

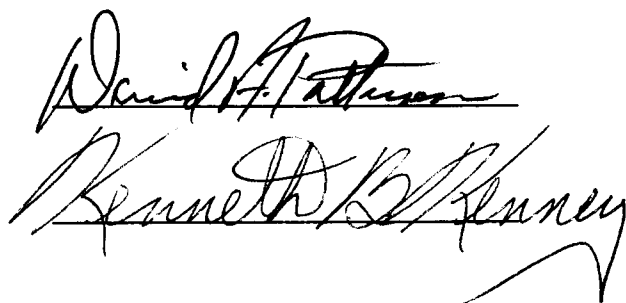
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I am submitting herewith a thesis written by Patricia Claire Oldham entitled "Lawrence County, Tennessee: Planning for the Global Economy-An Examination of Local Human Capital Development, Emerging Telecommunications Technologies, and the Increasing Self-Sufficiency of Local Economic Development Planning". I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Planning.



James A. Spencer, Major Professor

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Lawrence County, Tennessee: Planning for the Global Economy
*An Examination of Local Human Capital Development, Emerging Telecommunications
Technologies, and the Increasing Self-Sufficiency of Local Economic Development
Planning.*

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Patricia Claire Oldham
December 1994

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DEDICATION

This thesis is dedicated to all those with a “learning difference”, what others often refer to as a learning disability. It is for the educational professionals who truly challenge themselves to push past the status quo and learn more about how to teach differently for the many of us who may learn differently. It is for the researchers who provide new and insightful information regarding learning differences. It is also for the parents who may worry and become frustrated with “the system”, yet never lose faith in their child. It is for all those who truly believe that God makes every child “gifted”. This is my thank you to all those individuals and to my parents, Skip and Claire Oldham, who during my early academic career fought the fight when I didn’t know how and encouraged me to believe I could make my dreams a reality.

SPECIAL RECOGNITION

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ABSTRACT

This study was performed in order to observe the possible linkages among human capital development, emerging telecommunications technologies, and local economic development. No cohesive volume was available concerning the three areas and their implications upon the future of local economic development. Therefore, this work attempted to provide an introduction to the literature, plus develop a case study of a community which had chosen to use human capital development and telecommunications technology as economic development tools.

The study was developed through an extensive literature review, nine field interviews, and a case study of Lawrence County, Tennessee. The case study method was implemented to evaluate the practicality of human capital development efforts, the actors involved, the efforts necessary for success. It also was developed to provide an example for other communities to investigate further for the development of their own programs. The literature review and the case study were evaluated for themes and trends which were then discussed in a final chapter.

The study concluded that human capital development and telecommunications technology are two significant, emergent tools in economic development. When combined with local initiative; positive, consistent leadership; effective fund raising efforts; proper management of the telecommunications technology and the networks available, a community will benefit greatly. It generally will be able to become both more competitive and increasingly self-sufficient through the use of human capital development with telecommunications networks and infrastructure. Human capital development for

workplace preparedness and telecommunications technology will become increasingly significant as the global economy becomes more competitive. It is highly likely that the two will become as important to economic development as land, energy, and transportation have been in the past. Finally, the planning profession should strive to understand telecommunications advances, their uses, and the implications for planning holistic community growth. Planners should also remain aware of the growing significance of the globalization of the economy and its effect on local economic development efforts.

TABLE OF CONTENTS

CHAPTER	PAGE
1.0 PURPOSE, SCOPE, AND ORGANIZATION.....	1
1.1 Purpose.....	1
1.2 Scope.....	3
1.3 Thesis Organization.....	6
2.0 METHODOLOGY.....	8
2.0 Introduction.....	8
2.1 Literature Review Method and Criteria.....	8
2.2 Case Study Selection and Method.....	11
3.0 LITERATURE REVIEW.....	17
3.1 The Need for Human Capital Development as a Result of the Globalization of the American Market and Technological Advancements.....	17
3.2 Employer-Centered Human Capital Development Training.....	22
3.3 State Government and Human Capital Development.....	26
3.4 Telecommunications and Economic Development Opportunities.....	31
3.5 Educational Technology.....	44
3.6 Human Capital Development Needs Diagnosis Through the Tennessee Business Retention and Expansion Program.....	46

4.0	AN "A+ COMMITMENT TO EDUCATION" IN LAWRENCE COUNTY, TENNESSEE.....	51
4.0	Introduction.....	51
4.1	Geographic Location and General Demographics.....	54
4.2	The Need for Change in Lawrence County.....	56
4.3	The State of Tennessee and Lawrence County: An Interview with Ronnie Gaither of the Tennessee State Department of Economic and Community Development.....	58
4.4	Lawrence County, Tennessee Business Retention and Expansion Survey Results.....	68
4.5	21st Century Council of Lawrence County.....	72
4.6	The Education Foundation of Lawrence County.....	76
4.7	The Community Learning Network.....	83
4.8	The Network Resource Center.....	89
4.9	Concluding Discussion.....	98
5.0	DISCUSSION AND CONCLUSION.....	101
	BIBLIOGRAPHY.....	109
	APPENDIXES.....	119
	Appendix A. Plato 2000 Educational Software Curriculum.....	119
	Appendix B. Technology Hardware for the Community Learning Network and Network Resource Center	139
	VITA.....	155

LIST OF TABLES

TABLE	PAGE
3.1 Tennessee Classrooms New Funds for Classroom Improvement.....	28
3.2 Tennessee Business Retention and Expansion Responses:..... Importance of Factor to Firm's Future Profits	49
3.3 Level of Investment in Need Analysis for Training and Technology	50
4.1 Lawrence County Unemployment Rates: 1986-1994.....	51
4.2 Lawrence County Retention and Expansion Responses: Ability..... of Lawrence County Schools to Create a Qualified Workforce in 1989	69
4.3 Lawrence County Retention and Expansion Responses: Overall..... Student Achievement Rate 1990	70
4.4 Education Foundation Funding 1993-1994.....	76

LIST OF FIGURES

FIGURE	PAGE
1.1 Human Capital Development, Telecommunications Technology,.... Local Economic Development Initiative and the Resulting Increase in Community Competitiveness and Self-Sufficiency.	5
3.1 Fiber Optics: Changing Communications.....	32
3.2 Tennessee Economic Development Center: Plan of Facility.....	37
3.3 Rural Area Network.....	42
4.1 Lawrence County, Tennessee.....	53
4.2 Lawrence County Economic Development Promotional.....	55
4.3 Tennessee Telecommunications.....	92

Chapter One: Purpose, Scope, and Organization

1.1 Purpose:

Throughout the history of the planning profession, technology and education have been significant catalysts which have changed the study and practice of planning. By observing the trends of emerging technology in particular, planners have been able to use such advances to effect social, political, and economic change. The eighteenth and nineteenth centuries, for example, saw many changes due to the effects of the Industrial Revolution. The positive results of the new technology brought about increased economic stability, but it also caused planners and social activists to call for change in working standards, education, transportation access, and living conditions. The introduction of water-borne sewerage systems during the mid-nineteenth century additionally transformed the city and increased the need for planning through sanitary reform and the introduction of sanitary and municipal engineering. During the era of America's Manifest Destiny, incredible transportation advances carved new features into the landscape and linked the lives of Americans through railways, road construction improvements, and public inter-city transportation--all of which caused planners to grapple with the resulting effects of an ever increasingly connected, yet expanding, world. Even construction technology advances in the early years of the twentieth century brought about land use zoning policy which was due, in part, to the increased scale of the amazing skyscraper.

Today, as the United States forges on through the Information Age toward the twenty-first century, the increasingly global economy will place additional pressures on the country to provide educational opportunities which will create a globally competitive

workforce. The emerging telecommunications technology will link countries, businesses, governments, and individuals in ways never before readily available. Such technology will change the social, economic, and political landscape of the United States as promptly as did the era of transportation advances and the emergence of manufacturing technology. The planning profession, particularly economic development, will be forced to become an active participant in the impending telecommunications revolution and the continuing globalization of the economy. In anticipation of the telecommunication technology's transformation of the economy and the need for improved educational opportunities to prepare for the competitive global market place, Lawrence County, Tennessee: Planning for the Global Economy will provide an introduction to the possible linkages among human capital development, emerging telecommunications technologies, and local economic development planning.

Execution of a study concerning the variables of human capital development, applications of telecommunications technologies for economic development, and the trend toward more self-sufficient local economic development efforts is additionally important to carry out in that little other material is available which unites all the subjects. No cohesive volume has been designed which considers the implications of a combination of the three elements and the resulting impact upon the future of local economic development; particularly the impact upon those communities previously isolated from mainstream economic development activities and benefits. This document combines information on (a) current human capital development theory, (b) educational advances in technology, (c) advanced data retrieval systems for rural areas, (d) the trends in state to

local economic development relationships, and (e) a case study of a community that achieved its educational, technological, and economic development goals. These areas are compiled in an attempt to provide a helpful resource for numerous groups such as citizen committees, local government leaders, economic development professionals, and non-profit organizations. This thesis should be useful particularly for communities interested in accomplishing goals similar to those of Lawrence County, Tennessee; informative for those interested in economic development trends at the scholastic and governmental level; and a demonstration for industry and government of the realistic opportunities available through human capital development.

1.2 Scope

This study attempts to explore whether a locality or region can retain and/or expand its economic base by participating in or providing a continuous, pro-active education program which focuses on the development and maintenance of human capital. It seeks to observe the effects financial assistance, technical assistance, or economic development assistance from the state level had on the success of the program. It further studies how a community used new technologies to facilitate the effectiveness of economic development efforts and how they provided additional availability of educational resources. It includes an examination of human capital development programs that showed results at the state level and local level, Lawrence County, Tennessee in particular. The effect a human capital development program may have had on the economy or on attitudes toward human capital development is observed as well. The major actors within

economic development coalitions are determined and any of those actors or partnerships which were new or emergent in the field are identified. Finally, the thesis attempts to show if any relationships existed that would furnish new generalizable economic development policy directions or would testify to the emergence of a more independent, informed locality which is less reliant on the traditional level of state or federal assistance.

The researcher strove to observe a community in an attempt to support the graphic representation on the following page. When the need for improved human capital development (A) is present, a community which provides (B) local community education initiatives combined with (C) emerging telecommunication and education technology will result in (E) a more competitive, well-trained workforce. Only by combining the three variables of (B) local community education initiative, (C) availability and use of emerging telecommunications and education technologies, and a (E) competitive, well-trained workforce will the highest (F) positive job growth and heightened community competitiveness in economic pursuits exist, as well as, (G) the ability to have increased self-sufficiency of local economic development initiatives. Alone, (B) education initiatives without use of (C) emerging telecommunications and educational technology may provide (D) an improved workforce, but not (E) the most competitive, well-trained workforce necessary in today's global market. The availability of telecommunications technology and educational technology without both (B) proper local community education initiatives and (C) telecommunications and educational technology use may result in only some workforce education improvements, if any. Technology alone, unharnessed, is ineffective. Without combining the technology with community initiative it will remain an underutilized tool. Therefore, in order to produce either or both: (F) significantly positive

Human Capital Development, Telecommunications Technology, Local Economic Development Initiative
and the Resulting Increase in Community Competitiveness and Self-Sufficiency

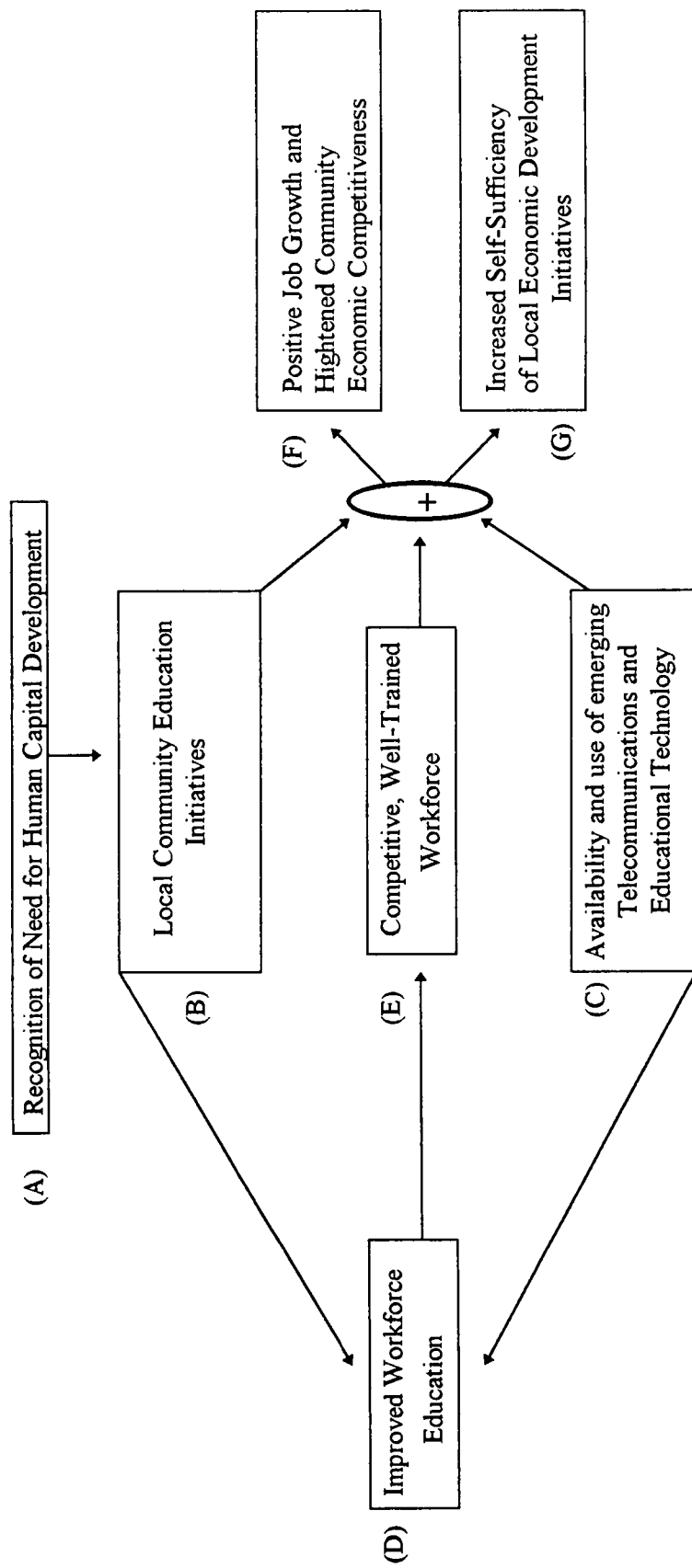


FIGURE 1.1

job growth and heightened community economic competitiveness or (F) increased self-sufficiency of local economic development initiatives, a locality or region needs to provide (B) local community education initiatives, combined with (C) availability and effective use of emerging telecommunications and educational technology, and (E) a competitive (not just improved), well-trained workforce. The reciprocal result of (F) and (G) is a regeneration of interest in further investment in a competitive, well-trained workforce and improved community morale.

1.3 Thesis Organization

Chapter one of this thesis introduces the reader to the research area and its connection with the planning field. It discusses the purpose of the study and describes the research goals. Next, the scope of the work is defined and a suggested model is explained. Finally, the chapter discusses the organization of the entire document.

The second chapter focuses on the methodology used to accomplish the thesis research. The process for choosing and organizing the literature review materials is explained. The case study criteria and selection are discussed, then the method of observation is summarized.

Chapter three reviews and briefly summarizes the literature pertinent to the discussion and arguments in this thesis. The literature review is included to provide the reader ample background in the subject, but it also relates theories and programs of significance to the model and research queries. The review does not include every

literature piece available, but instead, gives the reader a solid framework from which to build their own understanding or continue the research.

The case study of Lawrence County, Tennessee comprises chapter four of the thesis. It is a thorough examination of the county's use of human capital development, educational technologies and telecommunications applications in their quest to achieve economic and community development success. The revitalization of the county, education policies and activities, business and industry expansion and retention, telecommunications applications, and fiscal strategies are explained. Interviews with those closely involved in the revitalization efforts are also included.

The final and fifth chapter summarizes the research presented. Possible relationships among economic development, human capital development, and telecommunication and educational technologies are discussed and the research is compared with the model presented in chapter one. Significant trends and findings are presented in conclusion.

Chapter Two: Methodology

2.0 Introduction

A literature review and a case study provide the basis for the conclusions of this thesis. The methodology produced a qualitative study which is meant to be descriptive, not prescriptive. These methods were chosen in order to begin to pull together very fragmented subject material. The nature of the data available made it necessary to develop a study which established a solid information base which could be a stepping point for further, more quantitative or theory building research. The field of telecommunication and information technology is very new and the applications of that technology to human capital development and inter-governmental relations has only begun. This thesis attempts to provide an introduction to the emerging relationships and a programmatic example of the variables related to economic development in action. The use of a case study to evaluate the practicality of such efforts, the actors involved, and the efforts necessary for success will provide an example for other communities to model or investigate further.

2.1 Literature Review Method

An extensive literature research and review process was performed to gather the necessary information about the subject. Resources such as: national and local newspapers, trade publications, public relations information, government documents, scholarly journals, manuscripts, masters thesis, doctoral dissertations, data surveys, CD-ROM databases and other similar on-line services were utilized. Numerous sources in a variety of disciplines were examined for any information pertinent to human capital

development; educational, telecommunications, and information technology; and state and local economic development roles. The field areas of human resources, labor studies, business management, economic development, education, government and political science, computer science, economics, and planning had sources that were relative to the topic as well. Therefore, the researcher choose to broaden the literature review to many relative areas. This was necessary due to the lack of major research studies in the subject area. Any information which could help further define the relationships among the variables was collected in the hope to produce a helpful, inclusive introduction and investigation of the subject area.

The information often was highly fragmented. For instance, human capital development was approached regularly without a discussion of the use of new technologies to aid those efforts. Other times, new technologies would be discussed without relating it to the resulting changes that could occur between local and state government relationships or the increased economic development opportunities which could arise. The economic development field, at this time, had not published in depth research concerning the study variables either. Much of the economic development literature remained directed toward tax policy, infrastructure development, short-term economic strategies, and land uses.

Generally, the information was given from the singular perspective of a particular field. This was not surprising as the emerging relationships among human capital development; telecommunications and information technology; and state and local economic development are only beginning to be researched and documented further.

Telecommunications and information technology, for example, is just now being introduced to some academic fields. Therefore, few people have had the opportunity to truly understand the use of the technology or the results of combining human capital development, inter-governmental relationships and public administration with emerging technologies. The application of such technology simply is too new for substantial relationship studies to have been performed, yet it seems the relationship among the variables likely will be the subject of substantial research in the coming decades.

A large amount of literature was read, but few articles, as will be discussed in chapter three, provided substantial research theory concerning all areas. Furthermore, little of the literature offered hard data, but instead presented introductory views or general, informal information only. As the literature review progressed, it became apparent that most of the information necessary for the study would come from interviews and any other documents provided by those involved in the fields of economic development; telecommunications and information technology; and government. Any possible literature leads were traced in order to establish relationships and linkages among the subject areas.

The literature collected fell into eight categories:

1. general information on electronic, telecommunications, and information technologies;
2. network technologies and economic development;
3. educational technology applications;
4. state economic development initiatives and human capital development efforts;
5. federal education reform legislation;
6. workplace based education;

7. local human capital development initiatives; and
8. the globalization of the economy and future human development needs.

The information was reviewed and recorded for use in chapter three, the literature review. Later, the data gathered from the numerous sources was examined alongside the results of the case study. Significant themes and relevant trends were identified and recorded in chapter five.

2.2 Case Study Selection and Methodology

After the current literature review was performed to examine various programmatic efforts in human capital development, a case study was selected which:

(a) could provide the most information, (b) would provide ease of observability, (c) was in the State of Tennessee, (d) had an active program currently in place, and (e) which emphasized the use of human capital development and technology uses at the local economic development level.

Lawrence County, Tennessee was highly appropriate for examination by case study. It was within four to five hours driving distance for the researcher, had at least five years experience in educational advances, had initiated educational and economic development efforts from the local and grass roots level, and had used educational and telecommunications technology applications. Additionally, it had been recognized by the State of Tennessee for organizing a successful effort toward improving education, the community, and the economy.

At the time of selection, the availability of information through interviews, public meetings, public records, local newspapers, and citizen opinions was substantial. Leaders contacted in the community were very open to the opportunity to be the subject of such a study. The fact that the community was rural would allow observation of how remote, rural communities may be affected by the elimination of distance barriers through technology. Since Lawrence County had raised much of the funding on its own, the opportunity to observe how local communities raise funds for educational economic development efforts was available. It also was still actively implementing educational development for economic development. Often educational or economic development programs would be attempted, but fail due to funding cuts or lack of community and local government support, thus would not provide the opportunity to observe the policies and programs in action. Lawrence County, however, was still very involved in the implementation of their programs.

Another advantage to selecting Lawrence County was that information concerning the attitudes and expectations of local business leaders toward education had already been documented in *The Tennessee Business Retention and Expansion Program Survey* (R & E Survey) (1990) performed by Middle Tennessee State University. The program and survey were initiated and sponsored by the State of Tennessee's Department of Community and Economic Development and South Central Bell. Lawrence County was one of the first three counties studied and that 1989 data was expected to be useful background for the case study. The R & E data was used for perspective to understand

the 1989-1990 attitudes and beliefs about job training, job needs, and opinions about the adequacy of education/training facilities and technologies within the community.

A field visit was made to Lawrenceburg, Tennessee, the seat of Lawrence County. Randy Brewer of the 21st Century Council, Tim Pettus of the Education Foundation, and Cromer Smotherman of the Tennessee Elk River Development Agency were interviewed during the trip. A copy of the research proposal was available to any interested individuals in the community or to those being interviewed. Visits were made to the headquarters of the 21st Century Council of Lawrence County, the local office of the Tennessee Elk River Development Agency, and the Columbia State Community College. The Columbia State Community College building also housed the Community Learning Network, the Network Resource Center, distance learning facilities, and the soon to be opened research library. A thorough tour of the Lawrenceburg area and the facilities was given by the 21st Century Council Executive Director, Randy Brewer.

Joe Imorde, Director of Economic Development at South Central Bell in Nashville was interviewed during the field work. James Ingraham, Manager of Strategic Planning/Valley Initiatives, at the Tennessee Valley Authority in Knoxville, Tennessee also attended the same interview session in Nashville. Though all the interviews throughout the study were recorded on tape, the Imorde-Ingraham interview was not recorded due to recording problems caused by operator error. The interview instead was covered by notes that were taken.

Other interviews were performed over the phone. Interviews from Kay Dotson of the Community Learning Network in Lawrenceburg; Ronnie Gaither of the Tennessee

Department of Economic and Community Development; William "Chip" Smith of the Tennessee Department of Economic and Community Development; and Michael Magill of the Tennessee Board of Regents were recorded, with the interviewee's permission, over the phone. A total of nine interviews were performed and transcribed for this thesis. Each interview was between forty and ninety minutes in length. The interviews contributed the most reliable, up to date information to this thesis and were a bulk of the case study data.

The case study required the researcher to set appointments in advance with any individuals or groups who were willing to be interviewed about the motivations of the community's actions, the pro's and con's of the program's implementation efforts, state and local relationships, and other general data about the community's program mission. Other interviews dealt with the activities of the telecommunications industry, the Tennessee Board of Regents, and the Tennessee Department of Economic and Community Development. Interview questions were tailored to each interview situation. If the person to be interviewed requested that the questions be provided in advance, their request was honored. For example, the questions below were mailed to Mr. Cromer Smotherman (previously of the 21st Century Council, currently of the Tennessee Elk River Resource Valley) in order to learn more about the Network Resource Center.

Network Resource Center Inquiry

1. How did the concept of a Network Resource Center originate and with whom?
2. How long did it take to establish the NRC and what would be the process another county could follow to establish their own center?
3. What type of funding facilitated the success of the program?

4. What do you feel are some of the most effective ways to raise funds for projects such as this?
5. What type of teaching materials are required for the NRC?
How much staff?
What type of software?
What type of equipment?
6. How is the Network Resource Center being used at this time and how do you see it being used most effectively in the future?
7. Who are the main users of the Network Resource Center?
8. What is the difference between the Network Resource Center and the Community Learning Network?
9. How do you feel the Network Resource Center and other telecommunications technologies have impacted Lawrence County?
10. How can something like the Network Resource Center change a locality's relationship with the state government level?
11. Has Lawrence County become any more self-sufficient as a result of computer and telecommunications technology? Do policy makers have to rely on state information and coordination in economic and community development as much?
12. Why should Lawrence County emphasize education and workforce skills training?
13. To what extent are local businesses involved in training and improving worker skills? Is it generally independent of Lawrence County initiatives or does the county play a large part in changing business attitudes about lifelong learning and training?
14. How do you see the telecommunications technology such as Internet and long distance database retrieval and teleconferencing changing Lawrence County's relationship with the state?
15. What should other counties learn from Lawrence County's use of educational advances, technological uses, and economic development efforts?
16. How much support and guidance did local government receive from the state concerning workforce preparation, telecommunications advances, and economic development initiatives? Were the efforts state led or locally led?

17. It is not everyday that a county brings its unemployment rate down 11 percent in seven years (1986-1993). What type of local leadership base must be established in order for such economic development and educational advances to be made? Can good local leaders be made?

Some interviews were on short notice which did not allow for delivery of the interview questions in advance.

The conclusion and analysis was based upon the completion of the literature review and the case study of Lawrence County, Tennessee. The conclusions were not prescriptive, but descriptive. Ultimately, the emphasis was on identification of trends and observation of similarities with the model offered in chapter one.

