DO INSERVICE TRAINING PROGRAMS POSITIVELY AFFECT
STUDENT OUTCOMES?

by

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ABSTRACT

In educational settings, inservice programs are offered in a variety of ways and for a variety of reasons. The material that is presented at inservices is generally passed on to the students in a variety of ways, either through different styles of teaching, or different materials that were transferred through the inservice program. Literature was reviewed concerning the issue of impact that inservice programs can have on student outcomes. For this research, a group of nearly 6,000 students were pretested and posttested to determine whether the inservice teacher education programs could positively affect their scores. These effects were measured by comparing the results of the pretest and posttest administered by a federally funded project. The comparison studied the outcomes of the students whose teachers did participate in specific inservice trainings to the outcomes of the students in classes of teachers who chose not participate in the same inservice training. This comparison was carefully evaluated and the results showed that although participation in the inservice training programs may not have been the only factor, there was generally a positive effect on the outcome scores of the students of the participating teachers.
DEDICATION

To my mom, Ruth Elgar, who has been there cheering through the thick and thin, the darkness and the light.

And also to my friend Laura, who shared her many talents, and her family who shared her.
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CHAPTER I

INTRODUCTION AND THE PROBLEM

Introduction to the Study

This research study is designed to evaluate the direct effect that inservice teacher education training programs can have on the outcomes of students' test scores.

This evaluation is accomplished by comparing pretest and posttest scores. This research delves into a commonly used method of retraining teachers: inservice teacher education training programs. It seeks to evaluate the effectiveness of such programs by measuring the positive results of students that were enrolled in classes of those teachers who did not participate (Group A) and comparing them to the positive results of students who were enrolled in classes of teachers who participated in the inservice teacher education programs (Group B).

The remainder of this study is devoted to research on inservice education, the results of the pretest and posttest, comparisons of the percentages of gains overall and the specifically targeted gains. Also included are summaries of the inservice activities and examples of the tests that were used. Additionally, a summary is included of a survey sent
to 100 occupational/vocational teachers in a single school district, 50 of whom did participate in inservice teacher education training programs, and 50 of whom did not.

Background of the Study

Basic academic skills are inherent to most vocational skills and tasks. When an employer hires a student who has had occupational/vocational training, he/she needs to believe that this new employee has not only the ability to do the skill, but the ability to do basic math and English skills. Even more, the new employee needs to be able to think and make wise decisions. Often occupational/vocational programs are deemed to be for the students who are unable to make it through a program to get into a college, those who will have to work with their hands, not with their heads. Quite often, the teachers of the occupational/vocational programs get so involved in teaching skills that they forget to teach the academic side of their program. This situation should not continue. Students in the occupational/vocational programs need to be taught the basic academic skills of their program as well as the technical skills. Unfortunately, the students in an occupational/vocational program often are not able to make the connection between their academic classes and occupational/vocational class. Educators need to determine ways that may help their students to make a better connection. The issue of improved basic academic skill
development and acquisition is a concern of vocational, as well as general, educators. As students' opportunities to participate in vocational education continue to decrease, controversy continues regarding the degree to which vocational education should be responsible for students' basic academic skills (Parks, McKinney & Mahlman, 1987), although most vocational educators agree that it is essential to improve basic skills instruction in vocational education. Recent research underscores the need for basic skill improvement in vocational settings by showing that vocational students' average performance on standardized basic skill measurements is below that of their peers in academic settings (Weber, et al., 1982).

Teaching academics within the framework of an occupational/vocational program long has been ignored. Without stressing the necessary basic academics, students are completing occupational/vocational programs or courses without the requisite basic academics to enable them to think and reason on or off of the job site (Silberman, 1976).

Vocational Education has traditionally placed its emphasis on teaching the skills of the trade. Emphasis has been on teaching the most innovative technologies of the trade and creating skill standards that identify the knowledge, skill and ability levels needed for particular jobs. Sadly though, teachers have overlooked the need to place much, if any, emphasis on the academics that are basic
to skills within the programs. For today's students to have the edge they will need in the competitive job market, their vocational training must be expanded to include more emphasis on basic academic skills, as well as the actual skills for the job (Rosenstock, 1991). This study researches the effectiveness of inservice teacher education training programs that stressed methods of integrating the academics within the content of vocational/occupational programs.

