COMMUNITY COLLEGE COLLABORATION WITH BUSINESS AND INDUSTRY
IN PROVIDING WORKPLACE LITERACY PROGRAMS: A MODIFIED
CASE STUDY OF FIVE CORPORATE PROGRAMS
IN A METROPOLITAN AREA

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Janis G. Kutilek, B.F.A., M.S.
Denton, Texas
December, 1992
COMMUNITY COLLEGE COLLABORATION WITH BUSINESS AND INDUSTRY
IN PROVIDING WORKPLACE LITERACY PROGRAMS: A MODIFIED
CASE STUDY OF FIVE CORPORATE PROGRAMS
IN A METROPOLITAN AREA

DISSERTATION

Presented to the Graduate Council of the
University of North Texas in Partial
Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

By

Janis G. Kutilek, B.F.A., M.S.
Denton, Texas
December, 1992
Kutilek, Janis G., Community College Collaboration With Business and Industry in Providing Workplace Literacy Programs: A Modified Case Study of Five Corporate Programs in a Metropolitan Area. Doctor of Philosophy (Higher Education), December, 1992, 121 pp., 4 tables, bibliography, 89 titles.

The purpose of this study was to provide both businesses and institutions of higher education with a descriptive analysis of the programs of five companies that have utilized community colleges in their basic skills programs. The five companies represented included Texas Instruments Defense Systems Corporation and SGS-Thomson Microelectronics (electronics companies), Abbott Laboratories (a pharmaceutical company), J & E Die Casting (a small die casting firm), and Company X, a semiconductor company that requested anonymity. The community colleges included were Richland College, Brookhaven College, and North Lake College.

Modified case studies were used to obtain data collected through individual interviews with representatives from the community colleges and the companies. The syntheses of documentaries provided details of how the five community college-directed workplace literacy programs met,
or failed to meet, their literacy challenges. Descriptions of the curriculum and structure of each program were also included.

Numerous factors contributed to the success or demise of the programs studied. Elements that served as powerful assets when adequately supported were detrimental when neglected. Factors common to all of the programs were financial support, management philosophical support, confidentiality, adequate testing instruments, class schedule flexibility, instructor capability, physical classroom facilities, and work-related documentation integrated into the curriculum. The findings of this study support previous research concerning successful and detrimental factors found in workplace literacy programs.
Copyright

Janis G. Kutilek

1992
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>vi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td></td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td></td>
</tr>
<tr>
<td>Research Questions</td>
<td></td>
</tr>
<tr>
<td>Limitations</td>
<td></td>
</tr>
<tr>
<td>Definition of Terms</td>
<td></td>
</tr>
<tr>
<td>Basic Assumptions</td>
<td></td>
</tr>
<tr>
<td>Significance of the Study</td>
<td></td>
</tr>
<tr>
<td>Organization of the Study</td>
<td></td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE</td>
<td>10</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>The Community College Connection</td>
<td></td>
</tr>
<tr>
<td>Theoretical Basis for Workplace</td>
<td></td>
</tr>
<tr>
<td>Literacy Programs</td>
<td></td>
</tr>
<tr>
<td>Examples of Community College Collaboration</td>
<td></td>
</tr>
<tr>
<td>III. PROCEDURES OF THE STUDY</td>
<td>46</td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>Procedures</td>
<td></td>
</tr>
<tr>
<td>Analysis of the Data</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>IV. PRESENTATION OF FINDINGS</td>
<td>53</td>
</tr>
<tr>
<td>Company X/North Lake College</td>
<td></td>
</tr>
<tr>
<td>J &amp; E Die Casting Company/Richland College</td>
<td></td>
</tr>
<tr>
<td>SGS-Thomson Microelectronics/Brookhaven College</td>
<td></td>
</tr>
<tr>
<td>Abbott Laboratories/North Lake College</td>
<td></td>
</tr>
<tr>
<td>Texas Instruments/Richland College</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>Chapter</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>V. SUMMARY, DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS</td>
<td>101</td>
</tr>
<tr>
<td>FOR FUTURE STUDY</td>
<td></td>
</tr>
<tr>
<td>Summary</td>
<td></td>
</tr>
<tr>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>Conclusions</td>
<td></td>
</tr>
<tr>
<td>Implications</td>
<td></td>
</tr>
<tr>
<td>Recommendations for Future Research</td>
<td></td>
</tr>
<tr>
<td>APPENDIX</td>
<td>109</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>115</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Type of Program and Definition of Literacy</td>
<td>110</td>
</tr>
<tr>
<td>2. Program Goals</td>
<td>111</td>
</tr>
<tr>
<td>3. Assessments</td>
<td>112</td>
</tr>
<tr>
<td>4. Class Size and Numbers per Session</td>
<td>113</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

In their best seller, *Workforce 2000*, Johnston and Packer (1987, p. 116) purported that if all children who reach the age of 17 years between 1987 and 2000 were able to read, write, speak well, and solve mathematical problems requiring basic applications of algebra and statistics, the economy of the United States could once again enjoy the boom of the 1950s and 1960s. What will keep business from achieving this status? The answer could very well be workplace illiteracy.

In a related study, Coates, Jarratt, and Mahaffie (1990, p. 291) discovered that, although total illiteracy is minimal in the United States today, functional illiteracy is prevalent. According to the United States Departments of Labor and Education (1988), 27 million adults, or one out of five Americans, are functionally illiterate. In addition, an estimated 45 million adults are only marginally literate and need improved basic skills in order to enhance job performance. Estimates from the departments of Labor and Education suggest that one-third of America’s employees lack adequate basic skills. Although this number is increasing by two million each year (Wolman, 1990, p. 20), only four
million adults are currently being helped through literacy programs (Harman, 1985, p. 1). Evaluators of literacy programs over the past 20 years concur that literacy education has not been successful. It is further agreed that a conceptual framework is needed in order to provide successful and innovative methods (Fingeret, 1982, p. 7).

The state of Texas has not escaped the problems associated with functional illiteracy. While the national high school dropout rate is an alarming 25% (Stone, 1991, p. 46), Texas has a much higher dropout rate of 36% (Kunde, 1989, p. 30A). Texas ranks among the top three states in the nation in the number of illiterate adults ("One in Three," 1989). One in three Texans cannot read or write well enough to be productive on the job. Based on Texas Department of Commerce estimates, illiteracy costs the state of Texas $17.12 billion annually through loss of income, unemployment claims, lost tax revenues, training, and the cost of crime and welfare (p. 6).

The number of workplace literacy programs in Texas during the early 1990s has been limited by the state’s depressed economy. In their Report on the State of Adult Literacy in Texas, the Texas Literacy Council (1990-1991) concluded that many Texas employers do not currently have the necessary resources available to commit to literacy programs. In spite of this economic limitation, however,
the number of workplace literacy programs is slowly increasing (p. 40).

As corporations realize the costs of ignorance in the workplace, business leaders are beginning to initiate programs designed to improve the basic skills and abilities of their present and future employees. As the problem becomes more evident, more companies are realizing the necessity of providing remedial education for their employees. As a result, companies are spending more of their training-budget dollars on programs to bring their employees' basic skills to the level required to perform their jobs.

Statement of the Problem

The problem of this study was the investigation of community college collaboration with business and industry in providing workplace literacy programs.

Purpose of the Study

The purpose of the study was to provide both businesses and institutions of higher education with a descriptive analysis of the programs of five companies that have utilized community colleges in their basic skills programs. Descriptions of these programs provide a framework for examining the successes and weaknesses of specific community college programs. In addition, an analysis of the programs provides both a comparison and a contrast of the structure
of the programs with descriptions of their methods of implementation.

A descriptive analysis of the design and implementation of five community college-directed workplace literacy programs is provided in this study utilizing a modified case-study approach. The synthesis of documentaries provided details how the five community college-directed workplace literacy programs have (or have not) successfully met the literacy challenge. Descriptions of the curriculum and structure of each program are also included.

Evaluation has often proven to be the bane of literacy programs. The anticipation of evaluation affects students', teachers', and administrators' attitudes and behavior toward such programs (Smith, 1988, p. 132). In spite of this problem, however, administrators must, in some way, determine which methods work if they are to "identify and eliminate the barriers to effective programs" (Diekhoff, 1988, p. 630). The problems associated with evaluation are often greater in workplace literacy programs because skills needed by the employees of each company are different. For this reason, workplace literacy programs should not be evaluated by how they compare to other programs, but by how well they meet the goals of a specific company and its employees (Philippi, 1991, p. 257).

The workplace provides a unique environment for basic skills education. By identifying research questions that
are specific to the workplace learning environment, natural limits for inquiry are provided for this study.

**Research Questions**

The following research questions were developed for this study:

1. What are the prevalent types and characteristics of workplace literacy programs now offered by community colleges?
2. How common or unique are the programs' goals?
3. What factors contribute to the success of a workplace literacy program?
4. What factors mitigate against the success of a workplace literacy program?
5. What commitments (both philosophical and financial) are the companies expected to make to the programs?
6. What commitments are the participating community colleges expected to make to the program?
7. How effective are the workplace literacy programs studied? Do they meet their program goals? What types of evaluation are employed?

**Limitations**

The five companies studied were all within the Dallas metropolitan area. The findings and conclusions of this study are considered representative only of the styles of implementation of the community college workplace literacy
programs in place at the time of this study and within the particular context considered.

Definition of Terms

The following definitions apply to terms used in this study.

Functional illiteracy is the inability "to read or write well enough to meet the basic requirements of everyday life and work" (Wolman, 1990, p. 20). Functional illiterates struggle when reading street maps, classified advertising, product labels, or equipment directions (Fisher, 1978, p. 1). For this study, functional illiteracy is focused on the basic requirements of the workplace.

Basic skills and literacy are often used interchangeably. For this study, the term basic workplace literacy skills encompasses the skills necessary for an individual "to find employment, remain employed, qualify for promotions, or cope with change in the workplace" (Rothwell & Brandenburg, 1990b, p. 5). Examples of workplace literacy skills include the ability to read and write work-related documents and the ability to compute work-related mathematical problems (p. 6).

Literacy in the workplace and literacy at school are differentiated by a single dimension. Workplace literacy utilizes the interaction of three contexts: the worker (or reader), the text, and the task. School-based literacy, however, concerns only the reader and the text (Hutson,
Workplace literacy differs from vocational or technical training because it teaches individuals how to apply the skills to a task rather than teaching them the actual content of the task (Philippi, 1991, p. 1). According to Fingeret (1982, p. 16), any definition of literacy, whether in the context of school, work, or home, must assume competency.

Basic Assumptions

It was assumed that each company included in this study had specific problems related to workplace illiteracy. Each company had unique characteristics. However, information about the companies' illiteracy programs can be a valuable addition to the body of knowledge encompassing workplace literacy programs.

It was also assumed that representatives of the companies and community colleges included in the study answered interview questions truthfully and without bias.

Significance of the Study

In the New York Times (Fowler, 1990) a survey of 264 large companies was conducted. The survey focused on the national problem of illiteracy. Sixty-two percent of company chairmen reported that "building and keeping a qualified work force" was the single most significant issue of the decade. The chairmen also stated that their companies were offering literacy programs in order to
alleviate the shortage of qualified entry-level employees (p. 47L). Some businesses report that at least half of their employees require remediation in basic skills before they are able to learn new processes and technologies (Skrzyczy, 1989, p. G1).

Nationally, remedial courses are becoming more common (Zemke, 1989). In 1969, Polaroid began a program called Technology Readiness Program. Ford Motor Company offers employees remedial reading classes in 25 of its plants. United Auto Workers offers programs for attaining high school equivalency diplomas. American Telephone & Telegraph (AT&T) budgets $6 million annually for basic skills training. In 1988, Aetna Life and Casualty spent $750,000 on remediation for 500 of its employees. Corporations in America currently spend an estimated $300 million per year on the remediation of employees' basic skills—reading, writing, and mathematics (p. 35). Employers, who once were able to hire skilled employees, are now having to "make" rather than "buy" these employees (Charlier, 1990, p. R14).

According to Gordon (1990, p. 20) 11% of small organizations (100 or fewer workers) and 30% of large companies (10,000 or more employees) provide remedial training for employees. These companies' literacy programs are either taught in-house or are contracted to other entities such as Adult Basic Education, Literacy Volunteers
of America, Laubach Literacy Action, or community colleges (Harman, 1985, p. 18).

Newman and Beverstock (1990) described workplace literacy as an "inadequately researched area of concern" (p. 160). Ideally, they stressed, workplace literacy programs should provide a dual purpose. They should meet the needs of employers while also improving employee morale.

This study is significant to corporations because it provides employers with a framework of community college workplace literacy programs. It is significant to university research because it should stimulate further research on the specific problems identified from the case studies.

Organization of the Study

This chapter includes the statement of the problem, purpose of the study, research questions, limitations, definition of terms, basic assumptions, and significance of the study. A review of the literature related to workplace literacy problems, the theoretical basis for workplace literacy training, and community college collaborations are included in Chapter II. A description of the methodology and procedures used in collecting the data is provided in Chapter III and a presentation of the findings of the study is provided in Chapter IV. The summary, discussion, implications, conclusions, and recommendations for future research are included in Chapter V.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The United States is falling behind in the global marketplace as well as in the classroom. In 1982, an international mathematics examination revealed that the top 5% of America's high school senior mathematicians ranked last among twelfth graders in nine other developed nations (Magnet, 1988, p. 86). The prospect of a workforce that continues, decade after decade, to be unsuccessful in improving literacy is alarming. Although the United States will not founder immediately from its deficiency in functional literacy skills, its standing in international competition will continue to be adversely affected. Venezky, Kaestle, and Sum (1987), predicted that the result will be a society which is divided into factions of the skilled and the unskilled (p. 53). Torrence and Torrence (1987, p. 44) cited a 1986 Census bureau study which suggests that within 15 years the percentage of functional illiterates in the United States will reach 70%. Illiteracy in the United States can become a key element of its economic decline. A highly technological economy cannot succeed without a highly literate work force to maintain it (Green, 1991, p. 121).
According to Lewis (1988), United States Department of Labor reports show that approximately 15 million American employees have lost their jobs since 1979. It is estimated that approximately three-fourths of these employees required basic skills training before they could be retrained for another position. Many jobs that were held by Americans with minimal or no literacy skills have been moved to countries where labor is less expensive. Although corporations find this to be a cheap alternative to training, it may also be a very temporary solution (pp. 468-469). As indicated by Labunski (1985), no occupation requires zero basic skills, and the number of low level literacy jobs continues to decrease (p. 4). By the year 2000, 59% of employees will need to read manuals and write reports as part of their jobs. Currently only 16% have the level of literacy necessary for meeting this requirement (Wolman, 1990, p. 24). Elizabeth Dole (1990, p. 20), former United States Secretary of Labor, predicted that training in the basic skills would be the educational and economic challenge of the next decade and recommended a combined effort by educators, government, employers, and workers to meet the challenge.