Chapter Three: Literature Review

3.1 The Need for Human Capital Development as a Result of the Globalization of American Markets and Technological Advancements

As the U.S. Congress debated the fate of the North American Free Trade Agreement (NAFTA) in the fall of 1993, opponents of the bill argued that such legislative action would increase the risk of job loss for many American workers. Some Americans feared NAFTA would produce an even more favorable atmosphere for companies who would prefer to use cheaper labor in Mexico. In order to maintain American job market stability, the United States would have to guarantee that their workers would be adequately skilled and educated so as to provide internationally competitive workmanship and productivity. NAFTA was only one of the first manifestations of the rapidly expanding global economy.

Robert Reich reminded the nation, that, "with or without NAFTA, if this society is to join the new global economy, we have to create pathways for all people to get jobs. Otherwise, people will try to preserve the past." (Raspberry 1994, A18) Reich continued saying, "Free markets *and* human capital investment may be the only combination that can lead to enduring prosperity. The worst conceivable combination is protectionism and inadequate investment in education and training of the work force." (Raspberry 1994, A18)

Investment in human capital is just as important as the investment in tangible forms of capital such as infrastructure. Jorgenson and Fraumeni note that

investment in human beings, like investment in tangible forms of capital such as buildings and industrial equipment, generates a stream of future benefits.

Education is regarded as an investment in human capital, since benefits accrue to an educated individual over a lifetime of activities. (1993, 1)

Furthermore, they say, it is only by improving the availability of information about human capital development that further interest and faith in such investments can be increased.

Unlike many short-term responses such as lay-offs and finding cheaper labor, training investments require a longer gestation period before the payoff becomes evident.

(Jorgenson 1993) A *Journal of Policy Analysis and Management* commentary argued that training requires "additional short-run outlays that will only be recouped later on if the training actually increases worker skills and the new skills result in cost savings, increased output, or improved quality . . . no guarantees . . . of increased productivity." (Murnane 1994, 77) Yet the long term results of human capital development are essential to the success of the United States economy. (Murnane 1994)

Jeffrey Joseph, Executive Vice-President of the Center for Workforce Preparation and Quality Education (a U.S. Chamber of Commerce affiliate), notes that the widening skills gap is "impeding growth for the country and the economy as a whole." (Szabo 1993, 23) By the year 2000:

- More than 65% of all jobs will require some education beyond high school.
- 23 million people will be employed in professional and technical jobs-the largest single occupational category that requires ongoing training.
- 2 million people per year will lose their jobs due to shifts in technology, trade, and conditions of competition.
- 50 million people will need additional training just to perform their current jobs effectively. (Szabo 1993, 23)

"Lifelong learning and training," says U.S. Chamber of Commerce President, Richard Leshner, is essential "if U.S. industry is to remain world class" (Szabo 1993, 23)

The trend toward the need for "well-skilled, well-educated workers" has left many lower skilled workers behind. University of Chicago economist Stephen J. Davis maintains that, "the changes in the global economy 'favor people who use their minds rather than their hands,'" (Starobin, 2176) Furthermore, noted William Raspberry of the Washington Post, the U.S. is "witnessing the obsolescence of an entire class of worker: the industrious but modestly educated man or woman for whom a factory job meant economic security." (Raspberry 1994, A18). This could continue at least through the rest of the decade says, Harvard Business School economist Gary W. Loveman, and even "has the potential of being one of the major social issues of the next ten years." (Starobin 1994, 2176)

Repeatedly, economists are pointing out the growing advantages of a flexible, quality education in the economy of the 21st century. The changes in the workplace due to the introduction of computer technology have already made headlines for decades, yet technology has been taking enormous leaps forward due to new telecommunications technology. The workers who are prepared for such rapid advances will come out on top, according to a 1991 study by the National Bureau of Economic Research. (Starobin, 2179). The study noted that "workers who used computers on the jobs earned a 10-15 percent higher rate than otherwise similar workers." (Starobin, 2179). If economic growth is a priority for government on the local, state, or federal level, many agree that education must be placed at the forefront in order to prepare for the changes on the way.

Even twenty-five years ago, economist John Kenneth Galbraith stated, "that, if the educational system does not keep abreast of these requirements there will be a shortage of those with a higher educational qualification and a surplus of those with less." (1968, 237) Joan Fitzgerald further argues that, "in fact, as the skills mismatch studies document, the U.S. economy will not be able to remain competitive if large segments of the population are denied access to quality of education and training." (1994, 133)

Due to the current economic climate and the changing global economy, lack of human capital development will be a significant obstacle for many United States communities. Additionally, as new technologies arise, many firms have begun to restructure which also could cause the unemployment figures to shift upward. Though this occurred initially in the manufacturing sector, the service sector now is being affected as well. (Victor 1994) An increasing number of American workers, "are joining the ranks of the 'structurally unemployed'--a bleak phrase that's all but displaced the notion of temporary, or cyclical layoffs." (Victor 1994, 6) Over 2.2 million full time jobs were lost in 1993 due to corporate restructuring, defense downsizing, and international competition. (Victor 1994, 6) These workers are both blue and white collar workers. No longer is the professional insulated from economic downturns.

Joan Fitzgerald also calls for the broadening of the definition of economic development and the base of actors. "... The economic competitiveness of the United States," she says, "is jeopardized by a mismatch between jobs of the future and the skills of the population ... Consensus has emerged on many fronts that economic development must be better linked to education and training." (1994 Fitzgerald, J., 125) Some of the

new actors who must become active in this effort, according to Fitzgerald, are business, educators, labor, and community organizations.

The most significant theme within her work is the ultimate displacement of lower-skilled workers. Fitzgerald desires a training solution which will include those who have both a skills mismatch and other significant barriers such as discrimination against African-Americans and other minorities. Education could help all groups, she argues, but especially those who traditionally have been left to lower skill jobs. Though businesses, says Fitzgerald, often participate in the inner-city, they move the jobs to the suburbs or offer second-rate vocational programs that are not the same quality as wealthier suburbs would receive. She additionally points out, that corporations must not leave behind the low-skilled, inner-city markets. The technology will not displace existing workers, but instead, she fears, will exclude those who are not working and have low skill levels. Generally, Fitzgerald presses the traditional corporate paradigm to pay attention to those who may be left behind, while others receive the training that they need due to their geographic location, ethnic origin, or lack of education.

Another "... major failing of the U.S. education system is in facilitating school-to-work transitions for students not entering college," says Fitzgerald. (1994, 130) The European communities, she argues, supply a much superior system which the United States should examine. She concludes that public policy is necessary that will help "ensure that the curricula developed are responsive to the needs of the workplace and the community, that legislation mandates that planning and implementation be undertaken by

partnership comprised of educators, business, labor, and community representatives.”

(1994, 131-132)

3.2 Employer-centered Human Capital Development Training

Previously it was not a problem if U.S. workers lacked basic cognitive skills, however this is no longer acceptable. (Murnane 1994, 76) Many business owners have found that quality control costs have risen as a result of inadequate training. One business owner noticed that his employees had trouble reading blueprints, understanding directions and working in teams. All of those factors have led to the increased expense of work that had to be re-done, increased cost of parts due to re-shipment, and higher finance charges as a result of the delays. Employers have found that they need workers who have “analytical skills, independent judgment, and the ability to work closely with others in complex operations.” (Szabo 1993, 22) But, many employers, reported Murnane and Levy (1993, 77) do not feel it is necessary to train or feel they cannot afford to do so. Instead of providing training, many firms lay off workers or relocate their production activities to obtain less expensive labor. Yet, said Murnane and Levy, some companies only see training as money lost in the short run instead of long-term benefits for the company. They also say, “by improving information about the potential value of training, about how to actually train, and about how to pay for training, a training system can encourage firms under competitive pressure to invest in their workers.” (Murnane 1994, 78) Furthermore, they advocated the belief that “public policies do make a difference in a firm’s decision about whether to undertake general training investments.” (Murnane 1994,

79) The authors seemed to feel that anyone who helped initiate worker training would help the future economic conditions, considering

Deficiencies in the basic cognitive skills of the work force may be a significant obstacle to improving productivity by restructuring jobs and increasing individual workers' responsibility for product and service quality. Thus, finding ways to enhance the basic cognitive skills of today's workers is a critical challenge. (Murnane 1994, 76)

Bassi studied workplace education for hourly workers by analyzing seventy two programs for general characteristics. Previously, the belief was that human capital development was not necessary, but "by 1990" said Bassi, "a consensus had emerged that the competitiveness cure must include a large dose of human capital improvement." (Bassi 1993, 55) Most programs had the following characteristics, 64% of the programs taught reading, 58% math, 55% writing, and 40% taught English as a second language. The majority of the participants were released from work in order to take training without losing wages. Average class length was from one to two hours, two times a week. Most classes were held at the work site, were voluntary, had an average of nineteen pupils per class, and the average student was 31 years of age. (Bassi 1993, 62) However, said Bassi, over one third of the programs offered were considered only marginal in quality since they were designed to be a quick-fix. The programs also lacked vision, commitment from management, solid goals, and any outcome measurement. Bassi did decide, however, that the programs, though not the best, were instead often the initial attempt at hourly worker training. She felt this was a positive trend, "a new phenomenon" that could provide

evidence of a trend toward growth in the workplace provided education area. (Bassi 1993, 63)

The main reasons firms decided to have workplace education, listed Bassi, were: to reduce errors and waste; to offer as a worker benefit; to use an available subsidy; due to pressure from customers; changes in production necessitated training; transformation of corporate culture; required by customers; the training became available; needed to train for new technical knowledge; to attract new workers; meet new certifications; meet health and safety requirements; changes in the available work force; increased competition; workers identified need for training; or it was part of a labor agreement. (Bassi 1993, 64)

Other firms which did not choose to have training programs said that there was not a need; they didn't have the staff to support the program; they were too busy; did not know their skill needs or how to arrange for training education; or finally, were philosophically opposed in that it was not business' responsibility and turn over was too high for it to be of use to them. (Bassi 1993, 64) Bassi concluded that it was important for public policy to help firms implement programs and that any efforts to "share and spread fixed costs and information appear to be the key" (Bassi 1993, 70)

Motorola Corporation was one company that felt such employer based training was its responsibility and as a result, developed an award winning development program. In fact, by 1988 Motorola had become the first large company ever to win the Malcolm Baldrige Quality Award. In 1985, Motorola founded Motorola University, which grew to include fourteen branches. Hiring qualifications were tightened and the suppliers outside the Motorola company were also trained to assure quality. This was necessary

since, the company discovered that at least sixty percent of its workforce had trouble with seventh grade math. (Kelly 1994, 159) Though Motorola is one of the world's most successful electronics manufacturers, "Motorola's leaders [feared] that by the turn of the century rivals [would have] caught up and quality [would have] changed from a goal to a given. In the business wars of the coming decade . . . the most crucial weapons will be responsiveness, adaptability and creativity." (Kelly 1994, 158) Motorola's former chair, Robert W. Galvin envisioned the program which was intended to "develop those attributes . . . built around lifelong learning." (Kelly 1994, 158)

The program gives all Motorola employees at least 40 hours of training a year, but the corporation hopes to quadruple that amount by the turn of the century. Motorola also currently spends four percent of its payroll on training employees and suppliers, the third highest expenditure for an electronics firm behind General Electric which spends 4.6 percent and United States Robotics at 4.2 percent. The average United States industry training expenditure is 1.2 percent. Chief Executive Officer of Motorola, Gary L. Tooker, says, "if knowledge is becoming antiquated at a faster rate, we have no choice but to spend on education . . . how can that not be a competitive weapon?" (Kelly 1994, 158)

A Fitzgerald and McGregor study (1993 May) reported that a "central part of what is needed to correct the employment and skills mismatch is a post secondary education and training system to develop the skills of adult workers." (Fitzgerald 1993, 173) They argued further that national retraining programs as a whole had been ineffective, but that local initiatives had been more successful. "U.S. employment training has not been a major focus of the federal government polity toward employment and its

attempts at it over the last twenty-five years have been weak and inconsistent.” (Fitzgerald 1993, 173) Fitzgerald and McGregor studied the effects of training partnerships among labor unions, local business, and local economic development and concluded that labor has emerged as a major player in worker training efforts. Likewise, a local approach that looks at business strategy for retention and expansion would be necessary. It should be combined with an analysis of the local industrial base and worker skills should be used to develop the training agenda for the community. Ultimately, “it requires coordination of labor force training and economic development.” (Fitzgerald 1993, 174) They found that combining the efforts of labor unions and community and economic development organizations to create an effective “broad based task force . . . demonstrates that manufacturing job loss is not an inevitable force, but one that can be prevented by local planning.” (Fitzgerald 1993, 179)

3.3 State Government and Human Capital Development

South Carolina, ten years ago, was ranked 48th in the nation in literacy skills of their citizens. Yet, today, the state is one of the top education states in the nation. Former Governor Richard Riley, currently U.S. Secretary of Education for the Clinton Administration, led the state to its current successful education status. The state felt reform was necessary since “a literacy rate ranked 48th in the United States was not a drawing card for corporate investors, and that educational change and improvement were vital to the growth of the state.” (Johnson and Shreve 1993 Nov., 25) Particular emphasis was placed on technical and vocational education and as a result, the state is “a recognized

leader in the development of "tech-prep" that bridges the gap between high school graduation and the workplace. (Johnson and Shreve 1993, 25) The result has been that "today it appears this unusual combination of school reform, industrial recruitment and customized vocational and technical training has brightened South Carolina's economic picture significantly." (Johnson and Shreve 1993, 25) Many outside of the state also agree, the Carnegie Foundation in particular. In 1987 and 1990, it rated the state "first in the nation in academic expectations for students, clarity of school goals, leadership principles, core requirement for graduation and overall academic progress since 1983." (Johnson and Shreve 1993, 25)

South Carolina's dedication to education has paid for itself by helping bring over 40,000 new jobs to the state. At least 185 foreign companies have chosen South Carolina as a worksite and by late 1994 the Greenville/Spartanburg airport will be able to accommodate 747 Jumbo Jets to carry products out and materials into the region. (Johnson and Shreve 1993, 26) By 1996, Bavarian Motor Works (BMW) will build its first automotive plant outside Germany. The plant will be built in South Carolina since, as BMW executives "insist [that] the two primary factors in their decision . . . were the state's technical education system and its pro-business climate." (Johnson and Shreve 1993, 26) The article concludes saying, though "there are no statistics to tie South Carolina's tremendous economic growth to its education reforms . . . the connection would be difficult to deny." (Johnson and Shreve 1993, 26)

Tennessee also began a school-to-work program, the "Goals and Objectives of the 21st Century Challenge Plan", also known as the 21st Century Schools Program. The

formal legislation abolished the general track curriculum and required the student to choose between tech-prep or college prep by the end of the tenth grade. (U.S. General Accounting Office, 1993, 33) It also made many other reforms at the K-12 levels. Two additional academic assessments also will be required. Students must take a Work Keys test in their senior year to test their work readiness, in math, communication, science and social studies skills. The American College Testing assessment (ACT) will also be mandatory for all graduating seniors by July 1995. (GAO 1993, 33) The 21st Century Classroom will have computers and electronic data exchange and will have a much smaller class size. High school students will be required to receive a minimum of 180 hours of computer training and take more courses in math, world history, geography, and computer science before graduating. (TNECD 9-1993, 2) The students will receive extensive career education and development assistance and actual workplace exposure, ensured by more interaction between the educational system and the local business community. (GAO 1993, 36)

Table 3.1

Tennessee Classrooms New Funds for Classroom Improvement

	<u>1975-1991</u>	<u>1992-1993</u>
• Textbooks	6.3 Million	8.2 Million
• Materials and Supplies	3.9 Million	7.6 Million
• Additional K-8 Teachers to Reduce or Maintain Class Size	5.3 Million	31.4 Million
• Counselors	5.5 Million	4.7 Million
• Music, Art, & P. E.	11.4 Million	5.0 Million
• Special Education	0	4.1 Million
• Library Staff & Books	0	2.1 Million
• Technological and Instructional Equip.	0	8.0 Million
• Teacher Aids	19.5 Million	2.7 Million

(TN Dept. of Education 7-1993, 4)

All of this has been funded through a permanently funded half-cent sales-tax increase in which three of every three dollars of revenue will go directly to classrooms. As a result, many previously ignored classroom needs have received substantial increases in the first year of the program alone. Evidence of such budgetary reform may be seen in the table on the previous page, as published by the Tennessee Department of Education. Seventy-six cents of every new dollar of revenue for education must go directly to classroom improvements. The remaining twenty-four cents is to be used for utilities, transportation, and maintenance, yet any part of that money may be transferred into the classroom as necessary. (TN Dept. of Education 7-1993, 4)

Tennessee approved the largest state expenditure on vocational schools in its history, 4.6 million in 1994. Now called technology centers, the schools will assist in the school-to-work transition. The schools will be remodeled with new computers and the necessary high tech equipment. Thus far, the technology centers have a 93% job placement rate for their students. (Associated Press 1994, 4B) The 21st Century Schools program also redesigned the vocational education curriculum by adding classes such as mathematics for technology, principals of technology, and by requiring a graduation exam which will assess skills for prospective employers. (TNECD 9-1993, 2)

In a further attempt to combine economic development efforts and education of the workforce, the Tennessee Board of Regents recently established a new department and position. Michael Magill will fill the post as the executive director of the new economic development department at the Board of Regents. The office will be working with the Tennessee Department of Economic and Community Development to help coordinate

educational efforts with economic development policy. The Board of Regents will have the resources of all the higher educational facilities in Tennessee, except for those of the University of Tennessee system, to utilize for economic development and education agendas. (McC Campbell 1994) Magill said in an interview, that

it just makes sense that the resources that taxpayers are developing at the Board of Regents and at the Tennessee Department of Economic and Community Development be used to work together to capitalize on the resources and fully utilize them. Many have not been utilized fully in the past, but we now have the opportunity to combine efforts to do just that. Right now [the partnership] is working well and we've only been at it for two months. (Magill, Oldham 1994)

William "Chip" Smith of the Tennessee Department of Economic and Community Development believes that education is one of the top three important factors in the recruitment of a company. Companies today need an assurance from the area that they can have qualified employees for both the short and long term to train or retrain if necessary. (Smith and Oldham 1994) "We've got a revolution taking place here," said two term Tennessee Governor Ned McWherter, "and it all comes through education, training adult workers, and building highways. If you go into the communities that are really growing in Tennessee, you will find that funding for education has increased substantially." (Liles 1993, 67) As a result, the State of Tennessee has made the commitment to the necessary training through the successfully passed legislation which will make those necessary training resources possible. In a five year period, \$900 million

will go into Tennessee classrooms, more than had been spent in the last twenty years combined. (Liles 1993, 67)

3.4 Telecommunications Advances and Economic Development Opportunities

Wilson and Teske point out in their article, "Telecommunications and Economic Development" that telecommunications infrastructure has become a highly important factor in economic development. Furthermore, many businesses have found that in order to survive in today's competitive market, they must have fast and efficient telecommunications. (Wilson and Teske 1990, 158) Yet they acknowledge that,

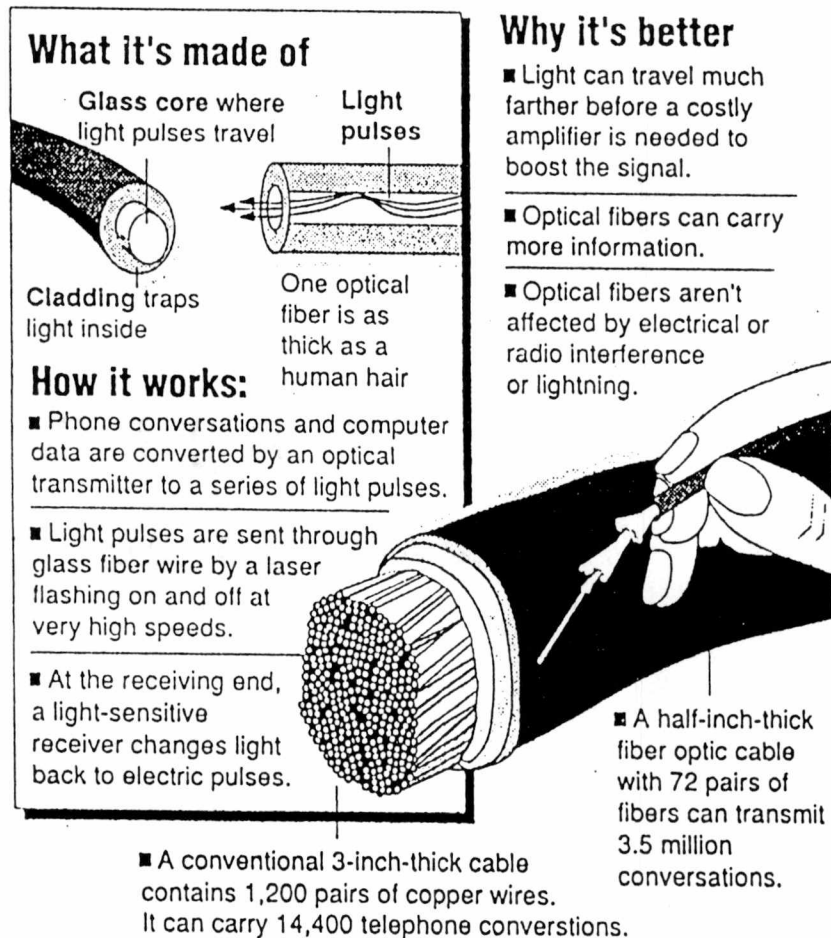
the relation between telecommunications and economic development is not well understood, at least in terms of the actual or potential effect of the public policy on this relationship A better understanding of the telecommunications industry is important as state and local governments attempt to use telecommunications policy as a tool for economic development. (1990, 158)

Emerging computer and telecommunications technology, argue the writers, will cause "factors such as higher education, labor force, quality of government, and telecommunications infrastructure" (1990, 163) to be much more important than land, transportation, and energy. (1990) Walton and Kraushar also propose that land and capital, though once the most important elements in past economies, will be replaced by data and information technologies. It will assure the future success of a community, business, or organization. (Walton 1990, 277) In addition, the fact that

FIGURE 3.1

Fiber optics: Changing communication

This new technology uses light pulses traveling through glass fiber to transmit information. Conventional telephone cable uses electricity traveling through copper wire.



SOURCE: Judy Treible, Knight-Ridder Tribune News, adapted from *Popular Science Magazine*, *World Book Encyclopedia*, and *The Re-Wiring of America*.

telecommunications provides “timely and reliable information and research data, means it will be important for local and state levels to be able to tap into those resources to be the most effective in policy development, economic development, research and development and corporate investment”. The telecommunications infrastructure consists of three general areas: (a) information technologies, (b) access and transmission technologies, and (c) switching and networking technologies. But, as Rural America at the Crossroads: Networking for the Future (OTA 1991) reported, “boundaries among them are not always clear cut, and are eroding in the face of technological change.” (OTA 1991, 66) Briefly, information technologies “allow individuals to store, process and reorganize data into a more useful form” such as through “computers, modems, facsimile machines, and answering machines.” (OTA, 66) Access and transmission technologies are the “means by which individuals can transmit or receive information from other individuals or systems.” (OTA, 66) by use of cables, fiber optic lines, radio waves or satellites. Using information technology and access and transmission technologies in a network leads into network technologies. It is the “means by which transmitted information can be managed, routed, and interconnected” using “switches, bridges and routers, local area networks (LANs) and signaling systems.” (OTA, 66)

Fiber optic lines, as diagrammed in the graphic on the previous page, remain a significant catalyst for change in telecommunications and its effect on numerous activities, including economic development. The capabilities of the fiber optic technology is best described by the passage below, also from the OTA report:

Fiber optics generally provide more capacity reliability, flexibility, and functionality than existing metallic cable. With minimum transmission loss, fiber allows more signals

to travel over longer distances with smaller numbers of repeaters than does copper wire. Thus it can support new broadband applications such as video [transmission], multi-media services, and very high speed data services. Already commercial systems have been developed that transmit 1.7 billion bits of information per second on a single pair of glass fibers, an amount equivalent to 24,000 simultaneous phone calls. (OTA 1991, 66)

The capacity, as stated in the report, is doubling each year. If this proves true, by 1995, up to 20 gigabits per second could be transmitted.

Digital technology, as opposed to traditional analog communications, allows for the transmission of audio, video, and data as bits of information compressed in to BITS (BInary DigiT). The bits are the smallest unit of information that can be used by a computer with eight bits equaling one byte, a kilobit is one thousand bits, a megabyte is one million bits, and a gigabit is one billion bits. (OTA 1991, 173) The established protocol for high-speed digital transmission is Integrated Services Digital Network (ISDN) which allow for simultaneous transmission of voice and high speed data. (OTA 1991, 173) Digital communications uses electronic and light-based systems and provides for a more efficient transmission of information. Any analog signals, such as video and voice, must be encoded first by using coder-decoders (Codecs) to convert the analog to digital form. Analog transmission is less efficient than digital and is much susceptible to interference. It also requires a continuous signal, such as a radio wave, whereas digital form can be compressed. (OTA 1991, 173) In 1991, approximately 98% of all AT & T switches used digital technology, and an average of 48% of all regional Bell operating companies had digital switching. (OTA 1991) Additionally, fast packet switching also allows for more efficient use of the communications network. Such switching capacities

allow for faster communications linked with the fiber optic capabilities to allow "real-time" communications and to expand the capacity of the telecommunications system as a whole. (OTA 1991, 173) The switching allows for "transmission of data by packets--includes data, call control signals, and error control information--so that the channel is occupied only during transmission of the packet." (OTA 1991, 173)

The technology infrastructure continues to become more significant since, "the creation of networks to use this technology is becoming a business necessity in finance, manufacturing, science, and education. These networks permit faster communication, linkage to supercomputer centers, electronic mail and news services, remote processing and data base retrieval." (OTA 1991, 77) Zinn and Hinojosa wrote one of the first articles introducing planners who were unfamiliar with Internet to the system and its applications. Internet, they state, "is a global computer network, made up of thousands of smaller networks, that links over a million computers located around the world . . . a vast resource that has been underutilized by planners. Internet provides a number of tools that enable users to communicate, send and receive files, and share data and other resources." (Zinn & Hinojosa 1994, 389) For example, Internet allows individuals to retrieve information on subjects such as economic data, the text of various legislation and international agreements, gain access to the Library of Congress catalog, tap into the White House public announcements, or read U.S. Supreme Court opinions.