Early in 1990, several teachers and administrators in a large, inner-city school district in the southwestern United States, who were well aware of the need to increase the teaching of academics in the vocational/occupational programs, met, brainstormed and wrote their way through the tedious job of completing an application for a federal grant. Through the Carl D. Perkins II Act, funding was granted to what the district refers to, and this research shall also refer to, as the Fusion Project.

The Fusion Project

In 1990, a school district in the Southwestern United States wrote a plan which they called the "Fusion Project" to address the requirements of the Carl Perkins Act. This project included, among others, the following topics: upgrading curriculum, equipment purchase and inservice training regarding the integration of vocational and academic education, guidance and counseling. The
concentration of this research project is on the inservice training aspect of the vocational/occupational teachers.

Under the guidelines of the Carl Perkins Act, the Fusion Project is to provide funding for occupational/vocational programs that serve the highest numbers of "special populations" including, but not limited to: Limited English Proficient (LEP), economically disadvantaged, handicapped students.

InsERVICE teacher education training was selected as a delivery method to model integration of the academics. The areas of concentration needed from within the English and mathematics framework were derived by polling the vocational/occupational teachers within the district. They were asked to identify the areas of English and mathematics that were necessary skills in their programs. They also were asked to identify which areas needed some new ideas on how to include academics in their programs. More specifically, as a result of this polling, basic mathematics and writing were chosen to be the primary academic areas which would be offered to the vocational/occupational instructors.

Inservices in both mathematics and writing were held by academically certified teachers in the two areas of concentration.

The participants in the inservice needed to meet certain criteria:

1. Vocational Occupational teacher or supervisors
2. They needed to be a District employee

3. Willing to utilize the activities within their programs

4. Limit of 25 participants each – first come, first serve basis.

Purpose of the Study

The purpose of this study is to research and evaluate the effectiveness of inservice training programs in methods that stress the academics through the content for teachers directly involved with the occupational/vocational programs.

It is the intent of this study to assess student outcomes, utilizing a testing instrument that paralleled a standardized test given as a pre- and posttest, and to summarize the results of a survey of both participating and non-participating occupational/vocational teachers. The results will show whether inservice training can have a positive effect or show no effect on student outcomes.

Further, this study will present statistics and conclusions to the following questions:

1. Do inservice education programs positively affect student outcomes? and,

2. What are the views that the teachers hold towards having to include the teaching of an increasing amount of academics as they (the academics) are related to their programs?
Statement of the Problem

With the federal funding secured, the Fusion Project began to undertake the endeavor of meeting the basic premise of the Perkins Act: to increase the emphasis upon academics in the vocational/occupational classrooms in the district. One of the vehicles that the Fusion Project determined might be the most effective was to conduct inservice training programs of the occupational/vocational teachers in the district.

Research Questions

1. Do inservice education training programs positively affect student outcomes?

2. What are the views that the teachers hold towards having to include the teaching of an increasing amount of academics related to their programs?

Rationale of the Study

By 1992, the U.S. Labor Department had initiated several programs to help employers determine what types of training they should offer. As an example, the Labor and Education Dept. planned to announce a joint effort with three industries to create voluntary skill standards. The idea was to identify the knowledge, skill, and level of ability needed for particular jobs so that workers could acquire them, along
with certificates of competence, from industry associations. According to statistics, Basic Skills (The three R's) are needed by 17 million workers, or 14% of the work force (Bernstein et al., 1992).

The purpose of the Carl Perkins Act funding was to increase the emphasis placed on academics in the vocational and occupational classes. The Carl D. Perkins Vocational and Applied Technology Education Act of 1990 is an important step in redirecting vocational education and ultimately, in restructuring high schools. There is a federal presence in vocational education, and its new codification presents features that have potential to profoundly and radically change the direction of vocational education for 4.3 million students. First is the requirement that vocational and academic education be broadly integrated. Second is the requirement that vocational education move from occupationally specific, narrow, skill-based training to offer instruction in "all aspects of an industry." Third is increased opportunity for vocational education to forge links with community economic development efforts (Rosenstock, 1991).