Who is going to correct the problem of the basic skills crisis? Karl Haigler (cited in Lee, 1988), former Director of the Adult Literacy Initiative of the United States Department of Education, put it succinctly: "You can keep
saying the schools ought to be (turning out people with basic skills) until the cows come home, but business is going to have to deal with the problem" (p. 28). According to Haigler, school innovations will not affect worker quality until the 21st century. Conversely, Craig Knaack (cited in Grimes & Renner, 1988), Director of Adult and Continuing Education at Highland Community College in Freeport, Illinois, stated that businesses are also having to change their attitudes regarding employee training:

Before, the emphasis was on training--how to train someone to do one job. Now business leaders are starting to realize that the person has to be able to receive the training (p. 10).

Seventy-five percent of the labor pool of the year 2000 is already in the job market (Lee, 1988, p. 28). If schools and businesses fail to provide adequate training, 75% of the adults in the United States will possess the reading and mathematical skills for only the lowest-paid, lowest level jobs by the onset of the 21st century (Peterson, 1989, p. 1).

Thomas Sticht, an early researcher on literacy in the workplace, stated that industry and business must provide more literacy education. He estimated a cost of $5 to $10 billion to create or retool the necessary literacy programs. He added, however, that the returns will be ten-fold (U.S. Department of Education, 1988, p. 40).
Percentages and statistics are oppressive and do not convey the total picture. According to Lopez (1989), a Chicago advertising firm estimated that only 1 in 10 applicants meets minimal literacy requirements for a mail-clerk position at their firm. At Motorola, 80% of the applicants fail an entry examination which is based on fifth-grade mathematics and seventh-grade English. New York Telephone Company found that less than half of 117,000 applicants were at a literacy level that enabled them to take the company’s entrance examination. From that number, a modest 2,100 passed the examination (p. R12).

There are many different reasons why workplace literacy programs are initiated. For example, when a newspaper installs new equipment and their workers cannot adapt to the new system, it may become evident that their third-grade level of reading which was adequate for the old system, does not provide the comprehension skills necessary for the new technology (Petrini, 1991, p. 30). Another example occurred when a manager of internal communications at Philadelphia Newspaper discovered that an employee left the company because she was unable to read the benefits manual (McGee, 1989, p. 47). In another example, 12 technicians responsible for machine calibration at a semiconductor plant in Arizona were tested on their aptitude in working with decimals, and not one technician passed the examination (Dodge, 1990, p. 1D).
In 1989, managers at Parker Bertea Aerospace Group, a manufacturer of aircraft parts, noticed a deficiency in mathematical skills in its employee base. To address the problem the staff decided to implement a test to screen out applicants who were deficient in the basic skills necessary to work in the shop. In order to validate the 20-question instrument, it was administered to 200 of the group's current employees. Because of the nature of the business, the staff assumed that the test group would have no trouble with the mathematics component. They found, however, that the workers relied heavily upon calculators and on technicians who were mathematics experts. Because of the emphasis on Statistical Process Control (SPC) for most of the group's business, a lack of mathematical skill could not be tolerated; therefore, mathematics courses designed to meet their needs were provided to both current and new shop employees (Mitchell, 1991, pp. 60-61).

SPC also revealed that employees had a problem with mathematics at the AP Parts Manufacturing Company, which produces parts for trucks. Three hundred employees were to be trained in a 20-hour SPC course. However, it soon became apparent that they were not learning the new technique because their mathematics and reading skills were inadequate for learning the new SPC logic (Berney, 1988, p. 26).

Although documentation is meager, anecdotal evidence suggests that basic skills deficiency is costly to companies
Sadler (1988) related an incident where an employee ruined an $8,000 piece of equipment because of a deficiency in English language skills. As a result of the incident, the worker's Illinois employer initiated an English as a second language course to prevent further mishaps (p. B2).

Paul Jurmo (cited in Petrini, 1989), senior program associate for Business Council for Effective Literacy, emphasized that true literacy is much more complex than just learning the three "Rs." Jurmo (cited in Petrini, 1989) also warned against one simple solution:

There is no single instructional methodology—whether it involves computers or particular workbook theories or the use of video or interactive video—that is going to help every worker in every workplace setting, and employers need to educate themselves about the pros and cons of available instructional approaches. (p. 19)

In a report on adult literacy in Texas for 1990-1991, the Texas Literacy Council (1990-1991, p. 3) surveyed literacy providers and found four types of instructional methods employed: class, small group, individual tutoring, and computer-assisted.

Employers are using a variety of strategies to address basic skills problems. Rothwell and Brandenburg (1990a) took Jurmo's (1989) recommendation one step further by suggesting that flexibility is the key to successful
workplace literacy programs. Rothwell and Brandenburg (1990a) advised that the definition of basic skills should be flexible enough to include problem solving and critical thinking. Instruction should also be flexible. Delivery must take into account the time availability of the adult learner/worker. If various media, such as computer-based programs or videotapes are included, instruction can be more easily adapted to individual learning styles (pp. 26-27).

As suggested by the Business Council for Effective Literacy (1987), corporations should exercise care when selecting an educational partner. Because most businesses do not have the resources or staff to develop and administer effective literacy programs, the choice of a provider is a significant decision (pp. 9-10). In a 1988 report, the United States Departments of Labor and Education suggested the need for flexibility of sponsorship. Although no one business or organization can address the entire issue, partnership can produce a lasting impact on workplace literacy (p. 19). Community colleges are specifically recognized for their innovation and responsiveness to employers (p. 31).

The Community College Connection

From an historical perspective, community colleges have been one of the two main providers of basic literacy programs. Adult Basic Education programs developed in the 1960s as an integral element of the war on poverty effort.
During this period, community colleges utilized their open-door policy to implement developmental education programs (Rossman, Fisk, & Roehl, 1984, p. vii). The discovery of low literacy skills among a large percentage of entering students prompted their action. Administrators in community colleges realized that as many as half of their incoming students required remediation. On an annual basis, remedial courses are provided by community colleges for several million students, thus encompassing 3% to 4% of the target population (Harman, 1985, p. 18).

In a 1988-1989 survey by the American Management Association, researchers found that only one-third of the more than 1,000 companies surveyed required their employees to take any type of basic skills test (Greenberg, 1989, p. 6). The researchers also found that most testing instruments were too generic to be effective and recommended the use of job-specific instruments (p. 22).

The evaluation aspect of literacy programs is especially problematic. In most situations, evaluation is either infrequent or the results are difficult to interpret. Some of the difficulties related to evaluation may be due to the design of programs. Open-entry and open-exit policies may also increase the problems. Because achievement data tend to reflect only the results of those who persist in a program, they may not provide an accurate picture of the effectiveness of the program. Further problems occur when
evaluations are tied to funding. In this environment, there is a tendency to enhance the positive aspects of a program and to obscure negative aspects (Padak & Padak, 1991, p. 374). In a descriptive study of workplace literacy, Green (1991) found one company that did not want to enforce any activity that might induce a union dispute. Green also found that unions had denied company participation in some literacy programs because of a fear that test results might influence personnel recommendations for job assignments or promotions (p. 124).

As a third party entity, the community college can greatly relieve problems of assessments. Community colleges can promote the idea of confidential testing of participants. The Northern Tube Division of AP Parts Manufacturing Company in Michigan formed a partnership with Delta Community College and found that testing was much easier when the college, rather than the company, assessed the students. When assessment was done by the community college, workers were less concerned that they would be coerced or that scores would be used against them (Berney, 1988, p. 31).

Chrisman and associates (1990) described community colleges and unions as vigorous partners in workplace literacy programs, but they stressed that community colleges could increase the number of services offered. The effectiveness of community college literacy programs
depended upon the approach taken by the college administration. While administrators at some community colleges were extremely entrepreneurial and adept at designing programs for particular employers in their community, others were more ingrained in traditional academe. In some states community colleges were discouraged from taking an active stance in the marketing of their programs by the requirement that any revenues from such projects be placed in the states' general coffers (p. 160).

Community colleges tend to be more attentive to corporations and their needs than four-year colleges and universities. Because community colleges are often under financed, they are, by necessity, more resourceful than other institutions of higher education in designing programs for adults. Community colleges have even been accused of being too entrepreneurial and aggressive in addressing the needs of older learners (Peterson & associates, 1979, p. 445).

Community colleges are more entrepreneurial in seeking partnerships with business. Ernest Boyer (cited in Nazario, 1990), chairman of the Carnegie Foundation for the Advancement of Teaching says of community colleges, "They are much more responsible to business than other institutions in higher education" (p. R20).

Garrison Moore (cited in McGee, 1989), senior research manager with the National Alliance of Business, described
community colleges as responsive and extremely adept at customizing basic skills programs for business (p. 42). Community colleges market customized courses to businesses and teach them at a corporate site or on campus—whatever is the most convenient for the employer and employees (Nazario, 1990, p. R21). Community colleges also offer a great deal of flexibility in curriculum content, cost, and delivery. Their strong link with local employers make them ideal providers for literacy programs (Dertouzos, Lester, & Solow, 1989, p. 86).

Many community colleges offer company-specific training at both the college and the worksite, with only a small percentage providing basic skills training. However, the potential for community college training programs is tremendous due to the convenience and accessibility. The number of community colleges in the United States and its territories has grown to over 1,200. Most are within a 30 minute drive for many students (Carnevale, Gainer, & Meltzer, 1990, pp. C.3-C.4).

In 1988, the American Association of Community and Junior Colleges (cited in Carnevale, Gainer & Meltzer, 1990) produced a report entitled Building Communities: A Vision for a New Century. The report, which was essentially an outline for maximizing involvement with business and industry, revealed that two-thirds of the community colleges have on-campus coordinators for business and industry.
According to the report, three-fourths of community colleges have designed exclusive training programs for employers (p. C.4).

According to Mills (1991), the first Texas Community College and Technical Institute Workforce Literacy Consortium conference in June 1991 emphasized the partnership approach as the best strategy for workplace literacy programs. Mills, Associate Dean of Rio Salado Community College, also indicated that corporations can identify job-specific information needed by employees but cannot address the educational aspect of the transfer of knowledge. Conversely, educators can teach the acquisition of skills but tend to do so in isolation. By sharing expertise through a partnership, the two entities can bring a total product to the workplace.

Theoretical Basis for Workplace Literacy Programs

The academic skills traditionally learned in the school and those which underlie workplace basics are not necessarily the same. Employees are often required to comprehend written instructions quickly in order to circumvent delays. Employees must be able to critically analyze information in order to recognize important components and to correct erroneous data (U. S. Congress, 1990, p. 155). Employers who provide basic skills programs for their employees expect to see improved work performance
as a result of the basic skills programs and are not interested in employees obtaining knowledge merely for the sake of knowledge. Employers are usually hesitant to make the commitments, necessary for successful literacy programs, such as giving employees release time to attend class, until they have seen a higher level of employee performance as a result of the programs (p. 176).

Lawrence Mikulecky (cited in Berney, 1988), a professor of education at Indiana University and a consultant in workplace literacy, posits that new knowledge must be taught in the context of the workplace in order for it to be transferable to the job. A combination of remedial skills and job specific training produces the best transfer of knowledge to the workplace (p. 34).

Mikulecky examined the literacy requirements for daily reading by students and by workers in order to determine how traditional schoolbook literacy prepared students for the workplace. Mikulecky found that workers on the job were required to read more competently and with more depth than were students (Mikulecky, 1982, p. 400). Students simply read to learn, workers utilized learning in addition to the assessment of information and the solving of problems (p. 413). Mikulecky also found that workers viewed reading as more important to their success than did students (p. 415). Mikulecky emphasized the assumption that generic literacy skills will readily be transferred to the workplace as
erroneous (p. 403), and stated that successful literacy programs are successful only to the degree that they do not assume generic literacy training correlates positively with job literacy training (Mikulecky & Strange, 1986, p. 334).

In his book *Illiteracy: A National Dilemma*, Harman (1987) referred to Mikulecky and Sticht's conclusion that:

Marginally literate adults in a job-related reading program made twice the gain in job-related reading than they did in general reading, suggesting that more rapid learning of particular types of reading will occur when training is specifically focused on that type of reading than on "general" literacy. (p. 2.16)

Thomas Sticht (1980) compared general reading skills with specific job related reading skills as part of his military research. He observed that,

Job reading gains were much larger than general reading. This is important because it indicates that people are learning what they are being taught. Clearly the present results show that reading is not altogether a generic skill assessable by any test of general reading. (p. 303)

In a 1980 study focused on the literacy demands of 100 occupations, Diehl and Mikulecky concluded that reading at work and reading at school are altogether different in terms of convenient extralinguistic cues, cognitive requirements, and the utilization of acquired information. They
recommended further research be conducted in these areas (p. 227).

Weinstein and Underwood (1985) suggested that within the realm of learning strategies there is a magnitude of metacognitive information-processing strategies that enable learners to discover discrepancies between what they know or do not know. Learners should then engage in and evaluate the extent of new knowledge acquisition to the degree they desire (p. 241). Metacognition refers to the ability to deliberately and consciously monitor one's own acts of cognition (Brown, 1980, p. 453). Locke (1975) emphasized the concept of metacognition in his guide on the process of studying. Besides reading the material, Locke stated, it is necessary "to be constantly checking to see that you are actually performing those mental operations that produce learning. In short you need to monitor your mental processes while studying" (p. 126).