The May 1994 issue of *American City and County* carried a cover story concerning the growing use of such networks in government services. Noack's article interviewed the Mayor of Diamond Bar, California, Gray Werner about the new city run

computer bulletin board system. It is used to provide information about government events, services, and policies to the community. Furthermore, citizens may use the computer system to forward their comments to the city manager. Werner said, "I think the system is helping to revitalize the interest in local government" (Noack 1994, 40) Noack stated that "many state governments provide access to computer bulletin boards and databases filled with economic statistics and analyses, and a majority of state legislatures also make public the summaries of bills committee hearing schedules and members' addresses and telephone numbers." (Noack 1994, 40) Slowly local governments are also using the networks and find that there is considerably less foot traffic in the government offices because citizens can access the information they need through the computer systems on their own. Many governments anticipate automating most services so that many licenses and other forms can be completed by the citizen and mailed to his or her home without a trip to the city hall. This could encourage more efficient use of time and government services. (Noack 1994, 41)

An example the use of such network technologies in Tennessee is the Tennessee Economic Development Data Center which is scheduled to open in Fall of 1994. Joe Imorde, South Central Bell's Director of Economic Development uses the phrase, "connect, communicate, collaborate" to explain the impact telecommunications advances will have on Tennessee business, industry, and education. South Central Bell will be opening a new Tennessee Economic Development Center in the recently constructed downtown Nashville South Central Bell Tower; a center which will connect Tennesseans to one another and the world. The proposed floor plan may be viewed on the following page. The center will be used in many ways, but of significance to this application is the

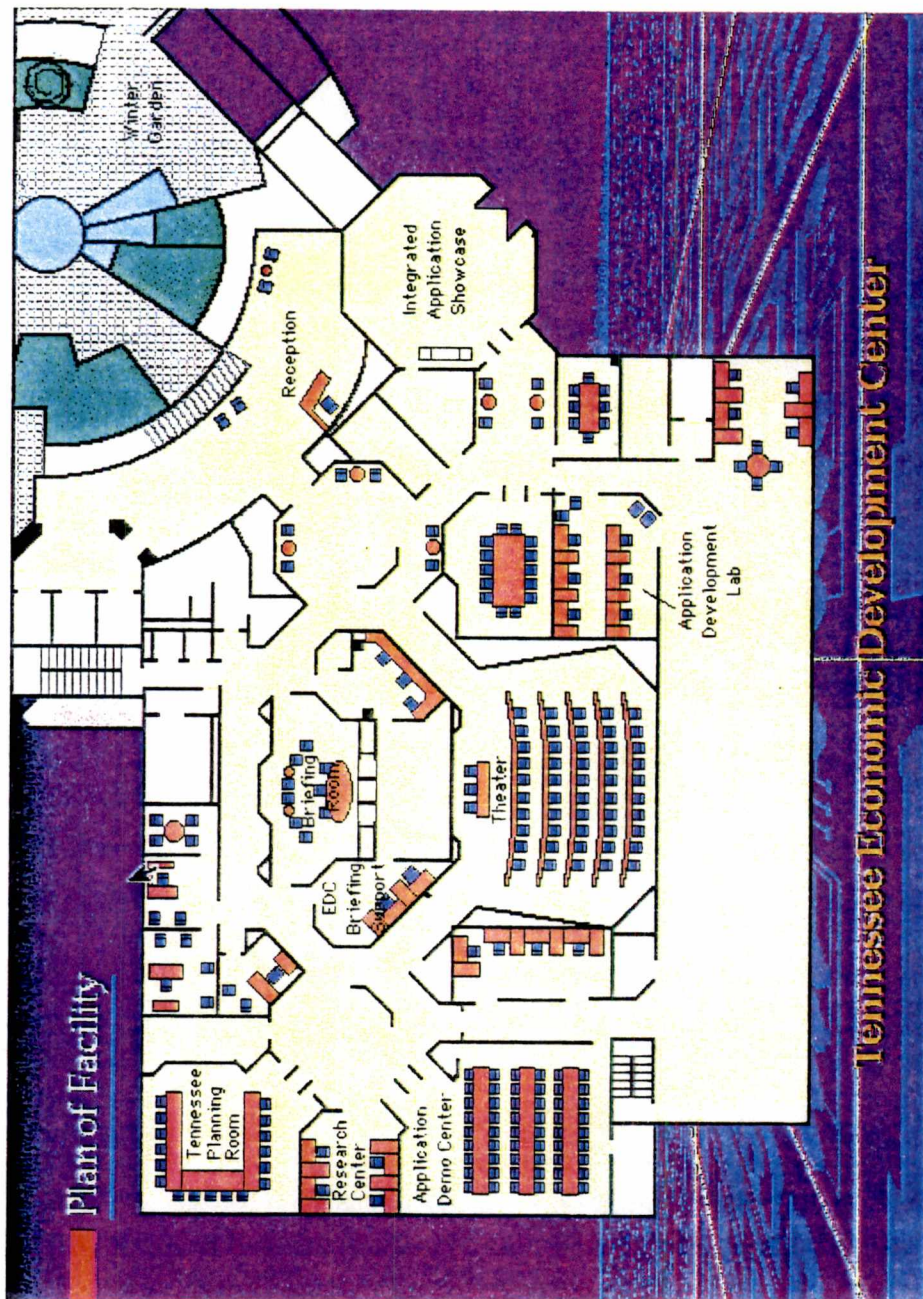


FIGURE 3.2

use of video conferencing between county officials, municipal officials, and prospective economic development clients. (Bruninga 1994, 1) The Network Resource Center (NRC) system would enable Tennessee counties with the proper infrastructure and equipment to hook up to communications lines which would allow them to retrieve up-to-the-minute information on federal and state legislation, data on various counties and states, and most any other information available on the Internet system. The uses of the Internet are growing daily and it would be of equally tremendous benefit to rural counties and municipalities. At this time, the Network Resource Center (NRC) will be used to "demonstrate and teach electronic commerce." As of 1995, for example, "anybody doing business with it will have to be able to do it electronically. Sixty percent of Tennessee manufacturers, says Imorde, do business with the federal government so they need to comply." (Bruninga 1994, 5)

Imorde noted further, that the state will be more successful if it is ready to handle such technological advances. He hopes that the NRC will "generate a forum for building long-term strategies and build interconnections between and among chambers of commerce and economic development officials" (Bruninga 1994, 5) The distance to and from meetings can be eliminated and information can be gathered more efficiently by all involved through the use of such telecommunications centers. "If [the center]", points out Imorde, "can generate a forum for long-term strategies and build inter-connections between and among chambers of commerce and economic development officials, . . . around the state, they can work together on a particular strategy for the state." (Bruninga 1994, 5) But, the technology is for more than just communication among those in

government and business; education is being radically changed and challenged by such advances also.

The Congressional Office of Technology Assessment (OTA) was asked by its Congressional Board of the 102nd Congress to perform a study concerning the impact of telecommunications upon rural America. The resulting study, Rural America at the Crossroads: Networking for the Future (OTA 1991) provided fundamental information about the emerging telecommunications infrastructure and its uses in conjunction with economic development. The study also offered goals and policies which would help rural areas use the technology in the manner most beneficial to the community.

The report states that due to the diversity of the rural communities, a variety of development approaches should be pursued. Though technology alone cannot level the playing field for rural areas, technology can help create a "holistic" approach to education, health services, economic development, government services, and the private economy. (OTA 1991, 4-14) Therefore, it is important to provide community development along with economic development and "failure to do so could expose rural areas to urban competition and only further widen the gap." (OTA 1991, 14)

Economic development, argues the study, must have goals which work in partnership with telecommunications policy. Though in the past, little conflict has occurred between regulatory policy and economic development goals, that may change quickly. Since communications was not considered an integral component of economic development, the impending reliance upon additional emerging telecommunications technology for economic development purposes will require a reevaluation of

communications regulatory policy in order to create a collaborative attitude among all involved. (OTA 1991, 17) "If the cooperation needed for economic development is to take place," issued the report, " government must provide incentives for cooperation while making it costly for players who fail to work together." (OTA 1991, 18) In order for telecommunications to be used successfully in economic development efforts in rural communities, stated the OTA report, the following ten criteria (OTA 1991, 18-19) , as summarized below, should be observed.

1. Create a vision and combine it with entrepreneurial leadership.
2. Use a broad-based, multidimensional integrated notion of economic development.
3. Develop strategies which make efficient and effective use of existing resources.
4. Be flexible in order to "address the needs and appeal to the unique strengths of each community."
5. Create flexible and creative rural network architectures (computer and telecommunications networks).
6. Incorporate technology transfer and educational applications.
7. Reconcile any differences between telecommunications regulatory policies and economic development goals.
8. Find ways to create cooperation among the key players.
9. Create economically viable rural communications systems and economies of scale in order to make such networks more feasible.
10. Allow communities the opportunity to choose economic development on their terms. It is essential the community believe in the strategy and is comfortable with it. (OTA 1991, 18-19)

In opposition to communities returning to the traditional smoke-stack chasing of the past, the report offered four recommendations and four strategies. The U.S.

Congressional Office of Technology Assessment recommended that communities (a) implement economic development which is holistic and comprehensive; (b) develop employment opportunities which would be “useful and satisfying, and [would] provide income levels consistent with the income of the region” (OTA 1991, 95); (c) strive to provide necessities for its citizens such as health services, adequate housing, educational opportunities, and government services; and overall, (d) strive to develop a “stable and vital community.” (1991 OTA 95) The implementation of such goals was to be accomplished by using four strategies as summarized below. (OTA 1991, 95-110)

Strategy I : Build individual capacities of the citizens by making education and human capital development fundamental building blocks for development.

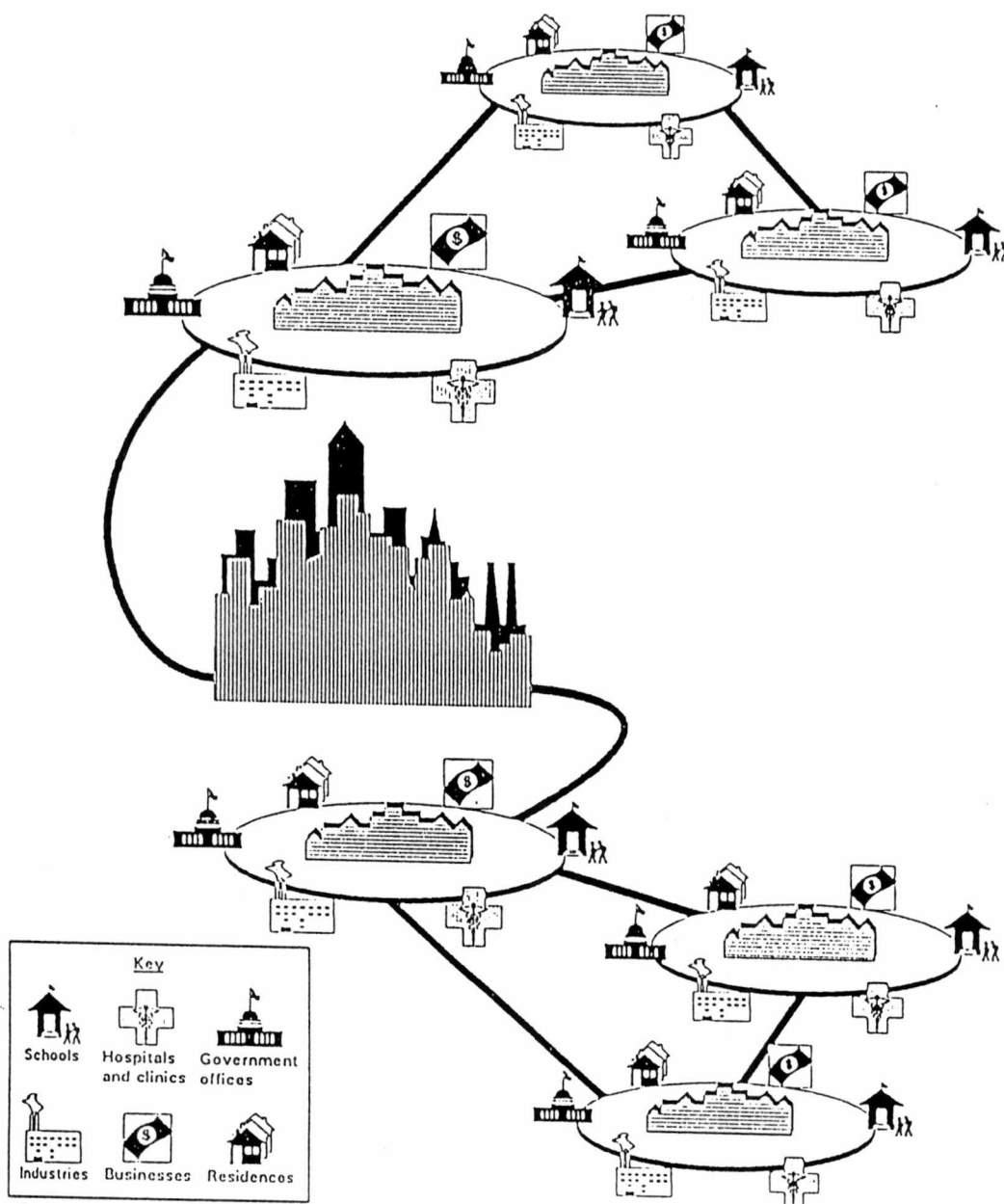
Strategy II: Build individual or enterprise capacity in order to have jobs for those participating in the human capital development initiatives. Develop a solid economic base through the use of programs which evaluate the strengths and weaknesses of the community then evaluate the data to create a comprehensive plan.

Strategy III: Develop social and organizational capacity to provide social and community organizations which will motivate citizens to use their abilities and to take initiative to help guide their community toward future community and economic development goals. Leadership development should be pursued as well.

Strategy IV: Finally, a community must be willing to build on its natural and human resources and identify the community public and private resources that are available. After doing so, the community must be willing to take the initiative to fill in the missing resources necessary to the success of the community and economic development program. All the elements are interdependent and therefore, must be developed to achieve holistic development. (OTA 1991, 95-110)

FIGURE 3.3

Rural Area Network



A Rural Area Network would be designed to foster the deployment of advanced technology to rural areas in an economically viable manner by pooling the communication needs of a community's many users—especially the businesses, educational institutions, health providers, and local government offices.

SOURCE: Office of Technology Assessment, 1991.

(OTA 1991, 10)

Though the rural community could be harmed by globalization, if they invest in “creating the right conditions--such as an educated workforce--rural communities might attract foreign businesses and capital to their communities. By using properly upgraded communications infrastructures, the area will have access to a much larger and diverse market and will be linked worldwide through communications technologies.” (OTA 1991, 50) The report further suggested linking rural areas to larger or metropolitan areas through Rural Access Networks (RANs). As seen in the graphic on the previous page, the RAN could link “business, educational institutions, health providers, and local government offices” (OTA 1991, 82) throughout the region. The rural area would receive information and services unavailable before such technology became available. Such telecommunications advances, however, must be integrated into a comprehensive development plan which is holistic in approach; as opposed to the singular goal of creating new jobs alone. The new technology should be integrated in order to improve the overall long-term quality of life of a community or region, not used merely to attract industry.

The Office of Technology Assessment report commented that

For too long, economic development has meant industrial recruitment. In a global economy, where skilled labor and high information content provides the competitive advantage, this strategy is outdated. If information technologies are deployed for the sole purpose of attracting information intensive jobs to rural communities, they will merely add a high technology dimension to the traditional smoke-stack chasing development strategies that have failed in the past. (OTA 1991, 91)

3.5 Educational Technology

In the next few years, communications companies such as Bell Atlantic hope to connect elementary and secondary schools throughout the nation to the "information highway" (Internet and other telecommunications technologies) as well. Many communities are introduced to educational technology by private companies, such as Jostens Learning Corporation. At Ronald McNair School in Queens, New York, students in the fourth grade class use multi-media software packages on personal computers to learn grammar, mathematics, and music in entertaining and creative ways. Textbooks have been replaced in that classroom with the software which has "music, narration, and graphics to make lessons "come alive." In one case, kids learn about acute and obtuse angles from a fisherman--who, the computer notes, is traditionally called an 'angler'." (Eng 1994, 86) Children find the graphics and the individual attention much more entertaining than the traditional "drill and practice" workbooks and textbooks. The teachers also are happy with the test scores the children have received in the three years since the Jostens program was installed. Sylvia Leslie has found that, "when they take my tests, they say, 'Oh, yeah, I remember that from the computer'." (Eng 1994, 86) The children have also excelled in national comparisons. "According to the New York Board of Education, the 144 kids in McNair who logged more than twenty hours in front of the personal computer last year showed an impressive 8 National Curve Equivalency in math." (Eng 1994, 86) The U. S. Government minimum for every student is zero.

The trend toward educational technology is also already occurring internationally, as “most countries now readily accept the premise that educational technology must be utilized to make their programs educationally effective” (Charp 1993a, 6) Yet funding remains an issue at home in the United States and abroad. Some communities have worked diligently to obtain funds to get such information centers in their communities. Two cities other cities, Dalton, Georgia and Lawrenceburg, Tennessee, have formed private-public partnerships to acquire the equipment, software, and facilities they need.

Dalton, Georgia, for example, formed the Education Is Essential Foundation, Inc. (EIE) through the Dalton-Whitfield Chamber of Commerce and private corporations. After hiring the Sunnyvale, California based firm, Computer Curriculum Corporation to design their first integrated learning system, the area installed their first integrated learning systems labs in 1990. By the end of 1990, 457 users of the integrated learning systems labs had received their General Education Development (GED) certificates. Janet Bolen, the project coordinator, stated that over one-third of the high school graduates in the area were adults who had received equivalency diplomas. The attendance at the learning labs had tripled within the first year of operation, thus three more sites were established that year alone. (Charp 1994b, 40)

Lawrenceburg, Tennessee has also joined the increasingly crowded “information superhighway”. Due to a desire to be recognized as “a top county, *the* top education county . . . ,” says Cromer Smotherman, the community has changed both its quality of education and its unemployment rate for the better. Smotherman, past chairperson of the

non-profit, private-public partnership 21st Century Council, and current Tennessee Rural Applications Center (TRAC) Project Manager for the Tennessee Elk River Development Agency, said, "we know that community development must precede jobs development . . . and we knew if we were going to have economic development using technology as our tool, education must be a part of it." (Fitzgerald S. 1994a, 1) The director of the Community Learning Network in Lawrenceburg, Kay Dalton, has seen the "potential for teaching skills that are missing in the community." (Fitzgerald S. 1994a, 1) The learning networks work toward providing the training that is really needed as a result of incorporating the data provided by the Tennessee Business and Retention Survey done by South Central Bell, The Tennessee Department of Economic Development, and Middle Tennessee State University in 1990. She says that Lawrence County is "profiling jobs we believe will be here thirty years from now and training toward that profile." (Fitzgerald 1994a, 7) The community's successful establishment of the Education Foundation, the 21st Century Council, a new Columbia State Community College branch, the Community Learning Network, and the local Network Resource Center are only some of the topics that will be examined within the case study of this thesis.

3.6 Human Capital Development Needs Diagnosis Through the Tennessee Business Retention and Expansion Program

The concept for a business retention and expansion program was begun by New Jersey Bell Telephone in an attempt to identify and address problems that firms were experiencing. New Jersey had been hit with numerous manufacturing plant closings and relocations in the late 1970s to early 1980s and felt such an effort was essential to help the

economically troubled area. They developed a survey which would help identify local strengths and weaknesses in a community.

South Central Bell and the Tennessee Department of Economic and Community Development began to implement their own version in 1989 called the Tennessee Business Retention and Expansion Program. (Tennessee Dept. of Economic and Community Development 1993 (TNECD Info Pack)) The program was “designed to promote an environment of growth and profitability for Tennessee businesses.” (TNECD State Summary, 1) The program was expected to help

- *Identify business climate strengths and needs as perceived by the community's industrial and business leaders.*
- *Provide original research data about the community*
- *Act as a catalyst for development of on-going economic development programs*
- *Strengthen the relationship between local government and business*
- *Create a better environment of business operation and expansion*
- *Establish a system to identify problems of local business*
(TNECD 1993, Info Pack)

South Central Bell and TNECD worked with the community leaders to coordinate the program, but it was the responsibility of the community to find volunteer interviewers and garner support from the local political leaders and industry management. The program was tailored to each community, then the results were analyzed by Middle Tennessee State University. After the data had been compiled and diagnosed, the final report for the

county was published. The community then could focus on the improvements that needed to be made in order to encourage business retention and expansion in their community.

The grass roots initiative was an important factor in the program since Tennessee Governor Ned McWherter felt that "No one knows a community's strengths better than citizens and leadership locally. The same for deficiencies and how to best overcome them" (1993 Nov., Boozer, 2)

By 1994, 45 of all 95 Tennessee counties had published reports available. Middle Tennessee State University also compiled the state data to create a state summary report and to maintain a database for future economic research. According to Dr. Reuben Kyle, professor of economics and finance at the School of Business at Middle Tennessee State University, "This database is enormously rich and is available as a public resource. Even though the survey instrument is adapted to fit each county and the basic question set has evolved as the consulting team has gained experience, the database includes responses to 79 questions with over 300 data points for each participant." (Boozer 1993 Nov., 2, 6)

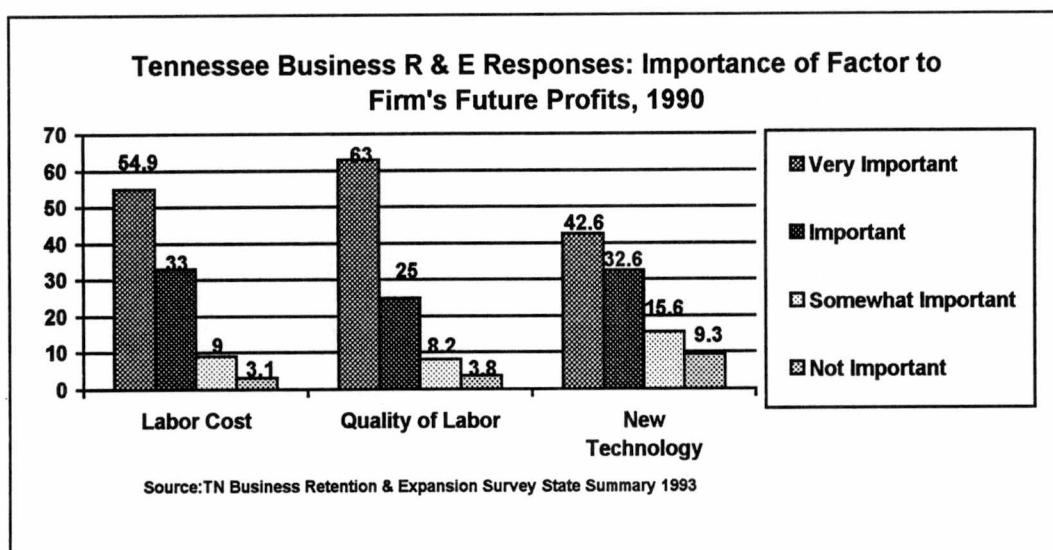
The survey also observes five areas related to economic and community development: "the county as a place to live and work; the educational and vocational training systems; employment conditions; employee relations and relationships with government; and the business climate in the community." (Boozer 1993 Nov., 6)

The questions relative to future training needs and the resources dedicated to employer based training are relevant to this study.

As reported in the Tennessee Business Retention and Expansion (R & E) Program Summary Report, Tennessee business and industry leaders acknowledged that the quality

of labor and labor costs are significant factors in their success. According to the Tennessee Business R & E report, 54.9 percent of the firms in forty-two Tennessee counties felt that labor costs were "very important" factors in the firm's future profits.