Significance of the Study

The results of the study can provide data useful to the district in determining the effectiveness of inservice teacher education training programs, particularly to
emphasize the importance of the teaching of academics within the occupational/vocational programs. Further, this study can provide meaningful data to other school districts who are involved in the integration of academics in the occupational/vocational areas. This data can be used in programs that are evaluating the possibility of utilizing inservice teacher education training programs.

The results could determine the continuation of the inservice training programs as a vehicle to heighten awareness of the need for academics to be stressed as well as the ease in which it can be taught within the programs.

Operational Definition of Terms

**ASAP:** Arizona Student Assessment Program Testing program to measure grade level skill & achievement levels of students versus using standardized tests such as the CAT (California Achievement Test).

**Authorware:** An editing software program developed by Macromedia Inc. Used within the Fusion Project to develop programs for student use.

**Course:** Area of study.

**ESP:** (Exceptional Student Program) In-District terminology for special education programs.

**Fusion Project:** Title given by designers to project, designed to "infuse the academics," which is Federally Funded. This research study utilizes this title as reference.

**Group A** Refers to those students in classes of teachers who did not participate in any of the inservice training opportunities.

**Group B** Refers to those students in classes of teachers who did participate in the inservice training opportunities.
Inservice: Training offered to district occupational/vocational teachers.

Integration of Academics: Placing of more emphasis on academics within the curriculum of occupational/vocational classes or programs. Main thrust of Fusion Project.

LEP: (Limited English Proficiency) Students whose first language is anything other than English. Ex: Vietnamese, Spanish.

"Possession of Basic Skills": Standards set by the project to satisfy State Department of Education standards to indicate proficiency.

"Possession of Advanced Skills": Standards set by the project to satisfy State Department of Education standards to indicate proficiency.

Program: A series of related courses of study.

Rubric: A guide used to score writing, judging the inclusion or exclusion of key points.

SCANS: An acronym for the Secretary's Commission on Achieving Necessary Skills. A report out of the U.S. Department of Labor which is often referred to as the SCANS Report or SCANS Report for America 2000.

Tech Prep: A course of study designed to prepare high school graduates for technically oriented careers which blends the traditional academic course content with practical examples of how the content might be applied to an actual job setting.

Assumptions and Limitations of the Study

The research in this study is limited to the students enrolled in occupational/vocational programs or courses in the district, and to those occupational/vocational teachers who chose to participate in the inservice teacher training program. It must be further noted that these students live
in a large, urban city and are very transitory for many reasons. Many students have moved about within the district and may not have been matched with prior scores. Large numbers of the students frequently move in and out of the district throughout the year, creating a difficult situation of not having an opportunity to be in a class long enough to be pretested and posttested.

It must be remembered that the ages of the students in this study are mostly 13-22. They may not necessarily have taken the test as seriously as one would wish.

Numbers were further limited because of the total number of students who took the pretests, any students who achieved pre-determined scores in both basic and advanced skills, were exempt (from taking) the posttest in May 1992. This caused the large variance in the numbers of total students tested to total pre- & posttested. The presumption is that all students pretested and posttested had a serious attitude towards the tests and tried to do well on both tests. The research is designed to indicate if inservice teacher education programs can positively affect student scores. But it is necessary to recognize that factors other than inservice teacher education programs may have had an affect on student scores.

Participants in the inservice teacher education training programs were self-selected. There was no random selection of teachers. When looking at the numbers of
teacher who were participants in the program, there was no contractual agreement that they would utilize the information that they learned or covered at the inservices in their own classroom. It would be hoped that teachers would transfer the information gained from the inservice to their own teaching, but this aspect was not monitored in any official way. Therefore, there is no absolute assurance that the participating teachers ever altered their emphasis on academic infusion as a result of the inservice programs. A great deal of unknowns could have impacted the student results in the pre- and posttests. We can only assume that the teachers took the information from the inservice and transferred it in the same manner to each of their classes, and that each of the students benefitted in the same way.

Likewise, it is also presumed that all of the teachers who responded to the survey took a serious attitude toward the survey. There was no reward or punishment for the survey being completed, only the hope that they would be willing to assist with ongoing research.

