that New Frontiers had impacted on the quantity and quality of resources they had dedicated to technology. One-third of the schools have networked their library, computer lab, administrative functions, and classrooms. Half of attending schools have emplaced their networks since attending New Frontiers. One-third of the teachers trained in technology use technology in support of classroom activities at least 75% of the time. The major reason given for not using technology in instructional support is funding limitations.

One of the limiting factors in employing technology in schools is money. New Frontiers has again, however, had a positive effect. All but one attending school spent less than $20,000 a year on technology before New Frontiers. Almost 30% now spend over $50,000 a year on technology. Budgeted money accounts, on average, for 45% of the dollars spent on technology, however, 53% of the schools have received grants for technology. Of the schools which have received grants, almost half of their monies allocated to technology came from that source.

One of the most important contributions that New Frontiers has made for attending schools is *why* technology is important and *how* it should be viewed. Technology is not an end in itself. It is becoming part of the fabric of the workplace into which our students will enter. The Industrial Age is behind us. Most scholars contend that we are now in the Information Age. Some, like David Thornburg, argue that we have already moved past the Information Age to what he terms the Communications Age. In either case, it is clear that our children need to understand the practical applications of technology. They need to be personally competent in its use. Beyond that, our children need to appreciate the power of technology as a communications tool and the impact it is already having on the world. Respondents report that New Frontiers embedded both goals in their minds as professional educators.

The New Frontiers experience has also had a tangible impact in the schools of those who have attended. Student achievement has improved in various forms. Students exposed to technology are producing higher quality work, especially in writing. More students are engaged in day-to-day classroom activities. There is a higher level of enthusiasm for completing projects. A higher spirit of cooperation exists among classmates.

There has been a noticeable change in teacher behavior. More teachers have a healthy sense of curiosity, and a renewed interest and enthusiasm in their work. They are more involved with parents. They are motivating their students more effectively. As teachers become more confident in the role that technology can have in their classrooms, they become more open to the varied intelligence strengths of their students. They tend to assume a new role as facilitators of learning rather than as imparters of knowledge. Technology is allowing teachers to expand their horizons in curriculum, pedagogy, and assessment. Technology is helping teachers use their time more effectively.

The learning process itself is also enhanced by the thoughtful application of technology. Planning and coordination tend to improve as teachers vie for access to precious few work stations. Technology provides students with more diverse avenues for research, and teachers with more options for assessment. Technology facilitates collaboration and it creates opportu-

nities for group problem solving. Students are provided with a hands-on learning tool that involves them more actively in the learning process. Technology generates more excitement for students and teachers. Learning can actually be fun! Perhaps, most importantly, technology generates more learning through understanding of concepts and ideas, rather than through memorization of facts.

There is another tangential effect of technology, particularly for Catholic schools. It engenders a feeling of school pride that transcends those in the school and includes parents, alumni, and even neighbors of the school. Respondents reported that technological advances have a bonding effect inside and outside of the school itself. Technology has become an important means of leveraging prospective donors. Parents and alumni see technology as an attractive, constructive way for their donations and gifts to be used. The entire school family becomes more aware of themselves as a learning community.

New Frontiers Beyond the Classroom

Many New Frontiers alumni have also recognized the potential impact of technology beyond the classrooms. Efforts are under way in many schools to automate report cards, progress reports, attendance, and grade books. Publications and yearbooks are being produced using authoring software. Business officers, development directors, admissions directors, and registrars are able to accomplish more and more of their work on computer work stations. Some schools have even automated their daily announcements. The library, as we have known it in the past, has given way to the media/resource learning center, much of which is automated.

Communications with parents and homes is enhanced through electronic bulletin boards, E-mail, and voice mail. Homework is being electronically posted in case students have the means and/or need to access that information. School events, admissions information, and newsletters are now posted on school home pages which are accessed on the Internet. Schools are advertising position vacancies in the same way. We should take seriously the fact that about one out of every four students now has a computer work station at home, most with Internet access.

The New Frontiers experience has been valuable for attendees in a variety of ways. They report receiving a sense of empowerment, commitment, and affirmation from the experience. It is important to interact with others who are further along with technology and who have been successful in employing it. New Frontiers has provided an excellent opportunity for team building among those who attended from each school. Attendees have found value in being exposed to the latest advances in a field that seems to be changing daily. The networking value of the workshop cannot be overestimated. Many attendees report maintaining contact with other, like-minded graduates of New Frontiers. The other common thread reflected in the surveys is a focus on the future, and how best to harness the explosion of technology in ways that are affordable and value-added to the learning process.

New Frontiers, a Stimulus

What New Frontiers has accomplished is to provide a stimulus to move forward and to take calculated risks to do what is right by our children. Constraints in money, training time, and resistance to change are limitations that we have to face anyway. The question that is implied by New Frontiers is, can we afford *not* to embrace technology within the limits of our resources and sense of mission for the future? New Frontiers has also served as a selling point for rallying community interest in the schools. Business partnerships are facilitated when those who will be employing our graduates see that we are focusing on skills they consider vital to their ability to compete in the marketplace of the future.

Useful Lessons

Respondents have shared some useful lessons from their experience with technology. Firstly, had they to do it over again, they would move more slowly. Technology is not cheap. We owe it to our tuition-paying parents to spend their dollars prudently as we integrate technology into our schools. Secondly, the principal has to be on board. He or she must understand and actively support the value and power that technology can bring to the school. They do this through budget decisions and philosophical support. Lastly, respondents report that more teacher training should have been done up front. Equipment and software acquisition should be timed to coincide with the capacity and motivation of faculty members to use it.

Conclusion

In conclusion, the value of New Frontiers to the schools which have been represented to date cannot be underestimated. Before New Frontiers, 46% of attendees could perform numerous technology tasks or perceived themselves as technologically competent. After New Frontiers, 78% perceived themselves as technologically competent. The real value in this is the *attitudes* that New Frontiers attendees have taken away from the experience. The facts indicate that when Catholic school leaders are exposed to the potential that technology can bring to their schools, they actively pursue integrating it into their respective environments. The results that have been reported in student achievement, teacher behavior, and learning process speak volumes for the value that technology can have in our schools and for the value of New Frontiers as a catalyst to consider the possibilities.

David A. Bouton is headmaster of Benedictine High School in Richmond, Virginia, and a New Frontiers alumnus.

APPENDIX A

Study Guide for *Aetatis Novae*

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STUDY GUIDE

FOR

AETATIS NOVAE

(THE DAWNING OF A NEW ERA)

Pontifical Council for Social Communications

Vatican City

1992

Prepared by
Angela Ann Zukowski, MHSH, D.Min.
Executive Director
The Center for Religious Communication
January 1993

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THE CENTER FOR RELIGIOUS COMMUNICATION
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"The people of God walk in history. As they...advance with their times, they look forward with confidence and even with enthusiasm to whatever the development of communications in a space age may have to offer."
(Communio et Progresso n.187)

INTRODUCTION

"The Dawning of a New Era" (Aetatis Novae, Vatican 3/17/92) offers Church leaders, communicators, educators and ministers a foundation for both reflecting on the new trends in social communications and communication technology, as well as, guidelines for designing integrated pastoral communication plans to support the mission of the Church in the 21st century.

In 1988 eighteen international Church communicators met in Nemi, Italy. The purpose of the gathering was to discuss the impact mass media and new technologies have had on the development of cultures and the mission of the church since the introduction of COMMUNIO ET PROGRESSIO (Pastoral Instruction on Social Communications, 1971). COMMUNIO ET PROGRESSIO is considered the Magna Carta of Church documents on social communications. In this document one finds both a clear articulation of the meaning and role of social communications for the Church, as well as, challenges for the Church to assume a proactive position in the information age.

The Nemi participants spent eight days reflecting on their cultural experience of Church communications and analyzing the 1986 international survey (Vatican) prepared for this convocation on the status of Episcopal Conferences (National and diocesan) implementation of COMMUNIO ET PROGRESSIO. The ultimate goal of the convocation was to offer pastoral insight and direction in social communications for "the dawning of a new era" for the Church in contemporary culture. The Nemi participants emphasized that if a new document were to be considered it should be a "supplement" not a replacement for COMMUNIO ET PROGRESSIO, thus building on the solid theological foundation expressed in COMMUNIO ET PROGRESSIO. The new document should reflect emerging developments in communications technology and mass media and their impact on the Church and society today. It was further recommended that the style and format of the new document be innovative. This could be realized if the document were short, simple, prophetic, and proactive with practical pastoral guidelines for implementation. The complete set of recommendations was presented to the Plenary Sessions of the Pontifical Council for Social Communications (Vatican City) following the Nemi convocation. These recommendations were accepted by the Pontifical Council for Social Communications. Thus began the three year process of developing AETATIS NOVAE incorporating international consultations of pastoral communicators and Church leaders. On February 22 AETATIS NOVAE was approved, and on March 17, 1992, introduced for implementation.

AETATIS NOVAE is a timely document. its message comes at a time when new diocesan structures are beginning to evolve. The message of AETATIS NOVAE is directed not only to bishops but to all persons who serve in education and ministry leadership positions in the church. The document states, "Catholic media work is not simply one more program alongside all the rest of the Church's activities: social communications have a role to play in every aspect of the Church's mission. Thus, not only should there be a pastoral plan for communications, but communications should be an integral part of every pastoral plan, for it has something to contribute to virtually every other apostolate, ministry and program" (Art.17).

The idea of an integrated pastoral plan for social communications is the heart of AETATIS NOVAE. The appendix, therefore does not stand as an afterthought but as the key for implementing the vision of the document. It presents the basic steps and elements to be considered in designing an effective, integrated pastoral communications plan.

What does AETATIS NOVAE mean for Catholic Communicators and ministers? I believe there are five important challenges which are based on collaborative efforts in communications (#30) of all ministries in the diocese. They invite us to reflect on the new media culture and to determine our role and relationship to this new culture within a Christian Catholic context (#4,6). Finally, these challenges encourage us to identify practical steps to prepare church leaders and the Christian community to be able to listen, dialogue and respond to the gospel message in the 21st century (#8). The key challenges are: 1) equipping Church leaders to understand, interpret and speak the "new language" of the new media culture (#1,2.8,11); 2) equipping all church ministers with media literacy skills (#4,7,8,9,12); 3) comprehending and responding to the social justice significance of the new media age and its impact on the development of peoples and cultures (#4,7,8,9,15); 4) equipping Church leaders and ministers with skills to use mass media and new technologies as a means to "offer meaningful proposals for removing obstacles to human progress and the proclamation of the Gospel" (#8,11,13,14); and 5) designing an integrated pastoral communications plan central to all the ministries of the Church (#21-33).

In closing, AETATIS NOVAE reminds us that "As the Spirit helped the prophets of old to see the divine plan in the signs of their times, so today the Spirit helps the church interpret the signs of our times and carry out its prophetic tasks, among which the study, evaluation, and right use of communications technology and the media of social communications are now fundamental". (#22)

THE STUDY OF AETATIS NOVAE

In order to support and encourage the study and implementation of AETATIS NOVAE the following questions have been developed. Three sets of questions are presented: 1) **MODEL A- A COMPREHENSIVE APPROACH TO AETATIS NOVAE** (Church leaders and Church communicators); **2) MODEL B- A STUDY GUIDE FOR PASTORAL MINISTERS AND EDUCATORS;** and, **3) MODEL C - A STUDY GUIDE FOR PARISHES AND FAMILIES.**

It is recommended that study circles read AETATIS NOVAE along with the document **COMMUNIO ET PROGRESSIO** (Pastoral Instruction on Social Communications, 1971). The interplay of these two documents can strengthen the impact and follow up of your discussions.

The purpose of this study guide is threefold: 1) to raise consciousness to the importance of communications to the mission of the Church; 2) to encourage a new integrated approach to pastoral communication planning in relationship to all the ministries within the Church; and, 3) to take time to become familiar with significant documents on Church communications as we stand on the threshold of the 21st century.

AETATIS NOVAE picks up the momentum of REDEMPTORIS MISSIO, in stating: "It is not enough to use the media simply to spread the Christian message and the Church's authentic teaching. It is also necessary to integrate that message into the 'new culture' created by modern communications...with new languages, new techniques and new psychology." (#37).

Following the inspiration of those Church communication leaders who prepared these important documents for our reflection and action for the "new media culture", we hope each person will endeavor to explore creative and innovative ways to bring your discussion(s) to bear on specific and practical methodologies for designing effective pastoral communication plans for your parish, diocese and ministries for the 21st century.

How might you use these materials:

- — The foundation for a diocesan synod discussion on communications.
- — The design of an in-service day for diocesan Church leaders/ ministers.
- — The basis for days of reflection for communication staffs and Catholic lay communicators in the media industry.
- — Reflection questions for special breakfasts for Catholic lay communicators in the mass media in your community.
- — Focus questions for an interdisciplinary meeting of ministry personnel in your diocese.
- — Adult religious education session(s) in the parish.

These materials may be duplicated and adapted to your particular culture and ministry.

We are eager to hear about the results of your discussions. It is our hope to develop an international network on sharing the insights, implications and applications of your discussions to enhance future developments related to the Church, communications and the media culture.

Sincerely,

Angela Ann Zukowski, MHSH, D.Min.
Executive Director

"We encourage the pastors and people of the church to deepen their understanding of issues relating to communications and media, and to translate their understanding into practical policies and workable programs.."

(Aetatis Novae n.3)

"The church therefore must maintain an active, listening presence in relation to the world-a kind of presence which both nurtures community and supports people in seeking acceptable solutions to personal and social problems."

(Aetatis Novae n.8)

MODEL A: A COMPREHENSIVE STUDY OF AETATIS NOVAE

(Church Leaders and Diocesan Communication Personnel)

1. How does media impact you or your communities religious and moral attitudes; political and social systems; and education? Give specific examples. What response can/should we make? (#1)

2. How do you perceive that communications influenced the "radical transformation" in '89-92 in Europe? Give examples. What about the impact on your perceptions of the situation? (#1-#4)

3. How has communications turned humanity into a global village? Give examples. (#1)

4. What special insights and/or contributions has "Inter Mirifica" and "Communio et Progressio" made on our/Churches/communities understanding of social communications?

5. Do you think people are more or less influenced by the media for their formation and development? Give examples.(#2)

6. What are the new possibilities and new pastoral problems which emerge because of the "new media"? (#2)

7. What is the short and long range impact of the developments in communication technology in our society for the development of human persons and on the mission of the local Church? (#3)

8. What ecumenical or inter-religious media cooperative efforts exist in our community? What new steps/approaches should be taken for the 21st century? (#3)

9. Does social communications determine our response to life and the development of peoples? Give examples. (#4)

10. If individuals/groups do not have access to the media, are all avenues for experiencing themselves closed in our culture? (#4)

11. In reference to #10 above, give examples from your community which demonstrate individuals/groups are silenced or closed off because of their lack of access to the media? What steps might be taken to address this situation?(#4)

12. What can we do to insure all peoples have access to information and are able to express themselves through the media resources in our community? (#4)

13. What are the advantages and disadvantages of deregulation and privatization in public telecommunications and broadcasting systems for our country and culture? (#5)

14. Is it possible for us to influence mass communication towards a richer sense of service to our communities? How? Why? (#5)

15. Why should we be concerned about the cross fertilization of one cultures "media experience" to another? (#5)

16. What steps do we take in our work to equip individuals with skills to discern the impact of the mass media on our lives and culture? (#5)

17. What theological principles are fundamental for understanding the importance of social communications? (#6)

18. How could the media contribute to the integral development of the person? (#7)

19. What is your experience of how media does or does not contribute to the development of the person in our culture today? Give examples. What steps can we take to address this concern? (#7)

20. Is media hindering or supporting human interaction in the family, work place and related social interactivity? Give examples. (#7)

21. How can the Church achieve an authentic "listening" presence in the world? What are the implications for the Church and the world? (#8)

22. How concerned are we with media policy and its impact on our culture? (#8)

23. What current media policies are under consideration locally/nationally/internationally requiring reflection and action on our part? (#8)

24. Why is communicating the Gospel essential for our culture? (#9)

25. What is your experience of dialogue/information within the Church? What steps can be taken to strengthen these activities? (#10)

26. How does the Church integrate the message into the "new culture" created by modern communications...with new languages, new techniques and new psychology". (#11)

27. What steps are we taking to critically evaluate the mass media and its impact upon our local and national culture? (#12)

28. Give current examples about how the mass media exacerbates individual and social problems? (#13)

9. Is the right to communicate a fundamental right and duty for all persons and cultures? If yes, how do we preserve it within our culture? (#15)

30. What are the various alterative forms of communications available to the church/culture today? How can we use them more effectively for communicating the Gospel? (#16)

31. How does our local church develop, maintain and foster communication instruments and programs? What steps need to be take to enhance or initiate these instruments and programs for effective ministry? (#17)

32. Is pastoral communications planning part of all our ministry planning sessions? How? Why? What steps are required to insure such a process? (#17)

33. What communication skills/formation are required for all people in ministry? What does our diocese/local church offer? (#18)

34. What type of pastoral professional support/care does our diocese/local church offer communication professionals in the media industry? How kind of priority is it for us? (#19)

35. Is communications work given an appropriate priority in your diocese/local Church? Why? (#20)

36. Who are the principle initiators of communication activities in your diocese/local Church? (#20) What Church support is offered?

37. What steps are taken to integrate these communication initiatives into the overall plan of our diocese/local church? (#20)

38. Identify key pastoral plans currently implemented by your diocese/local church? Review to see if the elements discussed in AETATIS NOVAE are incorporated in these plans. (#21)

39. If no to question 38 above, what aspects can be incorporated for the coming year?

40. Does our diocese/local Church have an integrated pastoral communications plan? If yes, are the elements described in AETATIS NOVAE included in our plan? (#24)

41. What steps are taken to include the five key issues to the plan described in AETATIS NOVAE #28-33?

MODEL B - STUDY GUIDE FOR MINISTERS AND EDUCATORS

1. Give specific examples how media can influence our values, attitudes, beliefs and behavior?

2. What practical steps can be taken to educate ministers, educators and the laity to the relations and impact of media and culture?

3. How has the media influenced your perception of world events? Give examples. Have you found a conflict in information in various types of mass media?

4. What problems exist in our culture in the '90's due to mass media?

5. Is mass media (social communications) the primary influence for what determines what is of importance or significance to us? Give examples.

6. Why is communications important for the Church?

7. What theological elements should be considered in defining a theology of communications for our ministries?

8. What is your experience of how media does or does not contribute to the development of the "person" in our culture today?

9. How can the Church assume a greater "listening presence" in our culture"? What role can we play?

10. How does the Church integrate her message into the "new culture" using a new language, new technologies and new psychology in order to dialogue, evangelize and catechize more effectively?

11. How does our local Church maintain and foster effective use of all media and support programs related to media education and media skill development?

12. Do the pastoral plans we have for various ministries include elements of pastoral communications as described in AETATIS NOVAE (#17-33)?

13. Does your diocese/local Church have a pastoral communications plan? How does it integrate the key elements of AETATIS NOVAE?

MODEL C- STUDY GUIDE FOR PARISHES AND FAMILIES

1. How does the media influence our formation of attitudes, values, beliefs and behavior?

2. To what extend has the mass media influenced our perception of world events? What steps do we take to assure a well-balanced perception for ourselves and family?

3. What is the long and short range impact of communications technology on our family relations, dialogue, work and use of time?

4. What community responsibility do we have to insure that all persons have the opportunity to express themselves through the media?

5. What are the threats and opportunities to deregulation and privatization of mass communications in our culture?

6. Do we have a moral responsibility to be concerned with the reality that our media programs and projects influence other cultures? Explain.

7. Why should the church be concerned about the development of communications technology and communications in general?

8. Does media hinder or support human interaction? Give examples?

9. Does our parish have professional communications personnel? How do we support them? How do we incorporate their gifts for enhancing the mission of our parish?

10. What is our experience of authentic dialogue with the local Church? Are there areas we can improve our dialogue? How?

11. What communication skills/awareness could help us as a parent, friend or family member to relate more wholistically?

12. What type of parish communication programs would enhance the mission and ministry of our parish?

13. Does our parish effectively use all the means of communication to enhance our mission and image within our local community? What can we do?

14. What elements of AETATIS NOVAE could we incorporate into our parish plan?

"(Communications) is the proclamation of the gospel as a prophetic, liberating word to the men and women of our times; it is testimony, in the face of radical secularization, to divine truth and to the transcendent destiny of the human person; it is the witness given in solidarity with all believers against conflict and division to justice and communion among peoples, nations, and cultures."

(Aetatis Novae n.9)

"...in today's world, so strongly influenced by media, church personnel require at least a working grasp of the impact which new information technologies and mass media are having upon individuals and society.."

(Aetatis Novae n. 18)

THE CENTER FOR RELIGIOUS COMMUNICATION

Church documents over the past 30 years have repeatedly reminded church leaders that effective communication is at the heart of the Church's mission and ministry.

To assist the Church nationally and internationally in achieving its communication objectives, the Center for Religious Communication:

- monitors the development of new communication technologies
- conducts research in pastoral applications of the latest communication methodologies
- offers workshops and seminars
- sponsors the annual Pastoral Communications Institute
- produces Focus on Media in Ministry and other publications and videos highlighting new models of pastoral communication
- offers consulting services for dioceses, parishes and religious congregations
- works with the National Catholic Educational Association, the National Council of Churches, the World jAssociation for Christian Communication, the Pontifical Council for Social Communications, Unda-USA, Unda-World, and other national and international organizations to further the progress of religious communication.

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"Every episcopal conference and diocese should therefore develop an integrated pastoral plan for communications, preferably in consultation with representatives of international and national catholic communication organizations and with local media professionals."

(Aetatis Novae n. 23)

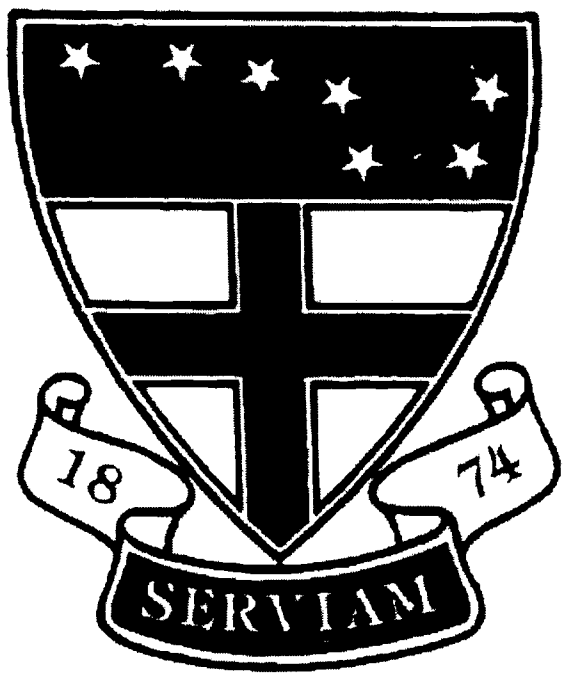
APPENDIX B

Ursuline Academy of Dallas: Educating Today's Young Women for 21st Century Leadership

(Reprinted with permission)

Ursuline Academy of Dallas

Educating Today's Young Woman for 21st Century Leadership



Ursuline Academy
Technology Plan
March 22, 1996

BACKGROUND INFORMATION

Ursuline's 121 Year History in Dallas

As the oldest continuous private school in Dallas, Ursuline Academy was first chartered by an Act of the Texas Legislature in 1876. The first school was located on the site where the Federal Post Office now stands, then relocated to East Dallas, on a city block bound by Bryan, Haskell, Live Oak, and St. Joseph streets. This imposing gothic structure was built in 1882 with additional wings completed in 1890 and 1902, and served as a grade school, high school, boarding school, and convent for sixty-seven years.