Psychologists defend the study of metacognition because it is ecologically valid - it has counterparts in everyday life situations. Self-interrogations regarding the learner's state of knowledge while involved in any problem-solving or reading task is a fundamental skill in diverse situations, whether at school or at work (Brown, 1980, p. 454). Paris and Myers (1981) added the conclusion that poor readers are not able to incorporate self-monitoring skills as well as are good readers. Instead
of striving for comprehension goals, individuals with poor reading skills read only to decode words (p. 5).

The cognizance of students' learning processes enable them to think critically and implement the process in their own particular job tasks (Philippi, 1991, p. 292). Many computer-based literacy programs have modules related to the learning process. This might indicate that instructor-led programs should include components of metacognitive strategies.

Contextually functional literacy instruction provides meaningful instruction to employees by utilizing their prior knowledge. The mental schemata from the work environment enables employees to link old and new knowledge (Philippi, 1991, p. 291). This model of comprehension is inferential. Readers use their current knowledge to attach meaning to textual information (Farr, Carey, & Tone, 1986, p. 136). The memory ability is not an inherent inclination for information storage. Instead, the ability to recall information is heavily reliant upon the nature of previously acquired information (Bransford & Vye, 1989, p. 177).

Soifer, Irwin, Crumrine, Honzaki, Simmons, & Young (1990) referred to "dynamic interactions" whereby reading is viewed as the process of learning meaning through the interaction of the information in the text, the learner's background knowledge, and the context of the learning situation (p. 4). Inferencing produces problem-solving skills. However,
according to Johnston (1981), reasoning and inferencing are not synonymous even though they are both integral parts of comprehension (p. 12).

Job-specific materials are beneficial to workplace literacy programs because they enable employees to learn and retain vocabulary pertinent to their jobs to a higher degree than does a generic vocabulary. Kirsch and Mosenthal (1990) suggested that task analyses should be completed for a particular population, whether it be industrial or military. They recommended that literacy tasks be obtained from a sample which reflects the needs of an entire population. Tasks would then be parsed, utilizing the job-specific vocabulary, and instructional efforts would be systematically focused on specific job related tasks (pp. 25-26). The vocabulary and structure of reading passages should be closely matched to job materials, according to Carnine, Kameenui, and Coyle (1984, p. 202).

In a study of uses of contextual information in vocabulary growth, Carnine et al. recommended that the proximity and configuration of such information should be carefully thought out when planning instruction (p. 202). Nagy, Herman, and Anderson (1985) agreed that contextual learning is a principal factor of vocabulary growth (p. 234), and suggested that its strength lies in its longitudinal, cumulative effects (p. 252).
In a study of measures of functional literacy, Kirsch and Guthrie (1977-78) proposed that general literacy be excluded. They recommended that measures be focused on practical competencies from employers that ensure the employees' ability to acquire pertinent information from job documents (p. 485).

Examples from the job give participants in literacy programs a frame of reference from which to learn. In fact, examples are much more powerful to learning than generic written instruction (LeFevre & Dixon, 1986, p. 27). In the minutes of the first meeting of the Secretary's Commission on Achieving Necessary Skills (Research and Evaluation Associates, 1990), Thomas Sticht provided an example involving the training of a group of electronics technicians. Sticht found that by using realistic activities and actual equipment, trainees better understood the information given and became more proficient. He advised that by "using a functional context approach [employees are trained] far more efficiently" (p. 5).

LeFevre and Dixon (1986) state that learners are more apt to infer procedure from a single example when the example is a familiar task (p. 28). They also emphasized that instructors should develop examples that are appropriate to the context of the instruction. Poor examples can deter learning (p. 29).
Job-related materials enable employees to learn by doing. Cognitive researchers agree that students should be able to utilize their present knowledge in order to augment learning. When students are actively engaged in activities that enable them to achieve significant job goals. They are better equipped to think mathematically, to read for meaning, to write succinctly, or to utilize other job enhancing activities (Bransford & Vye, 1989, p. 195). Indeed, one of the primary assumptions of adults as learners is that their application of knowledge is immediate rather than postponed. Accordingly, adults' learning orientation changes from a focus on subject to a focus on performance (Knowles, 1982, pp. 44-45).

How do adults learn? What framework allows maximum learning but still provides flexibility in the classroom? Soifer et al. (1990) advocated a whole language approach to literacy. As the term suggests, the approach involves a collaborative effort between the teacher and student. The learners' background knowledge is activated, and writing, reading, listening, and speaking, which comprise the elements of learning, are included in all lessons (p. 10).

As a learning strategy for the workplace, Sticht (1987) suggested building new knowledge on the basis of previous knowledge. This system provides students with an entry into the program. Sticht consistently emphasized learning by building upon prior knowledge (p. 664).
An imposing challenge of literacy education is to educate trainees to be aware of the strengths they already possess. Many workers have poor self-images. A long tenure of working in a highly-directed and repetitive job often reinforces a worker's low self-concept. By acknowledging their skills and language of the job, instructors may be able to move workers toward a positive attitude and thus enable them to become successful learners (Soifer, Young, & Irwin, 1989, p. 66).

Learners' background knowledge must be ascertained through a needs assessment. Such an assessment can reveal gaps between current and desired proficiencies (Galbraith, 1990, p. 8). Needs analysis includes context analysis, where learners are apt to apply that which they have learned. Context analysis enables the learner and teacher to focus on activities and use strategies that can lead to an encouraging educational experience (Knox, 1986, p. 67).

To summarize, the customization of curriculum to job tasks is the key difference between workplace literacy programs and traditional educational programs. Workplace literacy programs utilize many of the same components of workplace training: metacognition, utilization of prior knowledge, inferencing, needs assessment, and task analysis. The difference lies in the total concentration and immersion of literacy instruction in specific daily job-related activities.
Examples of Community College Collaboration

This section of the review of literature is a summary of published studies on workplace literacy and the community college connection. The following descriptions of community college collaboration provide unique insight from the literature.

**Rio Salado and Glendale Community Colleges**


In the mid-1970s, Digital Equipment Corporation (Digital) opened a plant in the city of Phoenix, Arizona. By the late 1970s and early 1980s it became apparent that some of Digital's employees lacked the necessary minimal basic skills. The need for a workplace literacy program was intensified in 1986 because of two innovations in the workplace: the computer product became more sophisticated, thus requiring more advanced testing and assembly; and a new work program was initiated called the Continuous Improvement Through Employment Involvement (CITEI). In addition, the company's work styles were changing from a singular approach to work styles that were more collaborative in nature (Vanis, 1989, p. 6).
Glendale Community College, with the assistance of the Rio Salado Community College staff, initiated a pilot to assess the literacy needs of Digital employees and to develop a training program to meet their needs (Vanis, 1989, p. 6). The community colleges staffed the project with administrative, full-time and part-time faculty, an assessment specialist, and a curriculum developer. They also committed financial support for additional resource persons (p. 7).

Digital proved to be an excellent business partner for the literacy program and was generous in the provision of resources. Digital provided funds for instruction, assessment, supplies, and tuition reimbursement. In addition, the company provided classroom space as well as assigning a person to manage the program (Vanis, 1989, p. 6).

Digital made the decision to participate because of a concern from management that basic literacy skills and English as a Second Language were two basic needs that needed to be addressed immediately through the pilot. Planners in the partnership decided that the program should be developed in three phases: the needs assessment, the curriculum, and the actual program implementation or delivery (Vanis, 1989, p. 8).

The needs assessment consisted of several components. Interviews were provided from management, training staff,
and employees. Reading materials were collected and analyzed. The FRY Readability Graph and the FORECAST Readability Index were used. Proficiency assessment tests were given to employees (Vanis, 1989, p. 8). The entire needs assessment was used to identify employees’ current literacy levels, how well skills were being performed on the job, and technology changes that would impact current skill levels in the near future (p. 9).

The needs assessment identified six curriculum priorities: English as a second language, mathematics, writing, oral communication, reading, and basic computer skills. Integrated into each course were the utilization of job-specific materials, critical thinking skills, team building skills, and oral communication skills. Curriculum modules were also developed to provide short and flexible delivery in the classrooms (Vanis, 1989, p. 10).

Classes began in the summer of 1987. The first class, English as a Second Language, was provided during work shifts as an indication of management’s support. The first class consisted of employees who were assessed at the zero to fourth-grade levels. Basic literacy courses were offered after working hours during the spring of 1988. The basic literacy courses were focused on reading, writing, and mathematics. In the fall of 1988 advanced courses were offered in the same areas, with the addition of oral communications classes (Vanis, 1989, p. 10). After the
pilot was completed, the community colleges and Digital agreed on a continual program to design, implement, evaluate, and revise the program (p. 11).

Vanis (1989) described a number of significant outcomes from the collaborative relationship between the workplace and community colleges because of this particular partnership. The exchange of information between entities was invaluable. Both industry and education developed a better appreciation for the application of knowledge. Digital was given the opportunity to realize the level of expertise and resources that community colleges can provide for training programs. The mutual commitment of fiscal resources allowed for a much better program than any singular entity could have provided. There was extensive communication between the colleges and Digital to ensure agreement on the focus of the program. Maximum efforts were made to utilize the expertise of the faculty, staff, and employees (p. 11).

In 1987, Vanis and Mills published a report of their project at Rio Salado Community College in Arizona. They initiated an adult basic education program in Maricopa County. Enrollment increased from 729 the first year to over 5,700 in 1986. They attributed the increase to the college's ability to provide classes in convenient locations and at convenient times. Some of the locations included businesses, shopping malls, churches, learning centers, and
the county jail. The classes were instructor-led but were supplemented with computer-based instruction and videodiscs. Although the program was not specifically focused on workplace literacy, it demonstrated to county businesses the adaptability of the program (pp. 4-7).

Mohegan Community College

Some of the community college links have been innovative. The Mohegan Community College Business Services Network, in a joint venture with the Connecticut Department of Labor, incorporated a traveling workplace literacy program. Basic skills courses were offered in a mobile van. Five IBM computer stations were provided inside a Winnebago van and offered the Basic Academic Skills for Employment (BASE) program. BASE provides assistance in vocabulary, punctuation, spelling, reading, writing, and mathematics. Skills are anchored to job competencies rather than grade levels. More than 3,500 individuals have utilized the program which has been in place since 1985 (Yarsa, 1990, p. 1).

The mobile training center has had a variety of clients—a women’s correctional facility, an Indian reservation, a Naval submarine base, and various insurance companies. Joan Yarsa (1990), director of the programs, explained that the van enables "workplace literacy training to be brought right to the doorstep of Connecticut’s businesses and industries for a minimal fee" (p. 1). The
program is considered a success (p. 4). Students have improved an average of 11.5% in mathematical skills and 9.4% in language skills. The combination of the BASE program and the mobile van offer a unique alternative for workplace literacy training (pp. 1, 4).

Red Rocks Community College and Barton County Community College

The BASE program is widely utilized as an instructional tool in workplace literacy collaborations. Red Rocks Community College, in Lakewood, Colorado, established a learning laboratory with 15 computer terminals. Sally Dey (1991), Director of the Center, stressed that BASE affords the opportunity for students to learn basic skills in relationship to job competencies in real situations rather than in isolation. The college plans to replicate the laboratory at the Coors plant. Both employees and their families will be invited to participate in the Coors program (pp. 1, 4).

Barton County Community College in Kansas also offers workplace literacy training skills at the Ellsworth Correctional Facility using the BASE program. Participation is voluntary, and inmates begin the program by choosing the type of job they would like to pursue. BASE is used to pretest the inmates in order to determine their present level of functioning for their chosen occupation. The inmates are then presented with a strand of lessons related
to the particular job. Upon completion, inmates are expected to possess the basic skills necessary for an entry level job in their chosen occupation (Pickard, 1991, p. 1). The BASE program affords inmates two freedoms—the freedom to choose the occupation desired, and the freedom to work on the program at their own pace. Instructors monitor student progress through a series of reports provided by the BASE program (p. 2).

**Meridian Community College**

Sometimes community colleges get involved in workplace literacy programs through the "back door." When managers at Peavey Electronics, in Meridian, Mississippi, decided to provide more than standard training to their employees, they chose to use the civilian version of the United States Army's Job Skills Enhancement Program (JSEP). In 1988, the National Alliance of Business received a $200,000 United States Department of Labor grant to analyze the effectiveness of civilian applications of JSEP. Peavey Electronics (Peavey) participated in partnership with Meridian Community College. Meridian Community College agreed to spend $100,000 to install the computer equipment necessary for the JSEP program. Peavey released employees to attend training 2 days per week for 2 hours a day. Peavey's cost for release time was approximately $70,000.

Peavey's investment was well spent—a third of the original group members were promoted, and some were promoted
twice. Another group increased their mathematics skills by three grade levels in 56 hours of training. Traditional adult learning takes from 60 to 80 hours to advance one grade level. The JSEP program was made available to all Peavey employees (Perry, 1991, p. 71).

Dundalk Community College

Since the early 1980s, Dundalk Community College in Baltimore, Maryland, has been a trend setter in the arena of industry-related training. Local employers have been able to eliminate the need for all or part of their internal training staffs due to the trainers available through the community college. Dundalk Community College entered into a partnership with General Motors (GM) and the United Auto Workers (UAW) to implement a literacy program after GM discovered that some of their employees' reading skills were not sufficient to meet the demands for retraining on new equipment. Employees participated in a full-time workplace literacy program of 6 weeks duration. Union and welfare monies were used to fund the employees' salaries. The union and GM paid the Dundalk Community College instructors. Assembly line operations were maintained by utilizing laid-off workers and rescheduling workshifts. The results of the literacy program were positive for everyone involved. On the average, the GM workers improved their reading skills by several grade levels. GM was able to keep quality employees. The UAW furnished positive assistance to its
members. Dundalk Community College developed and implemented the program to the satisfaction of all parties involved (Carnevale, Gainee, & Meltzer, 1990, pp. C.4-C.5).

**Roxbury Community College**

A 1989 evaluation of the Boston Workplace Education Collaborative (BWEC) yielded satisfying results to both employers and employees. The partnership consisted of Roxbury Community College (RCC), the American Federation of Labor-Congress of Industrial Organizations (AFL-CIO) of Massachusetts, and the Boston Private Industry Council (PIC). The partnership received a grant from the United States Department of Education’s Workplace Literacy Partnership Grants Program for 1988. The grant period was for one year, with a three month extension. The three entities joined forces to provide a comprehensive workplace literacy program to the Boston area (Levine & Pansar, 1990, p. 8).