Organization of the Remainder of the Study

Chapter II is a review of the literature associated with inservice training of teachers. The first section begins with a brief history of inservice education programs referencing philosophies and teachings of the late Madeline
Hunter. The next section looks at some successful and some not so successful programs. Chapter II includes an overview of the importance of planning, purpose, needs implementation and evaluation.

Chapter III describes the methodology. Beginning with an introduction of the intent and purpose of the study, the chapter continues with a discussion of the methodologies used and how the study was designed. Next, is a description of the instruments used and the data collection techniques.

Chapter IV includes a presentation of the test results, a description of the material covered at some of the inservices, as well as copies of the surveys. Findings are presented in tabular and graphical form.

Chapter V includes the summary of the study, conclusions and recommendations.
CHAPTER II

REVIEW OF THE LITERATURE

History of Vocational Education

Prior to the 19th century, vocational training was generally provided by a father, a mother, or through an apprenticeship program. During the Industrial Revolution of the 1820's, several vocational training programs were begun in the United States. These were started to help meet the increased need for skilled workers which the existing apprenticeship programs were unable to supply. Two of the earliest vocational technical schools were the Gardiner Lyceum, Gardiner, Maine in 1821 and the Rensselaer Institute, Troy, N.Y. in 1824 (Collier, 1992).

These programs and others that followed, along with legislation such as the Morrill Act of 1862, which established Land Grant Colleges, provided students with expanded opportunities for vocational training (Collier, 1992).

By 1917, the foundation had been set for the Smith-Hughes Vocational Education Act of 1917, in which federal funds were provided as a reimbursement for vocational agriculture, home economics, and vocational industrial education (Roberts, 1971). The traditional vocational
education has been misunderstood and abused over the years and now is having a great deal of difficulty defining itself (Rosenstock, 1991).

From the end of World War II until the early 1980's, the United States experienced a period of sustained economic growth based, by and large, on mass production manufacturing. The U.S. economy relied on a select cadre of college educated managers who supervised a workforce expected to perform routine tasks, a workforce that needed relatively little technical preparation and limited academic skills. As Hull (1993) notes, "This system worked...[until]...U.S. industries began facing the reality that they were competing in price and quality with companies from throughout the world" (Hull 1993, 5).

Schools became an easy target to blame for the U.S. not having individuals prepared as needed to meet these new workplace demands. Further, starting in the 1960's, the U.S. schools were burdened with trying to solve a number of ever more complex social problems. Public schools have addressed problems related to racial segregation, special needs students, drug abuse, AIDS, family life education, and rising crime in neighborhoods and schools. As time in school has become more and more burdened with education directed toward social problems, less and less school time has been available to provide the rigorous academic and technical preparation today's workers need. Also contributing to the lack of
preparation of a workforce with advanced technical skills has been the trend in U.S. high schools for more and more students to pursue either academic or general track curriculums, with fewer of them opting for occupational preparation (Schmidt and Wells, 1994).

In 1988, Workplace Basics researchers interviewed hundreds of employers from all sizes and shapes of companies and organizations and identified seven groups of skills that employers sought from their new employees: reading, writing and computation skills; listening and speaking skills; "learning to learn" skills; problem-solving and creative-thinking skills; personal-management skills; teamwork skills; leadership skills and organizational effectiveness (Marshak, 1994).

A popular report comes from the U.S. Department of Labor, the Secretary's Commission on Achieving Necessary Skills (SCANS) as a starting point for discussion. This commission has begun to take the first steps in answering those questions commonly raised by industry.

If traditional vocational education is outmoded, what system should be put in its place?

What kind of education and advanced training will workers require?

What kinds of skills and competencies will they need?

To what degree will they need to be comfortable with a range of technologies? (Stinson, 1994).
SCANS states, "Every student and every employee must learn the same set of skills and competencies, which range from basic reading and writing, to effectively organizing and allocating time, to selecting and applying appropriate technologies" (Stinson, 1994).