The present campus, located on Walnut Hill Lane in Preston Hollow since 1948, contains nine buildings on twenty-five acres. It is an idyllic campus conducive to learning. In 1990, the Texas State Historical Society acknowledged Ursuline's tree-filled site of distinctive buildings and beautiful extending lawns as a Texas historical site. A visible sense of Ursuline's tradition remains even today.

Ursuline's Purpose and Mission

Ursuline Academy provides an exceptional educational opportunity for young women from diverse backgrounds to pursue excellence in learning and application, Christian values and leadership. Our students' total growth and development, moral, spiritual, intellectual, social and physical, in a genuine Christian community, is the essence of Ursuline's mission. Our methods of instruction address individual learning styles while utilizing a contemporary curriculum and technology.

Ursuline Academy's tradition of quality education for young women is affirmed by the increasing evidence of the advantages of all-girls settings in education. According to a recent study by Wellesley College, girls in all-girls schools experience a higher rate of achievement since they receive more attention in class than in a coeducational setting and respond positively to the resulting higher expectations of their teachers.

Ursuline's Tradition of Serviam

The community of students is continually encouraged to look outward through a spirit of *Serviam* - "I will serve." Ursuline promotes this philosophy through an outstanding community service outreach program, to challenge our young women to assume roles of leaderhsip in our community and to recognize the responbilities by utilizing their gifts of mind and spirit to help others.

Last year students at Ursuline provided over 12,000 volunteer hours of service to innumerable not-for-profit and service agencies in Dallas, e.g. Dallas Society for Crippled Children, Special Olympics, national Kidney Foundation, Austin Street Shelter, Amigos de las Americas, Literacy Volunteers of America, and Stew Pot Kitchen, to name a few.

The Meadows Foundation of Dallas has honored Ursuline students four out of the last five years for their community work (Charitable School Project Award).

HIGHLIGHTS OF TODAY'S URSULINE

URSULINE ACADEMY was founded in 1874 by the Ursuline Sisters and is the oldest private school in Dallas. Educating young women in grades 9-12, the Academy is a college-preparatory school in the Catholic Christian tradition. Ursuline's culturally diverse student population is from a variety of socio-economic backgrounds, representing a cross section of society. The Academy has always welcomed students of all religious denominations.

STUDENT POPULATION

707 students and waiting list
14.5% minorities (African American, Asian, Hispanic and other)
24% non-Catholic

FACULTY AND ADVISORS

65% teaching faculty
70% hold advanced degrees

ACCREDITATION AND MEMBERSHIPS

Ursuline is accredited by the Southern Association of Colleges and Schools; Texas Catholic Conference; Texas Association of Non-Public Schools (TANS); Texas Association of Private and Parochial Schools (TAPPS); and National Catholic Educational Association (NCEA).

FACILITIES

The campus is located on over 25 acres of land in an attractive residential area of Preston Hollow in North Dallas.
The educational complex is comprised of nine buildings, including the Beatrice M. Haggerty Library.

ACADEMIC PROGRAM

The challenging academic program includes theology, English, foreign languages, mathematics, science, social studies, physical education, computer science, math, and fine arts.
Community service is required of all students.
Honors and Advanced Placement courses are offered to qualified students in all subject areas.
The number of students in each class ranges from 10 to 25.
Student-teacher ratio is 13:1.
In the 1995 National Merit Scholarship program, 12 Ursuline seniors received recognition for academic achievement; 2 were finalists; and 8 received Letters of Commendation.
Two Ursuline students were recognized by the National Hispanic program.
98% of the graduating seniors continued on to colleges and universities throughout the country.

LANGUAGE AWARDS

Nine places were awarded to Ursuline students in the English language part of the TAPPS competition.
Ursuline linguists took high honors in French, Spanish and Latin competitions at the University of Dallas Academic Rally, including 1st place in 8 of the 12 categories.
An Ursuline student was the "building winner" at the E-SU Regional Contest held at the Dallas Public Library.

FINE ARTS

An Ursuline sophomore was chosen as a member of the Texas Music Educators Association All Region Jazz Band.
An Ursuline senior earned membership in the Texas Music Educator's Region Orchestra.
Ursuline students garnered 59 places in the annual TAPPS art competition.
Four Ursuline student art projects were selected for the City Wide Student Art Exhibition.
At the Texas Visual Arts Association High School Competition, 75 Ursuline entries were selected to show, and nine awards were given.

ATHLETICS

In 1995, Ursuline athletes soared to three State championships, Cross Country, Track and Soccer.
Last year the Ursuline Swimming/Diving team won second in State competition.
With a record of 21-7, the Softball team earned Championships in District, Bi-Distirct and Regionals.
Eight Ursuline seniors received athletic scholarships.
The Tennis and Golf teams placed fourth and third, respectively, in state playoffs.

RECOGNITION AND AWARDS

46% of the class of 1995 received over $2.9 million in merit and talent based scholarships and grants from colleges and universities throughout the U.S. and abroad.
In 1993, the United States Department of Education recognized Ursuline with the Blue Ribbon Award for academic excellence.
In 1995 Ursuline was the recipient of the Meadows Foundation's annual community service award.
In 1990, the Texas State Historical Society acknowledged the Academy's campus as a Texas historical site.

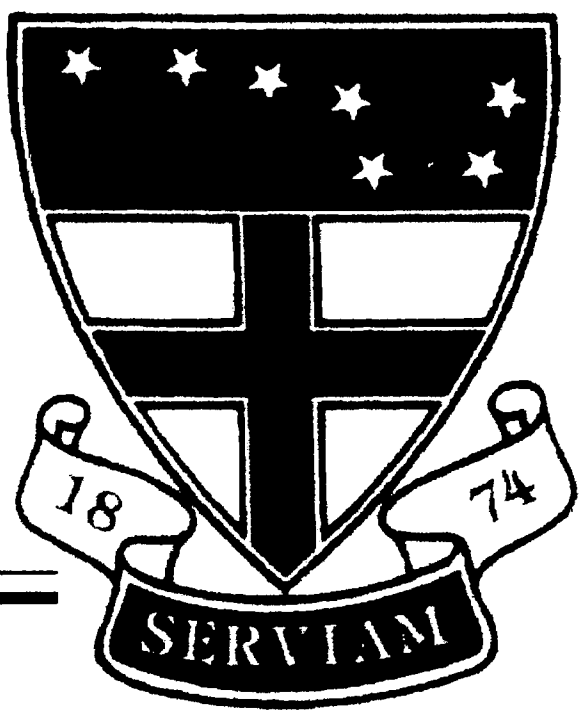
FINANCIAL

Tuition: $5,750 annually.
Balanced annual operating budget of $3,844,552
$186,001 was granted in scholarship aid, both merit and need based last year.
Ursuline has a modest endowment of approximately $2,500,000.

Our Vision

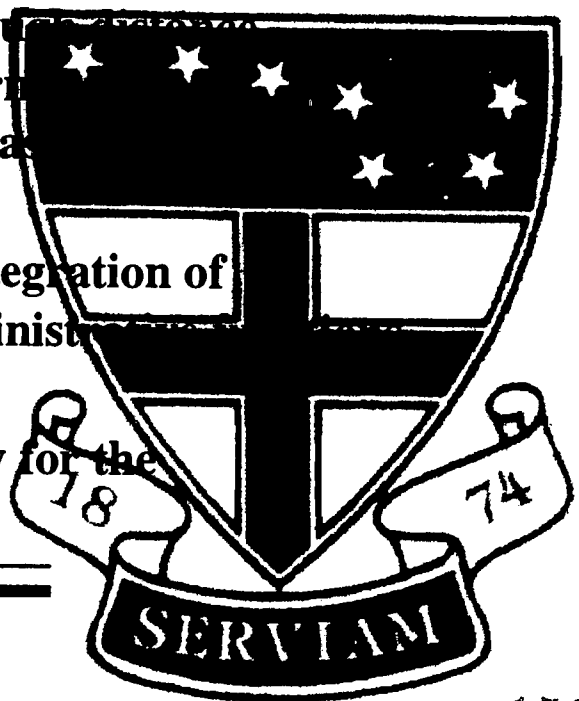
- Transform our industrial-age academy into an information-age school
- Afford all teachers and students the technological tools necessary to access, analyze, and utilize information
- Develop the mix of administrative and instructional methods and programs that continue to produce excellence and educational success.
- Create it by the year 2000.
- Support a purposeful path of innovation, evaluation, and continuing self-improvement.

With an eye on the future
and one foot in reality,
we'd like to share our vision.



GOALS for Integrating Technology

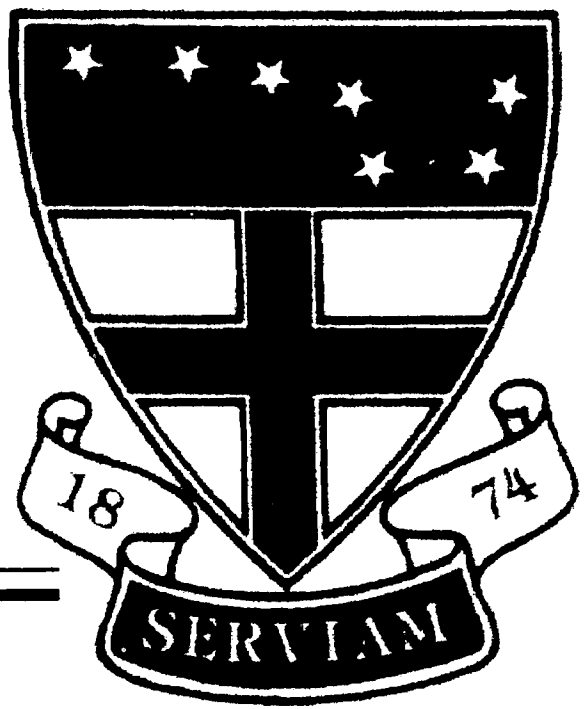
- **To create, by the year 2000, a national model secondary private school for girls through the infusion and integration of technology into all aspects of the educational program.**
- **To provide all Ursuline students access to state-of-the-art technology in order that they may flourish in an even-advancing technological world.**
- **To encourage self-directed collaborative learning thro… learning; and through the Internet to support an infor… superhighway which will infuse technology into every a… learning process.**
- **To offer extensive staff development to support the integration of technology into the curricular, instructional, and administ… of the school.**
- **To increase productivity through the use of technology for the instructional and administrative management of data.**



Overview

Ursuline's success for tomorrow depends upon the technology alliances made today.

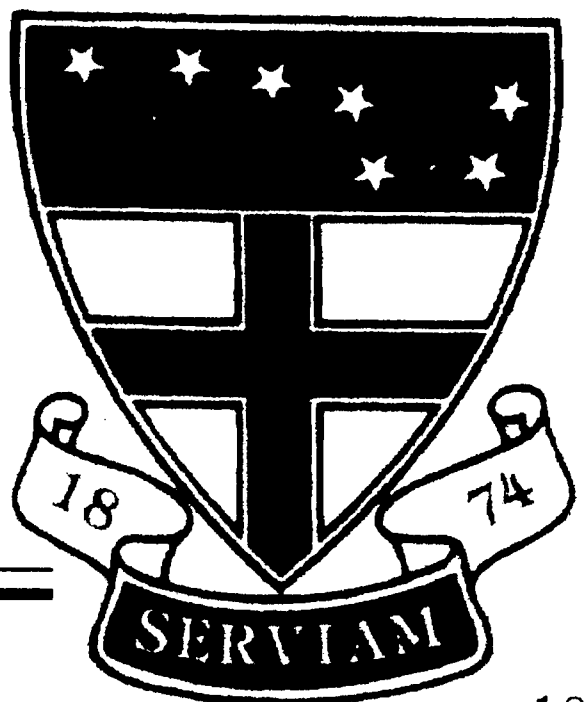
- Strategic planning
- High tech expertise
- Technology support
- Guidance/consultation
- Annual technology budgets
- Ongoing training of personnel
- Business partnerships



The Nuts and Bolts:
Needs Summary

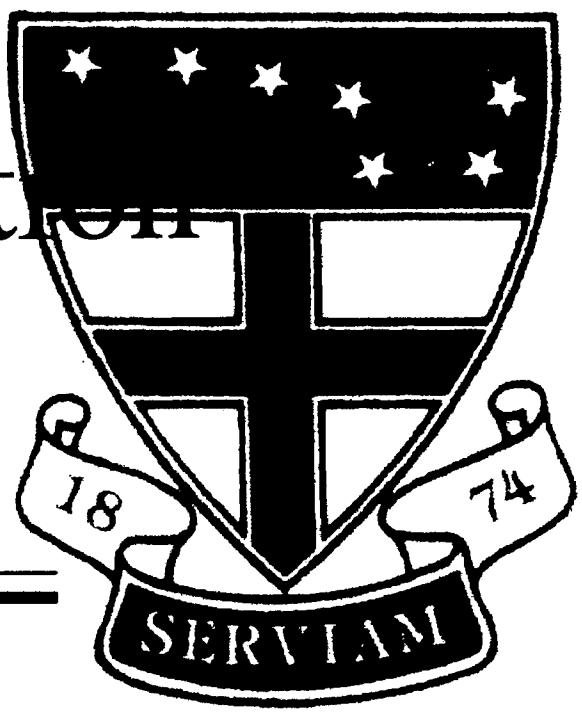
Total Project Cost: **$3 million**

- **A computer and phone line on every teacher's desk**
- **Lap top lease program for students and personnel**
- **Connectivity - networking throughout the school**
- **A multi-media foreign language lab**
- **Library/media center technologies**
- **Satellite technology infrastructure**
- **Two science labs with technology components**
- **State-of-the-art studio complex**
- **Teacher professional development**
- **Internet**
- **Technical support facility**

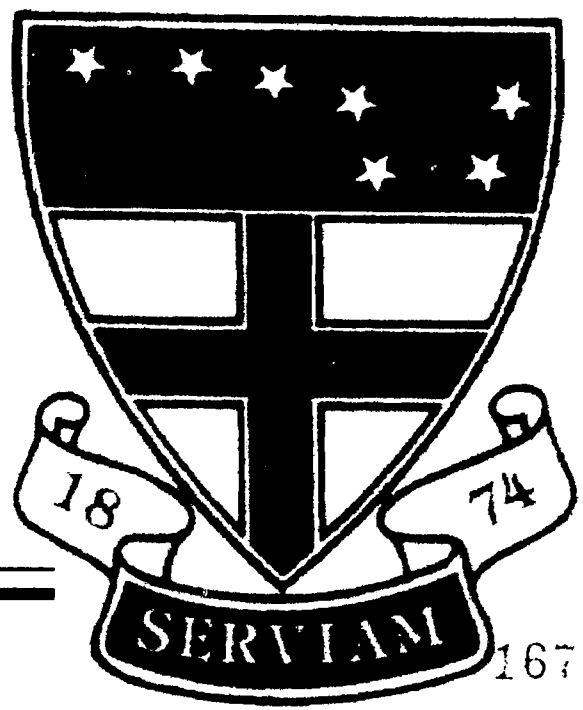


ACTION PLAN

- Infusing Technology
- Training Personnel
- Managing Information



INFUSING TECHNOLOGY



Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program

ITEMS REQUIRING COMPLETION

Phase I

STRATEGY	ACTION
Continue to provide students and staff with access to technology.	**Extend the distribution of power and network connectivity throughout all classrooms.**
	Provide intensive and continuous opportunities to update technology skills for faculty.
	Purchase printers to be placed in offices.
	Update the Macintosh and Windows labs.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
Provide students and staff with access to technology through expanded information services	**Accomplish Phase II of Library Plan** **Add at least another 7-Drive CD ROM Tower, 8 Pentium multi-media workstations in the library-media center.** **Upgrade the circulation infrastructure.** **Install a select version of a science index, etc.**

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
Continue to provide students and staff with access to technology	**Provide all educational areas with the ability to project information from computers**
	Purchase additional printers to be placed in strategic locations to provide greater student and faculty accessibility.
	Purchase recordable CD-ROM equipment for student and faculty production of multi-media.
	Purchase scanners, digital cameras and recording equipment for general school use.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
Offer a plan for each freshman family with the affordable opportunity to meet the requirement for student-funding of their own personal laptop computer. Mandatory starting with the class of 2000. Optional for classes of '97, '98 and '99.	**Find a lease/purchase package for student laptops inclusive of warranty, insurance, maintenance and software** **Provide work surfaces that are conducive to the use of laptop computers.**
Provide teachers and staff with affordable opportunity to purchase a personal laptop.	**Find a lease/purchase laptop package for Ursuline employees comparable to the student program.** **Equip and staff a facility to ensure in-house technical assistance for all computer users.**

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program

ITEMS REQUIRING COMPLETION

Phase I

STRATEGY	ACTION
Encourage all students and staff to communicate at local, national, and international levels	**Provide Internet access to faculty and students from all classrooms and the library**

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
Continue to provide students electronic access to college searches, application financial assistance, scholarship opportunities, and virtual reality visits to campus where this is possible.	**Purchase appropriate software and updates recommended by the College Board as well as on-line services as they become available.**
Give students and faculty/staff access to external information services.	**Afford students, staff, and faculty modem facilities to dial in from home to access the school library and to access the Internet.**

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
To incorporate advanced technologies to restructure the learning environments of all academic disciplines	**Provide continual opportunities for staff development in all phases of technology and curriculum.** **SCIENCE DEPARTMENT FOCUS** **Develop curriculum and instruction to implement the technology.** **Provide probes connected to software for lab experimentation.** **Upgrade stand-alone computers for science areas. Purchase necessary software to support new programs.**

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
	SCIENCE DEPARTMENT FOCUS **Redesign science classrooms with new desk consoles to accommodate technology integration with state-of-the-art science equipment.**
	MATH DEPARTMENT FOCUS
	Develop curriculum that addresses mathematical skills needed in today's technological society.
	Provide experimental interfaces to measure mathematical tasks.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY

ACTION

MATH DEPARTMENT FOCUS
Add open-ended software packages to allow for in-depth mathematical experimentation.

COMPUTER SCIENCE FOCUS
Develop a curriculum to reflect current trends in technology.

Purchase software necessary to implement and expand curriculum.

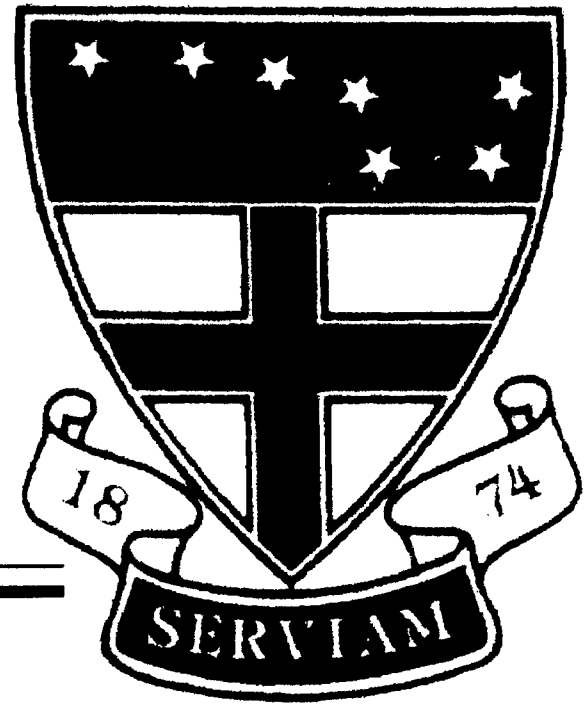
Build an additional computer environment that will enable learners to explore artificial intelligence and hardware construction.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
	FOREIGN LANGUAGE FOCUS
	Develop curriculum open to global influences and professional needs of Ursuline Academy students.
	Complete the foreign language lab with compatible computers.
	Purchase appropriate software to support lab activities and curriculum needs of all languages

TRAINING PERSONNEL



Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
	MUSIC
	Adjust and expand the music curriculum.
	Purchase appropriate software for the department.
	Plan for resources, space, and personnel to implement electronic music theory.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
	FINE ARTS FOCUS
	VISUAL ARTS
	Acquire three stand-alone computers for every art classroom.
	Position a scanner in each classroom.
	Purchase appropriate software for each art media.
	Provide three higher-end color printers for the department.

Infusing Technology Goal

To infuse and integrate technology into all aspects of the educational program
Phase II

STRATEGY	ACTION
	ENGLISH AND SOCIAL STUDIES FOCUS
	Develop dynamic curriculum to meet the needs of students in a technological society
	Purchase appropriate software to support curricular activities
	PUBLICATIONS FOCUS
	Upgrade computers in the publications labs.
	Purchase two scanners.
	Acquire a digital camera.

Training Personnel

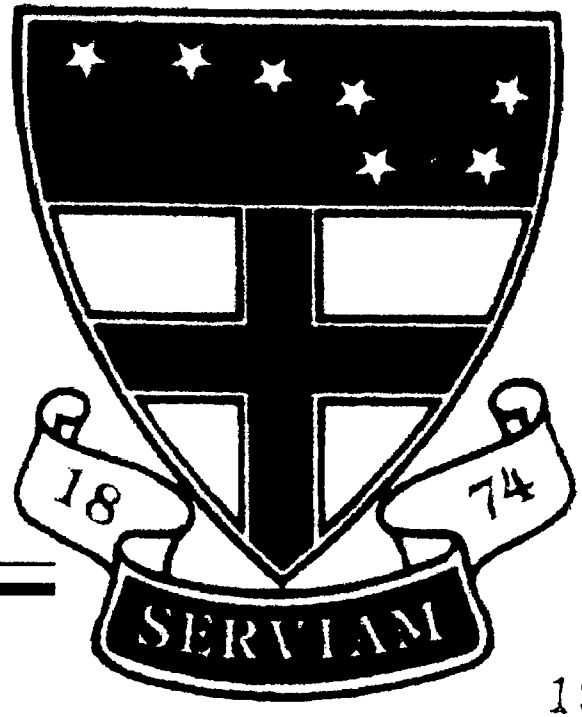
To provide extensive staff development to support the integration of technology into the curricular, instructional, and administrative functions of Ursuline Academy.

ITEMS TO BE COMPLETED

Phase I

Strategy	Action
Provide administrators and teachers with modeling, training, and support so that they are able to infuse technology into the curriculum.	Provide training opportunities for all personnel.
Provide all administrators and teachers with the ability to effectively use computers for student-centered activities and management tasks.	Establish user groups by departments Offer peer training opportunities. Coordinate classes, preservice and inservice training.
Expand training for staff and support staff.	
Encourage the use of technology by all personnel.	

MANAGING INFORMATION



Managing Information Goal

To increase productivity through the use of technology for the instructional and administrative management of data.

ACCOMPLISHMENTS

Phase I

- Administration, faculty and staff on a single network
- Purchased student data processing software for scheduling, attendance, progress reports and report cards.
- Initial installation of electronic mail.
- Install fax capabilities on network.

Managing Information Goal

To increase productivity through the use of technology for the instructional and administrative management of data.

Phase II

Strategy	Action
Encourage interactive communication both in and out of school	Expand electronic mail. Implement teleregistration system
	Install telecommunications requesting grades, arranging conferences.
Provide students and teachers with out-of-school access to technology	Expand Internet services for at home convenience.
	Provide accessibility to technology facilities for school and community.

APPENDIX C

Funding Educational Technology: Resource Materials

(Reprinted with permission)

Technology

Resource Materials

Updated and Revised from the Original February 1, 1996 PBS Videoconference Materials

Produced by:

Telecom Consulting • Project Development

CONVERGENCE SERVICES, INC.

Presented by:

PBS ADULT LEARNING SATELLITE SERVICE

Convergence Services, Inc. • 1215 Cameron Street • Alexandria, VA 22314
Phone: (703) 548-0010 • Fax: (703) 548-0726 • Internet: edtech@convg.com

Statements from Supporting Organizations

"Issues of technology will shape the very future of our nation's colleges and universities. But that future relies very heavily on having the resources available to make use of the new technologies. This teleconference couldn't come at a better time."