The components of the program included Adult Basic Education and English as a Second Language. The system was designed to help workers become more productive and to provide the employer with a qualified group of applicants and workers (Levine & Pansar, 1990, p. 8).

Two hundred and twenty-five workers attended classes at eight sites. The sites varied from a union hall to hospitals to a Westin Hotel. Class enrollments were limited to 20 students. There were four Adult Basic Education
classes and eight English as a Second Language classes (Levine & Pansar, 1990, pp. 9-10). Curriculum documents were developed by the BWEC staff and the employers. The curriculum was built throughout the grant period in order to incorporate the diverse needs of students at each particular site (pp. 13-14). For example, vocabulary words taught to restaurant workers were oriented to the food service profession. Vocabulary words taught to hospital employees related to the medical profession (p. 19).

The conclusion regarding the project was that major progress had been initiated toward the main goal of the project—of producing a workplace program for Greater Boston utilizing the major participants of business, education, and labor (Levine & Pansar, 1990, p. 15). Recommendations for improvement which are pertinent to this study include the following:

1. Responsibilities should be clearly defined among members of the partnership.

2. Employers should have more involvement in curriculum development. The curriculum should be specifically delineated from job requirements.

3. Student assessments should be closely correlated to job tasks. A collaborative effort should be made between the community college counselor, the teacher, the employee's supervisor, and the employee for determining the focus of the education of the employee.
4. Employee records should be extended to include complete demographic information. This would enable counselors and instructors to understand better the needs of their students (Levine & Pansar, 1990, p. 17).

5. Classes of 20 students were too large. Class size should facilitate the instructor's ability to give individual attention.

6. Class duration was 15 weeks. Instructors and union representatives felt that course length should be at least 1 year.

7. Class composition should include students with similar abilities. Instructors expressed difficulty in teaching classes of students with mixed abilities.

8. More counseling should be provided in order to ensure student success. Many capable students dropped out due to a lack of self-confidence. Some students who dropped out could have been retained with the presence an atmosphere of greater support from the employees' supervisors, instructors, and counselors (Levine & Pansar, 1990, p. 23).

Findings reflect that the BWEC was successful in delivering an effective basic skills program to employees. A high level of employee-employer satisfaction was experienced (Levine & Pansar, 1990, p. 1).
West Virginia Northern Community College

West Virginia Northern Community College (WVNCC) provided workplace literacy programs for both Weirton Steel Corporation and Union Carbide Corporation through the Workplace 2000 project (U. S. Office of Vocational and Adult Education [USOVAE], 1990, p. 1). The project was funded by a Workplace Literacy Partnerships Grant which was received from the United States Department of Education. The duration of the program was 18 months—from October 1, 1988 until March 31, 1990, p. 21. The focus for the entire program was to teach job enhancement skills (p. 5). Both corporations shared goals in two areas of skill enhancement--upgrading technological skills and improving worker's listening, speaking, reasoning, and problem solving skills. Weirton Steel opted to provide the basic literacy skills of reading, writing, and mathematics alone (pp. 3-4).

The curriculum development effort stressed the customization of courses. Although the college already had instructional modules for many of the courses, it quickly became clear that major modifications would have to be made to meet the needs of the partner corporations. The college assigned two instructors with expertise in curriculum design to revise the courses. They met with corporation employees, supervisors, and training specialists to produce customized instruction and courseware (USOVAE, 1990, p. 5).
The college hired most of the instructors from its own faculty. New teachers had to be knowledgeable in adult education. Industry-related experience was emphasized. The instructors were referred to as trainers because the project leaders feared that employees might have negative connotations of more traditional education terms. Teachers received Train-the-Trainer instruction. Because the courses were standardized, teachers had to be sanctioned for each course they taught (USOVAE, 1990, p. 6).

The two corporations promoted the programs differently. At Union Carbide, a subcommittee informally promoted the program. The college held a "lunch-box" seminar with employees to inform them of the program. Because Weirton Steel had an extensive television communication network throughout its facilities, the corporation's communication division developed recruitment video tapes for broadcast over the system. House publications were used to publicize the classes which included articles and registration forms. Brochures were sent to employees' homes. Employee involvement groups and committees were encouraged to advertise the program. Throughout all of the promotional efforts, a strong emphasis was placed on the job specific customization of the training. Training at both corporations was offered on a voluntary basis. This was a normal procedure since both were unionized (USOVAE, 1990, p. 7).
Approximately 20%, or 1,800, of Weirton Steel's employees took part in the program. The following courses were provided to the Weirton employees: (a) reading for the workplace, (b) writing for the workplace, (c) fundamental mathematics for the workplace, (d) oral communications, (e) problem solving and decision making, (f) time management, (g) interpersonal skills, (h) keyboarding techniques, and (i) computers and information processing (USOVAE, 1990, pp. 9-10).

Union Carbide had a much smaller program. Sixty-two employees were given computer operation instruction and 39 attended interpersonal and communication skills classes.

Louis W. Bender, a professor of higher education at Florida State University, was the external evaluator for the project. He made a total of three site visits (USOVAE, 1990, p. 21). Class materials were assessed with regard to the program objective. Training areas were examined. Bender conducted interviews with program coordinators, corporation management, and employee trainees. Proposed outcomes were contrasted with final outcomes (p. 22).

The instructors at Weirton Steel gave the trainees two evaluative instruments at the end of each class (one for WVNCC and one for Weirton Steel). The courses were consistently rated satisfactory and very satisfactory. Supervisors received a survey at the end of the project in order to rate their employees' work productivity. This
survey also yielded positive ratings. Bender made the following overall recommendations for the project at Weirton Steel:

1. Work shifts and flex time shifts were erratic, thus making scheduling of classes difficult. Employees' spouses should be able to attend the classes on a space-available basis.

2. Some supervisors did not support the project; thus, employees were forced to enroll during personal time. Management should emphasize the importance of the program to supervisors (USOVAE, 1990, p. 30).

3. Unions, management, and WVNCC administrators should be equally represented in the promotion and decisions of the project. Bender felt that union members felt slighted. All three entities should work together to achieve the maximum potential of the project (p. 31).

4. Reading classes were given to employees with 8th-grade level or above reading skills, rather than the anticipated lower reading skill level. Departments should be targeted where lower skill levels exist. Supervisors should encourage employees to attend the basic reading classes (USOVAE, 1990, p. 32).

The only recommendation Bender had for the Union Carbide operation was that classes be held at the plant site. Initially Union Carbide planned to provide a classroom at the plant but other arrangements had to be made
when space became unavailable. As a result, worker-trainees were required to travel to the WVNCC campus. They expressed frustration at the inconvenience of driving to the campus (USOVAE, 1990, p. 35).

When members of the partnership conducted their own internal evaluation, they found that 51% of the student-workers used their new skills on the job, 67% of the student-workers felt that their opportunities were enhanced, 79.3% of the supervisors reported that the student-workers were more productive on the job because of the classes and that the benefits of the classes outweighed the expenses of the work-release time, and 92.8% of the student-workers tested higher in reading (USOVAE, 1990, pp. 11-12).

Summary

Chapter II reviews the literature associated with workplace literacy and community college collaboration. Specific areas of review are an introduction to specific workplace related literacy problems, the community college connection, the theoretical basis for workplace literacy programs, and examples of community college collaboration.
CHAPTER III

PROCEDURES OF THE STUDY

Introduction

One of the 11 recommendations for the arena of adult literacy made by Hunter and Harman (1985) is the use of a case study approach. These researchers advised case studies to cover such fields as models for financing, models for generating competencies necessary to be functionally literate, and models of flexible approaches for attainment of goals (p. 134). The approach suggested by the last recommendation was used for this study. Community colleges have long been lauded for their flexibility. The success of a workplace literacy program is also dependent on its flexibility.

According to Good and Scates (1954), a case study is "an intensive investigation of the particular unit represented" (p. 729). Although quantitative techniques may be more easily managed, case studies also serve as a valuable tool for prediction purposes. Statistical studies do not necessarily perform the same function in education that they do in the sciences (pp. 772-773). Case studies seek "particularized information" through an exhaustive collection of available data about the subject area (Wise, Nordberg, & Reitz, 1967, p. 114).
Procedures

The use of the term "modified" in the title of this study refers to the judicious use of sources available for interviewing. The subject of literacy is exceptionally volatile for some companies. One of the companies under consideration for this study did not wish to be identified, even though employee confidentiality was assured.

The companies surveyed represented the community college link to literacy. Data were collected through interviews with program administrators for the businesses and community colleges. Interviews were recorded using handwritten notes or a tape recorder, depending on the preference of the interviewee. The five companies represented included two electronics companies (Texas Instruments and SGS-Thompson), Abbott Laboratories (a pharmaceutical company), J & E Die-Casting Company, and company X, a pseudonym for a semi-conductor company that requested anonymity.

Interview questions were divided into three categories: those directed to the corporations, those directed to the community colleges, and those directed to both the corporations and the community colleges.

The following questions were directed to the corporations:

1. How does your program define literacy?
2. Why did this program come into existence? Why is it necessary?

3. What are the program goals? Have they changed since the inception of the program?

4. How many employees are enrolled in the program currently? Annually?

5. What are the primary demographics of employees in your program?

6. Do employees find that the program has been beneficial and, if so, how?

7. How many employees drop out? Why?

8. Have you promoted your program to employees? If so, how?

9. Do employees receive any recognition for participating in the program?

10. Who made initial contact? Did the community college contact the company or vice versa?

11. How many program sites are there? What type of facilities are used?

12. What philosophical support has the corporation demonstrated during the inception and duration of the program? How many levels of management are involved?

13. What is the annual budget for your program? How is it funded?

The following questions are directed to the community colleges:
1. What are the logistics of your program—a step-by-step review of how it works?

2. What is the administrative structure?

3. What are the purposes and structure of the curriculum? What is the length of each unit?

4. What modes of delivery do you employ?

5. How are teachers selected? Are they provided with specialized training?

6. What type of needs analysis was implemented?

7. How do you determine which employees need remediation?

8. What philosophical support has the community college demonstrated during the inception and duration of the program?

The following questions were directed to both the corporations and the community colleges:

1. What makes the program distinctive? What peculiarities of the corporation have demanded modifications to the program?

2. In what ways has the program been successful? In what ways has it been unsuccessful?

3. What mistakes were made in the formulation of the program?

4. Do you formally assess the program? If so, how?

5. How do employees receive feedback? How often do they receive feedback?
6. What recommendations would you have for other companies beginning a workplace literacy program?

7. What are your future plans for the program?

Analysis of the Data

Research findings vary regarding the characteristics of an effective in-house basic skills program. The afterword to the 1988-89 American Management Association stresses that instruction in the basic skills "must be directly related to the job at hand if training is to succeed" (Greenberg, 1989, p. 70). Dunn-Ranken and Beil (1990) suggested the following four criteria:

1. Program goals should be well-defined.
2. Materials should be germane to student needs.
3. Students should receive continual feedback.
4. Evaluation methods should be employed to aid program effectiveness (p. 47).

In the *Workplace Basics Training Manual*, a publication of the American Society for Training and Development, Carnevale, Gainer, & Meltzer (1990) listed the following eight steps for a basic skills program "blueprint for success":

1. Identify the basic skills problem.
2. Build an advocacy with management and unions.
3. Present strategy for management approval.
4. Implement a task analysis.
5. Plan the curriculum.
6. Design the program.
7. Execute the program.
8. Evaluate the program (p. 9).

A field study of 18 successful workplace literacy programs conducted by Zalman (1991) revealed three design factors that differentiated them from programs that had failed. First, the programs utilized a strong kinship system. They consisted of corporation or union leadership, teachers, mentors, human resource representatives, and co-workers. The systems provided strong emotional and psychological support for students. Second, curricula were divided into short (one or two weeks) units. Quick accomplishment provided students with an incentive to continue in the program. The curriculum was customized specifically to the workplace. Employees easily related to it. Third, students received frequent recognition. Recognition from management visits, ceremonies, and community and company publicity reflected the kinship of the organization (p. 75-77).

Summary

The procedures of this study were designed to gain insight into the machinations of community college sponsored workplace literacy programs through a modified case study method. An interview schedule was devised utilizing three sets of questions: those directed to the corporations; those directed to the community colleges; and those directed
to both entities. Suggestions for analysis of the data included the investigation of program goals, task analyses, curriculum, materials, student feedback, and assessments.
CHAPTER IV

PRESENTATION OF FINDINGS

The purpose of this chapter is to present a summary of data obtained from 10 personal interviews with representatives from the community colleges and corporations regarding their workplace literacy collaboration. Each of the five modified case studies includes a description of the program, beginning with specific definitions of workplace literacy and culminating with recommendations for other companies and community colleges wishing to participate in a similar program.

All of the community colleges involved in this study were with the Dallas County Community College District (DCCCD). This analysis begins with a report of the administrative structure because it affects all of the corporations and community colleges involved.

The DCCCD has a Business and Professional Institute (BPI) on each campus. Each campus has one or more account executives who solicit external business from corporations and set up customized programs for them. The account executives contact a subject matter expert on campus when a corporation expresses an interest in a particular arena (D. Walker, personal interview, October 10, 1991). If the account executives do not find the proper resources
available on their particular campus, they are free to contact other campuses (R. Farrow, personal interview, November 7, 1991). The account executives construct the contract and serve as liaison between the company and the college throughout the program as necessary (D. Walker, personal communication, October 10, 1991).

Pricing for the programs is consistent district-wide, and funds earned from the corporations served go into the particular college's general fund (D. Walker, personal communication, October 10, 1991). It has been suggested this structure should change, that the money should be funneled to the departments earning it so that they can derive benefits. (R. Farrow, personal communication, November 7, 1991). As a unit, the BPI makes a profit, but as a college, it does not. The revenue is, instead, used to supplement other high cost areas on campus (K. Whitson, personal communication, November 15, 1991).

The hierarchy of power is somewhat confusing. Account executives report to a district office that is located in downtown Dallas. This prevents the colleges from impinging on each other's territory. However, account executives are also required to obtain permission from the president of each campus before any program implementation. This procedure reduces the confusion created when a campus prefers to solicit from a particular company in a different

The structure described is how BPI serves businesses in the community with customized programs, including workplace literacy. The one exception to this structure within the five case studies is Texas Instruments. The story of Texas Instruments is discussed within its individual case description.