For many years, complaints have been growing louder that the graduates or completers of the vocational/occupational courses were sadly lacking in their basic academic skills. One such barrier to integration is the nearly total separation between academic and vocational education in today's high schools (Rosenstock, 1991). Vocational programs are often, literally and figuratively, in the basement of the school. They have become a "dumping ground" for students with academic and/or behavior problems, and both the students and teachers in these programs are the lowest status in the school. Vocational students are left to "working with their hands," with very little and often very diluted academic content, as the system continues to fulfill the prophecy of the limited potential of "this type" of student. Integration of the academic education requires a different view: one that sees vocational education as a different way to learn the same academic concepts and skills that nonvocational students learn (Rosenstock, 1991).

True academic integration requires rethinking many of the beliefs held by some educators and administrators, and also may require a full restructuring of high schools.
Teachers need to work together, to see their mission as joined, not divided between those who prepare students for college and those who prepare them for work. There is a need to combine their forces, and by working together, vocational and academic teachers could come up with generative themes around which to organize units and courses. For example, students learning about the homeless can learn residential construction, and students learning construction can also study homelessness. The cultural becomes useful, and the useful becomes cultural. Vocational education becomes a part of the common curriculum, benefiting all students (Rosenstock, 1991).

The Carl Perkins Act focuses its attention on youth who exhibit two or more at-risk factors, being especially economically disadvantaged. Funds are channelled to districts with the highest concentrations of low-income families and to large programs (Terry et al., 1985).

Carl Perkins not only thought that education was important, but that education was the means for improving the quality of life for individuals and for the nation (Perkins, 1985).

Congress has mandated that applied research and development activities be undertaken on "successful methods of reinforcing and enhancing basic academic skills in vocational settings" and support for these activities has been financed through legislation such as the Perkins Act.
(Cohn, DiGangi and Irvine, 1993). The Carl Perkins Act legislation further required that attention be given to the infusion of academic elements into a vocational curriculum. That is to say, financial awards were to be given to school districts which successfully demonstrated district-wide impact, identified academic subject material, and sought effective methods of delivering these subjects to students who had demonstrated difficulty in achieving mastery in traditional school settings (U.S. Dept. of Labor, 1992).

Among many other fundamental skills, the SCANS Report deems that workers must show mastery of the basic skills: reading, writing, mathematics, listening, and speaking (U.S. Dept. of Labor, 1992).

Frequently Carl Perkins (D-KY) met with opposition in his quests to create and sustain federal programs of aid to education. During the Great Depression and the election of Franklin Roosevelt, both Perkins and Ronald Reagan reacted by becoming ardent New Deal Democrats. "Perkins never abandoned the political beliefs that he acquired during the 1930's, however, Reagan did" (Jennings, 1985, p. 565).

When Reagan was elected as President in 1980, he had come to believe that the federal government had little role to play in the solution of national problems, characterizing the government he was elected to lead as intrusive, unmanageable, ineffective, costly and not accountable (Jennings, 1985, p. 565).

From 1981-1983, Perkins fought Reagan every step of the way, using various methods. He held hearings with over one thousand witnesses, introduced bills, supported amendments on the House floor, anything he could do to blunt the effects of the President's proposals. Reagan did win a 35% cutback in federal support for the school lunch program in 1981, but Perkins won the war (Jennings, 1985).

History of Inservice Training

For many years, teacher-training workshops have been a major component in programs designed to combat lack of understanding about curricula. The rationale behind inservice teacher training hinges on the notion of a "chain reaction" of teacher-enhancement-student-enhancement actions. That is, knowledge transmitted in these workshops will bring about a change in teacher achievement and, subsequently, teacher opinions. Upon returning to their classrooms, these teachers will then transmit this knowledge to their students, thereby changing student achievement and opinions (Schober, 1984).
To supplement limited preparation, teachers are frequently offered a variety of inservice training or staff development programs (McKenzie et al., 1993).