--David L. Warren, President
National Association of Independent Colleges and Universities

"The challenge of the 20th century is finding resources to bring technology to schools to prepare students for life in the 21st century. It's not just equipment, it's also the infrastructure needs compounded by rapidly changing technology! This teleconference, focused specifically on the issues of funding, is critically important to teachers and other education employees who are struggling to make technology a reality in schools and colleges nationwide."

--Barbara J. Yentzer, Director
Center for Education Technology
National Education Association

"Technology is a driver in our society. As a nation we need to be sure all people have access to it, know how to use it, and are capable of dealing with the commercial, social, and ethical opportunities and dilemmas that come with it. This videoconference is a great way for people to get up-to-date information on where to find funds to meet these vital needs."

--Paul Houston, Executive Director
American Association of School Administrators

"Technology is vital to making today's schools capable of serving a student's needs. In a time of shrinking federal and state funding, schools need to look at a wide array of funding resources and strategies such as those depicted in *Funding Educational Technology*."

--Cheryl S. Williams, Director
National School Boards Association's Technology Program

"Distance education is spurring competition among community colleges and we all must seek new and innovative funding sources to remain competitive in the educational telecommunications industry."

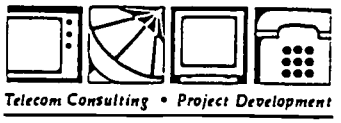
--Monica Pilkey, Director
Community College Satellite Network
American Association of Community Colleges

"NCTET is delighted to endorse the PBS broadcast "Funding Educational Technology." It is important that both the private and public sectors work together to explore creative financing portfolios for education technology funding. This program provides the opportunity for sharing ideas and successful models."

--Brenda Kempster, Co-Chair
National Coalition on Technology in Education and Training

Table of Contents
Funding Educational Technology
Resource Materials

This document has been updated and revised from the original February 1, 1996, PBS *Funding Educational Technology* videoconference materials.



CONVERGENCE SERVICES, INC.
1215 Cameron Street
Alexandria, VA 22314
(703) 548-0010/ (703) 548-0726 [Fax]
edtech@convg.com [Internet]

The mission of Convergence Services, Inc. (CSI) is to help organizations plan and fund educational multimedia, telecommunications, and information infrastructure projects. CSI specializes in serving nonprofit organizations, as well as for-profit companies that seek to partner with non-profits. To help organizations accomplish their goals, the company offers the following services:

- Strategic Planning
- Private and Public Fund Raising
- Government Relations
- Grantsmanship
- Partnership Building

Major projects have focused on teacher training, learning disabilities, and replacement of federal funding for public broadcasting. In addition, CSI produces videoconferences and counsels others on their communications projects. A particular interest with public television clients is helping them plan for the conversion to digital advanced television (ATV/HDTV).

Clients have included the Public Broadcasting Service, the University of Maryland, National Public Radio, Westinghouse Electronic Systems Group, the Cellular Telecommunications Industry Association, the Edison Project, WETA in Washington, DC, KTCA in St. Paul/Minneapolis, and a coalition of 40 state educational networks and major market public television stations.

PBS ADULT LEARNING SATELLITE SERVICE

1320 Braddock Place
Alexandria, VA 22314
(703) 739-5000

Established in 1988 by the Adult Learning Service of PBS, the Adult Learning Satellite Service (ALSS) delivers, via satellite, a broad range of high-quality, educational programming directly to colleges, universities, businesses, and other organizations with satellite-receive equipment. While public television station broadcasts continue to be the primary means of delivering telecourses to adult learners, ALSS extends and complements the Adult Learning Service by providing a non-broadcast programming service.

Through ALSS, organizations with satellite-receive equipment have the opportunity to acquire a wide selection of video programming cost-effectively. Obtaining programs such as telecourses, short courses, audio-visual resources, and live videoconferences through ALSS offers many benefits, including savings from "do it yourself" off-satellite taping and a choice of hundreds of high-quality training and instructional resources.

To date, 2,700 colleges have ordered ALSS programming, making ALSS the largest satellite-receive service for higher education. In total, more than 10,000 schools, businesses, and other organizations have acquired ALSS programs since 1989. ALSS offers a number of audio-visual resource programs and live videoconferences especially designed for workforce training programs and business management courses.

Learning Objectives

- To determine where and where not to look for funding for educational technology projects.
- To discover quickly the latest on federal budgetary action for discretionary ed-tech grant programs.
- To understand state ed-tech funding trends and how to benefit from them.
- To obtain a better sense of the kinds of projects that are likely to attract funding.
- To acquire the names of agencies, foundations, and other organizations interested in ed-tech projects and specific contact information for them.
- To gain confidence in seeking and working with business partners.

Program Agenda--Page 1 of 2

Introduction

John Lawson, President
Convergence Services, Inc. and Moderator
Will discuss the goals of the videoconference, outline the agenda, and give a general overview of ed-tech funding trends.

Panel 1: Government and Foundation Grants

TAPED ROLL-INS
Senator Jim Jeffords (R-VT), Chairman
Education, Arts, and Humanities Subcommittee

Bernadette Maguire-Rivera, Acting Deputy Assistant Secretary
Telecommunications and Information
National Telecommunications and Information Administration, Department of Commerce

Nora Sabelli, Senior Program Director
Applications of Advanced Technologies and Networking Infrastructure for Education
National Science Foundation

PANELISTS
Sharon Porter Robinson, Assistant Secretary for Educational Research and Improvement
Department of Education
Will provide an update on programs, including Challenge Grants for Technology in Education, at DoEd and other agencies for K-12, higher education, and special education.

Brenda Kempster, Immediate Past President and Chair of the Strategic Partnerships Committee
National Coalition on Technology in Education and Training
Will focus on state trends, including special state funds, state planning activities, and public utility commission actions.

Arlene Krebs, Author
"The 1996 Distance Learning Funding $ourcebook"
Will examine trends with foundations and other private philanthropy for K-12 and higher education.

Rayna Aylward, Executive Director
Mitsubishi Electric America Foundation
Will discuss foundation support for the use of technology for the education of people with disabilities.

Break

On-line tour by Arlene Krebs of Internet web sites for foundations and other funding sources (taped).

Program Agenda--Page 2 of 2

Panel 2: Adding Business to the Mix and "Putting it all Together"

Overview of second hour by moderator.

TAPED ROLL-INS
President Bill Clinton (excerpt from the State of the Union Address)

Laura D'Andrea Tyson, National Economic Advisor to the President

PANELISTS
Marilyn Reznick, Vice President of Education Programs
AT&T Foundation
Will discuss AT&T's recently announced, $200 million Internet, voice mail, and teacher training programs for schools, plus support for higher education.

Duane Albro, Group Vice President
NYNEX
Will discuss K-12 and higher education ed-tech programs conducted by NYNEX and provide an overview of activities at other Regional Bells.

Microsoft Video of "Connected Learning Community" Initiatives (Taped)

Delaine Eastin, Superintendent of Public Instruction
California Department of Education
Will discuss California's strong track record in public/private partnerships for ed-tech, including "Netday."

Thomas L. Purce, Vice President for Extended University Affairs
Washington State University
As someone responsible for development *and* distance education, will provide a case study on assembling ed-tech funding, including business and government support.

WRAP-UP
John Lawson, Moderator

ROLL CREDITS -- Acknowledge supporting organizations.

Panelist and Speaker Information

MODERATOR

John Lawson, President
Convergence Services, Inc.; Alexandria, Virginia

Mr. Lawson is the president and founder of Convergence Services, Inc. Under his direction, the company has grown to represent a wide range of clients in education and telecommunications. CSI has helped them plan, and raise public and private funds, for educational technology projects. Mr. Lawson is also a frequent speaker and panelist at conferences and workshops.

Previously, he was the director of national affairs for the Association of America's Public Television Stations. At APTS, he helped increase public television funding significantly and helped write public television into education, telecommunications, Head Start, and rural development legislation. A campaign he led won the *Award of Excellence in Government Relations* from the American Society of Association Executives.

Mr. Lawson also served for three years as director of public information for the South Carolina Educational Television Network. His work won national awards for institutional promotion and video production, including a *Gold Lone Star* at the Houston International Film Festival and a CINE *Golden Eagle*. Previously, he worked in the campaigns and administration of Governor Richard Riley, now U.S. Secretary of Education.

He also served as executive director of the Energy Research Foundation, which had an impact on the nation's nuclear waste policy in the mid-1980s. He has managed two statewide presidential caucus campaigns and was a delegate to the 1984 Democratic National Convention.

SPEAKERS

Duane Albro, Group Vice President--New York State Market Area
NYNEX; New York, New York

Mr. Albro is the group vice president of the NYNEX-New York State Market Area and an officer of the corporation. Since 1994, he has overseen customer services and operations in suburban and upstate New York, with annual revenues of $3.6 billion.

The group employs 8,600 managers and craft people to serve 4.5 million business, government, educational, and residential customers.

Mr. Albro is a member of the NYNEX Minority Management Association, the NYNEX Hispanic Support Organization, and the American MENSA Society. In 1990, the Governor of New York recognized his personal dedication to the cause of minority managers in business.

Rayna Aylward, Executive Director
Mitsubishi Electric America Foundation; Washington, DC

Ms. Aylward is the first executive director of the Mitsubishi Electric America Foundation, which made its official debut in February 1991. The Foundation is dedicated to helping young people with disabilities to lead fuller and more productive lives.

Prior to joining the Foundation, Ms. Aylward was the international director of Very Special Arts, an educational affiliate of the Kennedy Center that promotes arts and educational programs for people with disabilities in the U.S. and around the world. She is currently a member of the Employment Preparation Council of the President's Committee on the Employment of People with Disabilities and of the Development Council of the National Alliance of Business. She also serves on the Corporate Committee of the Council of Foundations and the Corporate Advisory Board of the Close Up Foundation, and is a trustee and officer of the Affinity Group on Japanese Philanthropy.

During nine years in the U.S. diplomatic corps, Ms. Aylward was assigned as a cultural attaché in Latin America and the Middle East. She has worked as a teacher, school administrator, and freelance journalist.

Delaine Eastin, Superintendent of Public Instruction
California Department of Education; Sacramento, California

Ms. Eastin is the highest ranking official in California's elementary and secondary public school system. Prior to her election as State Superintendent, she served four terms in the State Assembly. She is a staunch supporter of increased technology in public schools and has worked effectively with the business community. She has long advocated stronger technical and vocational training for students.

Before her election to the State Assembly in 1986, Ms. Eastin was a corporate planner for Pacific Telesis Group. She also has taught political science and women's studies.

She has received numerous awards from organizations representing teachers, teaching specialists, school administrators, and board members. These groups include the Industrial and Technology Education Association, the Learning Alternatives Resource Network, and the Faculty Association of California Community Colleges.

Brenda Kempster, Immediate Past President and Chair of the Strategic Partnerships Committee
National Coalition on Technology in Education and Training; Sacramento, California

The National Coalition on Technology in Education and Training is a national nonprofit coalition addressing current and potential issues of technology to improve education and training. In her role as former chair, Ms. Kempster is instrumental in working with private industry and educational organizations to shape the goals of the NCTET.

President of the Kempster Group, Ms. Kempster provides consulting services to private industry and the public sector in the area of telecommunications and education technology marketing and policy development. She also helps these clients build coalitions and alliances.

Prior to the Kempster Group, Ms. Kempster was the Executive Director of Education Marketing Policy and Strategy for Pacific Bell. She was responsible for the statewide education technology business unit for sales, marketing, and applications development.

She has been named a *Federal 100 Award* recipient by Federal ComputerWeek Magazine for her influence in the telecommunications arena. She is a member of the White House Learning and Technology Task Force and serves on the Board of Directors of the U.S. Distance Learning Association.

Arlene Krebs, President
New Orbit Communications; Brooklyn, New York

Ms. Krebs is the author of numerous articles and of *The 1996 Distance Learning Funding $ourcebook: A Guide to Foundation, Government, and Corporate Support for Telecommunications and the New Media*, a new edition of which is set for release in early 1996.

Ms. Krebs consults in the area of educational telecommunications, including distance learning, new media, and satellite communications. She also trains faculty and staff at K-12 schools and in higher education in new technologies, curriculum development, and interactive practices.

Ms. Krebs has more than 20 years experience in secondary and higher education and teaches graduate and undergraduate courses in new communications technologies at New York University and Marymount Manhattan College. Cited as one of the Key 100 Satellite Professionals in the United States, she serves on the Board of Directors of The Society of Satellite Professionals (SSPI) and is its vice-president of Projects and its International Education Chair.

Thomas L. Purce, Vice President for Extended University Affairs
Washington State University; Pullman, Washington

Dr. Purce has a broad portfolio at Washington State University, including development and distance and state learning. He has held numerous senior roles at university, corporate, and government offices. Prior to his current position, he had served at Evergreen State College in the capacity of executive vice president, interim president, and vice-president for college advancement. He was the Director of Research Park and Economic Development at Idaho State University. He was also the COO at Power Engineers, Inc. and the director of the Department of Health and Welfare and the Department of Administration for the State of Idaho.

Dr. Purce is affiliated with numerous organizations, including the American Council of Education and the National Association of College and University Business offices. He has served on the Board of Directors of the Northwest Public Affairs Network and the Washington Public Affairs Network.

Marilyn Reznick, Vice-President of Education Programs
AT&T Foundation; New York, New York

Ms. Reznick is responsible for directing AT&T's philanthropy in education and coordinating the company's growing interests in programs and services integrating technology into education.

In her 12-year career with AT&T, Ms. Reznick has directed corporate relations in New Jersey, New York, and New England, and supported multiple business unit interests. Prior to joining AT&T, she was the director of Admissions and an instructional development specialist at Southern Illinois University School of Medicine in Springfield, Illinois. She also served as a director of Alumni Affairs at the University of Hartford in Connecticut, and development specialist at Kendall College in Evanston, Illinois.

Sharon Porter Robinson, Assistant Secretary of Education, OERI
U.S. Department of Education; Washington, DC

As assistant secretary for Educational Research and Improvement, Dr. Robinson administers the DoEd's key discretionary grant programs for ed-tech, which are coordinated with ed-tech programs at other agencies. After her appointment by President Clinton, Dr. Robinson immediately seized the challenge of transforming the research enterprise of the Department of Education.

As a result of her initiatives, the Office of Education and Research Improvement (OERI) is now focused on the goal of sustaining and augmenting a consumer-driven research base that gives substance to the ideal that "all children can achieve to high academic standards." She is also developing, for the first time, standards to ensure that all research conducted by the Department of Education meets the most rigorous standards of excellence.

A lifelong civil rights activist, Dr. Robinson has waged a personal crusade to convince the education community of the ethical responsibility and economic necessity to develop strategies that will ensure that the traditionally underserved student populations receive an education that unleashes their full potential. A nationally recognized authority on assessment, she has given major addresses before numerous Congressional committees and national associations and has written major articles for publication.

Prior to assuming her position as assistant secretary for OERI, Dr. Robinson served in a variety of leadership positions at the National Education Association. In 1989, she became director of the National Center for Innovation, NEA's research and development arm. Dr. Robinson has also served as a consultant to the Board for Professional Teaching Standards.

Private and Public Funding Opportunities

Federal Programs

A number of federal grant programs explicitly fund educational technology. Others fund projects that historically have included ed-tech components. We have included the most important programs below.

At the time this document went to print, the White House and Congress were in an unprecedented budget stalemate, and six of the thirteen annual appropriations bills had yet to be enacted. Consequently, funding amounts for many of the following programs were still undecided. As available, we have indicated funding parameters based on Congressional and Administration action to date.

This information was compiled from several on-line and other sources. These included research on individual appropriations bills and reports on technology in education at the Departments of Education and Commerce. Please see the section titled "On-line Resources" for how to obtain information about some of these organizations and their programs and initiatives electronically.

United States Department of Education

► Eisenhower Professional Development -- Federal Activities

Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 260-2516
Christine Jackson

This program supports activities of national significance contributing to the development and implementation of high-quality professional development in the core academic subjects. Projects may be designed to develop teacher training programs, or disseminate information about exemplary programs of math and science instruction.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $18 million. The Administration requested $35 million.

► Eisenhower Professional Development State Grants

Office of Elementary and Secondary Education
400 Maryland Avenue, SW
Washington, DC 20202
(202) 260-2517
Daniel F. Bonner

The purpose of the Eisenhower Professional Development State Grants is to provide access for teachers, staff, and administrators to sustained, high-quality professional development. Only in schools with an enrollment of 50% or more from low-income families can the school use all Eisenhower funds for hardware and software purchases.

For FY96, the Senate Appropriations Committee approved $275 million for the Eisenhower Professional Development State Grants. The Administration requested $735 million. The House, in anticipation of the passage of an education reform block grant, approved $550 million and consolidated funding for the professional development and innovative grants program.

► Eisenhower Regional Mathematics and Science Education Consortia

Office of Elementary and Secondary Education
400 Maryland Avenue, SW

Washington, DC 20202
(202) 260-2519
Anita Brewer

This program supports grants to establish and operate regional consortia to disseminate exemplary mathematics and science instructional materials and provide technical assistance in the use of improved teaching methods and assessment tools to benefit elementary and secondary school students, teachers, and administrators.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $13.8 million. The Administration requested $15 million.

► Even Start

600 Independence Avenue, SW
Room 4400
Portals Building
Washington, DC 20202
(202) 260-0996
Donna Campbell

Even Start seeks to help parents become full partners in the education of their children; assist children in reaching their full potential as learners; and provide literacy training for their parents.

For FY96, the House and the Senate Appropriations Committee approved $102 million (the same amount appropriated in FY95). The Administration requested no funds for this purpose because Even Start activities were to be carried out through a broader adult education authority.

► Fund for the Improvement of Education

Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-1496

The program seeks to identify and disseminate innovative educational processes. Funds may be used to support a wide range of projects, including innovation in education, technology education, computer-based instruction, and comprehensive school health education programs.

For FY96, the House approved $33.8 million (the same as the Administration request and the FY95 level). The Senate Appropriations Committee approved $44.5 million.

► Fund for the Improvement of Postsecondary Education

Office of Postsecondary Education
7th and D Streets, SW
Washington, DC 20202-5100
(202) 708-5750
Preston Forbes

The program seeks to improve access to quality postsecondary education through innovative programs.

For FY96, the House and the Senate Appropriations Committee approved $15.1 million (which is $2.5 million less than the FY95 appropriation and the Administration request).

► Goals 2000

600 Independence Avenue, SW
Room 4000
Washington, DC 20202
(202) 219-2079
Joseph Conaty

The Goals 2000 program provides funds for state-level planning, including the integration of technologies into curricula. With a 1995 budget of more than $400 million, Goals 2000 promotes state-level coordination to help

schools make the right technological choices, such as ensuring that they are able to connect to present and future networks easily. State plans can help define interoperability and coordination decisions in ways that individual school districts cannot.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $300 million. The Administration requested $693.5 million.

► Higher Education Act, Title III

Office of Postsecondary Education
7th and D Streets, SW
Washington, DC 20202-5100
(202) 708-8816
Dr. Caroline J. Gillin

This program provides support for Historically Black Colleges and Universities, Hispanic-serving institutions, and other developing institutions that meet strict federal criteria. Grants made to HBCUs support operations, academic improvements, and endowments.

In FY95, $230 million was appropriated for all programs funded under this Title. In FY96, the Administration and both the House and Senate would reduce funds available for all schools other than HBCUs, cutting the appropriated amount to $180 million.

► Improving Access to Research Library Resources

Discretionary Library Programs Division
Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-1315

The program promotes high-quality research and education nationwide by providing funds to major research libraries to preserve and strengthen their collections, to make their resources accessible to researchers and scholars outside their primary clientele, and to make the collections available to other libraries whose patrons have a need for research materials. Public or private nonprofit institutions; an institution of higher education (including a branch campus); an independent research library; or a consortium of the above entities are eligible to apply.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $2 million. The Administration requested no funding.

► Library Research and Demonstrations

Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-1315

The program seeks to support research and/or demonstration projects in areas of specialized services to improve library and information science practices. Research and demonstration projects for the improvement of libraries may include the promotion of economical and efficient information delivery, cooperative efforts, and developmental projects related to librarianship, training in librarianship, and dissemination of information on services to selected clientele.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $2 million (which is $4.5 million less than the 1995 appropriation). The Administration requested no funds for this program.

► Literacy Programs for Prisoners

Office of Vocational and Adult Education
300 C Street, SW
Washington, DC 20202
(202) 205-5621

This program provides funds to state and local correctional agencies to establish programs that, to the extent possible, use advanced technologies to assist persons incarcerated in prison, jail, or detention centers to achieve functional literacy and life skills.

For FY96, the House approved $4 million. The Senate Appropriations Committee approved $4.7 million. The Administration requested no funding for this program.

► Media and Captioning Services

Office of Special Education and Rehabilitative Services
300 C Street, SW
Washington, DC 20202
(202) 205-9172

This program supports the captioning of films, videos, and television programs for the deaf, recordings for the blind, and cultural experiences for the deaf and hard of hearing.

For FY96, the House and the Senate Appropriations Committee approved $19.1 million, the same amount appropriated in FY95. The Administration requested no funds for this program.

► National Challenge Grants for Technology in Education

600 Independence Ave, NW
Washington, DC 20202
(202) 708-6001

Awards grants to consortia including at least one local education agency with a high percentage of children living below the poverty line and may include other local education agencies, state educational agencies, institutions of higher learning, businesses, academic content experts, software designers, museums, libraries, or other appropriate entities. Promotes the integration of the acquired technologies into a curriculum to help the local educational agency enhance teaching, training, and student achievement; promotes ongoing, sustained professional development for teachers, administrators, and school library media personnel served by the local educational agency to further the use of technology in the classroom or library media center; and ensures the successful, effective, and sustainable use of technologies acquired.

For FY96, the House approved $25 million. The Senate Appropriations Committee approved $15 million for the Challenge Grants and $10 million for the Regional Technology Consortia. The Administration had requested $93 million for the Challenge Grants and the Regional Technology Consortia (see below).

► Public Library Construction and Technology Enhancement

Office of Educational Research and Improvement
555 New Jersey Ave, NW
Washington, DC 20208
(202) 219-1303
Robert Klassen

The program supports construction of new buildings and acquisition or remodeling of existing buildings for use as public libraries; follows policies and procedures in constructing public libraries that will provide for the preservation of resources in the facilities; and acquires technological equipment. The term "equipment" includes information and building technologies, video and telecommunications equipment, machinery, utilities, and built-in equipment and necessary enclosures or structures for them, and all other items for the functioning of a particular facility to provide library services. State library administrative agencies may apply by contacting the Formula Library Programs Division at (202) 219-1303. Example: SAILOR, a non-commercial Internet service run by the Maryland library system.

FY96 funding for this program is estimated at $17.4 million. FY95 funding was $30.4 million.

► Ready-To Learn Television

Office of Educational Research and Improvement
555 New Jersey Ave, NW
Washington, DC 20208

Corporation for Public Broadcasting
901 E Street, NW
Washington, DC 20004

(202) 219-1496
Director

(202) 879-9600
Jocelyn Keaveney

These funds are managed primarily by the Corporation for Public Broadcasting. The program purpose is to develop educational programming for preschool and early elementary school children and their families; develop educational television programming and ancillary materials to increase school readiness for young children in limited-English proficient households; increase family literacy; and develop support materials and services that promote effective use of educational programming.

For FY96, the House approved no funds. The Senate Appropriations Committee approved $6.4 million. The Administration requested $7 million.

► Regional Education Labs

The DoEd awarded $41 million per year for a five-year period to 10 regional laboratories authorized under the Educational Research, Development, Dissemination, and Improvement Act. The awards assist educators and policy makers in exploring, designing, and implementing effective educational reform for all students. The 10 research labs are also expected to "help translate research into effective classroom practices and integrate advanced technology into their work and help other agencies do the same."

The labs are expected to receive more than $205 million over the next five years, subject to continued Congressional appropriation of funds.