Company X/North Lake College

Company X (X) manufactures semiconductors and has other locations in New York, and California. X has approximately 500 employees in the facility located in Irving, Texas (J. Doe, a pseudonym for the Human Resource Specialist at X, personal communication, October 29, 1991).

For its own purposes, X defines literacy as reading and writing in English at a sixth-grade level. The employee population at X primarily consists of Southeast Asians--Cambodians, Laotians, Vietnamese, and Koreans (J. Doe, personal communication, October 29, 1991). Only 20% of the company's employees are native English speakers (D. Walker, personal communication, October 10, 1991). Most employees are female first-generation immigrants. The median age is 30 years. Employees of X are solidly middle class, with no significant financial problems (J. Doe, personal communication, October 29, 1991).
The motivation to implement the program began when management realized that some employees were unable to read job specifications, and the work force was not changing with the technology. Although the company was purchasing more sophisticated equipment, the employees were not always able to use it correctly. Two additional criteria which added incentive to the company beginning a literacy program were (a) X had an "education-minded" president and (b) the availability of adequate funds for such a program (J. Doe, personal communication, October 29, 1991).

The literacy program at X was begun in the summer of 1989 (J. Doe, personal communication, October 29, 1991). After X had contacted North Lake College, J. Doe, met with Donna Walker, Director of the Learning Skills Center at North Lake College to negotiate the logistics. The resulting classes involved 48 hours of class time over a period of 6½ weeks (D. Walker, personal communication, October 10, 1991). The classes met five times each week and averaged 17 students per class. Enrollment for each session was between 125 and 150 students (J. Doe, personal communication, October 29, 1991). Seven levels of classes were necessary because some employees were almost proficient in English while others were much less proficient in reading and speaking English. Classes were scheduled according to employees' work shifts—6:00 a.m., 10:00 a.m., 12:30 p.m., 3:00 p.m., and 5:30 p.m. Sometimes two or three classes
were held at the same time (D. Walker, personal communication, October 10, 1991). In order to prevent the classes from severely affecting its manufacturing operations, X hired temporary employees to substitute while regular employees were in class (J. Doe, personal communication, October 29, 1991).

X promoted the program by setting up small meetings to directly describe plans for the program to employees. Representatives of the company explained to employees that some testing would be involved and that they should not feel threatened. Employees were assured that no one at X would ever see the results and that confidentiality would be maintained (J. Doe, personal communication, October 29, 1991).

Class schedules had to be extremely flexible because the program at X was mandatory. Everyone was tested using the University of Michigan test, the same test that North Lake College utilized to determine if students could enter a regular credit academic program. Test scores were kept confidential between individual employees and North Lake College. After the initial testing, North Lake College representatives met with the employees as a group and distributed a letter to each student reporting the test score and grade level. The letter also explained when and where they were to report to class. Students were tested at the end of each class and were required to retake the class
if they did not pass the test. No needs analysis was completed by the college (D. Walker, personal communication, October 10, 1991).

North Lake College was careful to send instructors to the workplace who could easily integrate their teaching methods for adult workers. They began by working in the college language laboratory at North Lake College so that personnel could view their level of student interaction and professionalism. Because of the sensitivity required in workplace literacy programs, North Lake College demands teachers who have "almost mothering images. They have to meet the basic qualifications and be experts in their field, but if the human element isn’t there, they are not getting into the classroom" (D. Walker, personal communication, October 10, 1991).

Instruction was primarily instructor-led. However, because the primary focus of an English as a second language program is to get students to communicate, instructors initiated discussion and then lead the class into conversations. Many of the teachers were creative. One teacher went to the arboretum and took pictures so that the class could write stories using the pictures. North Lake College also integrated workplace vocabulary into the curriculum. One goal was for employees to read the company’s safety policies and procedures, so that they would know what to do when an employee was injured.
North Lake College has considered asking employees to view a videotaped job situation and then to explain what is taking place. In addition to helping employees learn English, this technique would allow the company to learn from its employees. Because of difficulties with the English language, even brilliant employees who see a better way of performing their jobs often are unwilling to try to communicate their ideas to their superiors or coworkers (D. Walker, personal communication, October 10, 1991).

After the initial literacy assessment was completed, employees received feedback individually from their teacher. Although employees did not receive grades, they did receive Continuing Education Units from North Lake College (D. Walker, personal communication, October 10, 1991). X did not give any particular recognition to employees who participated in the program (J. Doe, personal communication, October 29, 1991).

Once the employees reached the college entrance level for English, they were graduated from the literacy program and were allowed to enroll in classes at North Lake College if they so desired. Retention of employees who failed to successfully complete the literacy program was a concern for the teachers from North Lake College. The teachers have returned to X one day a week in order to attend workshops with "round-robin" discussions for the purpose of encouraging employees to speak in English (D. Walker,
personal communication, October 10, 1991). If there was a mistake in the formulation of the program, it was the failure to include maintenance classes in the total plan (J. Doe, personal communication, October 29, 1991).

Although there has been philosophical support from the community college, the attitude at first was somewhat defensive. Some North Lake College employees expressed the opinion that it was not the college’s place to "help other companies get their house in order" (D. Walker, personal communication, October 10, 1991). A poll of the campus revealed that most supported the literacy program as part of the college’s mission statement because North Lake College is a community college (D. Walker, personal communication, October 10, 1991).

The program at X was unique because it was exclusively an English as a second language program (D. Walker, personal communication, October 10, 1991). Complete and enthusiastic support of the program was demonstrated by management from the president through lower management. Supervisors were happy because they were getting a better educated work force and were provided with workers to fill temporary vacancies. X would not reveal the actual budget figures, but indicated that the program was expensive (J. Doe, personal communication, October 29, 1991).

The program was successful in several ways. Scores from pretests and posttests revealed that English
proficiency was improved (D. Walker, personal communication, October 10, 1991). The trainees were enthusiastic about the program once they realized that they would not be penalized for not knowing English. Learning English made their lives easier. Many were motivated because their children could speak English fluently. As a result of their increased abilities to communicate, the employees were more confident on the job. The program gave the company’s employees a tremendous boost in morale and loyalty. Because the program was mandatory, there were not any dropouts (J. Doe, personal communication, October 29, 1991). The program was successful in educating the employees. However, a weakness of the program was the lack of continual reinforcement in English language skills which if not corrected, has the potential to undermine the success of the entire program (D. Walker, personal communication, October 10, 1991).

X’s program is on hold at present due to the lack of budgeted funds. The company appears to have lost interest in the program (J. Doe, personal communication, October 29, 1991). Program leaders at North Lake College, expressed a desire to continue remedial opportunities in English for employees and would like to initiate a mathematics program (D. Walker, personal communication, October 10, 1991).

Both X and North Lake College had several good recommendations for other companies. North Lake College warned that all levels should be involved from the
beginning, from the highest level of management to the lowest level of employee. Because program leaders at North Lake College were concerned with retention of information, they recommended that the company have an internal structure in place to support the program. They felt that an incentive program was needed to encourage supervisors to insist that their employees use English (D. Walker, personal communication, October 10, 1991).

X also recommended that better facilities be provided for classrooms. The classes at X were held in conference rooms which were sometimes inconvenient and not always conducive to learning. Ideally, classrooms should be designed especially for the program. Program coordinators at X emphasized that such a program is fairly expensive but feel that it is important for employees to be able to attend class during the work day.

Furthermore, they recommended that a company's management communicate in a very direct and positive way with their employees from the beginning of the program. They also believed that, when necessary, the company should not be hesitant to make the program mandatory (J. Doe, personal communication, October 29, 1991).

J & E Die Casting/Richland College

J & E Die Casting (J&E) is the Texas branch of a larger corporation, the Cascade Die Casting Group, and presently employs 57 persons, having just gone through a reduction in
force. There are four other branches located throughout the United States (M. Paredes, personal communication, November 7, 1991).

The program lasted five months and began in February, 1991. The BPI representative from Richland College was Rebekah Farrow and the J&E representative was Maria Paredes, Personnel Manager. The program was totally mathematics oriented. Literacy for J&E was defined as being proficient enough in mathematics to use Statistical Process Control (SPC). When the company began SPC classes, the trainer quickly discovered that employees lacked adequate mathematics skills. Management at J&E wanted to incorporate SPC with the latest technology in order to keep up with their competitors. J&E called Richland College to find out what was available for them (M. Paredes, personal communication, November 7, 1991). J&E gave Richland College SPC videotapes so they could assess the level of mathematics needed for SPC proficiency. This encompassed the needs analysis completed by Richland College (R. Farrow, personal communication, November 7, 1991).

The work force at J&E was 80% Hispanic, and predominantly male. Most of the employees were inadequately educated; some had only a fourth- or fifth-grade education. Most of the participants also had low income levels, although some employees from top management also attended
the classes to increase their mathematics skills

An instrument created by a mathematics instructor at Richland College was used to assess the employees' skills. The instrument was a 35-question test which also had instructions in Spanish. The same test was used as a posttest at the end of the course. Employees of all three shifts were assessed. Each student received an assessment sheet and met with the instructor individually. The instructor spent about 15 minutes with each student, explaining the test. Each student received an individual prescription. Students also received continuous feedback during the class (R. Farrow, personal communication, November 7, 1991). Both Richland College and J&E recorded the employees' scores (M. Paredes, personal communication, November 7, 1991).

Although a broad spectrum of mathematics skills existed within the group, 70% of the employees needed some type of remediation. Classes were scheduled in the evenings and in the afternoons, but not during work time. Employees attended classes after their shift and, initially, were paid to stay overtime. Originally one class was to be taught in English and another in Spanish. J&E was adamant about the need for a Spanish-speaking instructor. As the program progressed, the classes were combined because there were many levels of proficiency and the work schedules did not
divide evenly into a Spanish and an English class. Each
class was arranged to be a 30-hour course, to be completed
in 10 weeks. Classes met twice a week for 1\frac{1}{2} hours, in a
conference room within the company. The instructor gave
both Spanish and English instructions. The employees used a
self-study workbook which allowed the instructor to
facilitate many levels within the same class. Each class
contained 10 employees, which allowed for personal
interaction (R. Farrow, personal communication, November 7,

Several parameters were followed by Richland College in
selecting an instructor. Six instructors were interviewed
for the position. The instructor hired for the J&E program
was from Cedar Valley College. J&E specified that the
instructor must be male and Hispanic, in order to represent
the composition of the work force. Because of time
parameters, the instructor received no specialized training
for teaching in the work place. The representative from
Richland College indicated that this was a definite
deficiency of the program (R. Farrow, personal
communication, November 7, 1991).

There was no special promotion provided for the program
as was mandatory from the beginning. Employees were
cautionsed that, in order to get any promotions, they would
have to learn the SPC mathematics. They were also assured
that the classes would enrich their personal lives and were
given a certificate and continuing education units credit from Richland College (M. Paredes, personal communication, November 7, 1991).

J&E received excellent feedback from the employees. Paredes personally described how employees' faces would "light up" when they remembered the multiplication tables. One employee happily exclaimed, "Before, I didn't really know the zero—as round as it is, and now you won't even be able to short me on my check because I know how to figure out my check!" Another employee was proud that he could now help his young daughter with her mathematics. The employees' posttests reflected their success. One man scored 5% on the original assessment. When retested he scored 97%. There were, however, dropouts (although exact numbers were not available) in the program when the company ran out of funds to pay for overtime, and employees were asked to attend classes on a voluntary basis. However, most employees continued the program (M. Paredes, personal communication, November 7, 1991).

According to Paredes, the company supported the program, as evidenced by their initial financial commitment to the program. Funds for the program came out of a generic training budget (M. Paredes, personal communication, November 7, 1991). For the community college's part, Farrow was charged with customizing the program for business, even though she is a generalist. She emphasized the difficulty
of offering a college course to business without first customizing the course (R. Farrow, personal communication, November 7, 1991).

This program was distinctive because it first addressed mathematics, but also revealed further needs in both reading and writing. Eventually, J&E would like to have a complete literacy program (M. Paredes, personal communication, November 7, 1991).

From the community college perspective, the program at J&E was distinctive because of two criteria. First, it focused exclusively on mathematics. Second, J&E called upon Richland College to meet their needs because their SPC instructor was a Richland College graduate and had influence within the company (R. Farrow, personal communication, November 7, 1991).

The program was successful because it improved the employees' mathematics skills and demonstrated to them that the company's management cared about them (R. Farrow, personal communication, November 7, 1991). However, it was less successful because of miscommunication between Richland College, the instructor, and the company (M. Paredes, personal communication, November 7, 1991). Farrow never actually met with J&E management, which led to the miscommunication. She expressed her feelings about the program ending abruptly in the following statement: "It was almost like one day they had the money to pay overtime, and
one day they didn’t" (R. Farrow, personal communication, November 7, 1991).

Farrow suggested that the program should have included two different courses, one on general mathematics and one on pre-SPC mathematics. The format used did not allow enough time to bring employees up from a basic level to what they needed for SPC (R. Farrow, personal communication, November 7, 1991).

Paredes advised that all companies start a basic skills program. She stressed that their major asset is their employees, and, therefore, companies should do all they can to educate them (M. Paredes, personal communication, November 7, 1991). Furthermore, Farrow suggested that employees at all levels should be involved in planning such a literacy program. As Farrow emphasized, it is a tremendous commitment that demands the full support of both upper management and employees.

Another recommendation by Farrow was that the instructors be prepared to meet the work force. The limited time frame of J&E’s program did not permit instructors enough time for the selection of workbooks and materials. A more thorough investigation was recommended (R. Farrow, personal communication, November 7, 1991).

SGS-Thomson Microelectronics/Brookhaven College

SGS-Thomson Microelectronics (SGS-Thomson) is a company which manufactures semiconductor parts in Dallas, Texas.
The Dallas facility is the company's corporate headquarters. Other locations include Phoenix, Arizona; Montgomeryville, Pennsylvania; and Sommerset, New Jersey. The company has numerous field sales offices throughout the United States. The company presently employs 850 individuals, after experiencing four reductions in its workforce in 1991 (L. A. Hereford, personal communication, December 9, 1991).