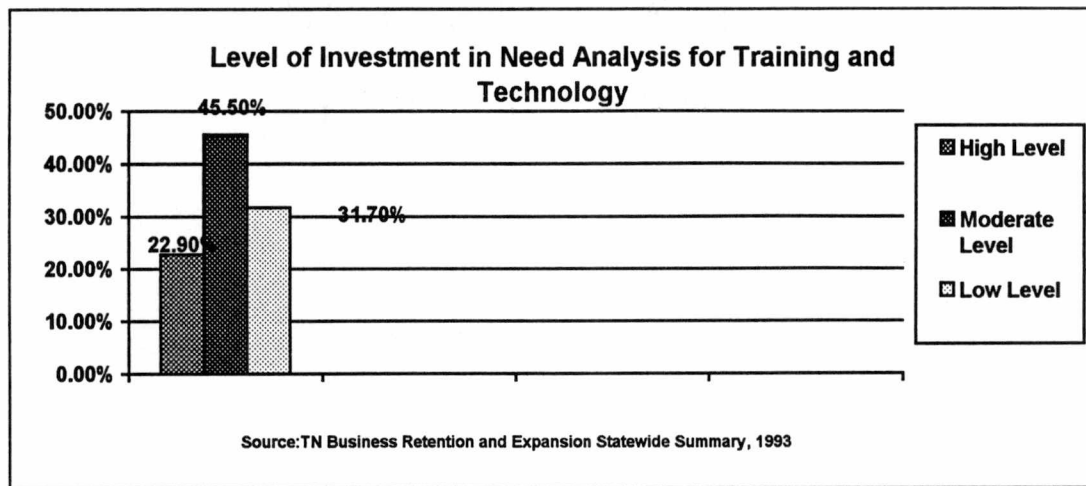
TABLE 3.2



When asked about the importance of the quality of labor, 63 percent felt that it was "very important" to the firm's future profits. Regarding the implementation of new technology in the workplace, 42.6 percent felt it was very important to the firms future profits. Furthermore, 27.5 percent of the firms stated that they presently required technical skills from their employees. When asked what labor skills they would need in the future, 41.6 percent of the firms responded that they would need technical skills. Yet, when asked how the special training required was acquired by workers, 89.1 percent of the firms reported that it was received on the job, 35.7 percent at state technology centers (formerly vocational-technical centers), and 20.7 percent at community colleges. More revealing,

however, was how resources were distributed to evaluate the need for skills and

TABLE 3.3



technology which might enhance their manufacturing process; 22.9 percent committed a high level, 45.4 percent a moderate level, and 31.7 percent a low level. (1993 June, TNECD, R & E Survey Summary) Though worker training is often highly effective in bringing down costs, few companies invest in such training. This is due in portion to the great risk companies attribute to training programs. Yet, in every community that participated in the R & E study, "education has ranked first in the list of community concerns, even where the local education systems [were] highly regarded." (TNECD, R & E Survey Summary, June 1993, 1)

Chapter Four: An “A+ Commitment to Education” **in Lawrence County, Tennessee**

4.0 Introduction

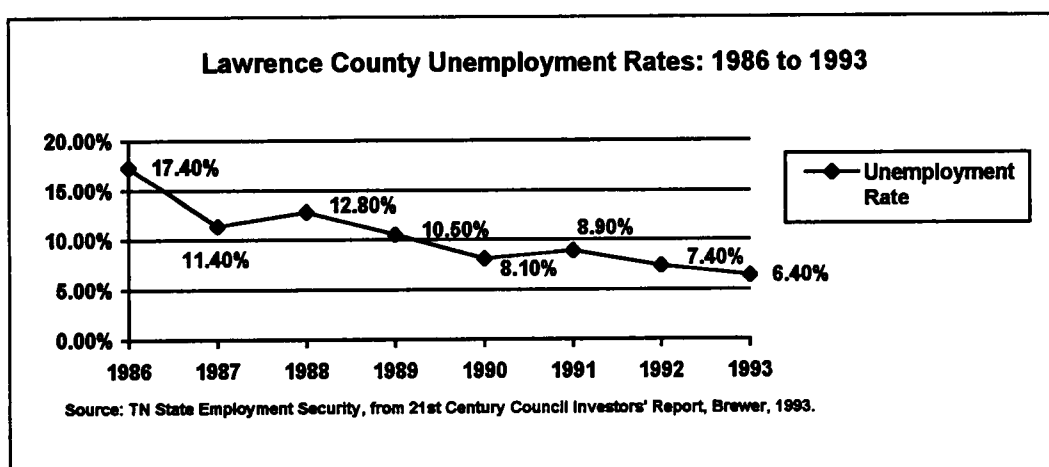
Just a few miles off Interstate-65, near the Tennessee and Alabama state lines, one can intersect with a “super highway”. Yet, until a few months ago, the main road to Lawrenceburg, Tennessee from I-65 only had been two lanes. For years local economic developers and community leaders bemoaned the state of Highway 43. They were convinced that improved transportation to and from I-65 would help take the county off the State of Tennessee’s list of “officially depressed counties”. Eventually the State of Tennessee Department of Transportation did provide funding for those greatly needed road improvements on Highway 43, but in 1986, the citizens of Lawrence County found a faster way to construct a super highway and to create a greatly improved horizon. Furthermore, the county was removed from the list of “officially depressed counties” before the first orange and white construction barrel was placed or the first bulldozer scooped into the red clay soil to four-lane the aging Highway 43.

Since 1986, Lawrence County has been rebuilding its community by investing in human capital maintenance and development. Due to a desire to be recognized as a “top county, *the* top education county,” says Cromer Smotherman, the community changed both its quality of education and its unemployment rate for the better. (Fitzgerald, S.H. 1994a, 1) Smotherman, a volunteer with the 21st Century Council and the current Tennessee Rural Applications Center (TRAC) project manager for the Elk River Valley Development Agency, notes, “we knew that the community development [had to] precede

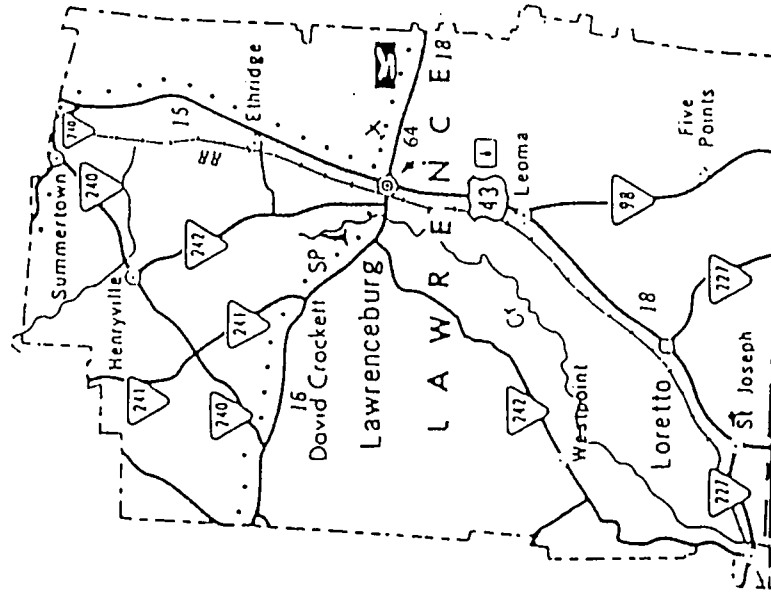
jobs development . . . and we knew if we were going to have economic development using technology as our tool, education [had to] be a part of it.” (Fitzgerald, S. H. 1994a, 1) This is in contrast to many rural communities which still look to infrastructure improvements as the key to economic development success and often continue to wait for someone else to save the community.

Instead of waiting on others, the citizens of a community can envision their future, imagine what they want their horizon to resemble, and make the choices that will enable them to compete in the rapidly changing global marketplace of the twenty-first century. Communities can recognize the advantages provided by emerging telecommunications advances; the reality of a more competitive, global marketplace; the need for a “holistic” approach to economic development; and the importance of community initiated private-public partnerships that will enable them to change their economy, as well as their way of life. (OTA 1991) Recognizing those trends, Lawrence County labored to drop its unemployment level eleven points in seven years, from 17.4% in 1986 to 6.4% in 1993.

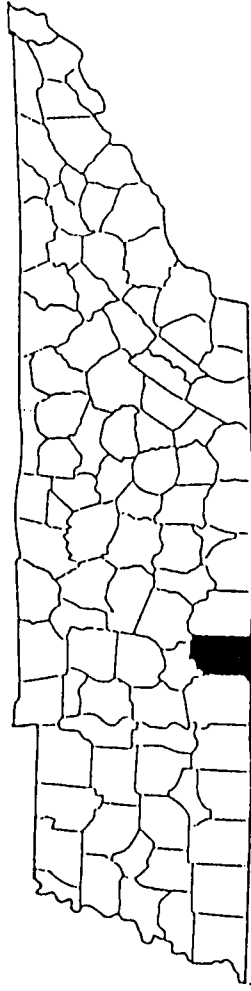
TABLE 4.1



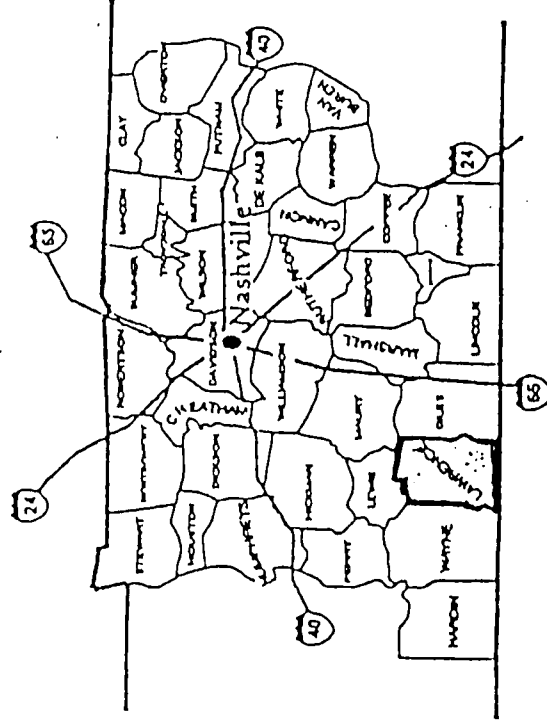
Lawrence County, Tennessee



Lawrence County View



State of Tennessee



Middle Tennessee Region

FIGURE 4.1

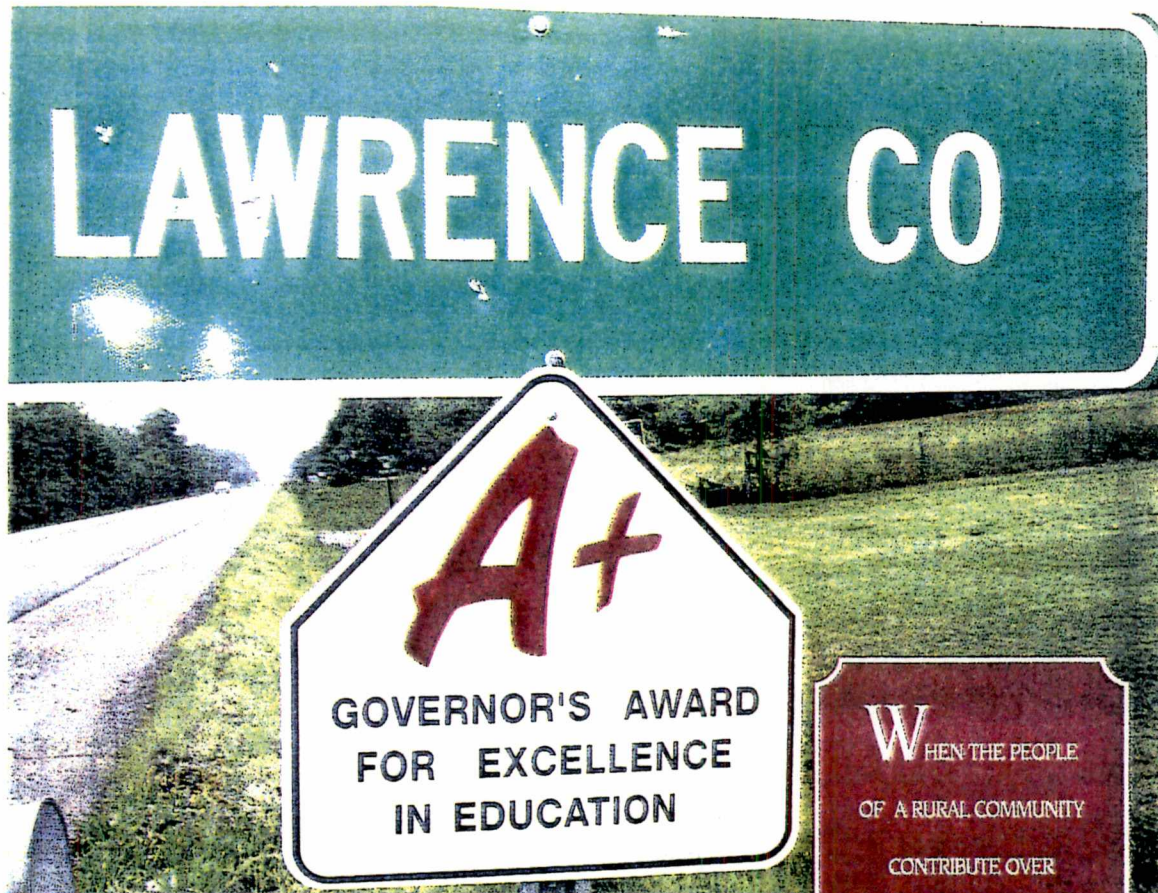
Additionally, six new industries made Lawrence County their home. The county's work has been recognized by many at the state level as a result. The county received their fifth *Governors' A+ Award* in 1993 for outstanding public commitment to education; the highest number in the state. For the fourth consecutive year, Lawrence County was honored with the Governor's Three-Star Community Award for outstanding economic development preparedness. (Brewer 1993).

The following case study of Lawrence County was developed to provide the information necessary for a comparison of occurrences in the county to the suggested model in chapter one of this thesis. The case study was achieved through researcher observations, data from numerous interviews, and the documents gathered from those involved in Lawrence County's revitalization. The most important objectives of this chapter were to document the Lawrence County experience, to create interest from other counties in pursuing goals and accomplishments similar to those of Lawrence County, Tennessee, and to provide an informative case study for use in this thesis.

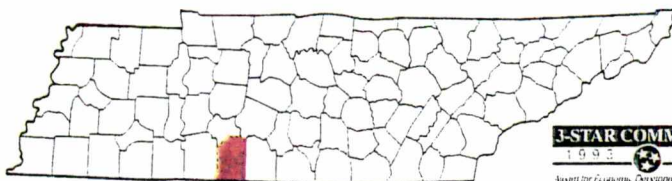
4.1 Geographic Location and General Demographics

Lawrence County, Tennessee is located in the lower Middle Tennessee region, as shown on the map on the following page. It is bordered by Lewis and Maury Counties to the north, Wayne County to the west, Giles County to the east, and the Tennessee-Alabama state line to the South. Lawrence County is 29 miles Southwest of Interstate-65 via U.S. Highway 43 and 78 miles southwest of Nashville, Tennessee. Highway 64 runs east and west across the county, through Lawrenceburg. According

FIGURE 4.2



THE ROAD TO A WELL-TRAINED
WORK FORCE LEADS TO
LAWRENCE COUNTY, TENNESSEE.



*Visit our new Community Learning Center
featuring computer-based skills training
and video conferencing capabilities.*

WHEN THE PEOPLE
OF A RURAL COMMUNITY
CONTRIBUTE OVER
ONE MILLION DOLLARS TO
EDUCATION PROJECTS,
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RANDY BREWER
21ST CENTURY COUNCIL OF
LAWRENCE COUNTY
P.O. BOX 190
LAWRENCEBURG, TN 38464
PHONE (615) 762-7951
FAX: (615) 762-7989

to the 1990 U.S. Census, Lawrence County had a population of 48,412. (Local officials, however, feel it is closer to 50,000 people.) The designated Labor Market Area consists of Lawrence, Giles, Lewis, Maury, and Wayne Counties, Tennessee. The projected population of the labor market area for the year 2000 is 145, 810. (TN Dept. of Economic and Community Development Data Sheet, 1994)

The major employers in the area provide a large variety of products and services which include automotive products, apparel, bicycles, caskets and vaults, machine parts, industrial supplies, chemical and mineral manufacturing, packaging materials, furniture, plastic products, fire pumps, construction materials, lawn equipment, and specialty fishing lures. The number of employees in each firm ranges from 6 to 3, 300. Though the area is traditionally non-union, a local of the United Garment Workers is in three manufacturing firms. (TDECD Data Sheet 1994)

4.2 The Need for Change in Lawrence County, Tennessee

In 1986, Lawrence County was shouldering an unemployment rate of nearly eighteen percent, had not seen any recent factory locations or expansion, and the entire community had extremely low morale. Yet, at that time, local leaders began working to find a solution. Prior to 1986, Lawrence County relied on the mayor and one staff person to provide economic development efforts. (Smotherman, Scottsboro 1994) They had very informal practices and few fiscal resources. In the earlier years, the mayor found success in attracting industries from the "rust belt", but that did not last long. Economic development had evolved into a highly competitive process and Lawrenceburg saw fewer

and fewer manufacturing locations or business growth. Initially, county leaders felt that if U.S. Highway 43 could be expanded into a four-lane road, their ability to attract new business would be highly successful. However, as community leaders further observed future economic trends, they realized that though the road and other infrastructure would remain a significant factor, the importance of having a labor force which could compete globally was even greater. In the past, like most of the nation, the county did not need a highly trained workforce. Yet, the need for sophisticated and technology savvy employees became an essential requirement for long-range economic development in the late 1980s. (Smotherman, Scottsboro, 1994)

The community set out to create a highly trained workforce, but they would have to raise all the funds, change many attitudes, and persuade local business people to support the economic development efforts. Furthermore, the proposed manner in which the workforce would be trained was new and unproven to the business community. Yet, the next years brought private-public partnerships, a new branch of Columbia State Community College, and the computerized Community Learning Network. The telecommunications supported Network Resource Center also was opened to provide access to a system which would link Lawrence County to the world through Internet, plus provide teleconferencing and distance learning opportunities.

In less than ten years, Lawrence County created an economic development and community development example which many have recognized as a model for other communities planning similar projects. Cromer Smotherman pointed out in a speech to a group in Scottsboro, Alabama, that they started out with very little. They began with "five

mayors, a county executive, a few Chamber of Commerce presidents, industry leaders, financial institutions, professional and business leaders,” all on a volunteer basis. The group had, “no budget, no structure, no formal organization, just a commitment and a willingness to learn, to give their time, build a model, and to set priorities.” (Smotherman, Scottsboro, 1994, 6) The group understood that it would take the effort of many citizens in the community to realize their vision. Lawrence County, says Mr. Smotherman,

is not unique from any other rural community. I firmly believe that every community has the talent, the gifts of leadership and the resources to become whatever the community wants to become. All communities have strengths and weaknesses . . . we are to build on our strengths and improve our weaknesses . . . [and] put aside things that might serve to divide us . . . (Smotherman, Scottsboro, 1994, 10)

4.3 The State of Tennessee and Lawrence County: An Interview with Ronnie Gaither of the Tennessee Department of Economic and Community Development

Ronnie Gaither was very aware of the circumstances in Lawrence County in the 1970s and 1980s. From the early stages of Lawrence County’s revitalization, Mr. Gaither was there as the field consultant from the Tennessee Department of Economic and Community Development. The following record of his interview (Gaither 1994) provides an ample introduction to the initial conditions in Lawrence County, some of the first steps taken by the State of Tennessee to assist the community, and what the State plans to do for and with Lawrence County in the coming years. The interview began by Mr. Gaither pointing out that in his twenty-seven years as a field consultant for the State, until the mid-1980s, “we never had any occasion to become involved in anything in Lawrence County

for any reason. In other words, if we ever had an industrial client, Lawrenceburg never crossed our brain. They just did not have a program down there . . . ” (Gaither 1994)

Throughout the conversation, Mr. Gaither was asked to discuss the role the State played in the success of Lawrence County, what other counties could learn from the Lawrence County experience, how the relationship between the state and the local level is changing due to technology, and certain important ingredients to a successful economic development program. For communities considering a similar development program, the interview will help one understand how the State of Tennessee can assist a community in a situation similar to Lawrence County’s in the mid-1980s. The June 18, 1994 phone discussion with Mr. Gaither continues as follows and begins with an explanation of when a field consultant enters the economic development process in a county.

PO: I had always been under the impression that if a local community like Lawrenceburg did not have a program that there were field consultants who went out to help communities develop one . . . but you were not sent to Lawrence County to “fix things” for them?

RG: *I am that field consultant, but let me point out, if that leadership is not there to get in contact with me, to touch me, to call me into the play, I never go. Because if the leadership is not there, there is not any sense in me going into that community since without leadership, we’ll be back on zero in eight or ten years.*

PO: Is that because no one is interested in it?

RG: *Right. Ten years ago, Cromer Smotherman . . . contacted me and wanted to know what needed to be done in Lawrenceburg. I knew about some really good programs in some other communities and one of the best ways to get one community to do*

something positive is to let them see some other community doing it. We took Mr. Smotherman to many communities to see various programs. Soon he settled on a program down in [Tupelo] Mississippi that he thought was a good one and he began to pattern their community development program after that one, but with many modifications he had seen in other Tennessee communities. That's where it all got started. I would go down to Lawrenceburg, sometimes I'd get up at five in the morning to meet Cromer for a breakfast meeting at seven o'clock to just talk about, "What do we do next?" That was our initial involvement. Then we went to meetings with mayors and judges and bankers and ladies and hundreds of those type things. All of them were talking about what needed to be done down here. Then Cromer put together a nucleus of five or six men and they did it. It took a few years, but you can see the results. Communities that have been supported by a major industry for a long period of time have the tendency to sit on their hands and do nothing.

PO: Is it ever the case that the major company wants it to stay that way? Are there times people are afraid to try new approaches and how do you get them out of that situation? What gives them the courage to begin to look for something else? What is the catalyst?

RG: *The community has to get in a suffering situation. Then this new leadership or these new people start working to change things. It is very difficult to get programs such as Lawrenceburg's going in a community under good economic conditions. The pain has to be there before they will get motivated . . . Lawrence County, Tennessee had shown up on all of our statistics information as being severely depressed, the unemployment rate had been in the double digits for eight and nine years, ten, if not more . . . A depressed county is classified as less than seventy-five percent median county per capita market income or a one year average greater than twelve percent. Therefore, Lawrence County must have been on that list for over twelve years.*

PO: What type of assistance was provided to Lawrence County by the State of Tennessee?

RG: *Initially, we helped them set up the private, non-profit organization called the 21st Century Council. We got it chartered as a non-profit organization by the State of Tennessee. All of this is almost too complicated to get into. We provided the infrastructure moneys to hook up the water, get the roads, the electricity, etc. to their industrial areas. Previously, they didn't even have an industrial area These improvements were occurring at the same time as plans for the education improvements. The actual educational program began a little later than that. They also asked to participate in the Governor's Three Star Program which required Lawrenceburg, basically, to do an extensive self-evaluation. They had to sit down and look at what was good about their community and what was bad. This is oversimplified, but when we took a look at some of the glaring defects we had down there . . . less than fifty percent of their students were graduating from high school. The Tennessee Business Retention and Expansion Survey was part of that self-evaluation. Then we decided, we don't even have an industrial park to put someone on , or water, or sewer, and we have an community with portable signs all over the place and we have nobody to even sell this place if somebody wanted to come in and buy. We started from scratch in that community.*

PO: I have had the feeling that groups such as the 21st Century Council have done a considerable amount of the work, whereas the local government has played a minimal part in the economic and community development efforts. After gathering my data, I don't see local government playing a very large role. Is this the case?

RG: *That is very true. Oddly enough, that is what has made this program so good. Though mayors and county executives have changed, the program has been stable through all of that political process. It has actually made it better. When an economic development program is tied to a mayor's coat tails, if he is beaten in the next elections, you are back on ground zero. That project has really been tied to Cromer Smotherman*

and five or six other very active individuals in the community. Cromer Smotherman got up everyday for ten years, put on his shirt, coat, and tie and went to work with no compensation. He is one of the most civic minded men I've ever known. I've asked him, "Cromer, why do you want to fool around with this?" He said, "I can't tell you how much this community has done for my family and me." When you write your thesis, you tell the world, there is NO substitute for good leadership.

PO: So the technical assistance you provided came in the form of time committed, meetings held, paper work with the State?

RG: *We told them how to set up the organization and do those type of things. I've been doing this for so long, we were able to avoid some of the problems that can occur. I knew the things that would work and wouldn't work that can get you bogged down and killed. Lawrenceburg had two priorities. One, you hardly can get to Lawrenceburg, they needed road improvements. One of the major complaints, I mean they put the pressure on the State Highway Department, they got their new four lane highway. These people have been able, along the way, to accomplish things that really made more people jump on the bandwagon. It was amazing. The college, I will never forget being down there at the early meetings talking about how they wanted a college. I told them they were twenty minutes from the main campus, why should you need one here? But, they wanted their own. They got it too. I use them as a model to get other communities motivated. I now have three other communities that are looking to establish their own colleges. They are all doing their educational foundation bit.*

PO: When you look at Lawrence County, what do you see there that other communities can use as an example? What should other Tennessee counties learn from Lawrence County's successes?

RG: *Boy, a lot of things. Other communities need to realize that they need to set up long-range goals and do some serious planning. Secondly, you need to have some*

continuity and some longevity from the people who are playing a role in this. Thirdly, there is nothing better in a community than having a community feel good about itself. If you go to Lawrenceburg, they'll tell you in a heartbeat, "we love this place".

PO: And that didn't used to be the case?

RG: *No, it is amazing. This college and all those other little things have just made this community. The fourth thing, this education thing has to be major. You know, in my territory of twenty-three counties I have never seen the economic situation as good as it is today. Many communities have 2.1% unemployment rates. This little part of the United States has been blessed.*

PO: If Lawrence County had not been committed to education and community development, yet still worked within this prosperous economic situation, would they have remained where they were ten years ago?

RG: *Yes, they would have. They would not have been where they are today. Just because the national or regional economic picture is really good, it may seem that it pulled everybody along. It did to some degree, but we had some things occur that really helped . . . but it was up to Lawrence County to be prepared for economic opportunity.*

PO: So, you all spent a lot of time in Lawrence County assisting them from the beginning?

RG: *Oh, yes.*

PO: If another county wants to do what Lawrence County did, then they are going to need a knowledgeable field consultant who understands how to get similar processes going?

RG: *They need some outside people pumping them up and telling them what might be the best direction. Some communities go off in a direction they shouldn't.*

PO: Have you seen any direct effects of their decision to use new telecommunications technology and computerized learning centers?

RG: *When a new industry looks at a community, one of the first places they go is to the existing businesses. When you take a client over to an industry and the manager says, "Hey, this technology thing, we're sending out people down there [to train] and it really is making a difference", I just cannot tell you how important that is to the chance of bringing in new industry.*

PO: So the business community in Lawrence County feels that the technology is really working and has been a worthwhile investment?

RG: *You should have been with me last year when I went to visit a company that makes all the labels for beer, and soap detergents, etc. When we spoke with the manager there, he said, "This is the way to go," and they decided to put big bucks into the project. Often, you see, when you have your unemployment rate down to between two and four percent, you have a shortage of qualified labor and it is absolutely necessary to train the remaining under qualified workforce. If you do not do something to train that two or three percent, they can really bring down the rest.*

PO: Will the telecommunications links provided through the Network Resource Center and the teleconferencing facilities change Lawrence County's relationship with the State? In the past, for example, communities have relied on personnel at the state level to do much of their research or background information on an industry prospect. Will Lawrence County be able to rely less on the State now for that?