► Regional Technology Consortia (Technical Support and Professional Development Consortia for Technology)

Office of Education Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-8070
Catherine Mozer

These consortia assist states and local educational agencies in the identification and procurement of resources necessary to implement technology plans, develop training resources for both elementary and secondary and adult education, provide referrals to sources of technical assistance and professional development, and assist institutions of higher education to establish preservice training programs in the appropriate use of educational technology.

For FY96, the Senate Appropriations Committee approved $10 million. The Administration had requested $93 million for the Challenge Grants and the Regional Technology Consortia (see above).

► School to Work

School to Work Opportunity Information Center
3040, 400 Maryland Ave, SW
Washington, DC 20202
(202) 260-7278

Provides grants to states and communities for the implementation of School-to-Work programs integrating academic and vocational learning with work-based learning. Software and related technology-based applications can be supported through these programs.

$125 million was appropriated to the Departments of Education and Labor in FY95.

► Small Business Innovation Research Program (SBIR)

Room 602D, 555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-2065

Seeks to help meet federal R&D needs and to stimulate technological innovation in small businesses, while requiring private sector commercialization of developed products. The Program has focused on the development of products that use computers and other high tech equipment for teaching and learning basic skills, science, and foreign languages; and providing the physically disabled opportunities to function more easily in society.

► Star Schools Program

Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-2116
Cheryl Garnette

Supports telecommunications partnerships to provide telecommunications equipment and programming to underserved students including those living in rural and urban areas. Through support from the Star Schools Program, more than 50,000 teachers along with a host of administrators, parents, and policy makers have participated in staff development and community awareness activities produced via satellite, compressed video technology, fiber optics, videodisk, and microcomputer-based networks. The Star Schools Program also supports four dissemination grants to establish clearinghouses of information about distance learning. The number of schools participating in live, interactive, instructional programs nearly doubles each year. The Star Schools Program also supports clearinghouses of information about distance learning.

For FY96, the House recommended no funds. The Senate Appropriations Committee approved $25 million. The next round of competitions for Star Schools grants is tentatively set for the spring of 1996. Funding for FY95 was $25 million.

► Technology Applications (Special Education)

Office of Special Education and Rehabilitative Services
Division of Innovation and Development
300 C Street, SW, Room 3525
Washington, DC 20202-2641
(202) 205-8123
Ellen Schiller

This program promotes expansion of the use of technology in the education of children with disabilities by supporting research, dissemination, and technical assistance related to the development, production, and marketing of technology for the education of children with disabilities.

For FY96, the House approved no funding. The Senate Appropriations Committee approved $9.9 million. The Administration had requested no funding.

► Technology, Educational Media, and Materials for Individuals with Disabilities

Office of Special Education and Rehabilitative Services
Division of Innovation and Development
300 C Street, SW, Room 3525
Washington, DC 20202-2641
(202) 205-8106

Technology, Educational Media, and Materials for Individuals with Disabilities funds projects and centers for advancing the use of new technology, assistive technology, media, and materials in the education of children and youth who are disabled and the provision of related services and early intervention services to infants and toddlers with disabilities. State and local education agencies, institutions of higher education, and profit and nonprofit public and private agencies and organizations may apply.

► Telecommunications Demonstration Project for Mathematics

Office of Educational Research and Improvement
555 New Jersey Avenue, NW
Washington, DC 20208
(202) 219-2181
Adria White

The program objective is to support teacher professional development in new mathematics standards using the publicly-funded telecommunications infrastructure. In FY95, a sole grant of $1.1 million was made to PBS MATHLINE.

For FY96, the House approved no funds. The Senate Appropriations Committee approved $1 million. The Administration requested $2.2 million.

► Title 1 -- Elementary and Secondary Education Act, Grants to Local Education Agencies

Office of Elementary and Secondary Education
400 Maryland Avenue, SW
Washington, DC 20202
(202) 260-0826
Mary Jean Letendre

These grants are awarded to SEAs under a formula, which make grants to LEAs also under a formula. The purpose is to improve the educational opportunities of educationally deprived children. This program funds about one-third of all software and hardware used primarily for basic skills instruction by schools. In 1993-94, more than $400 million was used to fund technology, approximately 15% of the total $6.7 billion that had been appropriated for FY95.

For FY96, the House approved $5.5 billion, and the Senate Appropriations Committee approved $6 billion. The Administration has requested $7 billion.

► Title 6 -- Innovative Education Program Strategies State Grants

Office of Elementary and Secondary Education
400 Maryland Avenue, SW
Washington, DC 20202
(202) 260-3696
Zulla Tony

Formerly known as Chapter 2 -- State Block Grants, these grants are awarded to SEAs under a formula, which make grants to LEAs also under a formula. The purpose of the Innovative Education Program Strategies State Grants is to help SEAs and LEAs meet the national education goals and assist in their reform of elementary and secondary education. State and local funds may be used for acquisition of instructional materials such as library books, curricular materials, and computer software and hardware. In FY94, approximately $125 million of Chapter 2 funds were spent on software and hardware purchases.

For FY96, the House approved no funds. The Senate Appropriations Committee approved $275 million for the Innovative Education programs, the reauthorized and revised Chapter 2 grant program. The Administration proposed to eliminate all funding for the Innovative Education Strategies Program. The FY95 appropriation was $347 million.

United States Department of Commerce

► National Endowment for Children's Educational Television (NECET)

Room 4096, 14th and Constitution Ave, NW
Washington, DC 20230
(202) 482-5802
Heather Birnie

NECET was created by the Children's Television Act of 1990. Its purpose is to fund the creation and production of television programming that is designed to foster fundamental intellectual skills in children. It had an FY95 budget of $2.5 million.

► Public Telecommunications Facilities Program (PTFP)

Room 4096, 14th and Constitution Ave, NW
Washington, DC 20230
(202) 482-5802
Richard P. Harland

PTFP awards matching grants to non-commercial entities to purchase telecommunications equipment, with the stipulation that the equipment be used for educational or cultural purposes. PTFP also provides smaller grants to assist these entities in planning for the purchase and use of telecommunications equipment.

For FY96, Congress approved $15.5 million, but the bill has been vetoed by the President.

► Telecommunications and Information Infrastructure Assistance Program (TIIAP)

National Telecommunications and Information Administration (NTIA)
Room 6043, 14th and Constitution Ave, NW
Washington, DC 20230
(202) 482-2048
Laura Breeden

Awards matching grants to state and local governments and nonprofit organizations for the planning and construction of telecommunications networks for the provision of educational, cultural, health care, public information, public safety, and other social services. In 1994, its first year of existence, TIIAP awarded $24.4 million to public and nonprofit institutions, including schools and universities. TIIAP funded 92 projects that use telecommunications capabilities in innovative ways for education, health care, public information, and other social services. Investment in telecommunications technology for K-12 education continues to be a priority for the program.

For FY96, Congress approved $21.5 million, but the bill has been vetoed by the President. Among other objections, the President wants higher funding amounts for this program.

National Science Foundation

► Academic Research Infrastructure

Office of Science and Technology Infrastructure
Room 1270, 4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1040

The National Science Foundation (NSF) invites institutions of higher education, independent nonprofit research institutions, research museums, and consortia in all disciplines to improve the condition of research and research training facilities. A total of $50 million is available for FY96 and awards will range from $100,000 to $2 million. Awards will not exceed five years in duration. NSF requires a match of 50% from PhD-granting institutions and from 20% to 50% from non-PhD-granting institutions. Awards using FY96 funds will be formally announced in the fall.

► Applications of Advanced Technology Program

4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1651 or
(703) 306-1130
(publication number 93-143)
Bonita Washington

The Applications of Advanced Technology Program provides grants to examine the strengths and weaknesses of new, innovative applications of advanced technologies, and to lay the foundation and knowledge necessary for the use of new, revolutionary computer and telecommunications systems and related technologies for teaching and learning science and mathematics.

► Computer and Information Science Educational Innovation

Office of Cross-Disciplinary Affairs
Room 1160, 4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1980
eipd@nsf.gov

The objective of the CISE Educational Innovation (EI) program is to stimulate innovative educational activities at the undergraduate level in CISE disciplines by encouraging the transfer of research results into the undergraduate curriculum. Awards may range from $400,000 to $600,000 over the three-year project period. Applicants should expect to pay half the amount of the NSF award.

► Minority Institutions Infrastructure Program

Office of Cross-Disciplinary Affairs
Room 1160, 4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1980

Through this program, NSF seeks to increase minority participation in the academic and research areas supported by the Computer and Information Science and Engineering (CISE) Directorate. Funds available are $50,000 for one-year planning grants and $800,000 to $1.5 million over a five-year period for establishing, enhancing, and operating facilities to support research activities and education programs. NSF makes about five planning awards and three to four implementation awards each year. Grantee cost sharing is at least one-fourth of total project costs. The 1996 application deadline is February 13, 1996. NSF may provide support for faculty, curriculum development, equipment, maintenance, support staff, expert consultants, and network membership dues.

► Networking Infrastructure for Education (NIE) Program

4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1651
E-mail: nie@nsf.gov

The NIE Program is a joint effort between the Directorates for CISE and for Education and Human Resources (EHR). The aims of the NIE Program are to hasten the development of a widespread high performance electronic communications infrastructure in support of science, mathematics, engineering and technology (SMET) education reform, and to lay a foundation on which strategies for the appropriate use of technology in support of increased student achievement can be developed. NIE awards build synergy between technology and education researchers, developers, and implementers to explore networking costs and benefits, test self-sustaining strategies, and develop models of a flexible educational networking infrastructure that will speed the pace of educational innovation and reform. Please note that budgetary constraints may require further postponement or cancellation of this competition.

► Teacher Enhancement Program (TE)

4201 Wilson Blvd.
Arlington, VA 22230
(703) 306-1650
Michael Haney

TE seeks to improve, broaden, and deepen the interdisciplinary and pedagogical knowledge of teachers, administrators, and others who play significant roles in providing quality mathematics, science, and technology education for students from pre-kindergarten through grade 12. To this end, TE promotes systemic change, in-service teacher development, dissemination, and other activities.

Other Agency Programs

► The Agricultural Telecommunications Program

U.S. Department of Agriculture
14th and Independence Avenue, SW
Washington, DC 20250
(202) 720-6084
Cathy Bridwell

Provides funding for the use of telecommunications in rural and urban areas, and may fund proposals if done jointly with land grant institutions.

For FY96, $1.2 million was approved by Congress and signed into law by the President.

► Distance Learning and Medical Link Grant Program

U.S. Department of Agriculture, USDA-RUS
Rural Electrification Administration (REA)
Room 2245-S
Washington, DC 20250
(202) 720-0410
Mark Wyatt

The REA provides grants to rural schools, hospitals, and other organizations to provide educational and medical benefits through distance learning and medical link projects in rural areas. The program finances facilities, such as classroom video equipment, that may be used to connect various rural sites together or to other urban sites through existing telecommunications networks.

For FY96, $7.5 million was approved by Congress and signed into law by the President.

► Elementary and Secondary Education in the Humanities

National Endowment for the Humanities (NEH)
1100 Pennsylvania Avenue NW, Room 302
Washington, DC 20406
(202) 606-8377
F. Bruce Robinson

The Elementary and Secondary Education in the Humanities program is designed to improve teaching of the humanities in K-12 schools. The program supports national and regional summer institutes; state and local collaborative projects; and special projects designed to improve the teaching of the humanities in K-12 schools. Public and private elementary and secondary schools, school systems, colleges, and universities, museums, and other nonprofit educational and cultural organizations can apply by contacting the number above.

For FY95, funding for NEH was $146 million. Overall funding for NEH will fall by approximately 40% in FY96 to $110 million. These programs are likely to be proportionately reduced.

► Information Infrastructure Technology and Applications Program (IITA)

National Aeronautics and Space Administration (NASA)
300 E Street, NW
Washington, DC 20546
(202) 358-4618
Paul Hunter

IITA has been sponsoring pilot programs to improve science, mathematics, engineering, and technology education through educational technology. The program aims to demonstrate technologies and techniques to facilitate educator-to-educator collaboration, to enable students to become electronic information explorers, and to provide teacher and student access to national information assets including real science data. The NASA IITA program includes eight NASA centers as well as an open solicitation program for Education, Training and Lifelong Learning in Aeronautics.

► Small Business Innovation Research Program (SBIR)

Office of Economic Impact and Diversity
Office of Small and Disadvantaged Business Utilization
Department of Energy (DOE)
ED-3, 905 H Street
1000 Independence Ave, SW
Washington, DC 20585
(202) 254-5583

Funding Educational Technology

The DOE provides an array of educational programs and materials for students, teachers, and the general public. In 1994, the DOE operated more than 800 math, science, and technology education programs serving more than 400,000 students and 30,000 teachers. DOE appropriated $2 million for the Summer Teacher Enhancement program and $1.9 million for the Teacher Research Associates from the FY95 appropriations bill. SBIR funds systemic studies and development towards meeting recognized needs in educational technology.

Foundation and Corporate Giving Programs

This is a representative list of foundations and corporations that have demonstrated an interest in, and history of, funding ed-tech projects. Most of these foundations have other areas of interest. Generally, technology is funded as a means of achieving broader goals.

After reviewing application guidelines and/or foundation or corporate annual reports, initial contact with most of these organizations regarding specific project ideas should be made by letter or brief proposal (unless otherwise noted). Phone numbers are provided where available.

Arlene Krebs, author of The 1996 Distance Learning Funding $ourcebook, provided a list that included many of the foundations and corporations in this section, as well as further information on several of these programs. Additional research was conducted by Convergence Services, Inc. (CSI) on-line and at the Foundation Center. CSI also contacted a number of foundations and corporations directly. If a foundation has a regional or company site priority for its programs, we have noted that with (R).

Please see the section titled "On-line Resources" for how to obtain information about some of these organizations and their programs and initiatives over the Internet and "Print Resource Materials" for books and other print publications about foundation and corporate giving. For information on how to order the $ourcebook, please see page 50.

► Advanced Micro Devices, Inc.

Manager, Corporate Contributions
901 Thompson Place, Box 3453
Sunnyvale, CA 94088

Giving for this computer chip maker has traditionally been based on 1% of pre-tax profit. The Company has given up to $10,000 worth of equipment a year to a list of more than two dozen universities. It has also given cash.

► Alcoa Foundation

2202 Alcoa Building
425 Sixth Avenue
Pittsburgh, PA 15219-1850

► American Honda Foundation

Kathryn A. Carey
Manager
P.O. Box 2205
Torrance, CA 90501-2205
(310) 781-4090

For the year ended March 31, 1993, the Foundation awarded 23 grants from $15,000 to $100,000. Support includes general/operating support, continuing support, program development, seed money, and matching funds.

► Ameritech Foundation (R)

Michael E. Kuhlin
Director
30 South Wacker Drive, 34th Floor
Chicago, IL 60606

Awards grants to multi-state and national organizations for education. The Foundation focuses on innovative projects that meet the educational, economic, environmental, health and human service, and cultural needs of the Great Lakes region. The Foundation's priorities emphasize the use of communications technologies to help solve societal problems. The education emphasis is on higher education, with support for minorities and for economic and business education. The Foundation supports K-12 schools and education associations that address school issues.

► Amgen Foundation

1840 DeHavilland Drive
Thousand Oaks, CA 91230
(805) 447-1000

Most of Amgen's giving is to K-12 and higher education institutions. This biotech company's programs have included $10,000 awards to outstanding K-12 teachers in the area.

► Amoco Foundation

200 E. Randolph Road
M.C. 3704
Chicago, IL 60601

► The Annenberg/CPB Project

901 E Street, NW
2nd Floor
Washington, DC 20004
(202) 879-9600
Attn: K. Smith

The Annenberg/CPB Project was created in 1981 with a gift of $10 million per year for nine years from the Annenberg School of Communications to the Corporation for Public Broadcasting (CPB). The Project is a national effort "at the forefront of an innovative movement in higher education to apply new developments in information and telecommunications technologies to teaching and learning...The Annenberg/CPB Project has also pioneered the use of computer and information technologies to make education more accessible for all students. With Project support, leading academic institutions across the country have been experimenting with hardware, software, modems, and interactive videodisk technologies to improve students' access to information and to engage students with dynamic learning capabilities." Funding guidelines for the program are available in the late fall or winter.

► Apple Computer

Partners in Education
One Infinite Loop, MS: 38J
Cupertino, CA 95014
(800) 974-2974

This annual program supports partnerships between a single K-12 school and single K-12 teacher training institution by providing computer equipment, on-line services, software, and training. Proposals should be for projects that integrate Apple technology with the goal of helping students and teachers collaborate on projects, share roles as learners and coaches, and incorporate lessons into future teaching and learning environments.

► AST Research

Manager, Community Relations
16215 Alton Parkway
Irvine, CA 92718

The regular contributions budget of this personal computer manufacturer is small. Its giving program includes in-kind donations and cash. Target areas include K-12 education.

► AT&T Foundation

Learning Network
Room 2700
550 Madison Avenue
New York, NY 10022-3297
(212) 605-6734 General or
(800) 809-1097 Learning Network

Through its five-year, $200 million Learning Network initiative, AT&T will provide schools with 100 hours of free connection time to its dial-up Internet service, AT&T WorldNet, and teacher-controlled browsing software. According to company officials, schools also will receive free use, for a period of time, of the company's national voice messaging service. Schools must have access to a computer, modem, and phone line to take advantage of the offer. Guidelines will be available this spring for the $50 million grant program within this initiative that will support teachers and will support technology training for the preparation of new teacher professional development programs in the use of new technologies.

► Autodesk Foundation

2320 Marinship Way
Sausalito, CA 94965

Through its small foundation, this software manufacturer gives about $200,000 to a range of education projects. The Company also gives away more than $1 million in software.

► Bell Atlantic Foundation

(Formerly Bell Atlantic Charitable Foundation)
Denise Bailey
Director
1310 North Courthouse Road, 10th Floor
Arlington, VA 22201
(703) 974-8845

Applications are not accepted. The Foundation gives funds for regional programs that demonstrate educational applications of telecommunications technology in pre-college math, and science and technology education. The majority of the Foundation's grants support regional and national education, especially K-12 science, technology, literacy, and arts education projects, and higher education engineering and technology education, with an emphasis on support for minorities.

► BellSouth Foundation (R)

1155 Peachtree Street, NE
Room 7H08
Atlanta, GA 30367-6000

The BellSouth Foundation focuses exclusively on education in the South, encouraging initiatives to improve the quality of instruction and to involve community partnerships in education reform. The Foundation awards about $4 million annually. In 1995, the Foundation paused in its grantmaking and underwent a year-long strategic planning process that resulted in new funding priorities and guidelines. These new programs are targeted for 1996-2000 and emphasize pre-K-12 schools. The Foundation intends to target specific communities to develop full-scale technology programs.

► Blandin Foundation (R)

(Formerly Charles K. Blandin Foundation)
Paul M. Olson
President
100 Pokegama Avenue, North
Grand Rapids, MN 55744
(218) 326-0523

Giving is limited to Minnesota, and the Foundation provides funds for program development, seed money, and matching amounts.

► Carnegie Corporation of New York

Dorothy Wills Knapp
Secretary
437 Madison Avenue
New York, NY 10022
(212) 371-3200

Under the Foundation's mandate for education reform, "specific attention is given to the efforts to strengthen the education profession, to analysis of various forms of school restructuring, to the potential of telecommunications technologies, and to linkages between schools and other institutions." The Foundation provides funds for general and operating support, continuing support, program development, conferences/seminars, and curriculum development.

► Chrysler Corporation Fund

Manager, Fund
12000 Chrysler Drive
Highland Park, MI 48288

Most of the Chrysler corporate giving is done through the Fund. While giving is national, most is limited to plant areas. Giving emphasis has been placed on elementary and secondary education, including childhood literacy.

► Cisco Systems, Inc.

Virtual Schoolhouse Grants
P.O. Box 5105
Belmont, CA 94002-5105
(408) 526-4226

In 1996, Cisco Systems, Inc., a provider of internetworking products, plans to help up to 50 K-12 schools connect to the Internet through its Virtual Schoolhouse Grants program. Individual schools may be eligible for up to $10,000. The training and support must be used for curriculum-based technology applications. A current, albeit non-grant-making project, sponsored jointly with MCI Corporation, is the *International Schools CyberFair 96*. Participating schools will be asked to conduct a research project involving community resources and publish their project on the Internet's World Wide Web.

► The Coca Cola Foundation, Inc.

Donald R. Greene
President
P.O. Box 1734
Atlanta, GA 30301
(404) 676-2568

The Foundation gives support primarily for education, including general and operating support, program development, and matching funds.

► Compaq Computer Corporation Foundation (R)

Director, Corporate Communications
P.O. Box 692000
Houston, TX 77269

Combined corporate and foundation giving of hardware and cash was estimated at $3.5 million for 1993. Education is one of three focus areas. Giving is limited to Houston.

► Corporation for Public Broadcasting (CPB)

901 E Street, NW
2nd Floor
Washington, DC 20004
(202) 879-9600

CPB is a private, nonprofit corporation created by Congress in 1967 to oversee the development of public radio, television, and other telecommunications services for the American people. Beyond its principal role of supporting public broadcasting stations and programming, CPB conducts a number of smaller grant programs. CPB announced in January that it made an $8.4 million grant, its largest ever for children's programming. The money will help fund four television shows that will air as part of the PBS Ready-to-Learn service. CPB has also supported the development of on-line educational and other services by public broadcasting entities.

► Charles E. Culpeper Foundation, Inc.

Linda E. Jacobs
Vice President, Programs
Financial Centre
695 East Main Street, Suite 404
Stamford, CT 06901-2138
(203) 975-1240 Fax: (203) 975-1847

Gives grants to organizations concerned with health, including medical education and research, higher education, and the administration of justice. In 1993, the Foundation awarded $324,000 to Cornell University towards the development of multidisciplinary digital library preservation and access project on America's infrastructure, "The Making of America."

► Dana Foundation

745 Fifth Avenue
Suite 700
New York, NY 10151

"Throughout its history, the Dana Foundation has supported the advancement of education. Its continuing concern is to invest its limited financial resources in ways that achieve a significant, measurable impact. The Foundation's current commitment is to the spread of well-tested innovations that have the potential to strengthen education in American public schools, especially for students in the early years of education." Many of these innovative ideas have been identified through the Foundation's annual Charles A. Dana Awards for Pioneering Achievements in Education.

► The Danforth Foundation

Dr. Bruce J. Anderson
President
231 South Bemiston Avenue, Suite 1080
St. Louis, MO 63105-1996
(314) 862-6200

The Foundation is "dedicated to enhancing the humane dimensions of life through activities which emphasize the theme of improving the theme of teaching and learning." It serves pre-collegiate education through grantmaking and program activities, particularly those in support of early childhood education, school and community partnerships, and administrators and legislators who formulate public policy on elementary and secondary public education.

► Digital Equipment Corporation

Manager, Corporate Contributions Programs
111 Powdermill Road
Maynard, MA 01754
(508) 493-9210

► Geraldine R. Dodge Foundation, Inc. (R)

Scott McVay
Executive Director
163 Madison Avenue, 6th Floor
P.O. Box 1239
Morristown, NJ 07692-1239
(201) 540-8442

The Foundation has an interest in projects on the national level that are likely to lead to significant advances in secondary education. Funds are given for general/operating support, continuing support, program development, and curriculum development.

► Eastman Kodak Charitable Trust

Essie L. Calhoun
Director, Corporate Community Relations/Contributions
343 State Street
Rochester, NY 14650-0517
(716) 724-2434

The Trust supports mostly regional giving in high employment areas, although giving is national for higher education. Low priority is given to building and endowment funds.

► Exxon Education Foundation

Director
225 E. Carpenter Freeway
Irving, TX 75062-2298
(214) 444-1104

Ranked from 1989-1990 as the 4th most generous corporation by the Public Management Institute, the Foundation has given more than $300 million to support education in the U.S. Historically, the Foundation has supported projects with technology-related components, although technology usually has not been the focus. Support currently includes program development funds and seed money.