The representations of SGS-Thomson considered literacy the ability to read well enough to learn SPC. Their goal was for their employees to have basic skills at an eighth-grade level. Their goals did not change during the program. Although a computer program had been purchased to enable their direct labor line to learn SPC, some employees would sit in front of the computer with their book and just turn the pages. Their test answers were bizarre. When asked directly what the problem was, each answered, "I just can't read this" (L. A. Hereford, personal communication, December 9, 1991). It is important to note that the employee population at SGS-Thomson consists of lower income level Afro-Americans, Caucasians, Hispanics, and Orientals. The majority of the employee base is Oriental—Vietnamese, Chinese, Cambodian, and Taiwanese. Managers at SGS-Thomson admitted that their problem involved English as a second language as well as a reading literacy problem (L. A. Hereford, personal communication, December 9, 1991).
SGS-Thomson's program with Brookhaven College began in summer 1990 and ended in May 1991 (L. A. Hereford, personal communication, December 9, 1991). SGS-Thomson's management contacted Brookhaven College's BPI Senior Accounts Manager, Kathleen Whitson, to initiate a basic skills training program. The SGS-Thomson representative was Larry Anne Hereford who was Manager of Employee Relations.

Representatives at SGS-Thomson had already tested all of their employees before contacting Brookhaven College. They had purchased a test from a consultant that covered basic mathematics, reading, and writing. SGS-Thomson did not want all of their employees retested. Brookhaven College decided to disregard most of the data from the test because it did not appear to be pertinent. There was no distinction on the test as to whether a person could not read because of lack of ability or because English was not his or her native language. The mathematics section had an inadequate number of questions and did not properly reflect the employees' mastery levels. No formal needs analysis was conducted by Brookhaven College. SGS-Thomson was adamant in their communication with Brookhaven College, declaring, "We need reading, writing and math" (K. Whitson, personal communication, November 15, 1991).

Brookhaven College offered basic reading and mathematics to employees on a voluntary basis. This provided college personnel the opportunity to retest
employees. Brookhaven College used the Nelson-Denny test, but administered it at a level beyond the skills of the employees. Employees were extremely frustrated. Brookhaven College decided to use data from the Nelson-Denny test and from the previously administered test in their plans to initiate classes.

In the fall 1990, Brookhaven College began a mathematics class, again on a voluntary basis. For placement in the class, the college created its own mathematics assessment. An adjunct faculty member designed the instrument especially for mathematics in the work place and structured it to be used with the workbook.

English as a second language classes began in the Spring 1991. Prior to this time, SGS-Thomson had offered classes within the company. After the first session, Brookhaven College began using the Test of Adult Basic Education (TABE) locator to assess employees' reading levels (K. Whitson, personal communication, November 15, 1991).

The courses varied in hourly increments. Reading, writing, and English as a second language were 30-hour courses. Mathematics was a 15-hour course. Class periods were two hours in length, one day per week, but were offered twice a week. Class size averaged 15 students. Employees who were in basic reading and writing classes could attend on Monday or Friday. English as a second language and
mathematics classes met on Tuesday or Thursday (K. Whitson, personal communication, November 15, 1991).

The three terms with Brookhaven College were: May-August 1990, September-December 1990, and January-May 1991. The first term had an enrollment of 64 students in reading and writing. The second term had an enrollment of 27 in reading and writing, 88 in mathematics, and 89 in English as a second language. The third term had an enrollment of 19 in reading and writing, 62 in mathematics, and 72 in English as a second language. Drop out rates were minimal (L. A. Hereford, personal communication, December 9, 1991). Classes were taught on the employees' days off, but employees were paid straight time for attending (K. Whitson, personal communication, November 15, 1991).

The instructors were selected from a pool of adjunct professors at Brookhaven College. Special training for the SGS-Thomson program included viewing a SGS-Thomson employee-orientation video and touring the plant. Whitson designated a lead instructor for each discipline to ensure that all classes were covered. Instructors were allowed to use any format they wanted. They used practical tools—newspapers, magazines, and telephone books—and incorporated the jargon of the company. Any printed materials were used that would help, from a specification sheet for manufacturing to the standard weekly memorandum they
received (K. Whitson, personal communication, November 15, 1991).

SGS-Thomson promoted the program to employees during the initial consultant testing. Hereford then attended department meetings and explained statistical data concerning how many employees were below and above an eighth-grade level. Results were anonymous. Notices were mailed to individual employees by the company reflecting test results and suggesting remediation in the various areas offered. The company sent the information to employees' homes in order to ensure their privacy (L. A. Hereford, personal communication, December 9, 1991). During the classes the employees' scores were not made available to SGS-Thomson; however, the company was aware of which employees did or did not move on to another class (K. Whitson, personal communication, November 15, 1991). At the end of the course, employees received a certificate and continuing education unit credits (L. A. Hereford, personal communication, December 9, 1991).

SGS-Thomson provided adequate classroom facilities for the program. Because the company had formerly been Mostek, which employed 10 to 12 thousand persons, several buildings around the present facility were available for use. Classes were held in a building that had previously been a training center (L. A. Hereford, personal communication, December 9, 1991).
Both the college and the company exhibited strong support for the program. Brookhaven College's president formed a task force to investigate the area's need for literacy programs. The team decided that a literacy person should be hired for the college--someone who could find good testing instruments and coordinate credit and non-credit dimensions for the college. The person has yet to be hired (K. Whitson, personal communication, November 15, 1991). Management at SGS-Thomson was also completely supportive of the program. There was never a question of it being the correct course of action.

At the conclusion of each class at least two directors of the manufacturing area, along with managers and supervisors, came to the class to congratulate the employees. The project was funded through the budget controlled by the Vice President of manufacturing (L. A. Hereford, personal communication, December 9, 1991).

The program was distinctive because of the predominantly Asian employee population (L. A. Hereford, personal communication, December 9, 1991). It was deemed a success because the employees of SGS-Thomson improved their skill levels (K. Whitson, personal communication, November 15, 1991). SGS-Thomson measured the success of the program by the employees' attendance rate. They were assured that the employees supported the program because the employees were willing to return to the workplace on their days off.
The company specifically did not want to retest the initial employee population to measure improvement because of concern that the employees had already been tested excessively. However, supervisors have since remarked on performance reviews that they have seen improvement (L. A. Hereford, personal communication, December 9, 1991).

The uneven starting point was a detriment to the program. Brookhaven College did not have good testing instruments or materials in place, and the employees had been assessed before the college became involved. The data provided from the program did not give Brookhaven College adequate employee assessment information (K. Whitson, personal communication, November 15, 1991). Representatives of SGS-Thomson realized that better testing tools were needed by the college. The initial Nelson-Denny test discouraged many employees because the level used was too advanced for their abilities. SGS-Thomson representatives generously attributed the problem to the fact that the program was put together in a short period of time (L. A. Hereford, personal communication, December 9, 1991).

An additional problem involved the anonymity of participating employees. The employees were never sure that their classroom performance would remain confidential. Management failed to convey a clear message that confidentiality would be strictly maintained.
Other company communication was equally unclear. Information that was to be filtered down to employees concerning starting dates and times was never received by some employees (K. Whitson, personal communication, November 15, 1991).

In making recommendations for other programs, Whitson stressed that adequate communication is vital to a successful program. A company-wide meeting should be held where top management utilizes a positive benefits approach and assures anonymity. Whitson also suggested that advanced classes be scattered throughout the program so that management can not ascertain whether an employee is attending a basic or advanced class (K. Whitson, personal communication, November 15, 1991).

Hereford stressed that the company should be included in the teacher selection process. She observed that some teachers in the program were tremendous educators, and others were not committed to the program (L. A. Hereford, personal communication, December 9, 1991).

At present, no plans have been made for further collaboration with Brookhaven College. SGS-Thomson is going to be on a split work schedule in the near future. This means that some employees will work a full-time factory schedule, 7 days a week for 24 hours a day, and others will remain on a 5-day work week. Because of their employees’ uneven schedules, SGS-Thomson considers a program such as
the one conducted by Brookhaven College impossible for the foreseeable future. Company representatives are currently investigating a self-paced computer-based program which would allow employees to come and go as their schedule permits (L. A. Hereford, personal communication, December 9, 1991).

Abbott Laboratories/North Lake College

The Abbott Diagnostics Division is part of Abbott Laboratories (Abbott), a pharmaceutical corporation of over 40,000 employees worldwide. The diagnostics division is one of six divisions, and employs about 1,600 persons at the Irving, Texas site (Z. Newlin, personal communication, December 3, 1991).

Abbott received a federal grant in March, 1991 in the amount of $312,000 to fund a work place literacy program. Abbott and North Lake College also contributed a total of $136,000, which brought the total program funds to $448,000 for 18 months of work place literacy classes (Z. Newlin, personal communication, December 3, 1991). A financial mandate from the government was that $18,000 be earmarked for evaluation and staff development. The PLATO computer-based skills program cost approximately $52,000 (J. Maki, personal communication, December 3, 1991).

The program began when a resource development employee at North Lake College obtained the federal regulations for work place literacy grants and believed participation was
viable for Abbott and North Lake College. Abbott and North Lake College had experienced good relationships in the past. Since Abbott is across the street from the college, company representatives had previously contracted with North Lake College for various courses. A committee was formed and coordinated by Kovider Mokhtari, Assistant Vice President of Instruction from North Lake College, and Zelma Newlin, Course Development Specialist from Abbott. Newlin had previously been Director of the Counselling Center at North Lake College (J. Maki, personal communication, December 3, 1991).

The grant was written in July 1990 (J. Maki, personal communication, December 3, 1991). Abbott made its contribution, and the grant was approved by the Department of Labor (Z. Newlin, personal communication, December 3, 1991). Administration of the project was handled by North Lake College; North Lake College was the grant recipient and Abbott was the business partner. The thrust of the grant was on contextual learning (J. Maki, personal communication, December 3, 1991). Before the receipt of the grant, Abbott assessed its employees' basic skills level and discovered that 85% of their employees scored below the ninth-grade level in reading and mathematics. Newlin discovered that most documentation that Abbott employees were expected to understand was at the sixteenth-grade level. Even if the employees had finished high school, they would still be
unable to figure out the necessary procedures. Newlin then explained to management, based on the assessment, only 5% of the employee population was able to understand the 3-day SPC course, upon which much of their business was based (Z. Newlin, personal communication, December 3, 1991).

The grant-funded program defined literacy as the ability to perform mathematics and reading tasks at an eighth-grade level. However, Abbott wanted their employees to be able to read personnel records, memorandums, any work related documentation, and to be able to utilize the mathematics required for their jobs. The company's goal was cross-trainability—for employees to be able to perform some or all of the jobs in their area. It was felt that their goal could be achieved by requiring employees to participate in a basic skills program designed to increase reading and mathematics skills (Z. Newlin, personal communication, December 3, 1991).

The racial demographics of employees at Abbott was closely divided into quarters: 25% black, 25% Hispanic, 25% Caucasian, and 25% Asian. About 50% of the employees are male and 50% were female. About three-quarters of the employees were over 40 years of age. Economically, employees at Abbott were in a lower salary range. Most had GEDs or high school diplomas. Among the employees, some had neither a high school diploma nor a GED. They had lied on
their job applications (Z. Newlin, personal communication, December 3, 1991).

Four full-time staff members were provided by the grant. Jackie Maki was the director of the program. There was a full-time administrative assistant. The other two positions were one-half time counsellor, one-half time teacher and one-half time course developer, one-half time teacher. The number of part-time instructors fluctuated from three to five (J. Maki, personal communication, December 3, 1991).

Students, or participants as they were referred to at Abbott, were encouraged to cooperate in their assessment. They were told that the program was an intermediate step in their education. They were told that it would bridge the gap of what they needed to know in order to take regular Abbott training and be effective on the job (J. Maki, personal communication, December 3, 1991). Communication of the program's goals and methods was facilitated through small groups (Z. Newlin, personal communication, December 3, 1991).

The employees were assessed by different methods. The TABE was used to assess reading skills. English as a second language proficiency was measured by the University of Michigan test. The mathematics assessment was initially developed by a North Lake College instructor and was inclusive of mathematics skills pertaining to a work

The classes were divided into three categories: Work Force Communication, Work Force Communication for English as a Second Language, and Work Force Mathematics. At various times, there were different levels within one class. Each participant received an individual development learning plan (IDLP) and met with the teacher on a weekly or bi-weekly schedule to work on objectives. The teacher assessed the participants continually. Classes were divided into 5-week sessions. Eighty to 100 students attended each session. They met for one hour, four times each week (J. Maki, personal communication, December 3, 1991). Classes were scheduled at the beginning or the end of work shifts (Z. Newlin, personal communication, December 3, 1991). Class size ranged from nine to 22; however, if more than 15 employees were in a class, two instructors were utilized. Most classes were instructor facilitated with little or no group lectures. Participants went to the PLATO laboratory at least once each week. The PLATO laboratory housed 10 computers. It was incorporated into the students' IDLP to facilitate the contextual workplace knowledge learned in the classroom (J. Maki, personal communication, December 3, 1991). Classes met in regular training rooms (Z. Newlin, personal communication, December 3, 1991).
Instructors were carefully selected. Because teachers are difficult to obtain on a part-time basis, the program paid a highly competitive salary to adjunct instructors. The teachers had to be able to work with adult learners. Flexibility was essential, as occasionally the curriculum had to be revised in the middle of a session. Teachers also were required to adapt to corporate etiquette because of their minimal but important interaction with management. Although there was no specific pretraining for instructors, Maki held a team meeting once a week and also met with the instructors individually once a week. Part of each team meeting was devoted to learning styles and skills analysis. Thus, the instructors were continually trained (J. Maki, personal communication, December 3, 1991).

One of the full-time employees conducted job skills analysis. The supervisor of a particular job was given a survey and was then interviewed. Ideally, two people participated in the analysis at once. This method allowed one to observe the job, using a job observation worksheet, while the other interviewed the supervisor (J. Maki, personal communication, December 3, 1991).