RG: *All the information they'll need will be sitting right there in that little town. They can do it all. They really won't need us for that anymore. They have access to that now. They are in the information business out there.*

PO: So that is really going to change their relationship with the State as far as those needs then?

RG: *Yes, it will.*

PO: Where do you see the State fitting in from now on? What do you do for Lawrence County now that they have a successful program?

RG: *We're going to recommend that community to the prospects we get. In other words, we will be their umbilical cord to the business prospects . . . Lawrence County will get their share. We'll also continue to plug in other moneys to them. If they locate a company there we will provide training money, water, sewer support funds. Who knows where we'll put more money.*

PO: Now that Lawrence County is up to speed, you can go on with a more standardized process with them?

RG: *We can relax a little bit on them and let them go on their own for a while. They can go on fine without us, even if they had no contact with us for a while. They have their own marketing efforts, strategies—they're independent now.*

PO: Do you see a trend toward local governments being more self-sufficient in economic development efforts as opposed to the state coming in and fixing things for them?

RG: *Oh, yes I do, yes I do. Let's go back fifteen years ago. In twenty-three communities in my jurisdiction in Tennessee, we had four professional people who were hired at the community to do the economic development work. Four had a hired gun in the community to do economic development work. Today, sixteen of those counties have one. Do you understand? That is significant that a community would put forth enough effort and believe enough to raise the money to hire someone professionally to do this job. From four to sixteen in twelve years, that's a tremendous difference.*

PO: So then the communities are hiring their own people and then working almost in a partnership with the State of Tennessee as opposed to the State holding their hand through the whole process?

RG: *Exactly, oh, yes. That's exactly what is happening.*

PO: Does having such professionals help you?

RG: *Oh, yes. I don't have to deal with as many of the local issues anymore. It is almost essential anymore to have those full-time professionals.*

PO: Looking fifteen years down the road, what do you see as the state's role with local communities?

RG: *It is going to become more advisory, honestly. When I first started in this business, we would grab an industrial prospect, put them in the car and take them on the local tour and have to explain to them what is so good about Lawrence County, Tennessee. Now, I can take a prospect, send him down there and be assured that the local community will give that person the right information. It is just an incredible marketing network that we have in this area.*

Throughout the conversation, the level of teamwork necessary to accomplish the success Lawrence County has today became very evident. A community, pointed out Mr. Gaither, needs things such as consistent, dedicated leadership; a long-range plan for development; an organization based on private-public partnership that is dedicated to community and economic development; total community support and consensus; experienced economic development advisors; plus technical and financial assistance from the state level. As communities come into their own, agreed Gaither, they will be less reliant on state assistance if they have the above mentioned items. The ability to do their own economic development research and marketing with the emerging telecommunications links to numerous data bases, and Internet resources will also give a county numerous advantages over other areas. Regarding education, technology, and economic development, Gaither reminded communities that education must be a top priority in order to attract the new, more technically advanced manufacturing firms of the twenty-first century. When Lawrence County decided to take a look at their own education system, they too had many shortcomings, as may be seen in the following discussion of the Tennessee Business Retention and Expansion (R & E) Survey results. Yet, Gaither explained, by using all the resources available from the state level and by developing most of the components necessary to a truly successful economic development strategy, Lawrence County emerged as a model for other communities to observe.

In the following sections, the results of the R & E study will be highlighted; the most active organizations and institutions in education, technology and economic development will be examined; and the application of telecommunications technology in

Lawrence County will be introduced. The results of those efforts will be presented in the final section.

4.4 The Lawrence County, Tennessee Business Retention and Expansion Survey Results

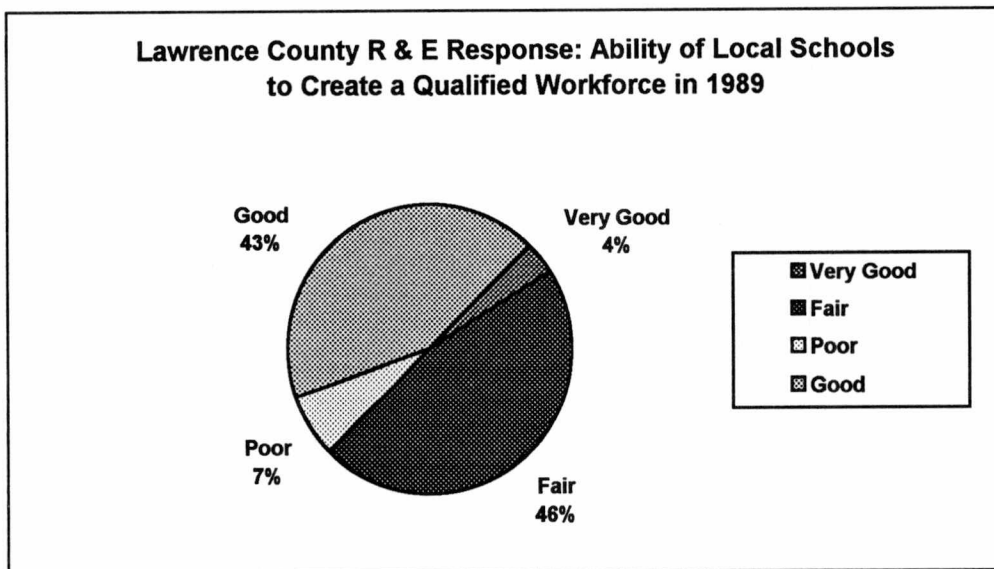
As mentioned in the preceding interview with Mr. Gaither, Lawrence County chose to participate in The Tennessee Retention and Expansion (R & E) Program Survey in March of 1990 to further analyze their economic conditions. The county was one of the first participants in the R & E Program. (The program's purpose and design is discussed in chapter three of this thesis.) The results of the survey, which was sponsored in Lawrence County by the 21st Century Council, were from 28 of the 31 manufacturing firms in Lawrenceburg and Lawrence County in 1990.

Though the Lawrence County Final Report deals with numerous issues of importance to local business, at this time, only data relevant to this study will be discussed. The data is provided to show the opinions of local business leaders regarding education and workforce preparation in Lawrence County in 1990. Comments given in addition to the standard survey questions will be included as well when they prove relevant to the study.

Business owners, when asked to rate the key issues effecting their future business decisions, cited the labor market at 25% of the time and various product market changes 25 % of the time. Additionally, some of the respondents remarked about the need for more skilled and unskilled labor. (TN Dept. of Economic and Community Devl. 1990, August , 3) Regarding the level of education required by a company, only eight of the

twenty-eight firms participating in the 1990 survey required a high-school diploma in order to hold a position at their company. Furthermore, only four of the twenty-eight firms recorded that 76% to 100% of their employees were highly skilled. (TDECD 1990 August, 4) When the managers did need skilled workers, fifty percent of the managers reported difficulty in finding those employees. Equipment operators were in highest demand and the second highest demand was for employees with math and computer skills. Employees in both of these categories remained difficult to procure. When asked about the need for additional training for their employees, 71% of the executives felt it was necessary. The companies, as a whole, expressed concern about the scholastic achievement of their employees and the capacity for the Lawrence County public school systems to educate the workforce needed in the community.

TABLE 4.2

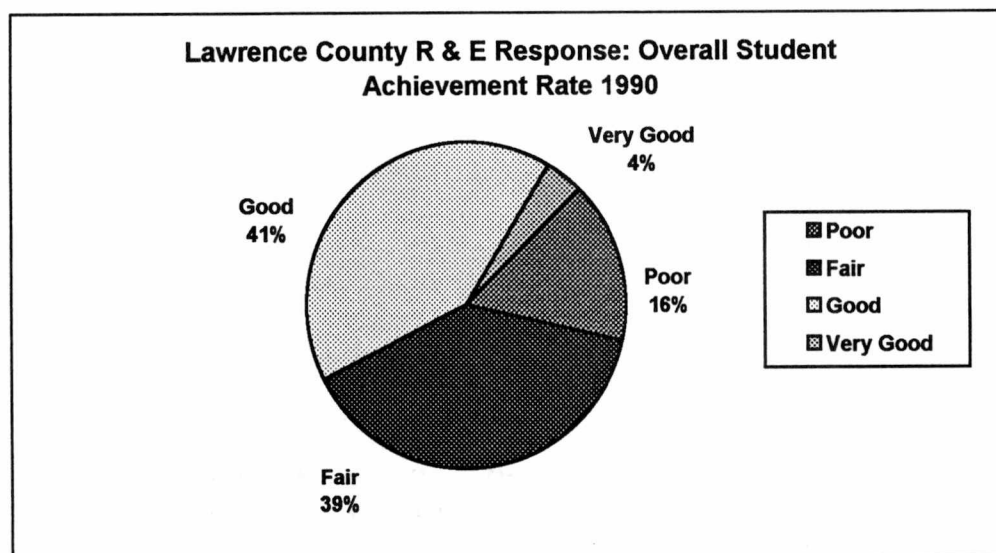


Yet, most of the businesses did not expect to invest heavily in internal training programs and facilities. (TDECD, 1990 August, 9)

Overall, the ability of the local educational system to create a qualified workforce was considered inadequate. The school system's ability to produce a qualified workforce, respondents answered, Poor 7.1% of the time, Fair 46.4%, Good 42.9%, and Very Good 3.6%. Some commented, "Drop out rate is terrible. Lot of room for improvement. Not good today--must look to the future--local system too political--looking out for self. Not enough complete requirements for diploma. General attitude toward education is very poor." (TDECD, 1990 August, 20)

Students' reading comprehension, solid math and science skills and general business understanding were cited as needing improvement well over 60% of the time. The 1990 overall student achievement was rated at Very Good 4% of the time,

TABLE 4.3



Good 41% of the time, Fair 39% of the time, and Poor the remaining 16%. Though the achievement rate is highest in the Good category, the survey design considered a combined rate of over 50% in both the Fair and Poor categories worthy of improvement or concern. (TDECD, 1990 August, 5-9)

The companies suggested ways to improve local vocational education. Among those recommendations were the following: a local industry needs survey, more hands on training, training geared to local industry, more specialized training, hire more qualified instructors who are willing to be more academically rigorous, and raise the level of computer literacy. One commented on the need to "look for training that can be used in the future, at present we're living in the past." (TDECD, 1990 August, 28)

The business climate in Lawrence County was on the upswing in 1990, according to 64.3% of the respondents and only 7.1% felt it was getting worse. Lawrence County received a good rating as a place to do business with a score of Good or Very Good 86% of the time. (TDECD, 1990 August, 21) Yet, the four firms which made up the remaining fourteen percent said communication between government and existing business needed improvement. Some felt that more job skills needed to be taught at the high school level and that the community needed to encourage a better work ethic. Basic education also needed to be improved and companies wanted workers with a higher productivity level. The respondents made it clear that they desired better schools and higher educational standards within the community's school system. (TDECD, 1990 August)

Finally, the R & E task force made seven recommendations in the study conclusion, one being the need to "encourage continued development of technical education curricula in the local school system and at the Lawrence County site of Columbia State [Community College]." (TDECD, 1990 August, 23) They decided to "make available information on the availability of outside sources of job training."

(TDECD, 1990 August, 23) The remaining six recommendations dealt with assistance to expanding industry, creation of an industrial services listing, the continuance of highway improvements, an expansion of Industry Appreciation celebrations, and conducting more seminars or forums of interest to local industry. In the years since the survey was conducted, Lawrence County has accomplished all seven of the recommendations through the work of the 21st Century Council, the Education Foundation, the Elk River Development Agency, and the volunteer efforts of numerous citizens.

4.5 21st Century Council of Lawrence County, Tennessee

Though in 1986 Lawrence County had great hopes of improving its future, nobody expected during the first meetings of the then unnamed, non-profit 21st Century Council, that such a momentous transformation of the county's economy, educational system, and community morale would occur. The community's willingness to improve its way of life also would bring six new industries into the county in the first half of the 1990s. Many in higher levels of government wondered why Lawrence County would even bother to try, but the determination of the small community rose above any prior skepticism. By becoming "*the* top education community", Lawrence County improved its workforce, applied the latest technological advances to its educational system, and as a result, substantially enhanced their level of community and economic development.

The 21st Century Council of Lawrence County established a public-private partnership of local government, industry executives, business leaders, and numerous volunteers with the objective to "maintain an aggressive recruitment program, provide

assistance to existing business and industry, assist education officials steadily upgrade the Lawrence County School System, and lobby the state for improvements to the highway systems surrounding the area.” (TDECD, 1990 August, 1) Within five years the Council had affected almost every aspect of life in the county. In November 1993, Michael McGuire, Assistant Commissioner at the Tennessee Department of Economic and Community Development, took the opportunity to comment about the success of Lawrence County in a letter to Randy Brewer, the Executive Director of the 21st Century Council, in which he said,

almost everyone in Middle Tennessee has heard about what Lawrence County has done over the past few years in economic development. If nothing else, you have demonstrated that economic development is more than just industrial parks and recruiting. Economic development must be a total community effort, across all facets of the community. Lawrenceburg has probably demonstrated this more than any other community . . . (McGuire 1993)

Only one month earlier, Tennessee Economic and Community Development Commissioner Richard M. Riebling had written Cromer Smotherman to say, “You should be proud of your community’s efforts. It’s a model I wish we could copy 94 more times.” (Riebling 1993) The emphasis Lawrence County has placed on education has provided the vision and the rallying point for nearly all the other economic development projects in the community. Leaders in Lawrence County remain fully committed to their emphasis on education as their economic and community development tool. Randy Brewer, Executive Director of the 21st Century Council, explained during a private interview in June the importance of high quality education and facilities to economic and community development saying, “It’s just your most important resource, your people, the ability of

your workforce. When we first started an economic development program . . . I think the main issue then was roads . . . but we started seeing a shift in what industry was looking for . . . people they could train to work for them.” (1994) Mr. Brewer noted that the road improvements were a top priority of the community in the early years, but they later recognized that rural communities, such as their own, often lack the technological sophistication to provide the excellence in education necessary to compete in the global economy. Rural communities generally are way behind and must work even harder to catch up to other areas. Industry and business, says Brewer, “need to have people who can do simple tasks like reading a ruler, reading and writing, communication skills. We have a lot of people who just don’t do that very well . . . and since the workforce is not growing like it was, we are going to have to re-educate those currently in the workforce, skills development became very important to us from a community development point of view.” (1994) Brewer added, if a community provides a highly trained workforce it is showing industry that they are interested in the well being of the community, as well as saving the industry millions of dollars in training expenditures. A community that can take care of itself is attractive to industry, business, anyone interested in moving to or growing within Lawrence County, Tennessee in the future. (1994)

The seventeen member 21st Century Council board raised the funds for the Columbia State Community College Building as its first project. The same building eventually housed the new site of Columbia State, the research library, the Community Learning Network, and the Network Resource Center. At the time, those involved never imagined the drive for the building would foster such successful projects in the future.

According to the *21st Century Council 1993 Investors Report*, "the site not only has provided convenient access for students taking normal course loads, but has become a computer and industrial technology center for local business and industry serving over six hundred students." (Brewer 1993) Lawrence County's local government agreed to fund half the cost of the facility if the community raised \$300,000 dollars in matching funds. Not only did the community raise the funds, but it also exceeded the need by raising \$430,000. In October of 1988, only two years after the first meetings concerning the redevelopment of Lawrence County, the 12,000 square foot Columbia State Community College facility was dedicated. Its placement adjacent to the Lawrence County High School assured easy access for those interested in furthering their academic careers. (Brewer 1993) The success of that project infected the community and provided the momentum to work toward new goals such as scholarship moneys that would allow local students to attend the new Columbia State site.

In an attempt to accelerate enrollment at the new site, the 21st Century Council and its many volunteers worked to raise about ten or twelve scholarships of \$1000 each, but once again, the community donated more than expected. By the end of the first year of the drive, \$25,000 had been raised for scholarships in 1989. From 1989 to 1994, 250 scholarships for \$1000 each had been awarded due to the community's donations and state academic works grants through Columbia State Community College. The unprecedented success of the fund raising efforts led the 21st Century Council to form The Education Foundation in 1990.

The Council remains the parent body, but the Education Foundation manages the financial aspects of the money raised to support kindergarten through twelfth grade needs and other education projects. The two bodies jointly nurture education initiatives and raise future funding. The creation of the Education Foundation, the contributions of the community and industry, the planning provided by the 21st Century Council, and the work of community educators has enhanced the management and success of education initiatives in Lawrence County.

4.6 The Education Foundation of Lawrence County, Tennessee

The Education Foundation of Lawrence County began its first fund raising drive in 1990, which netted \$500,000. Since then, the Foundation has been able to invest those funds, raise additional funds, and solicit support from local industry and business to support education in kindergarten through twelfth grade. In the 1993-1994 school year alone, the Education Foundation funded at least \$162,000 in projects to help the Lawrence County School System and its students. In the past three years at least \$350,000 has been donated to the Lawrence County School System.

Table 4.4

<u>Education Foundation Funding 1993-1994</u>	
Scholarships	\$35,000
Computer Equipment	\$60,000
Public Library Improvements	\$10,000
21st Century Classrooms	\$20,000
Columbia State Nursing Lab	\$12,500
Teacher Mini-Grants	\$25,000 (Brewer 1993)

When the State of Tennessee cut school funding for the 1991-1992 school year, the Lawrence County School System was left with a one million dollar shortfall. One of the

first line items cut from the county budget was textbooks. Since the textbooks, particularly science books, were critical items to many schools, the Education Foundation and the community provided \$82,000 to purchase the textbooks. The community did not want the children to go without the appropriate textbooks, especially since the science labs had just been reequipped by Education Foundation and community funds. (Brewer 1993)

The teacher mini-grant program, says Randy Brewer, has significantly increased teacher morale. "This seems to give teachers the incentive to do a better job, to try to come up with innovative projects, so we're really happy with [the program]." (Brewer 1994) Teachers must fill out a five or six page application to be considered for the grants. It outlines the project, the plan, and the necessary equipment. The completed application then is evaluated by the Education Foundation board. Brewer explained the process,

We find out whether or not the items that are being requested for the mini-grant program are available elsewhere in the system so we are not duplicating efforts or spending money from the Foundation on a project already provided by the local school system. Our trustees look at these with some advice from the school superintendent and one of his supervisors of instruction. Boy, it has been tough to evaluate the applications . . . the number of applications keeps going up . . . I'd love to see one of these days that we could approve practically all of them, but we decide how much we can spend and then fit how many we can approve into the formula. (Brewer 1994)

The program began for the 1990-1991 school year with thirteen or fourteen thousand dollars, the second year with about eighteen, and the third with between twenty-five and thirty thousand dollars for mini-grant projects. Brewer mentioned how surprised the Board of Trustees was when applications for very basic items were received. "You expect teachers to come up with these grand, creative ideas" remarked Brewer, "but then you

find the teachers asking for very basic items you thought they would have already had . . . though some are not sympathetic to that . . . You must remember that it's great to encourage innovation, but you cannot go around encouraging innovation when there are basics needed in the classroom first." (1994) Some mini-grant moneys have been used for math manipulatives for the lower grades, computer software, educational videos, and the reequipping of the Lawrence County High School chemistry lab. Brewer said, "they had nothing in the lab, they had to buy everything. That's very basic stuff, but you have to have it." (1994)

The non-graded primary unit also received \$27,000 in funding for new classroom supplies from the Foundation. The program was in need of supplies to effectively operate the pilot program in which the first three years are combined and children move at their own pace. Though the children gain the same level of education during those three years, each child is able to receive more individualized attention, participate in team and group work, and often accomplish much more than in a structured grade-level environment. The Education Foundation felt it was necessary to support new curriculum choices in the school system such as the non-graded unit. In another step to provide excellence in the classroom, the Foundation and Lawrence County raised over \$70,000 to create the first State of Tennessee 21st Century Classrooms, nineteen in all, in the Lawrence County School System. (Brewer 1993)

Though funding and fund raising for education ventures is an important responsibility of the Foundation, it also provides encouragement for other projects that may not require immediate funding. It often acts as the catalyst for projects or the liaison

among groups to produce additional education advances. The Chamber of Commerce also has helped advance education by sponsoring the Adopt-a-School program. Thirteen public schools and thirty-four local businesses and civic or community clubs have been matched. The sponsors "share materials and human resources to help meet basic school needs and provide incentives for better student and teacher performance." (Brewer 1993)

Since the 21st Century Council and the Education Foundation were founded, the Lawrence County Vocational Center has been testing all eighth graders entering high school "to assess needs, skills, and aptitudes." (1993) Following the test assessment, students elect to take either the Technical Preparation, "Tech Prep", curriculum or college preparatory classes. The Tech Prep student may emphasize engineering, business, or health services. They also continue to take applied math, general sciences, biology, chemistry, language arts, and industrial technology. When the tech prep students near graduation, they may enter an on-the-job work experience sponsored by the 21st Century Council, the Education Foundation, and provided by the Tennessee Department of Employment Security. The six week program includes an on the job simulation, plus interview skills and business practices instruction. (Brewer 1993)

Beyond the high school level, the Education Foundation has helped establish links among, industry, Tennessee Technological University, and engineering students. Tim Pettus, Treasurer of the Education Foundation, says that Lawrence County has been fortunate in that the local industry recognizes the importance of education and want to invest in their employees future and the future of their children. In an agreement to promote co-oping for Tennessee Tech students, local companies are providing co-op jobs

for engineering students. Though one major company had participated in such a program for over thirty years, the Education Foundation worked to involve the many other community industries. Many of the students who return to co-op are Lawrence Countians. Pettus believes Lawrence County will have a better pool of labor if those students return to their home county after graduation. "We want to grow our own engineers, mathematicians, and scientists. It is the only way to keep up with the technological changes. It's the kind of thing you can really do to direct the course of a community. It helps all involved . . . It's a win-win, slam dunk deal." (Pettus 1994)

In order for an Education Foundation to be successful, recommended Pettus, people must first be willing to give unselfishly of their time and money. "If you don't have these two things," he pointed out, "it's never going to get off the ground." (Pettus 1994) Second, Pettus and Brewer acknowledged that individuals who are unable to keep their ego in check cannot contribute successfully to such an effort. According to Pettus, "You just can't have anybody playing an end run on ego trips because the group will not support it." (Pettus 1994) Third, the money you receive from all your sources must be invested aggressively. People must see their money in action or they will be less willing to contribute the next time they are asked. "We've not been complacent with the money, we've had vision, we've challenged the school system . . . things that need doing, things that will really impact the community, we're not scared to take the steps necessary to get it done," added Pettus. (Pettus 1994) Some communities, however, may feel as if they never could be as successful as Lawrence County in fund raising, but Pettus disagrees.

No doubt the money is out there. It is out there in every county, no doubt. Our largest contributor, by far, lives six hundred miles from here. You have to do something

positive . . . a project like the Columbia State [Community College] building . . . You have to have a major thrust. The building is something you can see, feel, touch. There are things that are a lot harder to touch and that is when you must be prepared to answer peoples' questions about what you are going to do with their money. We try to make it as understandable as possible. (Pettus 1994)

How communication with the public is handled is another key to a successful community project or fundraising. "That is very key to this thing, you've got to beat your own drum and we don't do it enough because we don't have all the time and volunteers to keep up with it all." Pettus continued saying, "You have to have somebody who can communicate well, who has great writing skills and is willing to work to get free publicity. If someone out there reads an article and then wants to donate money this year, but hasn't decided where . . . you may get them thinking about your project." (Pettus 1994) Pettus speaks from experience and offered the following anecdote,

A lady called me from Ohio and left a message about wanting to donate some money. When I finally had the chance to call her back she explained that she wanted to establish a scholarship in memory of her late husband, a Lawrenceburg native. She said she wanted to donate three hundred, but I explained to her that we generally did not give scholarships for any less than \$1000. She said, 'No, I mean \$300,000.' She remains one of our largest private sponsors to this day. (Pettus, 1994)

The involvement of citizens, plus public and private entities has generated a great deal of pride in the community also. "We were able to get the city and county governments together . . . we've made a lot of progress in getting the three sections of the county to work together as well." (Pettus 1994) Pettus also felt that teacher morale improved as a result of the numerous projects. Local public office holders also believe in

the work of the 21st Century Council and the Education Foundation which has resulted in strong support for projects. According to Pettus, the Education Foundation has "changed people's attitudes . . . the number one key . . . That is what education is . . . the attitudes of the teachers, the children and the parents. If you are a teacher and you want to teach that child to learn, and you are a student and you are eager to learn good things happen. If there is a negative on either side of that, you don't get anywhere." (Pettus 1994)

The Education Foundation would like to encourage construction of three new schools in the next two years, yet realizes it will take nearly 22 million dollars to build them. Another goal is to investigate the possibility of granting "Chairs of Excellence" to public school teachers. A few thousand dollars would be awarded to an outstanding teaching professional with a portion of that award going directly to the classroom. "I think that would be a great thing to do and it would really hone in on your best and brightest teachers who want to achieve such things." says Pettus. Lawrence County knows, continued Pettus, that if they "want companies to expand and bring more people here, to buy cars, houses, expand churches, and so on--we have to improve our school facilities and our educational system" (Pettus 1994) He concluded, saying, that the communities which wait for the State to take care of their needs will be the ones that are left behind. The Community Learning Network on the Columbia State Community College campus, for example, is one way Lawrence County chose to take hold of its economic future.

4.7 Community Learning Network

Since its opening in February of 1994, The Community Learning Network (CLN) has been serving the needs of the business community and the citizens of Lawrence County. Currently, it assists many clients, provides a varied curriculum, and meets with business and industry on a regular basis to define their employment needs. Lawrence County has been improving its workforce through the CLN, establishing a more effective relationship with the business community, and increasing their odds of recruiting new businesses through their dedication to technology and education. The program has increased students' standardized test scores, boosted their academic skill levels, and provided many newly qualified employees to the Lawrenceburg workforce. The success of the program in its first seven months quickly has increased both financial and community support for its continued efforts.