► The Ford Foundation

Barron M. Tenny, Secretary
320 East 43rd Street
New York, NY 10017
(212) 573-5000

Giving is on an international basis. No support is given for programs for which substantial support from government or other sources is readily available.

► The Freedom Forum International, Inc.

(Formerly the Freedom Forum)
Charles L. Overby, President, or
Jerry W. Friedheim, Vice President, Public Affairs
1101 Wilson Blvd.
Arlington, VA 22209
(703) 528-0800

Applications are not accepted by the Foundation. The Foundation is primarily an operating program foundation making a limited number of grants. It is dedicated primarily to conducting and supporting national, international, and community programs that foster First Amendment freedoms.

► Gateway 2000 (R)
Public Relations
610 Gateway Drive
N. Sioux City, SD 57049
(605) 232-2000

Giving is based on annual profits and has been mostly limited to a an 80-mile radius of headquarters.

► GE Fund
(Formerly General Electric Foundation)
Clifford V. Smith, Jr.
President
3135 Easton Turnpike
Fairfield, CT 06431
(203) 373-3216

Established in 1952, the Fund made 444 grants for the year ending December 31, 1992. The grants averaged $5,000- $100,000.

► General Motors Foundation
President, Foundation
13-145 General Motors Building
3044 W. Grand Blvd.
Detroit, MI 48202

More than 50% of giving activity focuses on K-12 education. General Motors also has an interest in minority education.

► GTE Foundation
GTE GIFT Program
Box 6330, Room Q-520
Princeton, NJ 08541
(800) 315-5010

Initiated in 1983, this program has awarded more than $7 million dollars to 1,200+ math/science teaching teams. Teachers from 135 states are eligible for the program that awards about 60 grants of $12,000 apiece. Projects must demonstrate the innovative use of technology in education, be classroom-based, and have the potential for lasting benefits.

► Hewlett Packard Company Foundation (R)
Roy Verley
Executive Director
P.O. Box 10301
Palo Alto, CA 94303-0890
(415) 857-3053

Applications are not accepted.

► IBM Corporation
Information not included by request of Company.

► Intel Foundation (R)
Program Manager
5200 N.E. Elam Young Parkway, HF 3-48
Hillsboro, OR 97124-6497
(503) 696-2390

"The Company's K-12 education activities are organized under Corporate Contributions to bring coherence and focus to (education) efforts across sites." Its goal is "to focus the K-12 Education program where Intel has the most to offer and the most to gain: by increasing math, science, and technical literacy in the schools in its site communities by helping to develop a future work force that reflects the diversity in those communities." The manager of the K-12 program notes that as a rule, Intel is not in the business of creating K-12 education programs. "We're in the business of partnering with existing programs by providing resources, people, and expertise."

► The Joyce Foundation (R)

135 South La Salle Street
Suite 4010
Chicago, IL 60603
(312) 782-2464

Giving is primarily limited to the midwestern states. The Foundation seeks to address the "improvement of urban educational systems."

► W.M. Keck, Jr. Foundation (R)

Carl D. Hasting
Secretary-Treasurer
12575 Beatrice Street
Los Angeles, CA 90066-7001

Giving limited to Southern California.

► W.K. Kellogg Foundation

Nancy A. Sims
Manager, Grants Proposals
One Michigan Avenue, East
Battle Creek, MI 49017-4058
(616) 968-1611 Fax: (616) 968-0413

Incorporated in 1930, the Foundation seeks "to receive and administer funds for educational and charitable purposes." Support includes seed money.

► John S. and James L. Knight Foundation

(Formerly the Knight Foundation)
One Biscayne Tower, Suite 3800
Two Biscayne Boulevard
Miami, FL 33131-1803
(305) 539-0009

Support is available for capital campaigns, building/renovation, and program development. The education program has a national and local component with the local component limited to the 26 communities where the Foundation has an interest.

► Kresge Foundation

John E. Marshall, III
President and CEO
3215 West Big Beaver Road
P.O. Box 3151
Troy, MI 48007-3151
(810) 643-9630

No support is provided for elementary or secondary schools unless they predominantly serve individuals with physical and/or developmental problems. Challenge grants are available for building construction or renovation

projects, major capital equipment or an integrated system at a cost of at least $300,000; equipment costs may include computer software if applicable.

► Lilly Endowment Inc. (R)

Gretchen Wolfram
Communications Director
P.O. Box 88068
Indianapolis, IN 46208
(317) 924-5471

For the year ending December 31, 1993, the Endowment awarded 1,826 grants ranging from $2,500 to $3,750,000. A $575,000 grant was made to the Corporation for Educational Technology (Indianapolis, IN) for continued support of the Buddy System. This project places computers in the homes of elementary students in Indiana.

► John D. and Catherine T. MacArthur Foundation

Richard Kaplan
Director, Grants Management, Research, and Information
140 South Dearborn Street
Chicago, IL 60603
(312) 726-8000

► The John and Mary R. Markle Foundation

Lloyd N. Morrisett
President
75 Rockefeller Plaza, Suite 1800
New York, NY 10019-6908
(212) 489-6655 Fax: (212) 765-9690

The Foundation seeks to "examine and explore mass communications and explore the potential of information technology to enhance people's lives."

► MCI Foundation

Rolf Preisendorfer
1801 Pennsylvania Avenue, NW
Washington, DC 20006
(202) 887-2106

Established in 1986, "the Foundation primarily supports educational and charitable organizations that support the integration of information technology within education and society." Please also see the entry for Cisco Systems to learn about the International Schools CyberFair 96 program, jointly sponsored by Cisco Systems and MCI.

► The Andrew W. Mellon Foundation

Richard Ekman
Secretary
140 East 62nd Street
New York, NY 10021
(212) 838-8400

Support includes continuing support, program development, research funds, and matching funds. For the year ended December 31, 1993, the Foundation made 396 grants averaging $15,000-$600,000.

► Microsoft Corporation

1 Microsoft Way
Redmond, WA 98052-6399
(800) 555-4K12 (K-12 programs)
(312) 280-5048 (Libraries Online!)

Microsoft recently announced a number of education initiatives. "Working with key education groups, Microsoft is committed to supporting a 'Connected Learning Community' where all students have access to a computer, each is empowered to pursue his or her own individual path of learning, and where students, parents, educators, and the extended community are connected together. Through these efforts, Microsoft is providing programs that train teachers, advise parents, support libraries and museums, and motivate and reward students. Microsoft also works across the information technology industry with software and hardware developers to promote the effective use of technology in education." For information about Global Schoolhouse, see the section titled "Other."

► Mitsubishi Electric America Foundation

Rayna Aylward
Executive Director
1150 Connecticut Avenue, NW, Suite 1020
Washington, DC 20036

The mission of the Foundation is "to contribute to the greater good of society by assisting young Americans with disabilities, through education and other means, to lead fuller and more productive lives. The Foundation supports organizations and projects within its mission that have a national scope and impact, that demonstrate potential for replication at other sites, and that represent an innovative approach to addressing an important need." Phone calls during the application process are discouraged.

► Charles Stewart Mott Foundation

Office of Proposal Entry
1200 Mott Foundation Building
Flint, MI 48502-1851
(810) 238-5651

Among the types of support the Foundation provides are funds to eligible organizations for general and operating support, program development, and conferences and seminars.

► NEC Foundation of America

Sylvia Clark
Executive Director
Eight Old Sod Farm Road
Melville, NY 11747
(516) 753-7021 Fax: (516) 753-7096

"The Foundation supports programs with national reach and impact in the combined areas of science and technology education, principally at the secondary level, and efforts to apply technology to assist people with disabilities." Money is given for programs/groups with immediate national reach and impact.

► NYNEX (R)

Gale Cirigliano
1095 Avenue of the Americas, 41st Floor
New York, NY 10036

The Foundation provides support for all educational levels and for innovative solutions to the problems of the less advantaged, such as the education of youth. Funds are available for program development.

► Pacific Bell (R)

Education First
140 New Montgomery Street
Suite 1205
San Francisco, CA 94105

Pacific Bell intends to offer linkage to computer communications and interactive teleleaming to each of the 8,600 K-12 schools, libraries, and community colleges in its service area by the end of 1996. These applications are part of Pacific Bell's Knowledge Network, which uses the public network for providing voice, video, and data access to leaming resources.

► Pew Charitable Trusts

Rebecca W. Rimel
President
One Commerce Square
2005 Market Square, Suite 1700
Philadelphia, PA 19103-7017
(215) 575-9050

In each of its funding areas, including education, the Trusts stress the importance of developing capable and committed leadership. An application form is required.

► Reader's Digest Foundation (R)

Claudia L. Edwards
Executive Director
Reader's Digest Road
Pleasantville, NY 10570
(914) 244-5370

"The Foundation believes that people can make a difference in society, and that education is the key to individuals' realizing their full potential." Fields of interest include adult education--literacy and basic skills, libraries, and reading. No funds are available for capital, building, or endowment funds, operating budgets, conferences, publications, or special projects.

► Rockefeller Brothers Fund, Inc.

Benjamin R. Shute, Jr.
Secretary-Treasurer
1290 Avenue of the Americas
New York, NY 10104-0233
(212) 373-4200

Support is given for general and operating funds and program development.

► Alfred P. Sloan Foundation

Ralph E. Gomory
President
630 Fifth Avenue, Suite 2550
New York, NY 10111-0242
(212) 649-1649

The Foundation supports the innovative uses of communications technologies through its Independent Leaming Outside the Classroom program. This program focuses on the use of Asynchronous Leaming Networks (ALN) connecting higher education students on campus, at their worksites or homes. The purpose of the ALN is to support "on-demand," innovative approaches to math, science and engineering studies, particularly the use of multimedia technologies and computer networking for collaborative and self-paced education. In 1993, the Foundation awarded $697,422 to the New Jersey Institute of Technology "to initiate a project utilizing networked computer conferencing and video technology for reducing the average time to graduation with a B.A. degree in Information Systems for those who prefer to work at home."

► Southwestern Bell Foundation (R)

Charles DeRiemer
Executive Director

175 East Houston, Suite 200
San Antonio, TX 78205
(210) 351-2208 or (210) 351-2210
Fax: (210) 351-2205

The Foundation provides funds for program development, curriculum development, and seed money.

► Sprint Foundation (R)

(Formerly United Telecommunications Foundation)
Don G. Forsythe
Vice President, Corporate Relations
P.O. Box 11315
Kansas City, MO 64112
(913) 624-3343

Established in 1988, activities have an emphasis on business education, secondary education, and higher education. Support includes funds for general and operating support.

► Sun Microsystems, Inc.

Gary Serda
Manager of Corporate Affairs
901 San Antonio Road
Palo Alto, CA 94303

In 1995, the Company initiated the Open Gateways Project. In Sun Microsystems's efforts to connect all California schools to the Internet, this project seeks to bring telecommunications into classrooms. The hardware manufacturer will donate $1 million in hardware, software, training, and staff support to help K-12 students and teachers in San Francisco gain access.

► TCI Educational Technologies, Inc.

Vice President
P.O. Box 5630
Denver, CO 80217-5630
(303) 267-4751
(800) 254-3801 (PRIMESTAR)

TCI Educational Technologies, Inc. was created to take advantage of the existing broadband cable network that exists in communities around the country. Specifically, the Educational Turnkey Technology Solution consists of the following: Wide Area Networks, Local Area Networks, School/Home Connections, Hardware, Staff Development, and Hardware and Network Support. For schools not served by cable, PRIMESTAR by TCI seeks to provide access to educational programming on television. PRIMESTAR will give free mini-dishes and programming through the Goes to School project. PRIMESTAR takes advantage of the digital direct broadcast satellite television service, allowing access without cable. The equipment is available to the nearly 10,000 schools in its company communities that do not have access to cable television. There is no deadline for schools interested in participating in this project.

► Teagle Foundation

10 Rockefeller Plaza
Room 920
New York, NY 10020-1903
(212) 373-1970

The Foundation has a new $4 million program that will support collaboration among higher education institutions. The Collaborative Ventures program will provide grants to private postsecondary schools that pool their resources when addressing issues such as curriculum development, administrative expenses, and the impact of new technologies on education.

► Texas Instruments Foundation (R)

Ann Minnis
Grants Administrator
P.O. Box 6503011, MS 3906
Dallas, TX 75265
(214) 917-4505

Support includes funds for continuing support, capital campaigns, building and renovation, and research.

► 3Com (R)

5400 Bayfront Plaza
P.O. Box 58145
Santa Clara, CA 95052-8145
(408) 764-5000 Fax: (408) 764-6740

3Com supplies a complete range of networking solutions for elementary, secondary, and university educational environments. The Company has embarked on a partnership with the San Jose Educational Network to share networking solutions and human resources. For the past several years, 3Com has sponsored INET, the annual international conference on Internet development. In 1995, 3Com established the World 3Com Internet Spoken Here WWW browsing stations at local libraries in several towns in Massachusetts. The Company is also offering a challenge grant program. This $1 million program will help link schools, libraries, and museums in communities in which it has facilities.

► Time Warner, Inc. Foundation (R)

(Formerly Warner Communications Foundation, Inc.)
c/o Time Warner, Inc.
Mary E. McCarthy
Director of Corporate Contributions
75 Rockefeller Plaza, 14th Floor
New York, NY 10019
(212) 484-8022

Applications are not accepted.

► Toshiba America Foundation (R)

John Sumansky
President
1251 Avenue of the Americas, 41st Floor
New York, NY 10020
(212) 596-0060 Fax: (212) 593-3875

The Foundation's mission is "to support U.S. educational programs and activities at the junior high school and senior high school level--solely in the fields of science, mathematics, and technology." Grants attempt to respond to the basic needs of classroom teachers related to improvements in the curriculum and/or instruction. The Foundation emphasizes support for projects that emphasize participation by girls and minorities. Most grants are small, targeted to enhance classroom curricula with hands-on learning experiences.

► Toyota USA Foundation

Patricia Hull
Foundation Administrator
19001 South Western Avenue
Torrance, CA 90509
(310) 618-6766

The Foundation was founded in 1987. For the year ending June 30, 1993, the Foundation made 24 grants ranging from $10,000 to $100,000. An application form is required. Limitations include no support for public schools.

► US WEST Foundation (R)

(Formerly Mountain Bell Foundation)
Janet Kalicki
Grants Manager
7800 East Orchard Road, Suite 300
Englewood, CO 80111
(303) 793-6448 or (800) 843-3383

In 1994, the US WEST Foundation announced that it would emphasize the use of information technologies to improve education by better linking people and resources. Through its Teacher Network and in cooperation with the National Education Association, its local affiliates, school districts, universities, and state departments of education, the Foundation is training groups of teachers to use on-line computer services. The Foundation also has numerous other programs, including the Multimedia in Education Initiative.

Businesses

Computer and Equipment Donations

This information is included with the permission of Arlene Krebs, author of The 1996 Distance Learning Funding Sourcebook. For information on how to order the Sourcebook, please see page 50.

► Boston Computer Society

Computer and Peripheral Recycling Program
101st Avenue, Suite 2
Waltham, MA 02154
(617) 290-5700 Fax: (617) 290-5744
E-mail: msa@bcs.org
Contact: Marlene Archer

Donates computers, printers, monitors, and related equipment to nonprofits. Services include volunteer assistance. Membership fees range from $100-$300 based on budgets. Also provides on-line discussion groups for those interested in donating equipment or involved with the Society.

► Computer Bank Charity

15062-B 15th Avenue, NE
Seattle, WA 98155
(206) 365-4657

Donates computers and related equipment to non-profits and individuals primarily in the Seattle area, giving highest priorities to people with disabilities. Will consider applications elsewhere in Washington if transportation can be arranged.

► Computer Reclamation, Inc.

912 Thayer Avenue, Suite 210
Silver Spring, MD 20910
(301) 495-0280
Contact: Michael Wiggins

Donates computers and related equipment to non-profits in the metro Washington metropolitan area, but other organizations can apply if they arrange transportation. A donation of $25 per computer is requested.

► Computer Recycling Center

1245 Terrabella Avenue
Mountain View, CA 94043

(415) 428-3700
Contact: Mark Hoss

Donates computers and related equipment in the San Francisco Bay area.

► Computer Recycling Center

Cyert Hall, Room B-25
Carnegie-Mellon University
Pittsburgh, PA 15213
(412) 268-8609 Fax: (412) 268-8192
E-mail: retread@andrew.cmu.edu
Contact: Marc Bartholomew, Coordinator

Donates computers and related equipment to nonprofits and schools, but other organizations can apply if they provide transportation.

► Dallas Computer Literacy Program

4208 University Boulevard
Dallas, TX 75205
(214) 521-2938
Contact: Brian Mickel

Donates computers and related equipment in the Dallas area to non-profit groups providing computer training and public use. Program also offers training and repair services.

► Detwiler Foundation

Computers for Schools Program
470 Nautilus Street, Suite 300
La Jolla, CA 92037
(800) 939-6000 Fax: (619) 456-9045

Donates equipment to California K-12 schools.

► East-West Education Development Foundation

55 Temple Place
Boston, MA 02111
(617) 542-1234 Fax: (617) 542-0555
E-mail: alex@donate.org
Contact: Alexander Russell V

Donates computers and related equipment to non-profits and schools in the U.S. and other countries. Recipients are selected by equipment donors.

► Free Bytes

One Buckhead Plaza
Atlanta, GA 30305
Contact: Charles Shufeldt

Donates computers and related equipment to non-profits and schools in the Atlanta area. Organizations generally pay $30 per machine.

► Gifts in Kind America

Recycled Technology Program
700 North Fairfax Street, Suite 300
Alexandria, VA 22314

(703) 836-2121
Contact: Jeanne Brown

Donates computers and related equipment and software to non-profits and schools. Requires a membership fee. Charges $10 per computer. GIKA plans to work with 100 job-training programs to store the computers, evaluate, and repair them. Groups interested in becoming a training center should send a stamped, self-addressed envelope to request the Recycle/Reuse Center application form.

► Lazarus Foundation

10378 Eclipse Way
Columbia, MD 21044
(202) 205-8308 Fax: (410) 381-4762
E-mail: ebard@aol.com
Contact: Don Bard or Paul Dammitt

Donates computers to non-profits and schools in the Washington metropolitan area, with priority to groups working with children. Offers training and repair services.

► Marin Computer Resource Center

862 Sir Francis Drake Boulevard, No. 166
San Anselmo, CA 94960
(415) 454-4227 Fax: (415) 456-9492
Contact: Clay Thompson

Donates computers and related equipment to non-profits, school libraries, and low-income families (religious groups ineligible) in the Marin County area. Other organizations can apply if they arrange transportation.

► National Association for the Exchange of Industrial Resources (NAEIR)

560 McClure Street
P.O. Box 8076
Galesburg, IL 61402
(800) 562-0955 or (309) 343-0704
Fax: (309) 343-0862
Contact: Gary C. Smith

Donates office, building and maintenance supplies, toys, arts and crafts, books, electronics and computer software and supplies, hand and power tools, furniture, clothing and more to non-profits, schools, and religious groups. Annual membership fee of $645 allows members to select items from five different catalogs. Members average $7,000 per year. Members pay shipping and handling.

► National Cristina Foundation

591 West Putnam Avenue
Greenwich, CT 06830
(203) 622-6000
Contact: Yvette Marrin

Matches companies and individuals interested in donating computers and related equipment with non-profits and schools that serve people with disabilities in the U.S. and abroad. Donors send equipment directly to the beneficiary.

► Non-Profit Computing, Inc.

40 Wall Street, Suite 2124
New York, NY 10005-1301
(212) 759-2368
E-mail: npc@igc.org
Contact: John L. German

Donates computers and related equipment to non-profits, schools, and government agencies primarily in New York City. Offers training and repair services. Also donates to groups in U.S. and abroad when they can arrange transportation.

► Non-Profit Services

1605 63rd Street
Emeryville, CA 94608
(510) 658-4760
Contact: James Chao

Donates computers and related equipment to member nonprofit organizations in the San Francisco Bay area. Organizations must pay a $30 annual membership fee.

► Northwest Micro

Give to the Givers Program
620 SW Arctic Drive
Beaverton, OR 97005
(503) 626-2555

Donates computers and related equipment traded to local non-profits.

► Student Computer Recycling to Offer Underrepresented Groups in Education (SCROUNGE)

Pennsylvania State University
101 South Frear Lab
University Park, PA 16802
(814) 863-7688
E-mail: scroung9@psuvm.psu.edu
Contact: Geraldine Russell

Accepts computers and related equipment from companies and individuals in Pennsylvania and redistributes these to private and public schools. Offers brochures to those who wish to begin a computer-donation program.

► The Surplus Exchange

1107 Hickory
Kansas City, MO 64101
(816) 472-0444
Contact: Rick Kaplan, Executive Director

Donates and sells computers and related equipment to non-profits at a discounted rate. Charges a one-time membership fee of $50.

Educational Technology -- Public Companies

The publicly-traded companies listed below were selected from among those identified by the Education Industry Directory. Some of them offer financing packages that address the special budgetary considerations of educational institutions.

According to the Software Publishers Association, K-12 schools spent $2.4 billion on educational technology in 1994. Higher education spending on technology was approximately $6.0 billion. The consumer market for educational technology reached $522 million in software alone for 1994. Much of this software combines learning and fun on CD-ROM format and is referred to as "edutainment."

The information in this section is included by permission of EduVentures, Inc., the publisher of the Education Industry Directory. For information on how to order the Directory, please see page 49.

► Apple Computer, Inc.

1 Infinite Loop
Cupertino, CA 95014-2084
(408) 996-1010 Fax: (408) 974-3108

Industry Sector: Technology
Exchange: NDQ Ticker: AAPL
Revenues ($ millions): 1995: NA/ 1994: $9,188.7/ 1993: $7,977.0

Apple Computer, Inc. develops, manufactures, licenses, and markets easy-to-use personal computers, servers, peripherals, software, on-line services, and personal digital assistants. Apple serves the business, education, consumer, scientific, engineering, and government markets in more than 140 countries. In the education market, Apple holds a 28% share of the worldwide market for computers and has an even stronger lead in K-12 education, with a 61% market share of the U.S.-installed base, according to research by Quality Education Data.

► Broderbund Software, Inc.

500 Redwood Blvd.
P.O. Box 6121
Novato, CA 94948-6121
(415) 382-4449 Fax: (415) 382-4665

Industry Sector: Technology
Exchange: NDQ Ticker: BROD
Revenues ($ millions): 1995A: $171.6/ 1994: $111.8/ 1993: $95.6

Broderbund Software, Inc. develops, publishes, and markets personal computer software for the home, school, and small business markets and has sold over 30 million units of consumer software since its founding in 1980. The Company offers products primarily in three consumer software categories: personal productivity, education, and entertainment. The Company recently announced the pending acquisition of The Learning Company, which develops educational personal computer software products for use at home and at school.

► Capitol Multimedia, Inc.

7315 Wisconsin Avenue
Suite 800-E
Bethesda, MD 20814
(301) 907-7000 Fax: (301) 907-7005

Industry Sector: Technology
Exchange: NMS Ticker: CDIM
Revenues ($ millions): 1995A: $4.6/ 1994: $4.8/ 1993: $6.7

Capitol Multimedia, Inc. develops, publishes, and distributes high-quality entertaining and educational interactive consumer software products and innovative applications. The Company began focusing on the children's market within the CD-ROM interactive software industry with the acquisition of Animation Magic, Inc. in February, 1995. The Company's strategy for the children's software market is to target children ranging from 3 to 12 years of age and to develop families of software products that build strength in distribution channels and achieve brand name recognition and loyalty.