Participants found the program to be beneficial. They viewed the classes as being most helpful when employees were working on documentation specific to their job. Documentation from another unit was not considered by the supervisors to be as pertinent. The employees realized that
the training helped their marketability. They also realized non-work related benefits; they gained the skills necessary to read to their children, to do their tax returns, and to calculate their grocery budgets. Self-esteem was the greatest benefit. The employees viewed the program as one of the top benefits at Abbott, along with health insurance. Very few participants dropped out, 5% to 10% at most. Usually their reason was work-related—they felt that they just could not take the time off (Z. Newlin, personal communication, December 3, 1991).

Once members of management at Abbott overcame the initial skepticism and were shown the results of the initial assessment, they were extremely supportive—Abbott funded 23% of the program (Z. Newlin, personal communication, December 3, 1991). The community college was extremely supportive of the program, both because of the grant and because it was considered a national demonstration project. North Lake College administrators frequently visited the site (J. Maki, personal communication, December 3, 1991).

The program was distinctive from other local programs because of the grant. Like the previously described cases, the classes were held on-site and on company time (Z. Newlin, personal communication, December 3, 1991). Maki emphasized the contextual design of the curriculum. Because of the federal funding, she was very conscious of building a
process for others to follow (J. Maki, personal communication, December 3, 1991).

The basic skills of employees increased, making the program a success. Because the program was developed around job specific documentation, it validated the issue of workplace literacy as a corporate problem that must be addressed (Z. Newlin, personal communication, December 3, 1991). Employee morale was elevated by the program, which was not viewed as a stigma. The PLATO laboratory helped make the program exciting to the participants (J. Maki, personal communication, December 3, 1991).

The biggest problem was getting employees to attend regularly (J. Maki, personal communication, December 3, 1991). If they attended at least 75% of the classes, they received continuing education credit through North Lake College. They also received a certificate (Z. Newlin, personal communication, December 3, 1991). Eighty percent of the attendance problems were the result of real or perceived job pressures. Many times the participants did not want to let their fellow employees down by leaving their work station to attend classes. However, after the counsellor addressed the attendance problems, the situation improved (J. Maki, personal communication, December 3, 1991). Newlin noted that the only problem in the formulation of the program was the writing of the grant. It was redundant. Many expenses had not been included. A line
about potential promotions to participants should have been omitted. There was also an erroneous line concerning employees who were not doing their jobs effectively. They were effective, but they were depending on their coworkers to show them how to do their jobs (Z. Newlin, personal communication, December 3, 1991).

Recommendations for other programs include an initial job task analysis to investigate the specific type of mathematics skills the employees need rather than deciding on a general mathematics course. Assessment markets a literacy program simply because it discloses employee deficits to managements. Abbott does not recommend that companies undertake a literacy program with any partner other than a community college (Z. Newlin, personal communication, December 3, 1991). The community college offers continuing education credits and the very important anonymity factor (J. Maki, personal communication, December 3, 1991).

Because community college educators have experience in developmental classes, they are sensitive to adult learning. North Lake College and Abbott would prefer to move away from standardized assessments, and both view customized assessments as ideal. Customized assessments would also protect companies in case of lawsuits. If a company were asked, "Do the employees have to know this kind of
mathematics in their job?" the company could affirm that it was, indeed, necessary.

The program involving North Lake College and Abbott was designed to continue after the grant was finished. One of the options presently being investigated is to propose a continuation of the grant. The two entities could continue the program on a smaller scale now that the curriculum is intact. Under the proposed option, the curriculum would be continuously updated, but not recreated. Another option is for Abbott to continue the program totally in-house, as Texas Instruments has done. No one however, wants the cooperative project to end (J. Maki, personal communication, December 3, 1991).

Texas Instruments/Richland College

Texas Instruments Defense Systems Electronics Corporation (TI) is primarily involved in government contracts. They build armed missiles, radar detection devices, and many optic products, such as Forward Looking Infra Red, used during the Persian Gulf War. The North Texas division employs more than 10,000 persons. Four sites are located in Dallas along with sites located in McKinney, Lewisville, and Sherman (W. Freeland, personal communication, November 22, 1991).

The TI program began in February 1989 (W. Freeland, personal communication, November 22, 1991). Richland College initiated a grant for the United States Department
of Education. Jean Brewer, then Director of Learning Differences, saw a need for businesses to help employees who had difficulty with language development. She addressed the problem in the grant by offering to contact five Dallas corporations and offer them free classes on site for 1 to 2 years. She received a call from, and met with, Wayne Freeland, Manager of Job Enhancement at TI (J. Brewer, personal communication, December 2, 1991). Freeland had learned of Brewer's reputation through a contact at the Texas State School Board Association. He had sensed that learning differences were contributing to existing problems at TI. When he called, he found that not only could she help him, but that the necessary funds were available. The amount of the grant dedicated to TI was $50,000 (W. Freeland, personal communication, November 22, 1991).

The employee population at TI varied in age. The youngest student was 20 years of age, while the oldest was 61 years of age. Females slightly outnumbered males. Racial demographics were 50% white, 40% black, and 10% Hispanic. Most employees were in the middle-income range (W. Freeland, personal communication, November 22, 1991).

The problem that TI experienced was not initially labelled illiteracy. The definition of the problem that was given to Wayne Freeland was "the inability of people to pass tests around workplace specific training" (W. Freeland, personal communication, November 22, 1991). The training
included geometric dimensioning and tolerancing, blueprint reading and SPC. Employees were also unable to understand communications within TI concerning documentation and policy changes. Management suspected that the problem was due to low communication skills in reading and writing, with some concern about mathematics. The goal for the program was to "facilitate a person that has the ability to learn to remain competitive and flexible in the job skills that they presently have" (W. Freeland, personal communication, November 22, 1991).

TI promoted the program to employees during small group meetings. Company representatives explained to employees that the program was a free opportunity to have their skill level assessed. They emphasized facts and graphs from Workforce 2000 (Johnston & Packer, 1987) and explained how jobs at TI were becoming more diverse and technologically advanced. Because one of the sheet metal assembly jobs was being phased out at that time, the program was exceptionally timely for employees (W. Freeland, personal communication, November 22, 1991).

Brewer met with a licensed diagnostician, and together they designed a diagnostic tool using portions of various national assessments. They used portions of the Wide Range Achievement Test--Revised for mathematics and spelling. They also used parts of the Test of Written Language for writing and the Diagnostic Analysis of Reading Errors.
Handwriting was assessed by an instrument known as the College Handwriting Evaluation Scale. The assessment was promoted at TI's Lemmon Avenue site. Brewer, who expected about 60 employees to apply, had 175 applicants for the program. She assessed the employees in three groups. The assessment of each group took approximately two hours. Afterward, a team of coordinators from Richland College, who were trained by Brewer, met with employees individually to discuss their scores. Employees' scores were not shared with representatives of TI (J. Brewer, personal communication, December 2, 1991).

The basic language training classes began with 52 enrolled. There were three different levels of classes, each averaging seven students. Two classes were reading-based programs and one was a writing-based program. All of the courses met for 40 hours. TI provided a training room for the classes. Because TI did not have to pay for the original program, the company was willing to provide more than adequate resources and facilities (W. Freeland, personal communication, November 22, 1991). The employees were released for 1½ hours prior to the end of their shift, twice each week. Employees could attend classes on Tuesday and Thursday or Monday and Wednesday. Class numbers were intentionally kept small, with no more than eight persons in each class, in order to allow each member to receive
individual attention (J. Brewer, personal communication, December 2, 1991).

All of the classes utilized the instructor-led mode of delivery. Employees received continual feedback from their instructors. Brewer chose instructors based on their reputation for being competent teachers. All of the teachers were certified language therapists. Three years of experience were required. Brewer provided the instructors with additional training because the program was corporation based. She also wanted to diffuse any potential frustration an instructor might experience if they attempted to conduct class sessions as though they were normal college classes (J. Brewer, personal communication, December 2, 1991).

The feedback TI received from the employees was positive. At the end of classes, employees were given diplomas without any fanfare. Although retention rates for the classes were not as good as initially hoped, the dropout rate per class was less than 5%. However, TI calculated the dropout rate differently. If a student was advised to take three classes and dropped out at any point, TI considered the student to be a dropout. Using their method of calculation, the dropout rate was in the 50 percentile range. Many employees reportedly dropped out because of a lack of workplace relevancy. Employees had trouble understanding how the generic reading classes applied to their job. This motivated TI to alter the program so as to
make it more workplace related (W. Freeland, personal communication, November 22, 1991).

A job task analysis was not implemented until August 1989. By this time TI had realized that, although the generic literacy classes were going well, a job-specific approach would be better. Eight positions at TI were identified and studied. An evaluation team selected by Richland’s BPI conducted the analysis. They used a five-pronged approach which included (a) review of written job descriptions, (b) employee interviews and interviews with any management involved in the specific job, (c) observation of job tasks, (d) analysis of job documents for reading and math levels, and (e) synthesis of related technical skills required for the job (J. Brewer, personal communication, December 2, 1991). This job task analysis did not help the initial program survive. TI started its own program in January 1990 which was focused on workplace-specific literacy (W. Freeland, personal communication, November 22, 1991).

Interest for the program was initiated by a frustrated manager at TI. Basic education was a major concern of senior manager Paul Vetter, a former high school chemistry teacher. He provided the initial support to begin the program (W. Freeland, personal communication, November 22, 1991).
The community college lent its support in a different way. When the program became successful, the BPI elected to manage it (J. Brewer, personal communication, December 2, 1991). This proved to be detrimental, however, because the BPI program structure was not flexible enough to meet the needs of TI. TI needed more expertise than BPI could provide. By 1990, the only association TI had with Richland College was hiring its instructors (W. Freeland, personal communication, November 22, 1991).

From TI's point of view, the program was distinctive because it addressed the implication that reading, writing, and mathematics are prerequisites to training. Although management usually assumes the skill level and background of trainees to be equal, this is not always the case. It is very difficult to teach an SPC class to a diverse group of trainees--some with high school educations and others without high school educations. TI realized that they had to bring every participant to the same skill level before they could actually train the employees (W. Freeland, personal communication, November 22, 1991). From Richland's point of view, the program was distinctive because it was not "canned." Employees received individual attention from qualified instructors. Richland College tried to place the employees in groups so that there would not be a vast grade level discrepancy. However, it was sometimes difficult to
get homogeneous classes from the employees on a particular

The larger, in-house program currently in place at TI
exists primarily because of the earlier success of the
initial program. More than 800 employees are currently
participating in the TI program. The teachers employed
initially are currently employed in the TI program (J.
Brewer, personal communication, December 2, 1991; W.
Freeland, personal communication, November 22, 1991). TI
changed to an in-house program because they disagreed with
the structure proposed by the BPI. The BPI wanted to hire a
group of specialists--diagnosticians, curriculum developers,
counsellors, and teachers--and believed the process needed a
variety of individuals. TI disagreed. TI preferred to hire
one person who could do what was needed (W. Freeland,

The initial program while successful, also proved to be
weak because it was not work related. Since that time, it
has been discovered that the use of documentation from the
job causes (a) employees to become more familiar with the
documentation they utilize on a daily basis and
(b) constantly demonstrates why employees should attend
class. It eliminates the dilemma of how studying the
classics can help them on their job (W. Freeland, personal
communication, November 22, 1991).
Another weakness in the program was scheduling. Brewer described the time frame as a "nightmare" from the start. Because the program was so new, no one anticipated what a realistic time frame would be. Program coordinators initially tried to complete tasks in three weeks. They later realized such task completions required three months or more (J. Brewer, personal communication, December 2, 1991).

Another weakness was discussed when issues of privacy arose. Companies must maintain students' privacy in regard to test scores. Representatives of TI never saw an individual student's score. They received collective data that enabled them to report results to management, but students' confidentiality was strictly sustained (W. Freeland, personal communication, November 22, 1991).

In conclusion, Brewer recommended that companies hire a consultant to investigate and compare programs. A particular program might be feasible for one company but not for another. A company should be able to tailor a program to its specific needs. This may entail the hiring of a specialist to address a company's particular concerns (J. Brewer, personal communication, December 2, 1991).

Summary

Summaries of the five workplace literacy programs, which demonstrated diverse educational reactions to job related problems, are provided in this chapter. It is
interesting to note that some of the community college representatives were hesitant to be interviewed about their first program. However, when they heard of the struggles of other programs, they were less inhibited to speak. All of the programs were initial experiences for the community college personnel involved.

The companies involved ranged from a small die casting company of 57 employees to a large defense systems corporation of more than 10,000 employees. In each case the subjective evaluation of the overall program effectiveness was positive. In the cases where the program had ended J&E, SGS-Thomson, and Company X, the reason was the lack of funds or because the restructuring of the work schedule did not accommodate the structure of the community college's program.

The two ongoing programs differ. Abbott continues its relationship with North Lake College due to the grant North Lake College received for the program. However, Abbott plans to continue a partnership with North Lake College when the grant period is over. TI began with the community college but soon began its own massive educational program with no ties to the original program.

This study encompassed several types of literacy programs with their own particular definitions of literacy (see Appendix). X had strictly an English as a second language program. J&E had a mathematics program. TI had
basic language classes that covered both reading and writing. SGS-Thomson's program included reading, writing, and mathematics. The Abbott program encompassed all of the areas—English as a second language, reading, writing, and mathematics. It is interesting to note that all of the companies, with the exception of X, mentioned the onslaught of Statistical Process Control (SPC) in the workplace as one of the reasons if not the primary reason for their programs. However, the companies used different approaches to upgrade the employees for the use of SPC. J&E implemented a mathematics course, while SGS-Thomson began a reading course. Program goals were different because each program was unique (see Appendix).

The demographics of the companies' employees varied with the uniqueness of the companies. Both X and SGS-Thomson had employee bases consisting primarily of Southeast Asians. Both companies had English as a second language programs. J&E was the only company with employees who were predominantly Hispanic and male. The students were all considered lower income, except in the case of X and TI, where employees were in the middle income range. An important demographic common to all of the companies was the prevalence of the apprentice system. This bond held the various cultural groups within the company together and actually worked well until the companies' technology levels
became highly advanced. Current employees must be capable of integrating job information on their own.

There were no comprehensive needs studies, whereby the company asked the community college to assess the problem and structure a program to correct it. Essentially, the companies determined their own problems. The community college initiated tests using a particular instrument to measure the skills in the area of concern.