Clients using the Community Learning Network (CLN) range from age six to seventy and come from various backgrounds. Full-time students and those receiving Aid for Families with Dependent Children (AFDC) or Food Stamps will have the CLN fee waived. Since many individuals receiving assistance use the CLN and later choose to enroll in classes at the Lawrenceburg campus of Columbia State Community College, the CLN staff is prepared to assist them with financial aid and paperwork, such as a Pell Grant application, if a client needs additional funds to go to college. Clients receive academic support throughout their academic work at the CLN ranging from assistance with curriculum choices to counseling about future education paths. (Dotson 1994)

The lab staff consists of four people: the project director, an educational specialist, and two mentors. The educational specialist remains in the lab with the client to assist with the course load, but also gives counseling about academic choices. The mentors help maintain the operation of the lab by answering the phones, coordinating office work, and assisting clients with various questions. Kay Dotson, the project director, says they always are in need of extra help, but are working with the staff they have at the moment. (Dotson 1994)

One of the first steps a client at the Community Learning Network (CLN) takes is to attend a counseling session with a CLN staff member. An information sheet is completed at that time, the client is logged on the computer system, and an assessment test is given. All of this information is combined with the client's personal goals to construct a course load most appropriate for the individual. The CLN utilizes the TRO Plato 2000 educational software produced by TRO Learning, Inc. It promotes learning in various areas such as applied technology, teamwork, research, listening, reading comprehension, writing, and applied mathematics skills. A student may choose from over sixty courses, as shown in Appendix A. He or she also may take courses ranging from GED preparation to classes in chemistry, physics, and geometry. Every age group will find a class to further their education. Elementary students can do remedial work or a client can take Calculus. The opportunities for learning are only limited by the client's ambition and time. Individuals who have been laid-off or find themselves without employment can enter the CLN program to receive training in a particular employment field, while at the same time, work on applied skills such as reading comprehension,

mathematics, science, and communication skills. A computer produced performance report, as also seen in Appendix A, is created for each student so instructors may track their progress and understand how to best assist the student upon his or her next use of the system.

The CLN works nearly everyday with local businesses to build job profiles and establish “work keys” for clients. Work Keys help an individual receive the education necessary to be a highly productive and responsive member of the workforce. Unlike some adult education retraining, the CLN prepares its students by building a solid base of applied skills such as applied math, reading comprehension, and other courses on the Plato 2000 system; not just a one time skill. Kay Dotson, the CLN project director, points out that this is not “one shot” training. Companies are asked to evaluate a position and its skill requirements from an industry perspective. This enables a profile to be broad enough that it is an accurate representation of a position across most firms in the region, not just the position according to one company. The program creates a higher client placement rate and more flexibility in the future for the client. Ms. Dotson says the program currently has a 35% success rate, but she comments that the program is only five months into operations. She expects the placement rate to be as high as 75 % when they reach their one year date of operation in February 1995. The lower placement rate also, however, is a result of a positive factor. Many of those clients choose to continue their education at the Columbia State Community College and do not directly re-enter the workforce. (Dotson 1994)

The CLN computers have been in such demand that client time had to be limited in order to accommodate more people. Though it is slower in the summer, the average level of use will resume in the fall. Therefore, the need for more computers and easy access for all client groups resulted in Phase II, slated to open September 1st, 1994 in conjunction with the Public Housing Authority. The United States Department of Housing and Urban Development allowed the CLN to use a five room rental unit for a computer lab and child care center. While the clients work on one of the eight computers at the center, their children will receive care in another part of the center. The children will have educational activities in which to participate while their parents and family members further their own education. The CLN staff would like to see the center open from 8 AM to 9 PM. The daytime hours would serve low income, AFDC, and Food Stamp recipients, while students "at-risk" of dropping out of school would use the center during the evening hours. The day care center was made possible by a \$20,000 grant from the Child Care division of the Tennessee Department of Economic and Community Development. (Dotson 1994)

Industry also chose to take an active role in the new educational opportunities and they seem quite happy with the results. Many of the businesses liked the program because it is self-paced. For example, at one point of the year a plant may need people to work twelve hours a day which leaves little room for educational activities afterward. Yet, other times of the year, the employees may only work six hours and have plenty of time to come to the CLN. The flexibility the CLN offers through self-paced course work has made the program much more attractive to employees and employers. (Dotson 1994)

The CLN also benefits industry recruiting efforts. Prospective industries take Lawrence County more seriously as a prospective site when they see the commitment Lawrence County has to education through the Community Learning Network, Columbia State Community College, the Education Foundation's support of the public schools, and the Network Resource Center. One of the newer industries recently agreed to participate in a television news story about the effect of the CLN. Ms. Dotson said that the entire news piece was about how the industry benefited from the high priority placed on up to the minute educational facilities in Lawrence County. The fifteen businesses that work with the CLN put up fifty percent of the financing to establish the lab. The Tennessee Department of Human Services provided the matching funds to pay for the equipment and the staff. The industries also provide information daily to the CLN about what they expect of an employee for various positions. They have allowed Ms. Dotson to go to their sites and do job profiling or job task analysis. That information is then logged in the computer for later employer-student placement needs. A student also will know from the start of his or her program what an employer requires. (Dotson 1994)

Ms. Dotson remembers when the interest in education was not as high in Lawrence County. Before the 21st Century Council, she said, one of the large plants in Lawrenceburg would hire anyone without a high school degree or a GED. They essentially were saying to the community, says Dotson, that education was not important since you could make a good living without either requirement. Yet, after the 21st Century Council was established and the Columbia State Community College was built, that company changed its policy. In order to be hired, one had to have a high school

diploma or a GED and any current employee was required to have either one in order to be eligible for a promotion or pay increase of any type. Over one hundred people got their GED in one year. "Once you take a strong stand, whether you are the 21st Century Council, an industry, or a community leader, if you will stand on that and show the community you believe it, it will change the whole community," says Kay Dotson. (1994).

Ms. Dotson, in closing, offered five recommendations to those interested in preparing their workforce to keep up with the rapid pace of technological change in the workplace. First, the community must have vision and may have to encourage vision. Second, take the risk. It is important that leaders take the risk to meet with the community to get it interested and to continue the vision. Third, take people to other educational sites to see the computers, to talk to the industry, to talk with the students. Many attitudes change once a hands-on experience has occurred. Fourth, do not be willing to walk away from the project due to lack of funds. The funds are out there, somewhere in federal and state grants, local budgets, industry donors, private contributors. Fifth, create private-public partnerships. This is an essential element to success since everyone must work together to make such projects a reality. (Dotson 1994)

Public-private partnerships have been important throughout the Lawrence County effort to make community and economic development improvements. Yet, no public-private partnerships discussed so far have developed a more progressive vision involving economic and community development than the ones established to create the technologically advanced Network Resource Center in Lawrence County. The program is

yet another aspect of the county's dedication to the promotion of superior education and tenacious community and economic development efforts.

4.8 Network Resource Center

Unlike many rural communities, Lawrence County has a highly innovative telecommunications application available to the community. Housed in the same building as the Columbia State Community College (CSCC) and the Community Learning Network, the Network Resource Center allows Lawrence Countians opportunities to connect with a world of information. The center, opened in April 1994, is on or above par with what major metropolitan areas would have available. Most metropolitan areas have not even created a similar network. The center will enable students, professionals, and citizens the advantage of up-to-the-minute data retrieval, two-way teleconferencing, and learning opportunities never before available to metropolitan areas, especially not to the often isolated rural communities.

Begun in 1993, the concept of a Network Resource Center was sponsored by The Tennessee Elk River Development Agency (TERDA). The agency membership is comprised of ten counties in Tennessee and Alabama. Coffee, Giles, Lawrence, Marshall, Franklin and Grundy Counties are in Tennessee. The counties of Lauderdale and Limestone are just over the state line in Alabama. The agency began with the mission "to accelerate the application of technology for rural advantage by creating a public-private partnership to apply information technology for improved education, health care, government service, and economic development" (TERDA 1994, 1) The Tennessee

Valley Authority provided the bulk of the funding necessary to establish the project in the form of a \$1.5 million grant. (West 1994, 45) Further assistance was provided by a contract with a joint University of Tennessee and South Central Bell project, the Telecommunications Application Partnership (TAP). The terms of the contract provided the technical assistance necessary to make the project work conceptually and physically. (Larson 1994)

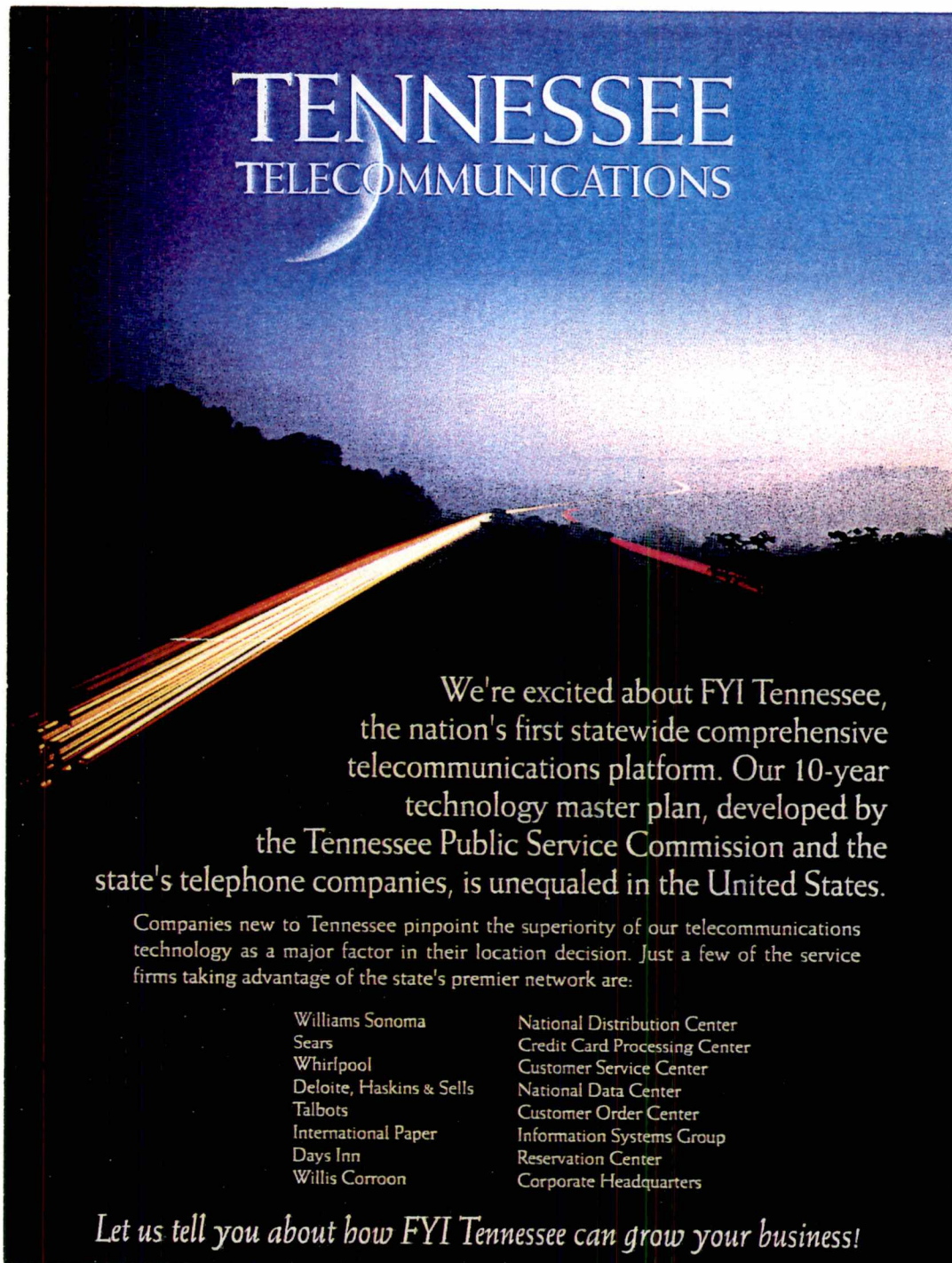
Though Lawrence County is the first to have a Network Resource Center, all ten counties are slated for their own by fall of 1995. The objective of the TERDA Network Resource Centers is "to provide a national model for the integration and benefits of information technologies in rural America and to enhance the quality of life in the Tennessee Elk River watershed." (TERDA 1994, 1) The NRC will provide advantages such as access to the world-wide system of Internet. Information such as White House press releases, the President's latest legislative plan, a rare copy of Thomas Jefferson's work, or the most recent data on a particular medical procedure could be found. Someone interested in furthering their education could take a class from the University of Tennessee without ever leaving town. Two-way video would allow teacher-pupil interaction across the miles. Business professionals in one community could video conference with clients or economic development specialists hundreds of miles away through "electronic commerce". Industries or local educational facilities could provide expert training through distance learning or educational software applications at a greatly reduced cost in time and money.

The access also could change the productivity of local government since Internet would provide access to more up to date information from the state and federal level. As a result, less time would be spent waiting on information from other government levels. Citizens would be able to access on their own much of the information they previously had requested from the government, which would mean fewer citizen requests for information as well. The rapid availability of information through Internet and other database retrieval systems, plus the opportunity for distance learning and teleconferencing; all eliminate the previous disadvantages of geographic boundaries, the lack of current data, the need to do time consuming research through manuals and paper indexes, plus the equally time consuming travel to meetings or out of town classes. In order to keep up with the changing global economy, such advantages will quickly become a necessity for survival of all those in business, education and government. According to a report by the Telecommunication Applications Program, a NRC is a community advantage economically since,

Business requirements for communications and information services are rising an average of 40% each year. When a community uses information technology as a way of life, they can market themselves to high technology manufacturers and service firms that require personnel capable of supporting just in time distribution, computer integrated technology, and business service operations.
(1993, Larson, 3)

According to Greg Larson, co-chair of the Telecommunications Application Program, "It ought to be easy for a small or medium enterprise (SME) in Lawrenceburg, [Tennessee] to create a relationship with another company in Mexico or Asia or somewhere else in

FIGURE 4.3



TENNESSEE TELECOMMUNICATIONS

We're excited about FYI Tennessee, the nation's first statewide comprehensive telecommunications platform. Our 10-year technology master plan, developed by the Tennessee Public Service Commission and the state's telephone companies, is unequalled in the United States.

Companies new to Tennessee pinpoint the superiority of our telecommunications technology as a major factor in their location decision. Just a few of the service firms taking advantage of the state's premier network are:

Williams Sonoma	National Distribution Center
Sears	Credit Card Processing Center
Whirlpool	Customer Service Center
Deloitte, Haskins & Sells	National Data Center
Talbots	Customer Order Center
International Paper	Information Systems Group
Days Inn	Reservation Center
Willis Corroon	Corporate Headquarters

Let us tell you about how FYI Tennessee can grow your business!

order to import or export” (Larson, Henderson, Ingraham 1994) He also pointed out during the interview that the concept of a Network Resource Center may seem to be easy to bring to fruition, yet it remains a very complicated process.

Though the NRC focus has been on communities, it also takes state and national development into consideration. For many years the State of Tennessee’s FYI program focused on developing the technical infrastructure, but as Larson pointed out, just building the infrastructure “is not a viable strategy . . . it’s not a ‘field of dreams’--you can build it and they won’t come.” (Larson, et. al., 1994) He adamantly acknowledges that if there is not “an effective means for a community to take advantage of it . . . communities [will not be] ready to do things effectively with the technology in order to use it effectively to have economic community impact. Therefore, you had to build something economically, self-sustaining at the community level and that’s the NRC.” (Larson, et. al., 1994) Currently, many groups are working to build an effective structure in which to operate within the state and the national levels, yet the concepts are so new, that the groups sometimes work together, other times they do not. The hope, however, is to have all organizations use the telecommunication technology network to its highest and best use; for instance for local, state, and national economic development. Barbara Henderson, Larson’s fellow co-chair at TAP, quickly noted that various politics are often involved in creating such cooperation among such diverse groups.

The NRC, said Ms. Henderson, was begun in an attempt to link the various groups involved with government services, utility services, those who understood the use of the technology. The concept of rural competitiveness through telecommunications

partnerships was first introduced to many in Tennessee at an Appalachian Regional Council meeting held in Knoxville, Tennessee in 1989. The theme of the conference was based upon the report published by the U.S. Congressional Office of Technology Assessment [OTA-TCT-471, 4/1991] entitled, Rural America at the Crossroads: Networking for the Future. Joe Imorde, the Director of Economic Development at South Central Bell, at about the same time, was encouraging the State of Tennessee Department of Economic and Community Development (ECD) to make further use of telecommunications infrastructure, said Henderson. As a result, the ECD began the Tennessee Business Retention and Expansion Program (R & E) to provide the opportunity for communities to do a self-evaluation. The data that came out of the R & E studies, said Larson, showed that the "four areas of any community, in order to be self-sustaining, [which needed] support from government entities and the public sector, were education . . . health care, government services delivery, and economic development . . . or in general business and industrial development." (Larson, et. al., 1994) Therefore, the need for networking became evident. Larson said, it was then, "we knew that if you could find a way to take care of your networking advantage, you could solve many of the problems in the four areas. You then would have linked economic and community development with telecommunications infrastructure to be prepared for economic changes." (Larson, et. al., 1994) The NRC became the concept to orchestrate effective management of the telecommunications network and its capabilities at the local level. Yet, said Larson, "an NRC is not really only a physical location with people and telecommunications equipment . . . [It is] a public-private partnership at the community level . . . that must work to solve

community problems and make sure that one of the four dimensions in the community does not develop excessively . . . ” while others remain behind. (Larson, et. al., 1994)

The physical center, as a result, is used to establish relationships and networks, as well as be a tool for the community in other ways. The telecommunications infrastructure becomes the means to the end, a holistic approach to economic development involving networking of people, supplies, and information to create positive community and economic development.

One of those dimensions is education and it too is strengthened by the use of a NRC in a community. The Elk River Development Agency believes that education is an important area that needs improvement in its region. The NRC then can be used to help reskill the workforce which will in turn help the economic situation. “Well, what better way is there to do that,” asks Larson, “than to take advantage of an underlying infrastructure advantage . . . telecommunications supporting video and data? . . . but then you’ve got to establish the people relationships so that the technology will be truly effective. People must communicate about their problems and abilities.” (Larson, et. al., 1994) Henderson added, that fortunately, “the Tennessee approach [was] looking to what the local communities [wanted] and [needed] . . . as opposed to just creating an infrastructure without involving the people networks and the community inputs.” (Larson, et. al., 1994) Many other states have a top-down approach instead which is less effective.

Larson revealed that the whole purpose of the NRC is to help communities connect, communicate, collaborate, and in the end be competitive. Timeliness is of great importance in today’s economy, argued Larson, therefore, “to take advantage of [the

telecommunications infrastructure] for economic competitiveness purposes is dependent on timeliness. Timeliness is very much a function of your ability to make connections on demand, to communicate effectively using those connections on demand, and to establish real relationships that are collaborative in nature in order to acquire a competitive advantage.” (Larson, et. al., 1994) According to a memo from the Lawrence County Community Learning and Information Resource Network (LCCLIRN 1994), connectivity will be achieved through the actual connections among the physical network and the services necessary to utilize the network. Two hundred eighteen Internet nodes will provide access for Lawrence County. (Appendix B includes the draft hardware specifications for the NRC.) Communications will be achieved by providing the software necessary to allow citizens and organizations to use communications such as electronic mail, file transfer, World Wide Web exploration, and Plato curriculum for example. This initial opportunity for citizens and organizations to use the network will use simplified software applications which make the network easier to use until the user chooses to learn about the more complicated ways of networking. Just as current computer software can allow computer users to do complex tasks without having to understand the computer program language behind the activity, the network software will enable even the novice to link on to the network with ease. Users will be able to access the intricate Internet through the user friendly Internet software guides such as Mosaic, Gopher, and Telnet. (LCCLIRN 1994) Collaboration will occur by working to achieve mutual benefits for the many groups and individuals involved in using and building the network. The network will be able to be used to its highest and best use if all those involved choose to work

together to make any necessary resources available. If all those involved work to facilitate the growth and productivity of the network, it will be developed and supported in the best manner possible. (LCCLIRN 1994)

Competitiveness will be achieved in many ways. In order to improve the quality of workforce skills, the network will be used to educate individuals and organizations. The network will provide educational opportunities which previously were unavailable. In the end, the use of the network to prepare highly skilled workers and to prepare the community for the high tech global marketplace will increase the competitiveness of Lawrence County. The hope is to improve the business and commerce practices; to generate more effective interaction among schools, hospitals, governments, businesses, and industries in order to better serve citizens and to provide additional economic benefits; to prepare the workforce and the business community for the requirements of the more competitive global marketplace.

The Network Resource Center (NRC) will attempt to create a "seamless integration of resources" throughout the community by connecting organizations and citizens through new technical communications capabilities such as digital switching centers, fiberoptic lines, computer stations, and Integrated Services Digital Network (ISDN) connections. (LCCLIRN 1994) Many rural communities would not have the availability of such telecommunications infrastructure, but Tennessee has been preparing the infrastructure throughout the state in the past ten years. Fiber optic systems will allow the rapid transmission of voice, data, and audio signals by using flexible glass rods that are capable of transmission of light signals to further transmit messages. Fiber optics can

carry hundreds of times more data than traditional copper wires, yet take up a tenth of the space. The quality of transmission is better and fiber optics are not as susceptible to noise or conductivity of lightening. ISDN is the protocol for high-speed digital simultaneous transmission of voice or high-speed data signals. (OTA Report 1991) For further information about telecommunications technologies, see chapter three, section 3.5. The availability of such telecommunications technology and the applications which enable citizens and organizations to use the services effectively will be an advantage economically at both the local and state level. It will allow technology access that few in the nation will have in the next two to three years. It is significant that Lawrence County, as a rural area, will have such access at an early stage, and therefore, will be able to support industries that need such telecommunications capabilities.

4.9 Concluding Discussion

Lawrence County's desire to provide a higher quality of life for its citizens through its investment in human capital development, its use of emerging telecommunications technology advancements, and its application of holistic economic and community development approaches led to many successful projects and awards. By developing a vision for their future, the citizens became motivated, dedicated, and determined to provide the best workforce for the future competitiveness of their community. The emphasis further resulted in a seventeen percent increase in job creation between 1990 and 1993, the fifth highest in the Mid-State, according the Middle Tennessee State University Center for Economic and Business Research. (Brewer 1993)

The formation of two highly successful public-private partnerships enabled Lawrence County to organize their resources, create long and short range plans, and raise funds very effectively. The attention they gave to their community brought further attention from the state of Tennessee in the form of technical assistance, financial support, and recognition for their successful projects and the strengthening of the economy. The educational standards they established brought about higher test scores, a new tech-prep program, opportunities for computer applications within the schools, well-supplied classrooms, and a new community college. The establishment of the Network Resource Center opened new paths for commerce and learning and the Community Learning Network provided the opportunity for Lawrence County's citizens to participate in lifelong learning to become more competitive in the workforce. Successful projects led to increased investment in further education projects such as the additional funding approved by the Lawrence County School Board (through a loan from Lawrence County) in June 1994 for at least 160 personal computers for the Lawrence County secondary schools. (Brewer 1994)

In 1993 alone, Lawrence County was asked to tell its story at numerous U. S. and Canadian Economic Development Conferences; welcomed at least six new industries and expansions; was featured in a series of newspaper articles in Gulfport, Mississippi; opened the advance telecommunications Network Resource Center with the Tennessee Elk River Development Agency; awarded at least \$23,000 in teacher mini-grants to Lawrence County teachers; and began the construction to four-lane Highway 43 and the improvement of the by-pass to Interstate 65. (Brewer 1993) The successes mentioned

here are an indication of the amount of planning, dedication, and resolve the citizens of Lawrence County showed in their economic development initiatives over the past eight years. Plans have begun to build additional schools for the area and the 21st Century Council and the Education Foundation remain highly successful in their fund raising and citizen motivating efforts in 1994. Lawrence County's example is worthy of further observation by those interested in providing such programs in their community through local initiative, human capital development efforts and the use of telecommunications and network advances.

Chapter Five: Concluding Discussion and Recommendations

The effects of technology, combined with the recurring need for human capital development efforts, have become more important as the world economy becomes more competitive. As economic development professionals approach planning for communities in the twenty-first century, no longer can the mere availability of land, water, transportation, and energy be the only major considerations in economic development. Rising above that paradigm is the new reality that the United States is falling behind due to the need for improved educational standards and school-to-work transitions for its workers. Throughout history, men and women have been forced to adapt to sweeping changes due to vast revisions of political or scientific thought; the end of the twentieth century is no different. Deemed the Information Age, the countries which are able to compete the most effectively in the new world of technology and the global economy will rise to power.

The introduction of rapidly advancing telecommunications and global network technologies into the field of business and education cannot go unheeded by planning professionals in economic development. This tremendous sea change will enable more frequent and simplified communication among economic development professionals at the state, local, and federal level. Such advanced technology will allow additional opportunities to create a more thoroughly educated workforce. Concurrently, it will escalate the need for a highly qualified, skilled workforce that can attract new industry and can exceed current production and quality standards on into the twenty- first century.

Economic development professionals will be required to understand the implications of the impending changes to the economy, to work effectively within such technologies, and to understand how to raise funds for communities to have access to the necessary technology. This remains, as Joe Imorde and others stated previously, a fantastic opportunity to "connect, communicate, collaborate," and be more competitive in the long and the short term.