► Children's Broadcasting Corporation

724 First Street North, Fourth Floor
Minneapolis, MN 55401
(612) 338-3300 Fax: (612) 338-4318

Industry Sector: Technology
Exchange: NMS Ticker: AAHS
Revenues ($ millions): 1995: NA/ 1994: $4.4/ 1993: $2.5

Children's Broadcasting Corporation develops, produces, and broadcasts innovative radio programming for kids and their families. The Company distributes its programming via satellite 24 hours per day to a developing network of radio stations across the U.S. Broadcast as Radio AAHS, the Company's programming includes music, stories, current events, weather, interactive quizzes, interviews, and discussions aimed at entertaining and informing its audience. Radio AAHS is licensed to be carried by 27 radio stations and is now available to approximately 30 percent of the U.S. population.

► Davidson & Associates, Inc.

19840 Pioneer Avenue
Torrance, CA 90503
(310) 793-0600 Fax: (310) 793-0601

Industry Sector: Technology
Exchange: NDQ Ticker: DAVD
Revenues ($ millions): 1995: NA / 1994: $87.9/ 1993: $59.1

Davidson & Associates, Inc. develops, publishes, manufactures, and distributes high-quality educational and entertainment software products for home and school use. The Company creates educationally powerful products using advanced multimedia technology and distributes these and selected affiliated label products to the home and school markets. The Company's products are easy and fun to use and incorporate characters, themes, sound, graphics, music, and speech in ways that the Company believes are engaging to the user. The Company's educational products, offered at multiple price points, are targeted primarily to pre-kindergarten through 12th grade age groups and address a variety of learning needs.

► Edmark Corporation

6727 185th Avenue, NE
P.O. Box 97021
Redmond, WA 98073-9721
(206) 556-8400 Fax: (206) 556-8998

Industry Sector: Technology
Exchange: NDQ Ticker: EDMK
Revenues ($ millions): 1995A: $22.7/ 1994: $11.7/ 1993: $8.7

Edmark Corporation is a developer and publisher of educational software products for children from 2 to 12 years old for the consumer and supplemental materials market. The Company's line of multimedia software products includes: KidDesk, KidDesk Family Edition, Millie's Math House, Bailey's Book House, Sammy's Science House, Thinkin' Things Collection 1, Thinkin' Things Collection 2, and Imagination Express. The Company's special education product line includes the Edmark Reading Program family of products. The Company also manufactures and sells the TouchWindow, a relatively low-cost touch screen used in special education and early childhood programs, and distributes a line of print and software educational products published by others.

► Enteractive, Inc.

110 West 40th Street
Suite 2100
New York, NY 10018
(212) 221-6559

Industry Sector: Technology
Exchange: NMS Ticker: ENTR
Revenues ($ millions): 1995A: $0.4/ 1994: $2.4/ 1993: $2.4

Enteractive, Inc. develops, publishes, and markets interactive multimedia products having both educational and entertainment content for the home and school markets. The Company developed and marketed 11 interactive titles through an agreement with Phillips Interactive of America, a division of N.V. Phillips, under which Phillips maintained full ownership rights to the titles and paid the Company development fees and royalties. The Company recently has shifted its focus from being primarily a provider of product development services for others, as with Phillips, to being a developer and publisher of products for which the Company maintains a significant ownership interest.

► IVI Publishing, Inc.

7500 Flying Cloud Drive
Eden Prairie, MN 55344-3739
(612) 996-6000

Industry Sector: Technology
Exchange: NDQ Ticker: IVIP
Revenues ($ millions): 1995: NA/ 1994: $7.0/ 1993: $2.3

IVI Publishing, Inc. is an electronic publisher of health and medical information in interactive multimedia formats. The Company develops, produces, markets, and distributes such information for the consumer and professional medical markets. The Company has entered into licensing agreements with the Mayo Foundation for Medical Education and Research, Time Life Inc., and the Glencoe Division of Macmillan/McGraw-Hill Publishing Company. In addition, the Company is developing children's health and safety titles and other titles for the education market. The Company's titles incorporate audio, text, video, and animated graphics that are linked in a complete computerized cross-referencing system. The Company has published all of its titles in personal computer CD-ROM format.

► Lancit Media Productions, Ltd.

601 West 50th Street
New York, NY 10019
(212) 977-9100

Industry Sector: Technology
Exchange: NDQ Ticker: LNCT
Revenues ($ millions): 1995: NA/ 1994: $8.9/ 1993: $3.7

Lancit Media Productions, Ltd. is a leading creator and producer of high-quality children's and family programming including the nine-time Emmy winning Reading Rainbow and The Puzzle Place, a major daily PBS children's series produced with KCET/Los Angeles. Other television projects include Backyard Safari, a natural science series currently in production, and a major new children's series in development with the Smithsonian Institution. Strategy Licensing, a Lancit subsidiary, also represents such popular properties as Sonic the Hedgehog, Carmen Sandiego, and Lemmings.

► Mathsoft, Inc.

101 Main Street
Cambridge, MA 02142-1521
(617) 577-1017 Fax: (617) 577-8829

Industry Sector: Technology
Exchange: NMS Ticker: MATH
Revenues ($ millions): 1995A: $15.9/ 1994: $27.5/ 1993: $25.6

Mathsoft, Inc. develops, markets, and supports general purpose calculation software tools and Electronic Books for technical professionals, educators, and students. The Company's principal product, Mathcad, can be used by desktop and laptop computer users to perform calculations from the simple to the elaborate, and then document the results. Mathcad offers technical professionals an interactive, intuitive, easy-to-modify alternative to their traditional methods such as pencil and paper, whiteboards, and calculators. The Company also markets Electronic Books as add-on products to Mathcad that deliver extensive off-the-shelf technical information, such as formulas and data, that is critical to technical problem solving.

► Midisoft Corporation

15379 NE 90th Street
Redmond, WA 98052
(206) 881-7176 Fax: (206) 883-1368

Industry Sector: Technology
Exchange: NDQ Ticker: MIDI
Revenues ($ millions): 1995: NA/ 1994: $5.0/ 1993: $2.5

Midisoft Corporation designs, develops, and markets interactive multimedia software which allow users to manipulate graphics, video, text, music, and other audio content for a variety of purposes including original music composition, education, and multimedia business presentations. Through internal development, selective licensing arrangements, and strategic acquisitions, the Company is broadening its scope to include a range of multimedia solutions for home, business, and school markets.

► Minnesota Educational Computing Corporation (MECC)

6160 Summit Drive North
Minneapolis, MN 55430-4003
(612) 569-1500 Fax: (612) 569-1556

Industry Sector: Technology
Exchange: NDQ Ticker: MECC
Revenues ($ millions): 1995A: $28.0/ 1994: $21.7/ 1993: $18.0

MECC is a leading developer, publisher, and distributor of fun, high-quality, educational software for use by children in the school and at home. The Company's products are designed principally for children ages 5 to 18, or in grades kindergarten through 12. The Company has been developing educational software and providing technology solutions for the classroom needs of teachers and children since 1973. The Company recently announced an agreement to be acquired by SoftKey, Inc.

► Byron Preiss Multimedia Company, Inc.

24 West 25th Street
New York, NY 10010
(212) 989-6252 Fax: (212) 989-6550

Industry Sector: Technology
Exchange: NDQ Ticker: CDRM
Revenues ($ millions): 1995: NA/ 1994: $3.1/ 1993: $0.8

Byron Preiss Multimedia Company, Inc. develops and publishes multimedia software for the consumer, education, and small business markets. The Company utilizes CD-ROM and other multimedia formats for on-line delivery of its software. The Company also publishes books and is developing its first on-line service.

► Sierra On-Line, Inc.

3380 146th Place, SE

Suite 300
Bellevue, WA 98007
(206) 649-9800 Fax: (206) 641-7617

Industry Sector: Technology
Exchange: NDQ Ticker: SIER
Revenues ($ millions): 1995A: $83.4/ 1994: $62.7/ 1993: $49.7

Sierra On-Line, Inc. creates, produces, and distributes multimedia entertainment, educational, and productivity software primarily for the home consumer market. The Company's products provide education and fun to children and adults in an animated, interactive environment. The Company's educational products include Sierra Discovery, Adi, and Berlitz for Business.

► Touchstone Applied Science Associates, Inc.

Fields Lane
P.O. Box 382
Brewster, NY 10509-0382
(914) 277-8100 Fax: (914) 277-3548

Industry Sector: Technology
Exchange: NDQ Ticker: TASA
Revenues ($ millions): 1995A: $2.3/ 1994: $2.0/ 1993: $2.3

Touchstone Applied Science Associates, Inc. designs, develops, and publishes educational tests, instructional materials, and microcomputer software. The tests, known as Primary, Standard, and Advanced Degrees of Reading Power (DRP) tests and Degrees of Word Meaning (DWM) tests, assess student progress in the following interrelated components of literacy: 1) the ability to comprehend the surface meaning of increasingly more difficult textual material; 2) the ability to reason with -- that is, analyze, evaluate, and extend the ideas that are presented in -- increasingly more difficult textual material; and 3) the size of students' reading vocabularies by measuring their understanding of the meaning of words appearing in naturally occurring contexts. Management believes that DRP tests were the first, and remain the only, commercial standardized tests whose results can be directly interpreted with respect to textual materials that a student can read.

► TRO Learning, Inc.

Woodfield Corporate Center
150 North Martingale Road
Suite 700
Schaumburg, IL 60173-2079
(708) 517-5100 Fax: (708) 517-2635

Industry Sector: Technology
Exchange: NDQ Ticker: TUTR
Revenues ($ millions): 1995: NA/ 1994: $28.4/ 1993: $26.5

TRO Learning, Inc. is a leading developer and marketer of microcomputer-based, interactive, self-paced instructional and testing systems used in a wide variety of settings. Offering comprehensive educational courseware specifically designed for young adult and adult learners, the Company's PLATO Learning Systems are marketed to middle schools and high schools, community colleges, job training programs, correctional institutions, government-funded programs, and corporations. The Company's TRO Aviation Training systems are marketed to airlines worldwide for use in training commercial airline pilots, maintenance crews, and cabin personnel.

► Westcott Communications, Inc.

1303 Marsh Lane
Carrollton, TX 75006
(214) 417-4100 Fax: (214) 417-4933

Industry Sector: Technology

Exchange: NDQ Ticker: WCTV
Revenues ($ millions): 1995P: $100.0/ 1994: $89.7/ 1993: $69.3

Westcott Communications, Inc. delivers workplace training and education utilizing various multimedia technologies including private satellite television networks. The Company provides training, news, and information to more than 20,000 subscribers with an estimated population of three million professionals and students in the corporate and professional, automotive, banking, government and public service, education, healthcare, and interactive distance training markets. The Company serves the educational market through its TI-IN Network which broadcasts three channels of primarily live and interactive programming for students, teachers, and administrators for approximately eight to ten hours per day. Approximately 1,100 high schools and 900 elementary and middle schools are subscribers to TI-IN.

Other

These are a sample of the growing number of organizations that are not grant-making entities, but have an interest in encouraging the use of technology in education.

► The Benton Foundation

Communications Policy Project
1634 Eye Street, NW
Washington, DC 20006
(202) 638-5770 Fax: (202) 638-5771

This Foundation's Project "is working to strengthen public interest advocacy in communications policy and to involve nonprofits in shaping the National Information Infrastructure."

► Consortium for School Networking (CoSN)

1555 Connecticut Avenue, NW
Suite 200
Washington, DC 20036
(202) 462-9600 Fax: (202) 462-9043

CoSN advocates connecting K-12 classrooms to the Internet.

► Electronic Frontier Foundation

1550 Bryant Street
San Francisco, CA
(415) 668-7171

The Foundation has worked in the past with industry, nonprofits, and government organizations to explore uses for new technology in K-12. The organization also works to advocate the civil liberties of online users.

► Global Schoolhouse

Headquarters
7040 Avenida Encinas
Suite 104-281
Carlsbad, CA 92009
(619) 433-3413 Fax: (619) 931-5934

Sponsored by Microsoft, the Global Schoolhouse is a division of the Global SchoolNet Foundation. The Schoolhouse focuses on projects for "life-long learning" and uses the most powerful Internet tools, including live video, to link K-12 classrooms to their communities and to other children around the world. The project seeks to support access to quality on-line educational resources and will help build "compelling content that teachers can fully integrate into instruction. "

► Global SchoolNet Foundation (GSN)

Formerly known as FrEdMail (Free Educational Mail)
P.O. Box 243
Bonita, CA 91908-0243
(619) 475-4852 Fax: (619) 472-0735

"Since 1985, GSN has been a leader in the instructional applications of telecommunications. Today the Foundation, a 501(c)(3) nonprofit corporation, is a major contributor to the philosophy, design, culture, and content of educational networking on the Internet and in the classroom." Having originated with a group of teachers in San Diego, and with no budget and minimal support, the teachers set about creating an educational information infrastructure starting at the grass roots level. GSN offers K-12 education the SCHLNet Newsgroup Service, a professionally managed K-12 newsfeed, providing an easy way to locate a collection of distance learning projects found anywhere on the Internet. GSN also offers the Global Schoolhouse described above.

► International Society for Technology in Education (ISTE)

1787 Agate Street
Eugene, OR 97403-1923

The ISTE is a "nonprofit professional organization dedicated to the improvement of education through computer-based technology." The complete ISTE guide to Resources and Services for Technology-Using Educators is available at no charge on-line or by surface mail. This guide includes publications, educational technology news, distance education courses, information on special interest groups, and additional information related to technology in education.

► The Lightspan Partnership, Inc.

2382 Faraday Avenue
Suite 300
Carlsbad, CA 92008
(619) 929-5900 or (800) 987-SPAN

Lightspan aims to create partnerships with educators who seek powerful tools to meet today's educational challenges. It is a "growing alliance of leaders in elementary education, feature film and TV entertainment, interactive software design, and telecommunications. "

► The National Center for Technology Planning (NCTP)

Dr. Larry S. Anderson
Founder/Director
P.O. Box 5425
Mississippi State, MS 39762
(601) 325-2281 Fax: (601) 325-7599

The NCTP is a "clearinghouse for the exchange of many types of information related to technology planning. This information may be: school district technology plans available for downloading via a computer network; technology planning aids; and/or electronic monographs on timely, selected topics. The NCTP was created for those who need help, seek fresh ideas, or seek solutions to problems encountered with planning...Collection occurs as school districts and other agencies around the world send their plans to NCTP to be added to the growing repository."

► National Coalition on Technology in Education and Training

P.O. Box 33458
Washington, DC 20033

"NCTET is a national coalition on current issues and potential uses of technology to improve education and training in America."

► National Education Association (NEA)

Center for Education Technology

1201 16th Street, NW
Washington, DC 20036
(202) 822-7360 Fax: (202) 822-7987

The Center was established to ensure that technology "truly does benefit the teaching and learning process. The Center's programs are designed to put NEA and its affiliates at the cutting edge...the Center will make information available (to its members and affiliates) in printed form and on-line with materials from external sources and materials especially created for NEA."

► Public Education Fund Network

601 13th Street, NW
Suite 290N
Washington, DC 20005

The Public Education Fund Network is a national association of local education funds (LEFs) committed to achieving high-quality public education for all American children, especially the disadvantaged. Its mission is to link and unite these LEFs and work with them to mobilize the energy and resources of their communities to build effective and successful public schools.

On-line Resources

Below are some Universal Resource Locators (URLs) that one can use to conduct on-line research. Use these World Wide Web and e-mail addresses to obtain information about government programs, foundations, businesses, and other organizations that have demonstrated an interest in bringing technology into the classroom.

This information is provided by Arlene Krebs, author of The 1996 Distance Learning Funding $ourcebook, with extensive additional research conducted by CSI.

Government

Clearinghouse for Networked Information Discovery and Retrieval (CNIDR)
http://www.cnidr.org

Created by the National Science Foundation, this Internet site supports networked information discovery and retrieval. One of its features is a research page that shows the results of an ongoing survey of K-12 schools with Internet connections.

Department of Education
http://www.ed.gov
ftp.ed.gov (logon: anonymous)
gopher ed.gov
almanac@inet.ed.gov

Educational Resources Information Center (ERIC)
http://www.cua.edu/www/eric_ae/home.html

Supported by the DoEd, ERIC offers more than 850,000 abstracts of articles and other documents on education research and policy.

Environmental Protection Agency (EPA)
http://www.epa.gov/0
gopher.epa.gov
gopher://gopher.epa.gov

Fund for the Improvement of Postsecondary Education
http://www.ed.gov/prog_info/FIPSE/
Internet: GOPHER.ED.GOV
FIPSE@ED.GOV

Information Infrastructure Task Force
http://iitfcat.nist.gov:94/doc/Education.html

National Aeronautics and Space Administration
http://hypatia.gsfc.nasa.gov/NASA_homepage.html
http://quest.arc.nasa.gov (NASA IITA K-12 Internet initiative)

National Science Foundation
http://stis.nsf.gov/start.htm
http://www.fastlane.nsf.gov/
ftp://stis.nsf.gov

National Telecommunications and Information Administration (NTIA)
http://www.doc.gov (Department of Commerce)
gopher.ntia.doc.gov

Public Telecommunications Facilities Program (PTFP)
ptfp@ntia.doc.gov

Telecommunications and Information Infrastructure Assistance Program (TIIAP)
tiiap@ntia.doc.gov

The White House
http://www.whitehouse.gov

Foundations

Annenberg/CPB
http://www.cpb.org/annenberg
cpb.org (for Funding Guidelines)
info@learner.org (information about the Annenberg/CPB Project)

Autodesk Foundation
http://www.autodesk.com/aboutad/foundati

Coca-Cola Foundation
http://www.cocacola.com (company information)

Charles A. Dana Foundation
http://www.dana.org/
danainfo@danany.dana.org (general requests)

Eastman Kodak Charitable Trust
http://www.kodak.com/ (company information)

Freedom Forum
http://www.nando.net/prof/freedom/1994/freedom.html

J. Paul Getty Trust
http://www.ahip.getty.edu/ (information about its Art History Information Program)
ssiegfried@getty.edu (information about the AHIP Networked Access Project)

MacArthur Foundation
gopher://gopher.macfdn.org:3016/
gopher.macfdn.org; port 3016
4answers@macfdn.org

Mitsubishi Electric America Foundation
http://www.hri.com/MEA/meafhome.html.###

Rockefeller Brothers Fund
http://www.rbf.org.rbf/

Sloan Foundation
http://www.sloan.org/

Business

Ameritech
http://www.ameritech.com (company information)

Apple Computer
http://www.apple.com (company information)
http://www.info.apple.com/education/1996grants.html (Partners in Education)

AT&T
http://www.att.com
http://www.att.com/education/learning_network

Bell Atlantic
http://www.bell-atl.com (company information)

BellSouth
http://www/bstbls.com

Ben and Jerry's
http://www.benjerry.com

Bolt Beranek and Newman, Inc.: National School Network Testbed
http://copernicus.bbn.com

Carnegie Corporation of New York
gopher://tigger.jvnc.net:3000/11/Carnegie_Corporation_of_New_York
gopher: tigger.jvnc.net, port 3000

Cisco Systems, Inc.
http://sunsite.unc.edu:80/cisco/web-arch.html
edu-grant@cisco.com

Convergence Services, Inc.
edtech@convg.com

Digital Equipment Corporation
http://www.digital.com

Eastman Kodak
http://www.kodak.com

Education Industry Directory/Report
edindustry@aol.com

General Electric
http://www.ge.com (company information)

Global Commerce Link
http://www.commerce.com/net2/library/education.html (Net Squared Education)

Intel Corporation
http://www.intel.com (company information)
http://www.intel.com/intel/educate/teacher/index.html

International Schools CyberFair 96
lists@gsn.org (to join the mailing list, send an email message and in the message type SUBSCRIBE cyberfair)

Jostens
http://www.jostens.com

Microsoft Corporation
http://www.microsoft.com/HEd/
http://www.microsoft.com/K-12/

The 1996 Distance Learning Funding $ourcebook
http://www.technogrants.com
funding@technogrants.com

NYNEX
http://www.nynex.com

Pacific Bell
http://www.pacbell.com (company information)
http://www.pacbell.com/superhi/CalRen/index.html (CalREN)
http//www.pacbell.com/superhi/EdFirst/index.html (Education First)
education@PacBell.com (Education First e-mail)

Southwestern Bell (SBC)
http://www.sbc.com (company information)

Sprint Foundation
http://www.sprintlink.net (company information)

3Com Corporation
http://www.3Com.com

US WEST
http://www.service.com/cm/uswest/home.html (company information)

Wentworth Worldwide Media
http://wentworth.com/classroom/default.html (Classroom Connect on the Net)

Other

Agency for Instructional Technology (AIT)
technos@linknet.com

AIT is a nonprofit, U.S.-Canadian corporation established in 1962. Its mission is to foster learning by developing, acquiring, and distributing quality technology-based resources and services, and by providing leadership to the educational technology policy community.

Benton Foundation
http://www.cdinet.com/benton
benton@benton.org

Computer as a Learning Partner
http://clp.berkeley.edu/CLP.html#top

Consortium for School Networking (CoSN)
info@cosn.org

This web site offers information on policy discussions involving school networking.

Council on Foundations
http://www.cof.org

Educom
http://www.educom.edu

This web site, geared towards higher education, provides information on many ed-tech issues. Its members are described in its literature as "institutions of higher education, nonprofit associations, corporations, and other organizations committed to education that is active and learner-centered, free from traditional constraints of time and space, lifelong and collaborative, cost-effective, responsive, dynamic, relevant, and accessible."

Electronic Frontier Foundation
http://www.eff.org

The Foundation Center DIALOG Files
79 Fifth Avenue, Dept. DA
New York, NY 10003-3076
(800) 424-9836
(212) 620-4230--in New York State

DIALOG allows users to find on-line key facts about thousands of grantmakers. Also allows one to generate detailed reports on a range of potential funders in a cost-effective manner.

From Now On: The Educational Technology Journal
http://pacificrim.net

Funding Educational Technology

This site is maintained by Jamieson McKenzie, a teacher in Washington State. It offers insight into Internet-based learning and advice for school officials on acquiring and using technology.

Global Schoolhouse
http://www.gsh.org
andresyv@cerf.net

Global SchoolNet Foundation
http://www.gsn.org
info@gsn.org

Houghton Mifflin GNN Education Center
http://www.gnn.com/gnn/meta/edu/index.html

Institute for Learning Sciences (ILS)
http://www.ils.nwu.edu

International Education and Resource Network (IERN)
http://www.igc.apc.org/IERN

International Society for Technology in Education (ISTE)
http://isteonline.uoregon.edu/ (general)
CompuServe: 70014,2117
iste@seas.gwu.edu (information on "legislation and national policy initiatives")

The Internet and Schools
http://sunsite.unc.edu/cisco/tracy-article.html

This site is a report on the activities and institutions shaping the role of the Internet in education. It is part of the Sun Microsystems, Inc. Cisco Education Archive.

George Lucas Educational Foundation
http://www.glef.org

National Academy of Sciences
http://nas/edu/nap/online/techgap/welcome.html

National Center for Technology Planning
http://www2.msstate.edu/~lsal
gopher://gopher.msstate.edu/00/Online_services/nctp.About.NCTP
gopher.msstate.edu
submenu: Resources Maintained at MsState University/
digital.cosn.org
submenu: Networking Information/

National Coalition on Technology in Education and Training
nctet@cosn.org

The Online Internet Institute
http://prism.prs.k12.NJ.US:70/0/WWW/OII/OIIhome.html

Public Broadcasting Service
http://www.pbs.org

Syllabus Web
http://www.syllabus.com

This site has information on the variety of technologies used to improve education.

Tech Corps
http://www.ustc.org

This private, nonprofit organization was formed to help organize the talents and expertise of community volunteers who are willing to help K-12 schools acquire technology and train teachers.

Technical Education Research Centers
http://hub.terc.edu:70/hub/owner/TERC

WETA
http://www.weta.com

Print Resource Materials

Books

The resources listed below were compiled from research through a variety of sources by CSI. Where possible, we have included ordering information and a brief description of the resource. This list is by no means complete, and we encourage participants to conduct their own research.