Numerous assessment instruments were used (see Appendix). SGS-Thomson changes instruments in the initial stages. TI used parts of several major assessment instruments. Richland College and Northlake College devised their own instruments especially for J&E and Abbott. No one instrument suited all of the companies' situations. Both Abbott and SGS-Thomson stressed the fact that testing at a level too advanced only frustrates and demoralizes employees.

Instruction in all of the cases was primarily instructor-led, but was not necessarily in a lecture format. Abbott utilized a PLATO laboratory, but it was supplemental to the regular classes. Most of the classes were small (see Appendix). All of the companies and colleges stressed the importance of selecting good teachers who were able to adapt to the particular communication climates of the companies. Most held informal teachers meetings, but only Abbott held both informal and structured weekly meetings.
Individual instruction was prevalent. Annual enrollment was a moot point to the programs. Numbers per session were the focus of the corporations and community colleges (see Appendix).

Except for the two companies that worked from grants (Abbott and TI), none of the companies would reveal their programs’ budget figures. They did, however, indicate that the programs were expensive. Expense caused the demise of two programs, X and J&E. The program at Abbott was especially significant because of the large monetary grant provided by the government.

All companies paid their employees to attend class (except for J&E in its final stages). SGS-Thomson made attendance inconvenient by asking employees to attend classes on their days off. X was clearly the leader in accommodating all involved by not only paying their employees to leave their shift, but by hiring temporary labor to take the place of regular employees while they were in class. Drop out rates were noticeably low when the programs were mandatory. J&E lost some participants when they depleted their funds for paying overtime. Drop out rates were minimal at the other companies.

Confidentiality was important in all of the programs, even those that were mandatory (X and J&E). Test scores were kept by only the community colleges except at J&E. TI did not review employees’ individual scores but kept score
data for reports to management. Confidentiality was perceived by the companies in various ways. SGS-Thomson believed that (before Brookhaven College appeared on the scene) confidentiality was maintained by sending test results to the employees' homes, rather than giving them to employees at work. However, without a third party involved, employees could rightfully assume that the company knew their scores. SGS-Thomson also noted that some supervisors made remarks on performance reviews regarding the classes. Although the remarks were complimentary, they still let the employees know that the company was very aware of how they were doing in class. Employees received certificates and credits through the community colleges, but no formal recognition by the companies was given. The companies did not want their other employees, who did not require the remedial training, to feel neglected.

Both companies and community colleges had to lend both philosophical and financial (on the companies' part) support to make the program a success. Lack of financial commitment led to the demise of the program at J&E. Company X presently has no budget for a continuance. All of the campus hierarchies provided philosophical support and viewed the business partnerships as an asset in integrating the community college into the community. Because community colleges are becoming more business oriented, they appreciated the income produced from the workplace literacy
programs. The companies seemed genuinely interested in improving their employees' level of education in order to maximize their job effectiveness. Improved morale was a valuable by-product.
CHAPTER V

SUMMARY, DISCUSSION, CONCLUSIONS, IMPLICATIONS
AND RECOMMENDATIONS FOR FURTHER RESEARCH

Summary

The purpose of this study was to provide both businesses and institutions of higher education with a descriptive analysis of the programs of five companies that have utilized community colleges in their basic skills programs. The five companies represented included Texas Instruments Defense Systems Corporation, SGS-Thomson Microelectronics (electronics companies), Abbott Laboratories (a pharmaceutical company), J&E Die Casting (a small die casting firm), and Company X, a semiconductor company that requested anonymity. The community colleges included were Richland College, Brookhaven College, and North Lake College.

Modified case studies were used to obtain data collected through individual interviews with representatives from the community colleges and companies. The syntheses of documentaries provided details of how the five community college-directed workplace programs met, or failed to meet, their literacy challenges. Descriptions of the curriculum and structure of each program were included.
Numerous factors contributed to the success or demise of the programs studied. Elements that served as powerful assets when adequately supported were detrimental when neglected. Factors common to all of the programs were financial support, management philosophical support, confidentiality, adequate testing instruments, class schedule flexibility, instructor capability, physical classroom facilities, and work-related documentation integrated into the curriculum. The findings of this study support previous research concerning successful and detrimental factors found in workplace literacy programs.

Discussion

The American Management Association stresses that workplace literacy instruction is to be related directly to the job in order for it to succeed (Greenberg, 1989, p. 70). The companies involved in this study felt a dire need for employees to be better educated in whatever capacity—ESL, math, reading, writing—in order for them to attain better job performance. It is doubtful that any company affected by the recession of the 1990s can afford to provide employees with anything but essential information or tools to be productive.

Dunn-Ranken and Beil (1990) suggested four criteria for effective basic skills programs:

1. Program goals should be well defined.
2. Materials should be germane to student needs.
3. Students should receive continual feedback.

4. Evaluation methods should be employed to aid program effectiveness (p. 47).

The companies involved had well defined goals. Student materials were related to the job (X, SGS Thomson), if not totally customized (Abbott). Students received continuous feedback at all companies. All companies utilized assessments, even though their aid to program effectiveness might be questionable.

All of the programs studied included the aforementioned Carneval, Gainer, & Meltzer (1990) eight steps for success except two: building an advocacy with management and unions and presenting strategy for management approval (p. 9). There were no unions involved in this study. Only J&E did not have complete management approval and this proved extremely detrimental to the program.

The synthesis of documentaries of this study did not corroborate with Zalman’s (1991) three design factors for successful programs: a strong kinship system; short curriculum units; and frequent recognition. A strong kinship system was not evident. Class duration was always longer than what Zalman suggests (one to two weeks), and most of the companies and employees expressed the desire that courses could have been longer. Recognition was present through certificates and continuing education units, but was always viewed as a byproduct of the program. The
biggest success factor for the program and employees was that their employer had taken the time and money to further their own underlying basic skills which would help them on the job.

Conclusions

The findings of this study suggest that corporations believe only the workplace specific curriculum is worthy of recognition. The underlying corollary to this thesis is that academic skills and workplace skills are two entirely different entities. However, the skills which comprise critical thinking—analysis, problem-solving, evaluation—must be learned in the academic classroom as well as the corporate training room. At what point does an individual move from absorbing information to synthesizing and analyzing information, as well as incorporating it into their lifestyle? One entity must not disclaim the other. Each program should complement the other.

Adaptability to new technology or increased productivity underlie the goal of workplace literacy. Examples from the job give employees a frame of reference from which to learn (LeFevre & Dixon, 1986, p. 27). Employees of companies studied were interested in education that enhanced their job performance. Responses reported by supervisors reflected that they were also interested in personal enrichment. After completing the program, participants reported they were able to apply their new
skills by balancing a checkbook, reading their paycheck and helping their children with their homework. Workplace literacy programs should devote a portion of their curriculum to personal enrichment. This enhancement has the potential to motivate employees, and ultimately cause them to be better employees.

None of the programs specifically addressed the employees' metacognition skills. An orientation course would be helpful to empower the employees to self-monitor their own learning and to encourage them to think critically. The programs used either a whole language approach to learning, or a modified whole language approach. These two approaches exemplify the arena of experiential learning which comprises all of the senses and builds upon the learner's background knowledge.

Based on the presentation of findings of this study, the following conclusions are warranted:

1. Advances in technology are leading to the demise of the apprentice system in the workplace. Immediate changes to a production line do not allow the luxury of time an apprentice system demands.

2. Corporations do not appear to want complete needs studies incorporated into the program. There are two reasons for the negation of needs studies. First, they do not want to devote the time to a complete needs analysis.
Secondly, they portend that they know their own problems and do not feel that an outside entity can adequately find them.

3. Comprehensive testing instruments are inadequate. Testing above the level of employees have proven to increase the frustration level of the employees.

4. The pedagogical skills in a college environment may not translate to the workplace. Some highly rated college instructors did not fare well in the corporation.

5. Lack of needs studies is detrimental to the success of a program. This study provided good examples of this conclusion. The lack of Statistical Process Control skills may be related to mathematics or language deficiencies.

6. Companies must be able to make a firm financial commitment for a specific period of time. Premature abandonment of the program, or a major modification due to finances can destroy employee confidence in the program and the company.

7. Only the community college representatives should have access to employee's scores and discuss them with students. The companies' knowledge of their employees scores causes employees to be fearful concerning job security.

8. Collaborative efforts appear to be valuable in workplace literacy programs. Both corporate representatives and educators share their expertise and integrate learning and workplace skills.
9. Collaborative efforts are enhanced when outside funding is available. Increased funding from external sources enables the corporation and the community college to provide materials conducive to the learning process, thus enhancing the learning environment with such items as state-of-the-art classrooms and computer support.

Implications

The following implications appear justified based on the summaries and conclusions of this study:

1. Corporations must attend to the individual's level of education in order to assure job proficiency.

2. Community colleges must be able to devise or locate comprehensive testing instruments.

3. Community colleges should develop specific programs for training instructors for workplace literacy programs.

Recommendations for Future Research

The following recommendations for future research are suggested based upon the summaries and conclusions of this study:

1. A more thorough case study approach should be implemented. Company and student confidentiality must be maintained, but research into the inner workings of a program would be beneficial.

2. Further procedures for implementing workplace literacy programs should be developed for community colleges
to enable them to begin workplace literacy partnerships with businesses.

3. A process should be identified to determine the type of skills necessary for effective workplace literacy instructors.

4. Further research should be conducted to determine if workplace literacy consultants believe that community college collaboration is a legitimate method of providing workplace literacy skills.
APPENDIX
Table 1

Type of Program and Definition of Literacy

<table>
<thead>
<tr>
<th>Company/School</th>
<th>Type of Program</th>
<th>Definition of Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company X and North Lake College</td>
<td>ESL</td>
<td>Reading and writing at a 6th grade level in English.</td>
</tr>
<tr>
<td>J&amp;E Die Casting and Richland College</td>
<td>Mathematics</td>
<td>Being proficient in mathematics in order to use SPC.</td>
</tr>
<tr>
<td>SGS-Thomson Microelectronics and Brookhaven College</td>
<td>ESL Basic reading and writing Mathematics</td>
<td>Being proficient in basic skills in order to use SPC.</td>
</tr>
<tr>
<td>Abbott Laboratories and North Lake College</td>
<td>ESL Basic reading and writing Mathematics</td>
<td>Being proficient in mathematics and reading at an 8th grade level.</td>
</tr>
<tr>
<td>Texas Instruments and Richland College</td>
<td>Basic language training</td>
<td>Being able to pass tests regarding workplace specific training.</td>
</tr>
</tbody>
</table>

Note. ESL = English as a second language; SPC = Statistical Process Control.
<table>
<thead>
<tr>
<th>Company/School</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company X and</td>
<td>Employees would be able to read job specifications.</td>
</tr>
<tr>
<td>North Lake College</td>
<td></td>
</tr>
<tr>
<td>J &amp; E Die Casting and</td>
<td>Employees would be able to use SPC.</td>
</tr>
<tr>
<td>Richland College</td>
<td></td>
</tr>
<tr>
<td>SGS-Thomson Microelectronics and</td>
<td>Employees would be able to use SPC.</td>
</tr>
<tr>
<td>Brookhaven College</td>
<td></td>
</tr>
<tr>
<td>Abbott Laboratories and North</td>
<td>Employees should be able to be cross-trained, so they can perform all or some of the jobs in their area.</td>
</tr>
<tr>
<td>Lake College</td>
<td></td>
</tr>
<tr>
<td>Texas Instruments and Richland</td>
<td>Employees would be able to learn skills to remain competitive and flexible in their present job.</td>
</tr>
<tr>
<td>College</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* SPC = Statistical Process Control.
<table>
<thead>
<tr>
<th>Company/School</th>
<th>Assessments Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company X and North Lake College</td>
<td>University of Michigan Test for English as a second language.</td>
</tr>
<tr>
<td>J &amp; E Die Casting and Richland College</td>
<td>35-question mathematics test with Spanish instructions designed by Richland College.</td>
</tr>
<tr>
<td>SGS-Thomson Microelectronics and Brookhaven College</td>
<td>Nelson Denny test for reading, Test of Basic Education locator for reading.</td>
</tr>
<tr>
<td>Abbott Laboratories and North Lake College</td>
<td>Test of Basic Education for reading. University of Michigan test for English as a second language. Mathematics test designed by instructor at North Lake College.</td>
</tr>
<tr>
<td>Company/School</td>
<td>Average Class Size</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Company X and North Lake College</td>
<td>17</td>
</tr>
<tr>
<td>J &amp; E Die Casting and Richland College</td>
<td>10</td>
</tr>
<tr>
<td>SGS-Thomson Microelectronics and Brookhaven College</td>
<td>15</td>
</tr>
<tr>
<td>Abbott Laboratories and North Lake College</td>
<td>15</td>
</tr>
<tr>
<td>Texas Instruments and Richland College</td>
<td>7</td>
</tr>
</tbody>
</table>
LIST OF PERSONAL INTERVIEWS


Farrow, R. (November 7, 1991). Senior Account Executive, Business and Professional Institute, Richland College Dallas, Texas. Personal interview conducted in office at Richland College.


REFERENCES

Berney, K. (1988, October). Can your workers read? 
Nations Business, 76, pp. 26-34.

Bransford, J. D., & Vye, N. J. (1989). A perspective on 
cognitive research and its implications for 
instruction. In L. B. Resnick & L. E. Klopfer (Eds.), 
Toward the thinking curriculum: Current cognitive 
research (pp. 173-205). Alexandria, VA: Association 
for Supervision and Curriculum Development.

Brown, A. L. (1980). Metacognitive development and 
reading. In R. J. Spiro, B. C. Bruce, & W. F. Brewer 
(Eds.), Theoretical issues in reading comprehension 
(pp. 453-481). Hillsdale, NJ: Lawrence Erlbaum 
Associates.

related basic skills: A guide for planners of employee 
programs. BCEL Bulletin, 2, 1-45.

Workplace basics training manual. San Francisco: 

Utilization of contextual information in determining 
the meaning of unfamiliar words. Reading Research 
Quarterly, 19, 188-204.


needs of Colorado community. Work Place Literacy 
Report, p. 3.


Peterson, L. (1989, May 7). Reading America’s future. The Tampa Tribune, pp. 1, 17A.