Telecommunications advances such as fiber optic lines, digital and fast packet switching, and the increasing affordability of high quality network capabilities are the catalysts of economic change. The exchange of information will be faster, more accessible and more up to date--all available at the speed of light. States and localities must be ready to handle the telecommunications revolution by developing the appropriate infrastructure and policy plans to implement positive change through the advanced technology. Along with the appropriate policy and technology management issues comes the need to evaluate communication regulatory policy. Governments should endeavor to create partnerships between economic development goals and telecommunications regulatory policy. Telecommunications is now an integral part of the economic development formula and as a result, it can have a great effect on the success of an economic development plan.

Economists additionally point out the need for a flexible, quality education to deal with the technological change and the competitive world economy. Many agree that if economic growth is a concern, as it generally is, then education must be put at the forefront. Previously, note many advocates, workers did not need additional training programs in the workplace, but this is no longer true. Under skilled employees are

expensive due to errors, lower production levels, and misunderstood communications. Employers are choosing to train workers today, even though many businesses feel it is not their responsibility to do so. Businesses are requesting such improvements as the use of industry needs and survey analysis; hands-on training geared to local industry; specialized, yet flexible training; a higher level of computer and math literacy; and more academically rigorous programs. Many such training initiatives have begun among labor, business, and local economic development agencies. The economic developer can take a role in educating businesses to the need for training and can facilitate public-private partnerships and industry analysis which benefit both the employer and the community. Therefore, economic developers are being called on to broaden their definition of economic development to include human capital development efforts and form coalitions which involve business, education, labor, community organizations and legislators. Furthermore, state education standards and reforms can help initiate human capital development efforts. The use of public facilities to train adults and younger students alike can double the effect of the infrastructure. Public universities also are often untapped at this time, but will be an excellent source of assistance with technological advances and research concerning human capital and economic development efforts.

As found by the Congressional Office of Technology Assessment, communities need to have a vision and leadership; adopt a broad definition of economic development; make the highest and best use of existing resources; and create flexible plans which take the uniqueness of each community into consideration. Furthermore, they advise communities to create networks which benefit the community needs in a holistic manner;

encourage technology transfer and educational technology applications; encourage cooperation among key players; make economically viable plans that are implementable; and be certain the community wants the advances and the accompanying plans. The application of technology for economic development, they argue should not be in the same tradition as the smoke stack chasing policies of the past, but instead, implemented in a holistic manner throughout the community.

In reference to the graphic representation offered in chapter one, the case study showed Lawrence County to be a primary example of how a community can become more economically competitive and more self-sufficient through the use of human capital development, emerging telecommunications technology, and the self-sufficiency of local economic development. Initially, the citizens of Lawrence County recognized the need for additional human capital development in their community. Next, in an attempt to provide overall community and economic development, local leaders, private citizens, and businesses forged a partnership to improve workforce education which would create a highly competitive, well-trained workforce. This was achieved by utilizing the initiative of the community and by introducing emerging telecommunications and educational technology to the educational process. By combining:

- the efforts of the local community to improve education;
- the use of innovative telecommunications and educational technology;
- and the creation of a competitive, well-trained workforce;

Lawrence County, Tennessee was rewarded with positive job growth, a higher level of community economic competitiveness, and increased self-sufficiency of local economic development initiatives.

In addition to generating the required community initiative; establishing a competitive, well-trained workforce; and introducing telecommunications and educational technology; it is also important to maintain community initiative, raise funds to support the educational advances, and establish public-private partnerships. For those also interested in accomplishing economic development through an emphasis on human capital development and telecommunications technology, the following guidelines were compiled from the analysis of the case study and from comments made by leaders in Lawrence County, Tennessee.

- *Establish and Encourage Excellence in Leadership.* It must have spirit, initiative, consistency and dedication.
- *Observe.* Visit other communities to see what works and look for program ideas that can be adapted.
- *Get Assistance.* Use all the assistance available from the federal, state and local governments. Get both technical and financial assistance and make the most of the advice and the support.
- *Create Vision.* Develop a vision of the future, initiate a goal around which to rally and maintain the enthusiasm for that vision.
- *Plan.* Do an analysis, hold public hearings, set up both short and long range plans.
- *Boost Morale.* Initiate projects in which the community can be proud. The enthusiasm and positive reinforcement will fuel reciprocal morale boosters.
- *Emphasize Education.* Place a large emphasis on education in the community through innovative human capital development efforts. Make use of available telecommunication advances and investigate the installation of other technology advancement. The commitment to improve the workforce, thus the quality of life, will

result in interest from prospective employers as well.

- *Think Holistically.* Commit to quality of life issues in the community such as education, health services, government services, and business assistance.
- *Be Prepared.* Build the necessary infrastructure and incorporate quality management strategies to participate in the technology networks of today and tomorrow.
- *Take Initiative.* Do not wait for someone else to come in and fix the economic situation or any other situation. Initiative on the part of the local community shows others who may be able to provide assistance that the community is willing to work to achieve their goals.
- *Build Private-Public Partnerships.* Promote the establishment of groups which are comprised of private business, labor, education, government, and citizens to develop strategies, lead initiatives, and raise funds for projects. Public-private partnerships are essential.
- *Educate about Technology.* Provide hands-on encounters for key players and the community to learn about Internet, personal computers, educational software, teleconferencing, and distance learning. Help people feel comfortable with the technology which often will build support and enthusiasm for further technological applications and infrastructure.

Lawrence County also was highly successful in their fund raising efforts for local initiatives, human capital development programs, and telecommunications infrastructure.

The Education Foundation suggested taking the following steps to assure that success:

- work to have people who are willing to be unselfish with their time and money;
- invest carefully, but aggressively so investors know their money is being used wisely;
- challenge the usual outcome, push beyond the average expectations;
- have active public relations efforts to educate and get people involved;
- work to change attitudes and raise morale through positive and effective use of funds.

By using such strategies, The Education Foundation has established a relationship of trust with the community and its holdings that far exceed what they ever expected.

A further recurring recommendation throughout the literature and the field studies is the importance of accurate analysis of the community. The Tennessee Business Retention and Expansion Program (developed by Joe Imorde of South Central Bell and the Tennessee Department of Economic and Community Development) was used in Lawrence and other Tennessee counties for example. The analysis should be used to identify strengths and weaknesses; provide a solid database; act as a catalyst for program development; help improve the business climate; strengthen ties between local government and business; and finally, establish a problem solving system and strategy.

In conclusion, human capital development and telecommunications technology are two significant, emergent tools in economic development. When combined with local initiative; positive, consistent leadership; effective fund raising efforts; proper management of the telecommunications technology and the networks available, then a community will benefit. It generally will be able to become both more economically competitive and increasingly self-sufficient through the use of human capital development with telecommunications networks and infrastructure.

Human capital development for workplace preparedness and telecommunications technology will become increasingly significant as the global economy becomes more competitive. It is highly likely that the two will become as important to economic development as land, energy, and transportation have been in the past. The planning profession should be willing to recognize the importance of the impending changes. The profession as a whole should strive to understand telecommunications advances and their uses, as well as, remain aware of the rapidly growing significance of the globalization of the economy and its effect on local economic development efforts. Planners who choose

to work within economic and community development must be foresighted enough to investigate the impending changes in the economy. Such changes will emphasize the need for effective, innovative educational methods which will produce highly competitive workforces and the increasing use of computers, telecommunications technology, and worldwide networking. Yet, the planners also should be creative enough to realize that though jobs are important, the telecommunications technology will also permit important advances in education, health care, and government services. Economic development in the twenty-first century should be able to broaden its outlook to include not only the acquisition of employment for citizens, but also the perception of employment as an opportunity to improve one's quality of life as a whole. The practice of economic and community development in the coming decades, if approached in a more holistic manner, will be more beneficial if the technology is managed in such a way as to provide for the many needs of a community, not just the economic desires.

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APPENDIX A:
PLATO 2000 CURRICULA
AND
COMMUNITY LEARNING NETWORK COMPUTER HARDWARE
INFORMATION



PLATO®
Education
Services

PLATO Instructional Programs

Five Steps to Success Using Computer-Based Education

Correlation of PLATO curricula to the site's curricula

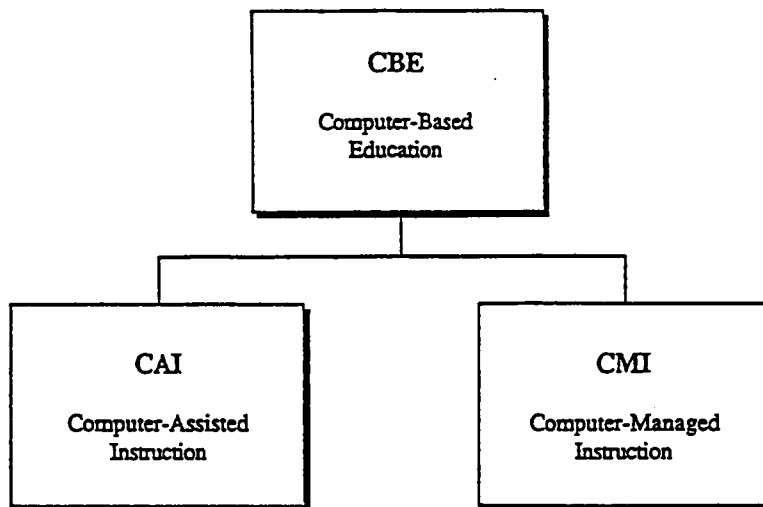
Reviewing the curricula

Planning and preparing through daily lesson plans

Monitoring student progress

Assisting students while on the computer

Computer-Based Education

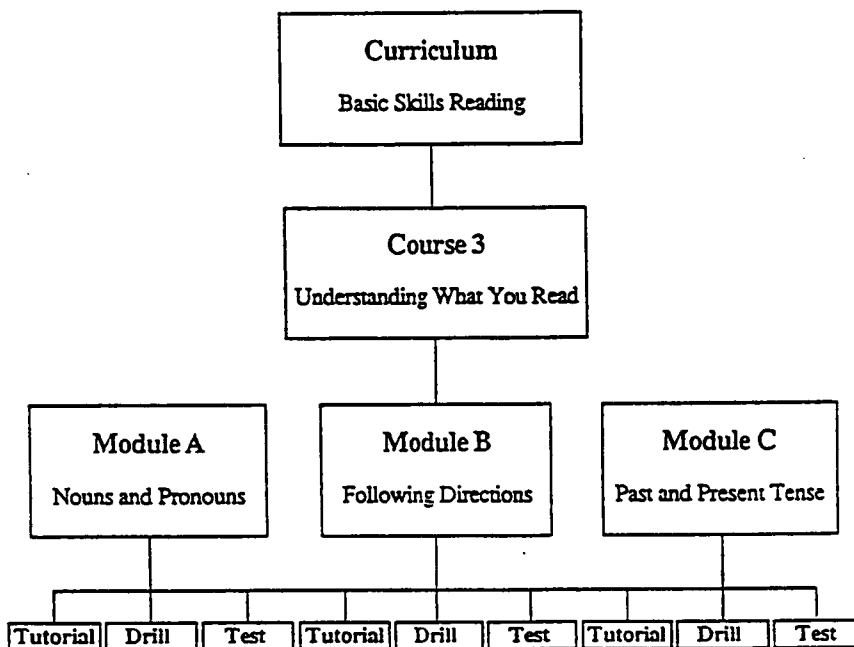


- PLATO Lessons
 - Individualized
 - Modular
 - Mastery-Based
 - Objective-Based
 - Self-Pacing
- Assessment Tests
- DOS-Based Lessons

- Roster Users
- Create and Edit Routing Activities
- Track and Report Student Progress
- Monitor Usage of System
- Provide Accountability Data
- Diagnose Learning Paths
- Assign Grade Level Specific Curricula

PLATO Curriculum Structure

Each curriculum has a number of courses. A course is divided into units called modules, which consist of a series of lessons: tutorial, drill, and test. The diagram below shows a typical module. Other modules have additional lessons: applications, problem solving lessons and reviews.

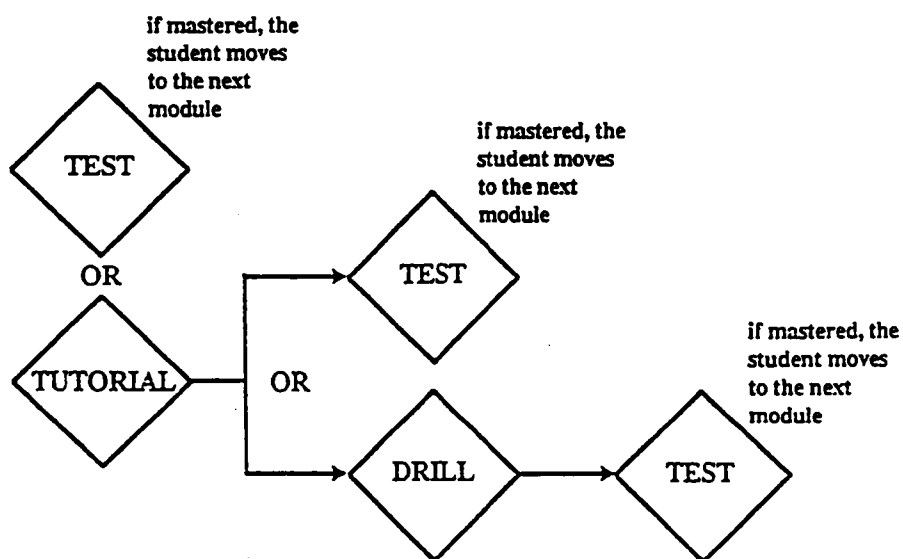


Sample Student Menu

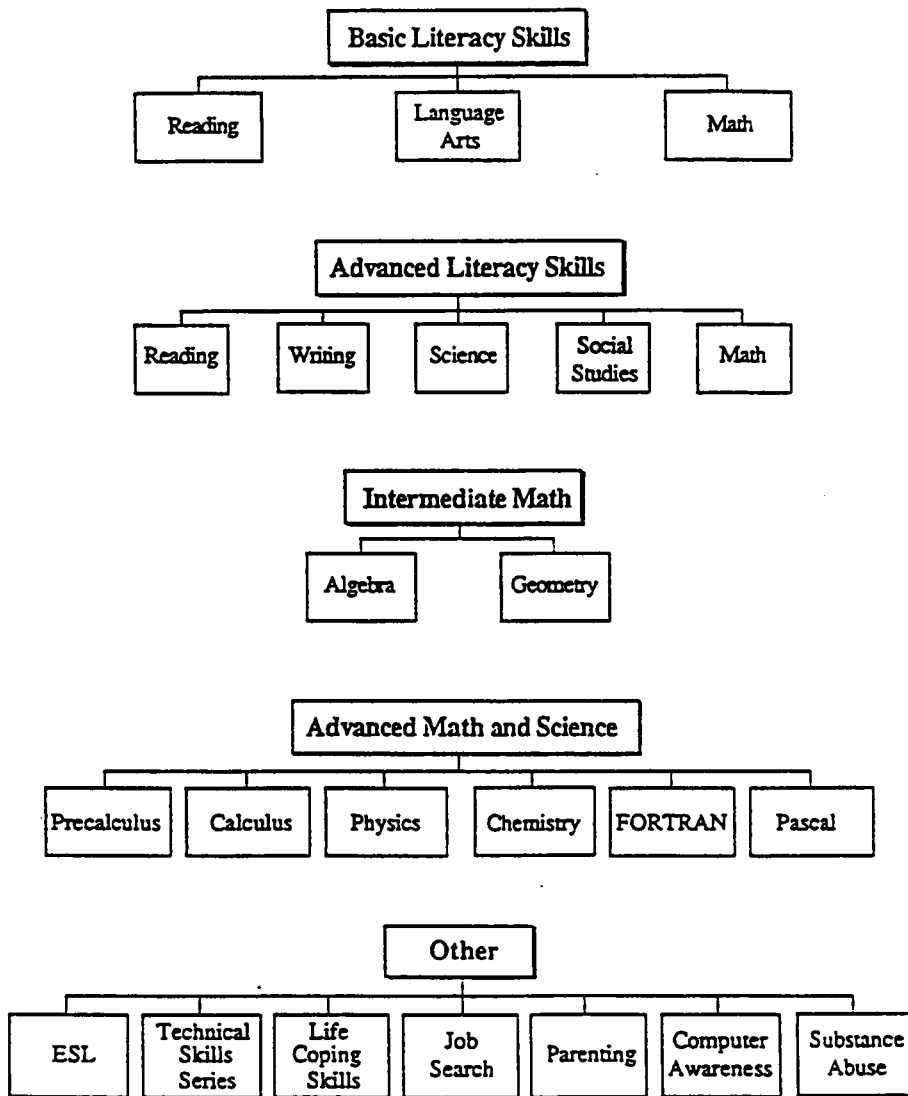
The module, Simple Verb Endings, consists of a tutorial, a drill, and a test. All the activities teach the objective for that module. Each type of lesson has a different function. The figure below shows the menu of a typical module.

- | | |
|---------------------------------------|----------------------------------|
| a. Simple Verb Endings . . . tutorial | – presents a new skill |
| b. Simple Verb Endings . . . drill | – reinforces a new skill |
| c. Simple Verb Endings . . . test | – tests mastery of the objective |

Student Flow Through A Module



PLATO Curricula



Curricula With Course Titles and Hours

Basic Literacy Skills

Math (95 hours)

Basic Number Ideas.....	8
Addition	9
Subtraction	8
Multiplication	15
Division.....	13
Fractions.....	19
Decimals.....	7
Ratio/Proportion/Percent	6
Geometry & Measurement ..	10

Reading (139 hours)

Making New Words.....	29
Understanding New Words	30
Understanding What You Read	33
Thinking About What You Read	27
Judging What You Read	20

Language Arts (112 hours)

Parts of Speech.....	43
Building & Using Sentences	28
Word Usage	18
Capital Letters & Punctuation	14
Writing Letters	9

Advanced Literacy Skills

Reading (40 hours)

Practical Reading	8
Reading Skills & Strategies ..	11
Interpreting Literature.....	12
Poetry.....	5
Drama.....	2
Commentary on the Arts & Literature.....	2

Math (33 hours)

Basic Number Ideas	7
Math Sentences 1.....	7
Math Sentences 2.....	4
Geometry.....	5
Measurement.....	5
Special Topics	5

Science (42 hours)

Chemistry.....	6
Physics.....	7
Biology.....	20
Earth Science.....	9

Social Studies (40 hours)

Geography.....	6
Economics.....	8
Behavioral Science.....	8
Political Science.....	8
History	10

Writing

Mechanics.....	8
Grammar.....	16
Diction & Styles.....	5
Sentence Structure.....	6
Logic & Organization.....	6
Essay Writing	4

Other Courseware Skills

<i>Courses</i>	<i>Hours</i>
Computer Awareness.....	9
Coping	19
Job Search	14
Parenting.....	14
Substance Abuse.....	6

Curricula With Course Titles and Hours

Continued

Intermediate Math

Geometry (22 hours)

Introduction to Geometry
Angles
Introduction to Triangles
Perpendicular and Parallel Lines
Right Triangles
More about Triangles
Polygons
Quadrilaterals
Transformations
Measuring Area
Introduction to Circles
More Circles
Measurement of Circles
Geometric Solids
Coordinate Geometry

Algebra (75 hours)

Sets/Numbers
Polynomials/Factoring
Math Sentences
Rational Expressions
Graphs
Systems of Equations
Probability

Advanced Math & Science

PreCalculus (22 hours)

Numbers and their Properties
Equations and Inequalities
Coordinates and Curves
Functions and Their Graphs
Exponential Functions
Trigonometric Identities and Equations
Calculus I (29 hours)
Limits I
Limits II
The Derivative
Techniques of Differentiation
Derivatives of Trigonometric Functions
Chain Rule and Related Rates
Tangent Line Approximation and Differentials
Applications of the First Derivative
Applications of the Second Derivative

Calculus II (30 hours)

Introduction to Inverse Functions
Inverse Trigonometric Functions
The Natural Logarithm
The Natural Exponential Function
Other Logarithm and Exponential Functions
L'Hospital's Rule
Integration by Substitution and by Parts
Tech. of Integration Inv. Trigonometric
Partial Fractions
Numerical Integration
Improper Integrals
Length of Curves
Introduction to Series
Tests for Convergence of Nonnegative Series
Additional Topics on Convergence/
Divergence of Series
Power Series

Curricula With Course Titles and Hours

Continued

Advanced Math & Science

Calculus I (continued)

General Properties of Continuous/
Differentiable Functions
The Indefinite Integral
The Definite Integral
The Fundamental Theorem
Geometrical Application of the
Definite Integral
Physical Applications of the
Definite Integral

Chemistry I (36 hours)

Measurement and Calculation
Classification of Matter
Atoms, Molecules, and Ions
Chemical Formulas and Equations
Thermochemistry
The Physical Behavior of Gases
The Electronic Structure of Atoms
Chemical Bonding
Liquids, Solids, and Intermolecular
Forces
Solutions

Chemistry II (35 hours)

Chemical Reaction Rates
Gas Phase Equilibria
Acids and Bases
Aqueous Equilibria
Free Energy, Entropy, Equilibrium
Electrochemistry
Main Group Chemistry
Coordination Chemistry

Physics (30 hours)

Units Dimensions and Vector Addition
One-Dimensional Kinematics
Two-Dimensional Kinematics
Force and Particle Statics
Particle Dynamics and Gravity
Work Kinetic Energy, and Power
Potential Energy & and the Conservation
of Mech'l Energy
Center of Mass and Linear Momentum
Impulse and Collisions
Problem Solving in Particle Motion
Rotational Kinematics
Torque and Rigid-Body Motion
Rotational Dynamics
Angular Momentum
Problem Solving in Rigid-Body Motion
Oscillations

Physics II (27 hours)

Charge, Matter, and Coulomb's Law
The Electric Field
Gauss's Law
Electric Potential
Capacitors and Dielectrics
Current and Resistance
DC Circuits
The Magnetic Field
Magnetic Field of a Current
Faraday's Law
Inductance and E/M Oscillations
Magnetic Properties of Matter

Computer Sciences

Fortran 77 (26 hours)

Programming and Computers
Basic Sequential Program
Modular Design
Control Structures
Repetition and Arrays
Characters as Data
More on Arrays
Subprograms
Formatted Input and Output

Pascal (19 hours)

Computer Concepts
Pascal Structure
Blockbusting
Problem Solving
Control Structures
Attributes of Data
Modularity
Modularity
Data Structures

Curricula With Course Titles and Hours

Continued

Technical Skills Series

Industrial Electronics (290 hours)

Basic Electronics
Semiconductor electronics
Digital Electronics

Pneumatic Power Fundamentals (37 hours)

Introduction to Pneumatics
Preparation and Distribution of Air in
Pneumatic Systems
Use of Air in Pneumatic Systems
Pneumatic Maintenance and
Troubleshooting

Hydraulic Power Fundamentals (54 hours)

Basics of Hydraulics
Hydraulic Components
Hydraulic Circuits
Hydraulic Maintenance and
Troubleshooting

Mastering Programmable Controllers (60 hours)

Mastering Programmable Controllers
Applied Electronics

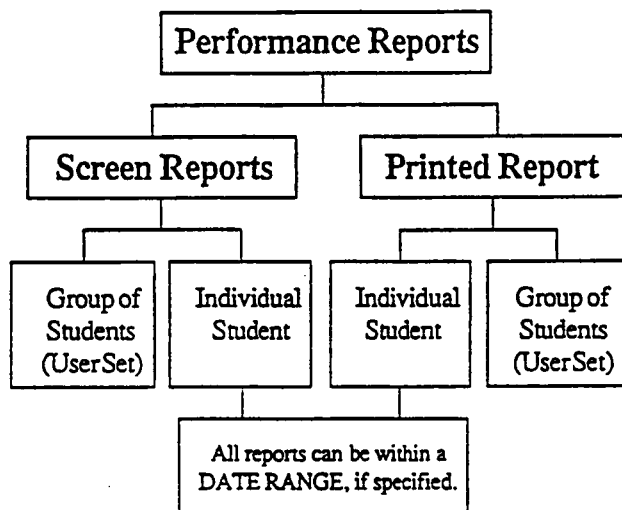
Statistical Methods for Improving Performance (15 hours)

How to Improve Quality
Data Collection
Charting
Pareto Charts
Cause and Effect Analyses
Frequency Distribution
Control Charts
Applying SPC

Student Performance Reports

Performance Reports are available for individual students or a group of students.
Reports show:

1. Number of tries and status – completed, started, exempt, locked out, has no end
2. Score or mastery of last test – mastered, not mastered
3. Total time on task



Single Student Performance Report

Single Student Performance Report

Printed 7/27/92

Student: student1

Routing Activity: allmath

Titled: Electronic Curriculum

Code key:

C--Complete N--Not Started M--Mastered

S--Started --No End NM--Not Mastered

E--Exempt L--Locked

Report on all student activity within routing activity

Status: started Score: Tries 4 Start: 5/20/92, 10:15:12 Finish: pending

Status

Activity Name	Activity Title	Tries	Score	Time in	Start	Finish	Last on
blm0math	Basic Skills Math	S 002	NM	0:19	5/20/92	pending	6/05/92
algebra	Algebra Series	S 002	NM	0:25	6/10/92	pending	6/10/92
geometry	Geometry	NE 000		0:00	pending	pending	
alm0math	Adv. Literacy Skills Math	NL 00		0:00	pending	pending	

This report shows student progress at a curriculum routing activity level. Reports are available for all the routing activity levels.

Supplemental Reports

This report option will print individual student performance reports. The following options are available.

Print PLATO Supplemental Reports

- (1) Single Student Activities
- (2) Single Student Routing Activities
- (3) Class Activities
- (4) Class Routing Activities
- (5) User Set of Classes Activities
- (6) User Set of Classes Routing Activities
- (7) List of Students Assigned to Classes
- (8) List of Classes Assigned to User Sets

The activity reports will contain this type of information.