► Carroll's Federal Assistance Directory

Carroll Publishing
1058 Thomas Jefferson Street, NW
Washington, DC 20007
(800) 336-4240 or (202) 333-8620
Fax: (202) 337-7020
Internet: tcarroll@aol.com
$137 for a one-year subscription (2 issues)

The directory lists 1,390 programs that assist the American public, as individuals or groups. Types of assistance listed include money, property, or service.

► Computers and Technology in School Library Media Centers

by Katherine Toth Bucher
ISBN 0-938865-36-6. $34.95. September 1994.

Includes 10 sections plus a glossary. 3-ring binder. 258 pages. Recommended for those wanting "a surface overview of all kinds of technology."
- Booklist/January 1, 1995

► Computer Resource Guide: Computer Grants Directory, 4th Edition

Public Management Institute
ISSN 0743-944X
ISBN 0-916664-54-6

Published in 1991, this book includes information on organizations that have funding for technology and on some of the caveats of developing proposals.

► Copyright for School Libraries: A Practical Guide

by Carol Mann Simpson. Softcover. 115 pp
ISBN 0-938865-31-5. $16.95. March 1994.

"Media specialists everywhere. . .will be wise to acquaint themselves with this comprehensive, up-to-date, and surprisingly readable guide."
- School Library Journal/September 1994

► Directory of Building and Equipment Grants

Research Grants Guide, Inc.
P.O. Box 1214
Loxahatchee, FL 33470
(407) 795-6129

This directory lists funding sources for equipment, building and renovation, and innovative procedures to secure funding for computers and free computer software.

► Directory of Computer and High Technology Grants

Research Grants Guide, Inc.
P.O. Box 1214
Loxahatchee, FL 33470
(407) 795-6129 Fax: (407) 795-7794
$52.50 + S&H

Information on more than 600 foundations that provide hardware, software, and technology-related grants.

► Directory of Grants for Organizations Serving People with Disabilities, 9th Edition

Research Grants Guides, Inc.
P.O. Box 1214
Loxahatchee, FL 33470
(407) 795-6129 Fax: (407) 795-7794
$55.50 + S&H

The directory lists more than 800 foundations awarding grants to nonprofit organizations. In addition, there are three informative articles on grantsmanship and twenty-two federal program profiles. Funding sources are arranged by state.

► The Education Industry Directory

John M. McLaughlin, Editor
14th Seventh Avenue North, Suite 115
St. Cloud, MN 56303
(612) 251-8323 Fax: (612) 251-2459
$95/ $65 for public schools, universities, libraries, and nonprofit organizations

Developed as a resource guide aimed at the for-profit education industry in the U.S., the Directory provides listings on more than 1,000 public and private companies involved in the education industry. It also includes an overview of the $600 billion education market. The book is categorized by the following four sectors: Education Management Organizations (EMOs), Educational Services, Educational Products, and Non-Instructional Services. See page 54 for information on how to order the Education Industry Report.

► Giving USA 1995

American Association of Fund Raising Counsel (AAFRC)
25 West 43rd Street, Suite 820
New York, NY 10036
800-46-AAFRC or (212) 768-1795
175 pp; $45

Provides an estimate of charitable giving in the United States. The book contains more than forty graphs, charts, and tables and over 175 pages of information. Also included are lists of the year's largest gifts.

► Government Assistance Almanac 1995-96

J. Robert Dumouchel
Omnigraphics, Inc.
Penobscot Building
Detroit, MI 48226
(313) 961-1340

A guide to more than 1,370 federal financial and other domestic programs. Covers grants and loans, fellowships, scholarships, and more than 4,000 addresses and phone numbers for program headquarters and field offices.

► A Guide to Developing Education Partnerships

Superintendent of Documents
Government Printing Office
Washington, DC
(202) 512-1800 Fax: (202) 512-2250
#065-000-00619-7
$4.25

► Guide to U.S. Department of Education Programs

Superintendent of Documents
Government Printing Office
Washington, DC
(202) 512-1800 Fax: (202) 512-2250

► Internet for Library Media Specialists

by Carol Mann Simpson
ISBN 0-938865-39-0. $23.95. March 1995.
Softcover. 200+ pp

Written by the editor of TECHNOLOGY CONNECTION, this book is meant to take you in easy steps from getting on-line yourself to bringing teachers, administrators, and students along. Also includes information on accessing various Internet access points.

► The 1996 Distance Learning Funding $ourcebook

Arlene Krebs
New Orbit Communications
39 Plaza Street
Brooklyn, NY 11217
(800) 228-0810 (ORDERS--Kendall-Hunt Publishing)
(718) 857-3717 Fax: (718) 857-6335
$42.50 + $4.00 S&H

The book is a guide to foundation, corporate, and government support for educational telecommunications and the new media. It also contains tips for grant writers and discusses trends in educational media.

► An Overview of Evaluation Research on Selected Educational Partnerships

ERIC
Order: ED 325536
$3.53

► Project Abstracts: Educational Partnerships Program

OERI

Order: PIP 93-1117
Free

► Spotlight on Corporate Philanthropy: Profiles of Recent Giving, 2nd Edition

Capitol Publications
1101 King Street, Suite 444
Alexandria, VA 22314
(800) 655-5597 Fax: (800) 392-7886
Order Code: SCP1
$97

Learn the types of giving among companies in 30 different industries.

► Synthesis of Existing Knowledge and Practice in the Field of Educational Partnerships

OERI
Order: PIP 93-1102
Free

Books -- The Foundation Center

79 Fifth Avenue, Dept. QA
New York, NY 10003-3076
(800) 424-9836
(212) 620-4230--in New York State
(212) 807-3677--Facsimile

The Foundation Center is an independent national service organization established by foundations to provide an authoritative source of information on foundation and corporation giving. The New York, Washington, DC, Atlanta, Cleveland, and San Francisco reference collections operated by the Foundation Center offer a wide variety of services and comprehensive collections of information on foundations and grants.

Cooperating collections are libraries, community foundations, and other nonprofit agencies that provide a core collection of Foundation Center publications and a variety of supplementary materials and services in areas useful to grantseekers. Cooperating collections can be found in all 50 states and in Puerto Rico. The Center recommends that interested parties call the collections in advance. To check on locations or current information, call toll-free 1-800-424-9836.

► Corporate Foundation Profiles, 8th Edition

ISBN 0-87954-505-4
Order Code: CFP8
716 pp; $145

This updated volume brings reliable information on more than 228 of the largest corporate foundations in the U.S. Each of these grantmakers gives at least $1.25 million a year. Information includes address, contact person, purpose and giving limitations, application guidelines, and an analysis of the sponsoring company.

► The Foundation Directory • 1995 (softcover)

ISBN 0-87954-598-4
Order Code: FD17S
1,945 pp; $175

Essential data on more than 7,000 of the largest U.S. foundations.

► The Foundation Directory, Part 2
ISBN 0-87954-599-2
Order Code: FD295
987 pp; $175

Extends Directory-level coverage to the more than 4,200 mid-size grantmakers that give up to $200,000 each year.

► The Foundation Directory Supplement • 1995
ISBN 0-87954-613-1
Order Code: FDS95
594 pp; $115

Crucial updates on The Foundation Directory and The Foundation Directory, Part 2. This supplement is published six months after those books are published.

► The Foundation Grants Index
ISBN 0-87954-648-4
Order Code: G124
2,124 pp; $160

Describes the grants of $10,000 or more awarded by over 1,000 of the largest U.S. foundations in the U.S. More than 68,000 recently awarded grants included.

► The Foundation Grants Index Quarterly
ISSN 0735-2522
Order Code: GIQI
4 issues annually; 200 pp per issue; $95 including shipping and handling

The grant information update service delivers descriptions of 5,000 recently awarded grants every three months.

► The Foundation 1000 • 1995/1996
ISBN 0-97954-645-X
Order Code: F10004
2,826 pp; $285

In-depth profiles of the 1,000 largest foundations in the U.S. Includes facts on grantmakers who award 210,000+ grants each year.

► Guide to U.S. Foundations, Their Trustees, Officers, and Donors
ISBN 0-87954-601-8
Order Code: USFDN3
2 vols., 4,235 pp; $225

A comprehensive list of all U.S. grant-making foundations and the decision makers who run them.

► National Directory of Corporate Giving 1995/1996, 4th Edition
ISBN 0-87954-646-8
Order Code: CORGI4
956 pp; $195

Portraits of company-sponsored foundations and direct-giving programs. Includes over 2,600 sources of corporate grants.

► National Guide to Funding for Elementary and Secondary Education, 3rd Edition

ISBN 0-87954-607-7
Order Code: ELED3
589 pp; $135

Provides facts on 2,100 foundations and corporate direct-giving programs. The Guide is designed to help organizations get facts to bolster the target list of funding prospects. This directory is useful to find local grantmakers as well as major grantmakers with national funding priorities.

► National Guide to Funding for Libraries and Information Services, 3rd Edition

ISBN 0-87954-605-0
234 pp; $95

Published in April of 1995, this resource provides facts on some 600 foundations and corporate direct-giving programs, each with a history of awarding grant dollars to libraries and other information centers.

► National Guide to Funding in Higher Education, 3rd Edition

ISBN 0-87954-550-X
Order Code: HIED3
981 pp; $135

The grantmakers featured in each edition of this resource award millions of dollars to colleges, universities, professional and technical schools, scholarship funds, and a range of other related programs and projects.

Monthly and Weekly Publications

The publications below carry a varying amount of information related to funding for educational technology. They provide a wealth of information on related topics. The list is a starting point for those seeking regular updates on this evolving ed-tech field.

► Aid for Education Report

CD Publications
8204 Fenton Street
Silver Spring, MD 20910
(800) 666-6380 Fax: (301) 588-6385

Tracks government and private grant programs.

► Chronicle of Higher Education

1225 Twenty Third Street, NW
Washington, DC 20037
Weekly; $75 per year

General articles on many aspects of higher education. Issues include a section on philanthropic gifts and grants.

► Chronicle of Philanthropy

1255 Twenty Third Street, NW
Washington, DC 20037
Biweekly; $67.50 per year

Source of information on the types of projects funded by foundations. Also includes reports on issues and trends in the nonprofit sector, including updates on corporate and individual giving.

► Corporate Philanthropy Report

Capitol Publications, Inc.

1101 King Street, Suite 444
Alexandria, VA 22314
(800) 655-5597 Fax: (800) 645-4104
11 times per year; $205 for-profit; $185 for non-profits

Source of information on different industry giving trends. Brief articles on issues, and reviews of current giving by companies, including contact information.

► Currents

Council for Advancement and Support of Education
Suite 400, 11 Dupont Circle
Washington, DC 20036-1261
(202) 328-5900 Fax: (202) 387-4973
10 times per year; $95 (non-members only)

Articles on fund raising and development management for educational institutions. Also includes book reviews and conference updates.

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Arlington, VA 22203
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► Education Grants Alert: The Weekly Report on Funding Opportunities for K-12 Programs

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Alexandria, VA 22313-2053
(800) 655-5597 Fax: (703) 739-6517
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14 Seventh Avenue North, Suite 115
St. Cloud, MN 56303
(612) 251-8323 Fax: (612) 251-2459
12 times/ $179-special rate for school districts, universities, libraries, and other nonprofits (regular is $299)

This newsletter is devoted to the activities of companies that are playing a larger role in the delivery of education. Each month, EI covers seven sectors of the industry: Preschools, EMOs, Education Products, Education Services, At-Risk Youth, Postsecondary, and Training and Development. Issues also contain industry stories, commentary from the Advisory Board, reform initiatives, company profiles, and interviews with industry leaders.

► Education Quarterly

Congressional Hispanic Caucus Institute, Inc.
504 C Street, NE
Washington, DC 20002
4 times per year; Free

Includes information about educational grants for Hispanic students and educators.

► Federal Assistance Monitor

CD Publications
8204 Fenton Street
Silver Spring, MD 20910

(800) 666-6380 Fax: (301) 588-6385
24 times per year; $259

Tracks federal grant programs.

► Federal Grants and Contracts Weekly

Capitol Publications, Inc.
P.O. Box 1453
Alexandria, VA 22313-2053
(800) 655-5597 Fax: (703) 739-6517
50 times; $359

Provides project opportunities in training, service, and research.

► Federal Register

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

This daily publication contains notices of new grants from federal agencies, grant application guidelines, and regulations and requirements for federal grant programs.

► Foundation & Corporate Grants Alert

Capitol Publications, Inc.
P.O. Box 1453
Alexandria, VA 22313-2053
(800) 655-5597 Fax: (703) 739-6517

Reports of corporate giving and foundation grant programs.

► Foundation Giving Watch

The Taft Group
835 Penobscot Building
Detroit, MI 48226
12 issues per year; $149

Provides short sketches of new grant-making programs, new foundation updates, and profiles of grantmakers.

► Foundation Grants Alert

Capitol Publications, Inc.
P.O. Box 1453
Alexandria, VA 22313-2053
(800) 655-5597 Fax: (703) 739-6517

Supplement to Federal Grants and Contracts Weekly.

► Foundation News and Commentary

Council on Foundations
1828 L Street, NW
Washington, DC 20036
(202) 466-6512

Published bimonthly, this publication embodies and promotes the goals of the Council on Foundations, serving as a vehicle for information, ideas, analysis, and commentary relevant to effective grant making.

► Fund Raising Institute Monthly Portfolio

The Taft Group
12300 Twinbrook Parkway, Suite 520
Rockville, MD 20852-1607
(800) 877-8238
Monthly

Brief articles written by consultants on interesting and innovative ways to be a successful fundraiser.

► Fund Raising Management Magazine

Hoke Communications, Inc.
224 Seventh Street
Garden City, NY 11530-5771
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Articles geared to the fundraiser with special reports on marketing legal issues. Also includes book reviews.

► Giving USA Update

American Association of Fund Raising Counsel (AAFRC)
Trust for Philanthropy
25 West 43rd Street
New York, NY 10036

Published four times a year, the Update includes information on state laws regulating charitable organizations.

► Local/State Funding Report

Government Information Services
4301 North Fairfax Drive, Suite 875
Arlington, VA 22203-1627
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► News, Notes & Deadlines

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Washington, DC 20036
(202) 659-2104 Fax: (202) 835-1159
E-mail: thanson@acuo.org

► NonProfit Insights: The Independent Bimonthly Newsletter for NonProfit Professionals

(Formerly Tax Exempt News)
Whitaker Newsletters Inc.
313 South Avenue
P.O. Box 340

Fanwood, NJ 07023-0340
(908) 889-6336 Fax: (908) 889-6339
Bimonthly; $250 a year

Published bimonthly, this newsletter covers fundraising, tax/legal and foundation/corporate features. Subscription costs include semiannual index.

► Philanthropic Studies Index

Journals Division
Indiana University Press
601 N. Morton Street
Bloomington, IN 47404
(812) 855-9449 Fax: (812) 851-7931
$75

► Report on Education Research

Capitol Publications, Inc.
1101 King Street, Suite 444
Alexandria, VA 22314
(800) 655-5597 Fax: (800) 645-4104
26 issues; $209

Details information related to school improvement, assessment, setting and meeting student achievement standards, teacher training, math and science achievements, at-risk students, and curriculum design.

► Technology Connection: The Magazine for School Library Specialists

Linworth Publishing, Inc.
480 E. Wilson Bridge Rd., Suite L
Worthington, OH 43085-2372
(614) 436-7107 Fax: (614) 436-9490
$36

This publication includes articles, reviews, and practical advice for those seeking to connect their K-12 schools to the Internet.

► TECHNOS: Quarterly for Education and Technology

Agency for Instructional Technology
Box A
Bloomington, IN 47402-0120
(812) 339-2203 Fax: (812) 333-4218
4 issues; $20

A forum for the discussion of ideas surrounding the use of technology in education, with a focus on reform. The publication includes issues-oriented articles touching on all levels of education.

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APPENDIX D

School Net K-12 Classroom Wiring Standards

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SchoolNet K-12

Classroom Wiring

Standards

OHIO SCHOOLNET
K-12 CLASSROOM WIRING STANDARDS

THESE STANDARDS SPECIFY BASIC REQUIREMENTS. SCHOOLS MAY EXCEED THESE REQUIREMENTS FOR LOCAL NEEDS USING OTHER RESOURCES.

BACKGROUND
The Ohio Department of Administrative Services (DAS) is required by the 1995-96 Capital Bill (H. B. 790) to develop technical standards for educational technology and infrastructure for Ohio SchoolNet to ensure compatibility, uniformity and interconnectivity. In developing technical standards, DAS shall work with the SchoolNet Technical Standards Review Committee (named by the Superintendent of Public Instruction) and shall design standards that allow a range of technologies to be used in the classroom, including, but not limited to voice, video and data communications, telephone service, cable television service and computer workstations and software.

DAS invited various interested parties (schools, Ohio Educational Computer Network "A" sites, instructional television organizations, telecommunications providers, computer industry, governments, individuals) to participate in jointly developing these standards. This process involved a period for comments and consensus.

The purpose of this standard is to have uniform and progressive specifications as a basis for building the telecommunications infrastructure in all Ohio classrooms. DAS is planning to maintain this standard, updating it as technology evolves or standards change. It is envisioned that the useful life of the proposed classroom wiring will be well in excess of the ten years minimum projected by the Electronics Industry Association/Telecommunications Industry Association (EIA/TIA) underlying standards. DAS solicits and welcomes comments that may be used in the periodic updating of this standard. It is believed items now covered will remain useful but changes will be more likely adding additional optional capabilities.

The proposed standard is based on a) input from existing and future users, b) the type of services envisioned, and c) projections for future services. It utilizes existing international, U. S., and de facto standards. It is structured in a modular fashion to accommodate existing infrastructures as well as expansion for future growth. Consideration has been given to cost, efficiency, portability, open architecture, and useful life. The standard is flexible, providing school districts wiring options to accommodate local and site specific applications.

APPENDICES
Appendix 1 lists the standard documents of the Electronics Industry Association (EIA) and the Telecommunications Industry Association (TIA) used as background information and the final referee for questions concerning this document. These documents are extensive and include many items not germane to Ohio SchoolNet. This SchoolNet wiring standard selects the appropriate items from the EIA/TIA suite of standards.

Appendix 2 contains explanatory notes, rationale, and assumptions used in the preparation of this document to clarify the decisions,

recommendations, and treatment of certain exceptions from this standard on an individual case basis.

GLOSSARY OF TERMS

CLASSROOM OUTLET (called TELECOMMUNICATIONS OUTLET by EIA/TIA)
Information outlets in a classroom (such as wall jacks).

CLASSROOM WIRING (called HORIZONTAL WIRING by EIA/TIA)
Connection (wires and cables) between the Classroom Outlet and the Telecommunications Closet.

TELECOMMUNICATIONS CLOSET
Intermediate point of connection between the Classroom Outlet and the Backbone Wiring. Power and some electronic equipment may be needed at this location.

BACKBONE WIRING
A group of cables in a school building inter-connecting the Telecommunications Closet(s) and the Main Equipment Room

MAIN EQUIPMENT ROOM
Distribution and connection point for information flow between the Backbone Wiring and public/private networks. Power, electronic equipment, cross-connects, and cables link internal voice, data, and video signals, computers, and other electronic devices to the outside world.

CLASSROOM OUTLET STANDARD

Category 5 Cable
- will be terminated in eight position modular Category 5 wall jacks
- will be tested for performance standards if used for data
- will be tested for continuity and pair reversal
- testing procedures are in TSB-40 (Appendix 1)

Coaxial Cable
- will be terminated at the wall jack on "F" type female connectors
- will be tested for open, short, and ground

SchoolNet Installation Requirement
The following four connectors and related tests are required:
Category 5 type, eight position modular wall jack for voice
Category 5 type, eight position modular wall jack for data
Two "F" type female connectors for video
All test results will be provided to the customer and become part of the permanent record.

Other Wiring
Category 3 Cable
- terminated in eight position modular Category 3 wall jack
- used for voice if already in place, not acceptable for data.

Optical Fiber Cable
- will be terminated with "ST" or "SC" type connectors for both single and multi-mode fiber strands
- will be tested
- exceeds SchoolNet requirements, installed with local funds.

Electrical Wiring
outside the scope of the SchoolNet wiring standards and funding
strongly suggested that each telecommunications closet be equipped with a minimum of one, preferably two, 20 Amp 110 V grounded circuits dedicated to voice, data, and video applications
the latest national, state, and local building and electrical codes observed
existing, dedicated 15 Amp service is acceptable.

CLASSROOM WIRING STANDARD

Category 5 Compliant Cable
two 4 pair 24 gauge copper cables, unshielded and twisted
all conductors will be terminated at both ends
total length not to exceed 295 feet (90 meters)
jacks and termination hardware will be installed
end-to-end tests comply with standards in Appendix 1

Coaxial Cable
shall be RG-6
two 75 ohm coaxial cables
jacks and termination hardware will be installed
end-to-end tests will be performed

SchoolNet Installation Requirement
The following four cables, installation techniques and related tests are required:
Category 5 for voice
Category 5 for data
Two 75 ohm RG-6 coaxial cables for video
Wiring is home-run to the telecommunications closet
Visually exposed wiring shall be enclosed in wire mold or conduit
All test results will be provided to the customer and become part of the permanent record.

Other Wiring
Category 3 Compliant Cable
one 4 pair 24 gauge copper cable, unshielded and twisted
all conductors will be terminated at both ends
jacks and termination hardware will be installed
end-to-end tests comply with standards in Appendix 1
used for voice if already in place, not acceptable for data.

Optical Fiber Cable
62.5/125 um multi-mode, 4 fiber strand cable, running directly between each Classroom Outlet and the Telecommunications Closet
8 um single mode, 2 fiber strand cable, running directly between each Classroom Outlet and Telecommunications Closet
end-to-end tests will be performed
exceeds SchoolNet requirements, installed with local funds.

Electrical Wiring
outside the scope of the SchoolNet wiring standards and funding
strongly suggested that each classroom, adjacent to the classroom outlet, be equipped with a minimum of one, preferably two, 20 Amp 110 V grounded circuits dedicated to voice, data, and video applications
the latest national, state, and local building and electrical codes observed.

existing, dedicated 15 Amp service is acceptable.

TELECOMMUNICATIONS CLOSET STANDARD

Type and quantity installed are selected from the following based on the applications

Category 3 (voice only) and 5 Cables
all termination and cross-connect hardware will be high density insulation displacement contact (IDC) type

Category 5 Cable
will be terminated on Category 5 termination and cross-connect hardware for data

Coaxial Cable
75 ohm RG-6 cable will be terminated on "F" type connectors, gender and bulkhead requirements will be determined based on local applications
50 ohm cable will be terminated with hardware as specified in IEEE 802.3 (ref. B1.4)

Shielded Twisted Pair (STP) Cable
STP will be grounded at the Telecommunications Closet end
media interface connector is specified by IEEE 802.5 (ref. B1.5)

Optical Fiber Cable
both single and multi-mode fiber strands will use "ST" or "SC" type connectors in fiber termination panels
patch cables will be of matching mode grade and connector type

SchoolNet Installation Requirement
In small buildings (small number of classrooms and distance from the farthest Classroom Outlet to the Main Equipment Room not exceeding 295 feet), Telecommunications Closet will be used only as a wire pull through point. All terminations will be at Main Equipment Room. In large buildings, Telecommunications Closets will be individually designed based on local needs and site specific applications.
All test results will be provided to the customer and become part of the permanent record.

Other Wiring
Electrical Wiring
outside the scope of the SchoolNet wiring standards and funding
strongly suggested that each telecommunications closet be equipped with a minimum of one, preferably two, 20 Amp 110 V grounded circuits dedicated to voice, data, and video applications
the latest national, state, and local building and electrical codes observed
existing, dedicated 15 Amp service is acceptable.

BACKBONE WIRING STANDARD

The Backbone Wiring medium is selected from the following types based on the voice, data, and video requirements for proposed services. Typically, it is not possible or economically justified to pre-install backbone wiring for the entire life of a telecommunications wiring system. The backbone wiring medium is usually installed for a specific planning period, depending on

application requirements with new capability added. The principal standard for backbone wiring is EIA/TIA-568 (Appendix 1).

Category 3 Cable (voice only)
multi-pair, 3 pairs per classroom, running directly between each Telecommunications Closet and the Main Equipment Room

Category 5 Cable
multi-pair, 3 pairs per classroom, running directly between each Telecommunications Closet and the Main Equipment Room
Classroom Outlet to Main Equipment Room total length not to exceed 295 feet (90 meters) for data applications

Coaxial Cable
shall be RG-6
75 ohm, 3 cables running directly between each Telecommunications Closet and Main Equipment Room
effective in video and broadband applications from 5 MHz to 450 MHz; covered in IEEE 802.3 (ref. B1.4) and IEEE 802.7 (ref. B1.46) specifications
50 ohm, 3 cables running directly between each Telecommunications Closet and the Main Equipment Room
will be terminated with hardware as specified in IEEE 802.3 (ref. B1.4)

Shielded Twisted Pair (STP) Cable
150 ohm, 2 pairs per classroom, running directly between each Telecommunications Closet and Main Equipment Room

Optical Fiber Cable
62.5/125 um multi-mode, 12 fiber strand cable, running directly between each Telecommunications Closet and Main Equipment Room
8 um single mode, 12 fiber strand cable, running directly between each Telecommunications Closet and Main Equipment Room

SchoolNet Installation Requirement
In small buildings (small number of classrooms and distance from the farthest Classroom Outlet to Main Equipment Room not exceeding 295 feet), Telecommunications Closet will be used only as a wire pull through point - no need for Backbone Wiring. All terminations will be at Main Equipment Room. In large buildings, the Backbone Wiring will be individually designed based on local needs and site specific applications.
All test results will be provided to the customer and become part of the permanent record.

MAIN EQUIPMENT ROOM STANDARD

Type and quantity installed are selected from the following based on the applications

Category 3 and 5 Cables
all termination and cross-connect hardware will be high density insulation displacement contact (IDC) type
Category 5 data cables will be terminated on Category 5 terminations and cross-connect hardware

Coaxial Cable
shall be RG-6
75 ohm cable will be terminated on "F" type connectors, gender

and bulkhead requirements will be determined based on local applications

50 ohm cable will be terminated with hardware as specified in IEEE 802.3 (ref. B1.4)

Shielded Twisted Pair (STP) Cable

STP will be grounded at Telecommunications Closet end media interface connector is specified by IEEE 802.5 (ref. B1.5)

Optical Fiber Cable

both single and multi-mode fiber strands will use "ST" or "SC" type connectors in fiber termination panels

patch cables will be of matching grade

SchoolNet Installation Requirement

In small buildings (small number of classroom and distance from the farthest Classroom Outlet to Main Equipment Room not exceeding 295 feet), Main Equipment Room will be used for all terminations, cross-connects, and electronic equipment. In large buildings, Main Equipment Room will be individually designed based on local needs and site specific applications.

All test results will be provided to the customer and become part of the permanent record.

Other Wiring

Electrical Wiring

outside the scope of the SchoolNet wiring standards and funding

strongly suggested that each classroom, adjacent to the classroom outlet, be equipped with a minimum of one, preferably two, 20 Amp 110 V grounded circuits dedicated to voice, data, and video applications

the latest national, state, and local building and electrical codes observed

existing, dedicated 15 Amp service is acceptable.

APPENDIX 1

Underlying Standards

All standards documents referred to in the above specifications are listed below and are maintained and available for schools and vendors in each region at Ohio Educational Computer Network "A" sites and Instructional Television Foundation offices.

EIA/TIA-568, Commercial Building Telecommunications Wiring Standard

EIA/TIA-569, Commercial Building Standard for Telecommunications Pathways and Spaces

EIA/TIA-606, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

EIA/TIA-607, Commercial Building Grounding and Bonding Requirements for Telecommunications

TSB-36, Technical Systems Bulletin, Additional Cable Specifications for Unshielded Twisted Pair Cables

TSB-40, Telecommunications Systems Bulletin, Additional Transmission Specifications for Unshielded Twisted-Pair Connecting Hardware

NEC, ANSI/NFPA 70, National Electrical Code

APPENDIX 2
Explanatory Notes, Rationale, Assumptions

Considerable deliberation has been given to the decision of NOT recommending optical fiber in the Classroom Wiring. In video applications, the two 75 ohm coaxial cables have ample bandwidth capability to serve multiple two-way channels. In data applications, Category 5 cable is certified to provide in excess of 155 Mb/s (SONET OC-3) of capacity. The cable manufacturer participant discussed current, successful testing at 622 Mb/s (OC-12). The cost of electronic equipment associated with fiber, both in the classroom and in the telecommunications closet or main equipment room, is substantial in comparison to copper-based or no equipment.

The consensus of the parties involved in setting the SchoolNet wiring standards is that the basic classroom wiring can be accomplished for less than an average of $500 per classroom. One issue to consider is what is the additional cost of adding fiber at the time the basic wiring is installed. A rough approximation of the costs follows, which about doubles the per classroom wiring cost.

If fiber is placed as a "future", it is important to install single mode fiber which is needed for some advanced services even today. Multi-mode fiber is commonly used for lower speed applications (e. g. 100 Mb/s FDDI).

Fiber Add-on	Non-Plenum
1 - 4 strand multi-mode fiber	140
8 - ST type connectors	48
1 - 4 strand single-mode fiber	140
8 - ST type connectors	48
Testing and labeling	55
Fiber Add-on Total	$431

This assumes no additional placement cost. If this add-on is later, add at least $80 plus some consultation cost. Additionally, in most cases, coax and twisted pair wiring is directly connectable to end user equipment, while fiber optic cable requires additional equipment to change light pulses to electrical signals. Single mode equipment is more expensive than multi-mode equipment.

Category 3 cable is also not recommended. It is believed that the Ohio SchoolNet procurement of wire will bring the cost of Category 3 and 5 cables to parity. Category 3 is only included for voice usage and if it already exists. Category 5 would need to be added to be compliant with the minimum recommendation.

Many sections in this document enumerate various physical media. Many school districts in Ohio have differing installed cable plants. The purpose of the above document is to standardize all future cable plant installations while allowing existing cables to be used where appropriate. Although each school district's migration strategy may be different, the final Ohio SchoolNet base configuration wiring will be uniform and equitable among all school districts in Ohio.

The application of the State's initiative may accommodate specialized applications of physical medium based on local needs and site specific applications. When these applications are identified, they may be considered on an individual case basis.

Backbone Wiring has been recommended as running directly from the Telecommunications Closet to the Main Equipment Room. This configuration is most commonly known as "star" topology. Star topology is the most flexible and easily maintained, as well as having a long, useful life. Backbone wiring should be individually designed based on local needs and site specific applications.

An example utilizing the recommended Backbone Wiring in a large school building is as follows:

Category 5 cable - multi-pair cable for voice
Coaxial cable - three 75 ohm cables for video
- three 50 ohm cables for data
Optical Fiber cable - 12 fiber strand multi-mode cable
- 12 fiber strand single mode cable
- fiber will be for more robust installations

Category 5 multi-pair cable is used for both voice and data applications. The total length of the cable from the classroom outlet to the data equipment may not exceed 295 feet.

Three 75 ohm coaxial cables are recommended so that one can be used for video, one for data (IEEE 802.3 (ref. B1.4) or IEEE 802.7 (ref. B1.46)), and one as a maintenance spare.

Both single and multi-mode optical fiber cables are recommended. The multi-mode fiber can be used for analog or digital video applications if economically and technologically justifiable, as well as data applications, i.e. FDDI. The single mode fiber can be used for the same applications as multi-mode fiber. Additionally, new developments and new technology, such as ATM, utilize single mode fiber. With lower cost lasers, this fiber is becoming more affordable. It will be the preferred medium for robust networks of the future.

This standard supports one outlet in each classroom. Schools should carefully consider additional outlets for multipurpose rooms and computer laboratories. The incremental cost of

additional outlets would be the smallest if done at the same time as the SchoolNet outlet. There are cost-effect wiring hubs that can allow a computer laboratory to use the single SchoolNet wiring outlet. Similarly, there is equipment that allows multiple channels on the coax.

The Classroom Outlets should be in the proximity (two feet) of the electrical power outlets for convenience and to eliminate potential trip hazard.

EIA/TIA 569 recommends mechanical protection (i. e. wire mold/conduit) for all telecommunications wiring.

The incremental cost of multi-strand fiber cables (12 strands) is minor in comparison to the cost of labor for placement. However, the termination cost of the additional fiber strands must be considered when making a purchase decision for a modest number of fiber strands versus 12 strands in one cable sheath.

The EIA/TIA 569 standard recommends a minimum of two dedicated 15 A 110 V ac duplex electrical outlets, each on separate circuits, in every Telecommunications Closet. In every location where power is required, 20 A circuits are recommended. The incremental cost of a 20 A circuit (versus a 15 A circuit) is negligible. However, existing 15 A, dedicated service should continue to be used.

APPENDIX E

Sample Selection Criteria for Hardware Acquisition

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Sample Selection Criteria for Hardware Acquisition

Hardware; this appendix deals with the acquisition of technology hardware. This may include but is not limited to the following: computers, monitors, printers, scanners, modems, modem servers, routers, CD-ROMs, equipping a computer lab, interactive classrooms, VCR's, televisions, video-disc players, cameras, FAX machines, CAD/CAM classrooms, photography, Projection devices, adaptive technologies, labs/classrooms, satellite hook-up, library/media management hardware, administrative technology hardware. Plans for preventive maintenance, security, and protection of all equipment needs to be included.

Evaluation Criteria Components:

Compatibility and Industry Standards:

- is the hardware compatible and futuristic in regard to other pieces of hardware in your technology plan;
- are there industry standards for similar hardware components;
- is transfer of operating knowledge from other technologies applicable?

Ease of Operation:

- can hardware be installed and maintained by local staff persons;
- are adult and student users able to access/use hardware with minimal additional technology competencies;
- can hardware be serviced, maintained, and upgraded locally?

Support:

- is technical support provided by vendor at minimal cost and available in a variety of mediums;
- are printed and electronic manuals written and understandable;
- does the vendor have a strong Research and Development Department;
- does the vendor have a strong commitment to the Educational Community?

Cost:

- is the cost competitive within the market place for like specifications;
- are the required/requested components included in the purchase price;
- are detailed and renewal warranties available?

Specific Considerations:

- is there the capability for and ease of using multimedia;
- is the equipment networkable;
- does the hardware includes sound utilities, video input/output, etc;.
- is the built in memory sufficient and expandable;
- is the hard drive storage adequate and expandable;
- are computers and printers compatible;
- are there adequate electronic devices available for backup and storage of data;
- are printers adequate to handle current and future job loads;
- are monitors ad projection devices adequate for small and large groups;
- do presentation systems have quality sound in and out capabilities

Ordering Suggestions:

1. Occasionally group purchases/bundles are available; investigate current or pending offers
2. Hardware packages may not provide adequate memory for necessary program functions; consideration should be give to the savings of the package vs. the cost of additional memory upgrades.
3. Consideration must be given to whether a line of equipment is being discontinued; what implications does the discontinuance have on issues such as maintenance.
4. Review the type of warranty which is provided on the hardware.
5. Maintain copies of all warranties.
6. When purchasing software, it is recommended that companies offering 30 day preview of software be used whenever possible.

Software Guidelines

This appendix deals with the acquisition of software. All software acquisitions need to interface with the current and future hardware components of your technology plan. When evaluating software the following points should be kept in mind:

- Reliability and track record of the vendor
- Options for technological support
- Compatibility of software with current and future hardware
- History of product updates/revisions
- Preview/sample options
- Compatibility with other programs being used
- Ease of operation and installation

Sample Software Guidelines

Widespread interest in the educational application of computerized technology indicates the on going need to comment on its application in the schools of the_____ diocese / district. These comments assume that school/parental emphasis and use are placed within the context of ethics and use of technology. At present, there are six areas which we choose to address: 1) Teaching Productivity Software; 2) Teaching with Computerized Technology; 3) Computer Assisted Instruction; 4) Facilitating Information Access with Technology; 5) Teaching Computer Programming; 6) Staff and Administrative Use of Technology; and 7) Technology Assisted Instruction.

Teaching Productivity Software

Teaching productivity software includes the use of keyboarding, word processing, data bases, spreadsheets, telecommunications, graphics, and desktop publishing. The idea is that application of the skill and using the software is the goal, not merely mastering the use of the program itself. For example, teaching word processing to students should be related to the teaching of the writing/revising process and application of those word processing skills should be an expectation for those students. Or, teaching use of a database management package should be related to a project involving organization and analysis of information.

Guideline:

Productivity or application should be a major goal of the computerized technology curriculum in the schools.

Teaching with Computerized Technology

Computerized technology has specific capabilities which make it an ideal teaching tool for many classroom situations, but it is not the ideal medium for all classroom instruction. If the focus of a lesson were hypothesis formation and testing, deductive reasoning, analysis, sequencing, classifying, or categorizing the instructive nature of technology does make it an ideal teaching tool. In this situation, the technology helps focus understanding by providing feedback to the students which they may use to modify their thinking strategies.

Guideline:

Teacher use of computerized technology in the classroom for instruction in the various subject areas is a goal toward which schools should consistently move.

Computer Assisted Instruction

Computer assisted instruction considers the computer as a means to help the student reinforce the basic subject matter in the curriculum. In this interactive application it could be used 1) to develop and reinforce skills and proficiency (as in spelling and mathematics); 2) to increase understanding in a variety of subjects through supplementary exercises and problem solving activities as well as; 3) to manage information efficiently.

The usefulness of any computer-assisted instruction for enrichment and deeper understanding of basic subject matter is primarily dependent upon the appropriateness of the software and the teacher's ability to incorporate the software into the lesson design/plan.

Computer-assisted instruction software needs to be evaluated or prepared in accord with the norms one would use in the critical evaluation of any supplementary instructional materials, e.g.:

- degree of relationship between the objective of the supplemental program and the concept/skill being taught in the basic curriculum
- interaction between student and subject matter (or teacher)
- quality use of time
- motivational level
- level of thinking involved
- clarity of instruction
- sequentially progressive program versus repetitious presentation/practice
- single lesson versus part of a larger program
- method of feedback to student
- ease of teacher monitoring/record keeping

One of the differences between computer software and most other supplementary materials seems to lie in its complexity. Most computer software offer various skill levels. The student is only required to learn enough about the operation of the computer to manipulate the software. Thus, the decision to use a computer for computer-assisted instruction rests essentially on the evaluation of the quality and quantity of the software available and its compatibility with the program of basic instruction.

Guideline:

Computer-assisted instruction is essential in today's society and needs to be further developed.

Facilitating Information Access with Technology

Providing access to a vast array of information resources is a primary skill students will need to be successful in life. Emphasis should be given to teaching these information retrieval skills through the existing media/library curriculum. Students should be exposed and have experience in a variety of programs and services; these should include but not be limited to: commercial online services, commercial program/curriculum services, web sites/pages, laser disks, CD-ROMs, on line libraries/resources, e-mail programs, video conferencing, chat forums, etc.

Guideline:

Exposure and real life experiences in electronic information retrieval/sharing needs to be integrated in the existing curriculum.

Teaching Computer Programming

Teaching computer programming is appropriate for those students who have the interest and the aptitude. The formal structure and abstract conceptualization in programming make learning to program inappropriate for some students. However, for the students who have the aptitude for

it, learning to program can help them develop skills in logic and analysis which can be of value in various problem-solving situations.

Guideline:
Teaching computer programming is for those students who have the interest aptitude for it. All students may be introduced to programming, but not all students need to study it in-depth.

Staff and Administrative Use of Technology

Computerized technology can greatly facilitate the many staff and administrative tasks which are part of a school. In looking to hardware and software for school use, it is good to keep the following in mind:

- schools should decide what tasks and reports are needed and purchase hardware and software that will accomplish these
- school personnel need to be trained in accord with the equipment to be used
- when hiring personnel, preference should be given to applicants with knowledge and experience in computerized technology
- cost factor (initial expense, time saved performing tasks, long range benefits, tasks for which it is used,...)

Guideline:
Staff and Administrative use of computerized technology is encouraged when it is efficient and cost effective

Technology Assisted Instruction

Technology assisted instruction considers computerized technology as a means to enhance the student's understanding of the subject matter in the curriculum. In this interactive application it can be used for retrieving information, for building skills, for processing information, for producing media, and for communicating current messages. Technology assisted instruction also takes into consideration student motivation, learning styles, special needs, multi-cultural awareness and futuristic education.

Guideline:
Technology assisted instruction should be used to enhance the thinking processes in organizing, analyzing, and interpreting information and developing evaluative skills in order to become an intelligent consumer of information for the purpose of solving problems and making decisions.

Sample Software Evaluation Form/Instrument

Reviewer's Name: _____

Date: _____

Program/Software Title: _____

Copyright Date: _____

Vendor: _____

Author(s)/Designer(s): _____

Cost: _____

Program Operating Requirements: _____

Necessary Additional Software: _____

Program Components: _____

Purchase Options: _____

Program Overview and Description

1. Curriculum area(s) and specific topic: _____
2. Prerequisite skills necessary: _____
3. Appropriate users (check all that apply)

Pre K - K	Garde 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	High School	Administration	Instructional	other

4. Type of program:
   - Teaching Productivity Software
   - Teaching With Computers
   - Computer Assisted Instruction
   - Teaching Computer Science
   - Office Use
5. Instructional group size: Individual Small Group Class
6. Is this program an appropriate instructional use of the computer? Yes No
7. Briefly list the program's objectives.

_____

_____

_____

_____

_____

Yes	No	NA	
_____			Are they clearly stated in the program or in the documentation?
_____			Are they educationally valuable?
_____			Are they achieved?

8. Briefly describe the program.

Please check Yes, No, or Not Applicable (NA) for each question below. To add information or to clarify answers use "Comments" at the end of each section:

Yes	No	NA		**Educational Content**
_____			1.	Is the program content accurate?
_____			2.	Is the content appropriate for intended users?
_____			3.	Is the difficulty level consistent for interest and vocabulary?
_____			4.	Is the content consistent with National Curriculum Standards for the particular program areas?
_____			5.	Is the content able to be integrated into current program as opposed to a separate add on component?
_____			6.	Is the content free of racial, gender, ethnic, political bias and other stereotypes?
_____			7.	Is the content presented in an interactive medium incorporating higher level thinking skill processes?
_____			8.	Is the content presented to multiple learning intelligences?

Comments:

Yes	No	NA		Presentation
_____			1.	Is the program free of technical problems?
_____			2.	Are the instructions clear?
_____			3.	Is the material logically presented and well organized?
_____			4.	Do graphics, sound, and color, if used, enhance the instructional presentation?
_____			5.	Is the frame display clear and easy to read?

Comments:

Yes	No	NA		Teacher Use
_____			1.	Is record-keeping possible (within the program or through documentation worksheets)?
_____			2.	Does a teacher have to monitor student use?
_____			3.	Can teachers modify the program?
_____			4.	Is the documentation clear and comprehensive?
_____			5.	Does the vendor provide technical support?

Comments:

Overall Evaluation (Check one)

_____ Excellent program. Recommend without hesitation.
_____ Pretty good program. Consider purchase.
_____ Fair. But might want to wait for something better.
_____ Not useful! Do not recommend purchase.

Comments:

Building Modification Guidelines

As a site/district/diocese plans to integrate technology into their program emphasis needs to be given to modifying existing space and facilities to accommodate technology. If a site/district/diocese is planning on new construction the following points should be considered. Building committees/commissions should be aware of the physical needs and utilities necessary to accommodate technology. A requirement for awarding construction job(s) to architect should be aware of the role of technology in education when

- **Connectability**
  - Internal - Network Design
    - ◇ Provisions for transmitting data between stations: twisted pair, coax, fiber; best recommendations: 10Base T or 100Base (Fast Ethernet)
    - ◇ In new construction conduit needs to be laid so adding wire will be least expensive
    - ◇ Analog and digital phone lines
    - ◇ Face plates in each room to accommodate a variety of networking/wiring options
    - ◇ Provisions for decided network topology (star, bus ring).
    - ◇ Location and selection of hubs bridges, switches, routers, modems.*
    - ◇ Location of equipment/wiring closets.*
  - External - Internets:Wide Area Network (WAN) and Intranets: Metropolitan Area Networks (MAN); how a site/district/diocese will connect between buildings and other remote sites needs to be considered when planning a WAN
    - ◇ Provisions for internet connections: direct or dial up.
    - ◇ Provisions for modems, modem servers, and Dial Servers.
    - ◇ Provisions for router options: Router: 56K, T1, T3 Lines; CSU/DSU; LAN to LAN access; Dial on Demand(DOD)
    - ◇ Provisions for Building to Building Links: DOD; spread spectrum over a network bridge; Microwave; ATM (Asynchronous Transfer Mode); FDDI (Fiber Distribution Data Interface).

- **Presentation**
  - ◇ Provisions for large screen colored monitors with computer and VCR connections for instruction and presentations
  - ◇ Provisions for LCD projection devices
  - ◇ Provisions for room darkening for better display resolution
  - ◇ Provisions for auditorium type screen/projection for large group presentation
  - ◇ Provisions for flexible computer lab set up
  - ◇ Provisions for adequate grounded electrical outlets, with options for expansion
  - ◇ Provisions for audio and video conferencing
  - ◇ Provisions for adequate sound systems

◆ **Atmosphere Control**

- ◇ Provisions for climate control for air conditioning, heat, and dust control in all areas where advanced technology will be used
- ◇ Provisions for adequate and appropriate lighting
- ◇ Provisions for marker boards to decrease dust

◆ **Space Design**

- ◇ Provisions for furniture which will accommodate all technologies correctly
- ◇ Flexible spacing which will allow for a variety of arrangements using a variety of technologies
- ◇ Equipment positioning/location for the age appropriateness of the user/learner
- ◇ Provisions for adding future networks and hubs with minimal redesign
- ◇ Adequate and expandable storage options

◆ **Security**

- ◇ Provisions for the safe use of all equipment/services
- ◇ Provisions for the security of all equipment and software
- ◇ Provisions for the security of all user's data and information
- ◇ Provisions for the security of all connect sites/webs to the LOAN

◇ *Knowledge of network fundamentals and rules is essential prior to decisions.

Constituent Needs Survey

Component A.

Hardware; this component deals with identifying all existing technology hardware. This may include but is not limited to the following: computers, monitors, printers, scanners, modems, modem servers, routers CD-ROMs, equipping a computer lab, interactive classrooms, VCR's, televisions, videodisc players, cameras, FAX machines, CAD/CAM classrooms, photography labs/classrooms, satellite hook-up, library/media management hardware, administrative technology hardware.

Item	Make	Model	Purchase Date	Specifications	Location	Time Use

Component B.

Software; this component deals with existing computer software, laser discs, CD-ROM discs, and/or information retrieval programs.

Program	Platform	Version	Vendors	Copyright	Location	Requirements	License

Component C.

Building Modification; this component deals with outlining any building modifications that will be required to facilitate all the phases of components A and B. Areas to be included in this component are wiring for network systems, two way distant learning, modem hook ups, satellite reception, other buildings/institutions; climate control to accommodate optimum learning and technology usage; location of computer centers, video labs, CAD classroom, media centers; location of central server systems, technologies in the individual classrooms/departments; and furniture to support the technology plan. If a new building or addition is undertaken it is recommended that many of these technology specifications be incorporated into the original building plan since it is more cost effective to incorporate when building as opposed to adding later. It is recommended that those responsible for decisions concerning building modifications have a basic knowledge of types of networking, cabling specifications; federal, state, and local building codes; fire codes, communications mediums. etc.

Location	Modification	Cost	Time

National Catholic Educational Association
1077 30th Street, NW, Suite 100
Washington, DC 20007-3852
phone (202) 337-6232
fax (202) 333-6706
http://www.ncea.org

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

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