STUDENT PERFORMANCE REPORT—ACTIVITIES

Date Printed:

11/08/92

Page 1

Code Key:

Student: Sam Pull C - Complete L - Locked M - Mastered
Routing Activity: rrr S - Started - - No end NM - Not Mastered
Title: Reading Writing Arithmetic E - Exempt

Report on All Activities of Student

Where Some Action Occurred between: 11/05/92 and 11/07/92

Activity Name	Skill Level	Activity Title	Score	Tries	Completion Time Hrs:Min	Status	Start	Last Changed	Initial Complete
rrr	10	Reading Writing Arithmetic	NM	2	0:23	S	11/05/92	11/07/92	
alm4a1	10	Special Angles - Part 1: Test 1	M	1	0:1	CL	11/05/92	11/05/92	11/05/92
alm4a2	10	Special Angles - Part 1: Test 2	M	1	0:0	CL	07/11/92	07/11/92	07/11/92
alm4b1	10	Special Angles - Part 2: Test 1	M	1	0:1	CL	11/05/92	11/05/92	11/05/92
alm4b2	10	Special Angles - Part 2: Test 2	M	1	0:0	CL	11/05/92	11/05/92	11/05/92
alm4d1	8	Circles/Arcs/Circumference: Test	NM	1	0:1	SL	11/05/92	11/05/92	11/05/92
alm4d1	8	The Pythagorean Theorem: Test 1	M	1	0:1	CL	11/05/92	11/05/92	11/05/92
alm4e1	9	Using Geometry: Test 1	M	1	0:2	CL	11/05/92	11/05/92	11/05/92
alr3c1	10	Sensing: Tutorial		1	0:9	C	11/06/92	11/06/92	11/06/92
alr3e1	10	Sensing: Mastery Test	M	1	0:1	CL	11/06/92	11/06/92	11/06/92
alw1a1	7	Spelling Rules: Mastery Test	M	1	0:0	CL	11/07/92	11/07/92	11/07/92
alw1b1	7	More Spelling Rules: Mastery Test M	M	1	0:0	CL	11/07/92	11/07/92	11/07/92
alw3a1	8	Confusing Words: Tutorial		1	0:7	C	11/07/92	11/07/92	11/07/92

Total time in activities: 0:23

PLATO History

- In 1963, Control Data Corporation and the University of Illinois combined their resources to develop the technology later to be called PLATO.
- In 1965, Control Data Institutes were established to train computer technicians and programmers for the industry. The institutes provided an opportunity to use PLATO courseware as an effective educational tool.
- In 1976, Control Data bought the rights to the PLATO name and courseware from the University of Illinois.
- By 1978, PLATO Basic Skills courseware was ready for the external market. This was followed two years later by the High School Skills enrichment curricula.
- In 1980, a computer-managed instructional system was developed which facilitated individualized learning and relieved the teacher of paperwork necessary to track student progress. This management system allowed instructors to tailor the courseware to each student's needs by selecting specific courses and lessons he/she must take and exempting other lessons or tests.
- From 1980 to the present, responding to the needs of the market place, the technical capabilities of PLATO are enhanced and state-of-the-art delivery systems are developed to allow broader access to PLATO's vast body of quality courseware.
- Over the years, millions of dollars have been spent enhancing, revising and adding to the PLATO curriculum. Educators across the United States have provided and continue to provide the educational expertise to ensure that the PLATO curriculum includes accurate content and appropriate instructional methodologies to meet the needs of students and educators.
- In 1986, the first local area network system was announced which was compatible with industry's technical standards. It combined PLATO courseware with a flexible management system.
- In 1989, The Roach Organization acquired the PLATO computer-based education products developed by Control Data.
- In 1992, The Roach Organization became a public company and changed its name to TRO Learning, Inc. to better identify the nature of its business to its clients.
- Today, TRO's strategy is to build a premier training and education company whose primary objective is to integrate technology, courseware, and services into comprehensive solutions for its clients.
- TRO's mission is to work with its clients in a "win-win" environment, creating flexible solutions and relationships that are beneficial to all partners, both now and for years to come.

AMENDMENT TO CLIENT ORDER FORM
Lawrence County Community Learning Network
Lawrence County Schools Project

District License for up to 250 PLATO 2000+ Licenses
(Includes Gold label Hardware per attached list)

I. Investment Summary \$573,208

II. Invoicing is to Lawrence County Government and distributed as shown:

Lawrence County Government Local Funding	\$ 383,758
Lawrence County Education Foundation	50,000
Lawrence County Government Technology Grant	139,450

Total System Addition	\$ 573,208

III. Customer will provide transportation from Minneapolis, Minnesota to Lawrence County for installation at each school. TRO Learning will install and test each network at each location. Installation charges are waived. Transportation will be provided by Southland Express at NO CHARGE.

IV. Pricing includes TRO Learning's Total System Support Program (TSSP) that will include the following software upgrades and support services to the Lawrence County Schools Project:

1. All PLATO 2000+ upgrades for courseware and curriculum manager.
2. An 800 toll-free number for 24 hour-a-day support.
3. Remote Diagnostic Software and a modem at each site for troubleshooting and problem solving.
4. A full-time Education Specialist will be provided on-site in Lawrence County in addition to a Project Manager being assigned for implementation, installation, and initial training.

V. TRO Learning agrees to provide (7) additional standalone administrative workstations with 9600 baud modem. One (1) each to be located at five (5) K-6 schools and two (2) each at county school system central office. Meets state mandated requirements for Tenn. Educational Network.

Southland
EXPRESS, INC.

Phone (615) 762-6509

P. O. Box 926 - Lawrenceburg, Tennessee 38464

June 13, 1994

Mr. Marty Dunkin
County Executive
Lawrence County Government
Lawrence County Courthouse
Lawrenceburg, Tennessee 38464

Dear Marty:

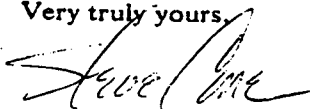
I would like to take this opportunity to advise you of the financial support of Southland Express in support of the Lawrence County Community Learning Network's expansion to Lawrence County Schools.

We are willing to support this effort in the form of a donation of services by providing for transportation of all equipment and software required under your purchase order for this system addition from TRO Learning in Minneapolis, Minn. to Lawrenceburg, Tennessee.

It is also our understanding that this shipment will be insured by TRO Learning until it is receipted in Lawrenceburg. We will be available to pick-up this shipment on 72 hours notice. We understand it will be staged and ready for shipment in about 30 days or about July 10, 1994.

This is a very worthwhile project and will help enormously in the effort to build our schools and Lawrence County into a strong community. We are glad we can provide this support.

Very truly yours,



SOUTHLAND EXPRESS

Steve Cone

LAWRENCE COUNTY COMMUNITY LEARNING NETWORK (Lawrence Co. Schools)
Master Site License Investment Summary (150-250 Workstations)
Page 1 of 3 (Uses existing hardware at LCVS)

Units	Description	Per Unit	Hardware	Software
Lawrence County Community Learning Network				
1	PLATO Master Site License (150-250)			\$250,000
1	PLATO Record Transfer Software	\$150		\$150
Lawrence County High School				
3	Network File Server DX-33	\$9,995	\$29,985	
35	LANstations (15,10,10)	\$1,295	\$45,325	
3	25 User Novell Network	\$0	\$0	
3	PLATO Record Transfer Software	\$150		\$450
3	Dot Matrix Printer	\$350	\$1,050	
Loretto High School				
1	Network File Server DX-33	\$9,995	\$9,995	
20	LANstations	\$1,295	\$25,900	
1	25 User Novell Network	\$0	\$0	
1	PLATO Record Transfer Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
Summertown High School				
1	Network File Server DX-33	\$9,995	\$9,995	
20	LANstations	\$1,295	\$25,900	
1	25 User Novell Network	\$0	\$0	
1	PLATO Record Transfer Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
Lawrence Vocational School				
1	File Server Conversion Package	\$180	\$180	
20	WorkStation Accessory Package	\$40	\$800	
1	RDAS and Modem	\$250	250	
1	PLATO Record Transfer Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
Coffman Middle School				
1	Network File Server DX-33	\$9,995	\$9,995	
10	LANstations	\$1,295	\$12,950	
1	25 User Novell Network	\$0	\$0	
1	PLATO Record Transfer Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
South Lawrence Elementary (7th and 8th Grades)				
1	Network File Server DX-33	\$9,995	\$9,995	
10	LANstations	\$1,295	\$12,950	
1	25 User Novell Network	\$0	\$0	
1	PLATO Record Transfer Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
Leoma Elementary (7th and 8th Grades)				
1	CD-ROM Server w/ RDAS & Modem	\$2,246	\$2,246	
5	LANstations	\$1,295	\$6,475	
5	NetWare Lite License	\$85	\$425	
1	PLATO Record Transfer Software	\$150		\$150
1	Remote Site Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	

LAWRENCE COUNTY COMMUNITY LEARNING NETWORK (Lawrence Co. Schools)
Master Site License Investment Summary (150-250 Workstations)
Page 2 of 3

Units	Description	Per Unit	Hardware	Software
Ethridge Elementary (7th and 8th Grades)				
1	CD-ROM Server w/ RDAS & Modem	\$2,246	\$2,246	
5	LANstations	\$1,295	\$6,475	
5	NetWare Lite License	\$85	\$425	
1	PLATO Record Transfer Software	\$150		\$150
1	Remote Site Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
New Prospect (7th and 8th Grades)				
1	CD-ROM Server w/ RDAS & Modem	\$2,246	\$2,246	
5	LANstations	\$1,295	\$6,475	
5	NetWare Lite License	\$85	\$425	
1	PLATO Record Transfer Software	\$150		\$150
1	Remote Site Software	\$150		\$150
1	Dot Matrix Printer	\$350	\$350	
Lawrence County Public Housing (Adult)				
	JOBWork Grant		(\$23,295)	(\$54,400)
1	Network File Server DX-33	\$9,995	\$9,995	
10	LANstations (8,2)	\$1,295	\$12,950	
1	PLATO Record Transfer Software	\$150		(\$150)
1	Dot Matrix Printer	\$350	\$350	
Total Project Purchase Price			\$225,508	\$197,700
Total System Hardware and Software				\$423,208
3 yrs. Total System Support Program (TSSP) See Notes				\$150,000
Total System Pricing				\$573,208
Investment Summary:				
	Lawrence County Education Foundation			\$50,000
	Lawrence Co. Gov't. - Ed. Foundation Technology Funding			\$10,000
	Lawrence Co. Gov't. - Library Media Technology Funding			\$35,482
	Lawrence Co. Gov't. - Tn. Ed. Network Technology Funding			\$93,968
	Lawrence Co. Gov't - Balance of Funding Required			\$383,758
Total Investment				\$573,208

- NOTE (1)** - Includes all "on-site" courseware training for teachers and school system staff. Includes all staging and installation of all equipment. Includes (1-800) Hotline access, Educational Specialist Support, RDAS Technical Support, and all Courseware Up-Grades. Shipping is FOB Minneapolis, MN and will be staged for unloading by site. The system dedicated TRO Educational Specialist and Account Manager will be responsible for project implementation and on-going training and support.
- NOTE (2)** - Includes a one (1) year warranty agreement on file servers CD-ROM servers, and workstations from TRO. "On-site" service provided for file servers and "Depot" service for workstations.
- NOTE (3)** - Includes at NO CHARGE, seven (7) stand-alone workstations with 9600 baud modem for one (1) each at five (5) K-6 schools and two (2) at county Central Office for "Tn. Ed. Network."

LAWRENCE COUNTY COMMUNITY LEARNING NETWORK (Lawrence Co. Schools)
Master Site License Investment Summary (150-250 Workstations)
Page 3 of 3

File Server

- 486DX CPU - 33 MHz
- Upgradable motherboard
- Full tower case for expansion
- 32MB RAM with 256KB Cache Memory
- 1.44MB 3.5" floppy drive
- 1.6GB (unformatted) SCSI-2 Hard Disk Drive
- Internal CD-ROM Drive for Netware
- SCSI-2 Controller for hard disk, tape drive and CD-ROM drive
- 2GB DAT Tape Drive
- 32 Bit EtherNet Lan Adapter
- VGA Monochrome Monitor
- MS DOS 6.X Software (most current version)
- Novell NetWare version 3.12 - 25 User License
- Blank Cartridges for storing backups of courseware
- Required cables for Network
- UPS Battery Back
- Administrator's Workstation Diskette for PLATO on Network
- RDAS remote diagnostics system for HOTline support
- 9600 Baud Modem for RDAS
- PLATO System Documentation Kit

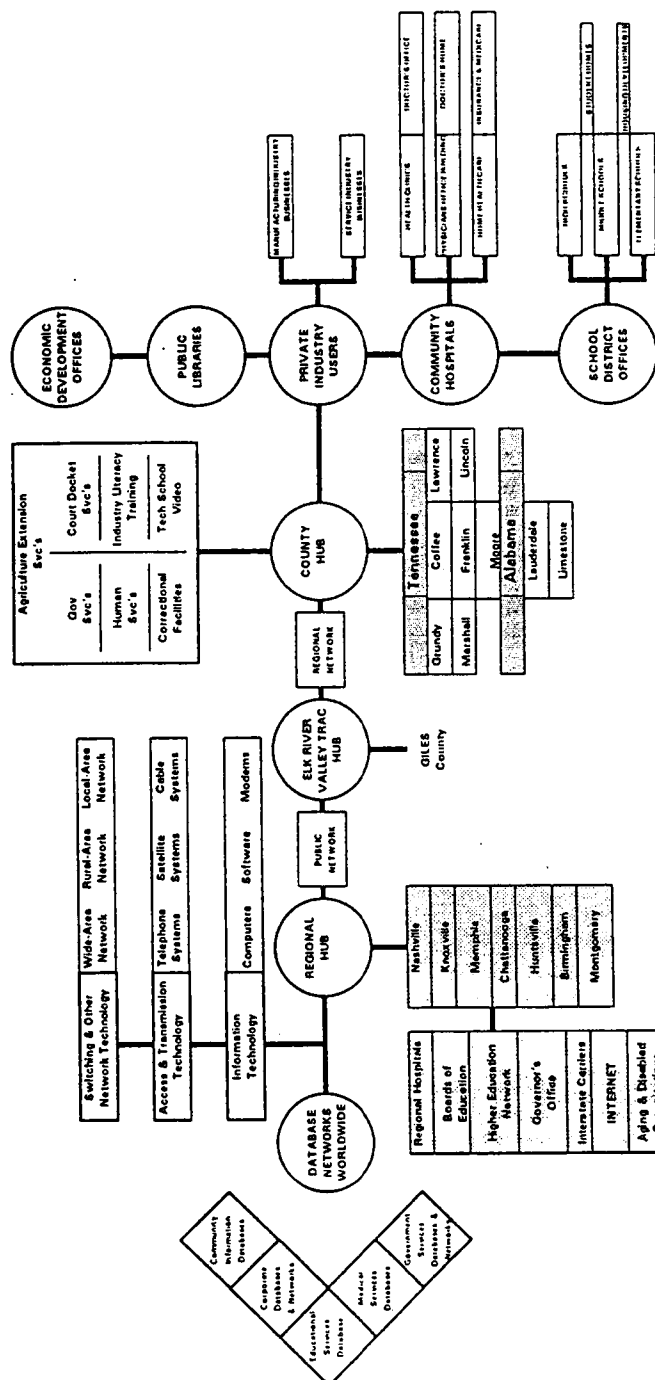
Work Stations

- LANstation-486SX 25 MHz
- 4MB RAM
- 1.44MB 3.5" floppy drive
- 14" .28DPI SVGA Color Monitor
- SVGA Graphics Card with 1MB RAM
- 16 bit EtherNet LAN card
- Mouse
- Network Cable and T-Connector
- MS DOS 6.X Software (most current version)
- PLATO Workstation Accessory Kit

APPENDIX B

**NETWORK RESOURCE CENTER PHYSICAL DESIGN CONCEPT
AND
NETWORK RESOURCE CENTER HARDWARE LISTING**

The TRAC Physical Design Concept



CODEC, Related Equipment, and Accessories

Item	Quan.	Description	Price	Cost
1	1	VTEL part# 005-873 basic Mediamax (or equal) platform package per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
2	0	VTEL part# 005-969 (or equal) 30 FPS factory kit per enc. specifications. Factory installed. Manf. _____ Model# _____ Warranty _____	\$	
3	0	VTEL part# 005-751 (or equal) 30 FPS kit per enclosed specifications. Field installed. Manf. _____ Model# _____ Warranty _____	\$	
4	1	VTEL part# 005-866 (or equal) blue chip algorithm per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
5	0	VTEL part# 005-709 (or equal) Penpal Graphics per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
6	0	VTEL video mail part # 005-867 enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
7	1	VTEL part# 005-781 (or equal) picture-in-picture option factory installed per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
8	1	VTEL part# 005-304 (or equal) handheld infrared remote per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
9	1	VTEL part# 005-241 (or equal) infrared detector per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

CODEC, Related Equipment, and Accessories

Item	Quan.	Description	Price	Cost
1	1	VTEL part# 005-873 basic Mediamax (or equal) platform package per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
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5	0	VTEL part# 005-709 (or equal) Penpal Graphics per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
6	0	VTEL video mail part # 005-867 enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
7	1	VTEL part# 005-781 (or equal) picture-in-picture option factory installed per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
8	1	VTEL part# 005-304 (or equal) handheld infrared remote per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
9	1	VTEL part# 005-241 (or equal) infrared detector per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

CODEC, Related Equipment, and Accessories (continued)

Item	Quan.	Description	Price	Cost
10	0	VTEL part# 600-328 (or equal) AT compatible keyboard per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
11	0	VTEL part# 005-609 (or equal) rack mount shelf per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
12	0	VTEL part# 600-144 (or equal) graphics tablet only (hardware) per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
13	1	VTEL part# 605-900-02 (or equal) KB extension cable (30 ft) per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
14	1	VTEL part# 605-416 (or equal) 25 foot graphics extension cable per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
15	1	VTEL part# 600-175 (or equal) 10 foot RS-449 cable per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
16	0	VTEL part# 605-299 (or equal) 50 foot RS-449 cable per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
17	0	VTEL part# 605-359 (or equal) 250 foot RS-449 cable per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	

CODEC, Related Equipment, and Accessories (continued)

Item	Quan.	Description	Price	Cost
18	0	VTEL part# 605-268 (or equal) Null modem adaptor cable per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
19	0	VTEL part# 605-269 (or equal) loop back test connector per enclosed specs Manf. _____ Model# _____ Warranty _____	\$	
20	0	VTEL 600-213 (or equal speaker per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

CODEC Camera Equipment and Accessories

Item	Quan.	Description	Price	Cost
1	1	VTEL part# 005-1082 (or equal) Smart camera kit with Sony CCD color camera with 8x1 zoom controller, and lens per enclosed specifications with 10 foot cable. Manf. _____ Model# _____ Warranty _____	\$	
2	1	VTEL part# 005-1083 (or equal) Smart camera additional kit assembly (includes camera, 8x1 lens, controller per enclosed specifications with 50 ft cable. Manf. _____ Model# _____ Warranty _____	\$	
3	2	VTEL part#605-1061-04 (or equal) 50 ft cable per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
4	0	VTEL part# 600-159 (or equal) color CCD camera per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
5	0	VTEL part# 005-335 wide angle lens kit per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

Monitors and Related Hardware

Item	Quan.	Description	Price	Cost
1	0	Mitsubishi CS-3515-R(or equal) 35 inch color monitor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
2	2	Sony CKV-27EXR (or equal) 27 inch color monitor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
3	0	Sony PVM-2530 (or equal) 25 inch color monitor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
4	2	Sony PVM-1390 (or equal) 13 inch color monitor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
5	3	Panasonic TR-930 (or equal) 9 inch monochrome monitor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
6	0	Bretford BBULC48-C4 w/security belt(or equal) TV stand with electrical outlet and strap per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
7	2	Lucasey ACM-2030 (or equal) ceiling mount per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
8	2	Lucasey ACM-1420 (or equal) ceiling mount per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

Audio Equipment and Accessories

Item	Quan.	Description	Price	Cost
1	2	Biamp Advantage One (or equal) 8 channel audio mixer per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
2	0	Biamp Advantage AG-II (or equal) 8 channel audio gate per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
3	2	Biamp 48 volt (or equal) power supply per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
4	12	Crown PCC-170SW (or equal) program-mable function push-to-talk super eardioid microphone per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
5	0	Electro-voice model #819 (or equal) conferencing microphone per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
6	1	Sony ECM-55B (or equal) lavalier microphone per enclosed specifications Manf. _____ Model# _____ Warranty _____	\$	
7	2	Symetrix A-220 (or equal) audio amplifier per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
8	2	Anchor AN-1000X (or equal) speaker per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
9	1	Shure M-267 (or equal) audio mixer with M268R (or equal) rack kit per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

Audio Equipment and Accessories (continued)

Item	Quan.	Description	Price	Cost
10	2 	AKG model K-141/2 (or equal) headphone with 0.25 inch plug, installed, per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
11		Lectrosonics model H-185 (or equal) wireless transmitter module with lavalier microphone (M-140) per enc. specifications. Manf. _____ Model# _____ Warranty _____	\$	
12	1 	Lectrosonics model R-185 (or equal) wireless receiver per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

Visual Support Equipment and Accessories

Item	Quan.	Description	Price	Cost
1	0	Elmo EV-308 (or equal) video overhead unit per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
2	1	Elmo EV-368 (or equal) video overhead unit per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
3	0	Elmo TR-35G (or equal) slide transfer unit per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
4	1	Sigma VDA-100 (or equal) video distribution amplifier per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
5	1	Panasonic WJ-220 (or equal) 6x1 video per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
6	0	Videotek RS-10A (or equal) 10x1 video/ audio switcher per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
7	1	Panasonic AG-1280 (or equal) four head VHS VCR with remote per enclosed specs Manf. _____ Model# _____ Warranty _____	\$	

Rack and Related Components

Item	Quan.	Description	Price	Cost
1	1	Stantron VCSF200-78-25 (or equal) equipment rack per enclosed specs. Black color. Manf. _____ Model# _____ Warranty _____	\$	
2	1	Stantron VCSS200-78-25 (or equal) rack side per enclosed specifications. Black color. Manf. _____ Model# _____ Warranty _____	\$	
3	2	Stantron VCPM-4051-3W (or equal) rack power strip per enclosed specs. Mount in item #11. Manf. _____ Model# _____ Warranty _____	\$	
4	3	Stantron VCES120025 (or equal) equip- ment shelf per enclosed specifications Manf. _____ Model# _____ Warranty _____	\$	
5	1	Stantron VCD600-78L (or equal) rack door per enclosed specifications. Black color. Manf. _____ Model# _____ Warranty _____	\$	
6	1	Stantron VCD60078PD (or equal) rack door per enclosed specifications. Smoked plexiglass. Manf. _____ Model# _____ Warranty _____	\$	

AC POWER support hardware

Item	Quan.	Description	Price	Cost
1	0	Tripplite LC1800 (or equal) line stabilizer per enclosed specifications Manf. _____ Model# _____ Warranty _____	\$	
2	1	Zero surge ZS1800 (or equal) surge suppressor per enclosed specs. Manf. _____ Model# _____ Warranty _____	\$	
3	0	Emerson AU-750RE (or equal) 525 watt UPS. Manf. _____ Model# _____ Warranty _____	\$	
4	1	Emerson AU-1000RE (or equal) 700 watt UPS. Manf. _____ Model# _____ Warranty _____	\$	
5	0	Deltec 1250 RM (or equal) 900 watt UPS per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	
6	2	ACCO part# 50674 (or equal) surge-protected six (6) outlet power strip per enclosed specifications. Manf. _____ Model# _____ Warranty _____	\$	

Schedule I Computer System

Item	Quantity	Description	Unit Price	Cost
1	10	Power Macintosh 6100/60 AV Teacher Solution Bundle B1978LL/A (or equal) computer system per enclosed specifications Manf. _____ Model# _____ Warranty _____		

**Schedule I Presentation System
PowerBook**

Item	Quantity	Description	Unit Price	Cost
1	10	PowerBook 520c 4MB HD160 With 8MB Memory Exp. Kit M1845LL/A & M1913LL/A (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		
1	10	PowerBook 540 12MB HD240 With Global Village PowerPort/ Mercury Modem M3120LL/A (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		
1	10	PowerBook 540c 12MB HD240 With Global Village PowerPort/ Mercury Modem M3121LL/A (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		

**Schedule II Presentation System
LCD and Overhead Projector**

Item	Quantity	Description	Unit Price	Cost
1	10	Sharp QA-1150 LCD Projector with carrying case (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		
1	10	Dukane 4003 Overhead Projector with 2 spare bulbs, 25 foot cord reel extension cord with 4 outlets and carrying case (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		

**Schedule III Presentation System
Speaker System**

Item	Quantity	Description	Unit Price	Cost
1	10	Apple Design Powered Speakers M4475LL/B (or equivalent) per enclosed specifications Manf. _____ Model# _____ Warranty _____		

VITA

Patricia Claire Oldham was born in Johnson City, Tennessee on September 2, 1969. She is the daughter of Claire Trethaway Oldham and George English Oldham III. Ms. Oldham attended schools within the Johnson City, Tennessee Public School System from elementary school until her high school graduation. She began her education in Johnson City at Annie Wilder Stratton Elementary School, continued at Liberty Bell Junior High School, and graduated from Science Hill High School in May 1987. The following September, Patricia entered The Centre College of Kentucky in Danville, Kentucky to receive a liberal arts education. In June 1991, Ms. Oldham graduated from Centre with a B.A. in Government and minors in English and history. She entered The University of Tennessee Graduate School of Planning in August of 1992, where she specialized in economic development and land use. During her first year at Tennessee, she was granted an internship with the City of Knoxville, Tennessee, Department of Community Development. The following year, Patricia was awarded a research assistantship with the Department of Energy's Oak Ridge National Laboratory located in Oak Ridge, Tennessee and managed by Martin Marietta Energy Systems. In December of 1994, the bicentennial year of the University of Tennessee, Ms. Oldham received her Master of Science degree in Planning.