Educators are frequently encouraged or required to modify curricula and teaching behaviors in order to meet the changing needs of the students. Traditionally, inservice education programs have served as primary vehicles for stimulating these modifications, but teachers often resist such programs. This reluctance to embrace innovations results from numerous factors, including teachers' fears of being blamed for variables beyond their control or becoming scapegoats should innovations fail. One such case study relates a failure: a teacher called "Ms. Miller" who had been teaching for a number years was encouraged by administration to participate in an inservice program. She knew that her class sizes of 50 to 75 students needed more supplies than she had, such as three bean bags and a few balls. Often she used imagination to teach her classes. The inservice program mandated a better environment than this, and she felt that the administrators who had encouraged her to take the program, would intervene on her behalf, but they did not. Ms. Miller received little or no support or appreciation for the problems in her classes. As this situation and the inservices continued, Ms. Miller changed from being an enthusiastic participant to a distraught teacher with feelings of anxiety, physical ailments,
depression, frustration, inadequacy, disappointment and disgust. She eventually resigned her position. A primary catalyst leading to resignation was her fear of being blamed for failing to use innovations which she found unworkable. Participants need to believe that inservice programs represent opportunities to learn rather than times to be judged (Faucette, 1986).

Inservice education can be a very valuable technique. Inservices can be used to deal with many different areas, such as discipline techniques, class climate, staff relationships; most are designed to increase teacher effectiveness. A world famous proponent of inservice education was the late Madeline Hunter. School districts across the country have required teachers as well as administrators to attend Hunter workshops with a goal to improve the teachers' effectiveness. Many were taught by Hunter herself, or by a Hunter trained representative. Through the inservice trainings, a teacher can provide the students with a variety of exciting learning experiences, and at the same time include the essential elements of instruction that promote learning (Batesky, 1987).

Teaching the academics through inservice trainings has become popular. For instance, in the field of mathematics, research evidence continues to accumulate that an informed implementation of the Mathematics Teaching model results in increased student learning. This approach to inservice
training in mathematics involves teachers as professional partners and attempts to overcome some of the difficulties inherent in changing complex teaching behavior. The inservice training program gives attention to mathematics content, methods of teaching mathematics, and management issues (Good and Grouws, 1987).

Often a school district will hold an all-day or half-day inservice for the staff to attend. These can be quite costly when one considers the salaries of the staff members, plus the cost of obtaining speakers for the program and often very little information is received. Teachers are harried, rushing to get to the meetings, trying to understand what is being presented, hurrying through the lunch time, and catching up on the preparation for the next day. They must also grade papers from that day and get rooms and supplies readied for the next day.

One district in Pennsylvania held an inservice program on the teaching of health and development of students' self-image. In the plans, along with two top-notch speakers, they also included a two-hour lunch break. For this lunch, held at various local restaurants, they invited people from the community such as a radio personality, the mayor, a player from each of the local professional sports teams, a poet, an industrial inventor, a judge, an athletic trainer, and several established professionals who were previous graduates of the high school. The district paid for the lunches of the
invited guests, the staff members were able to sit down and chat with the guests (teacher ratio was 10-12 per guest) and have a relaxing two-hour lunch. Or they could also brown bag it in their classroom, marking papers. By allowing some options in the inservice, the district was able to make it more valuable, more interesting, and at the same time, inexpensive (Haviland, 1985).

Often times, the process is not explained, students are just told how to do something, and then the instructor moves the class along. Later on in the program, the instructor wonders why the students can't figure out how to do something on their own, when they have "done it a million times already" (Baldwin, 1992).

The purpose of the Carl Perkins Act is to fund occupational/vocational programs that serve large numbers of special populations, i.e. limited English proficient (LEP), economically disadvantaged, and special education students. The Phoenix Union High School District Carl Perkins Plan (hereafter referred to as the Fusion Project) addresses four areas for use of the Perkins' funds in the district:

1. Instructional Support

Instructional aides are provided to occupational/vocational programs. Bi-lingual aides are hired when possible. Two aides are assigned to each comprehensive campus. One works exclusively with the Business Education department, while the
other works with the Life Management and Industrial Technological Education departments.

2. Career Planning/Student Services
Staff members receive student data that enables them to assist students in planning their high school and career related studies. Students take interest inventories and achievement tests during their freshman year to establish baseline data. They are reevaluated periodically.

3. Curriculum Modification
Staff members develop integrated vocational/academic materials with two goals in mind: first, to improve the success of special populations; and second, to begin a processs for developing and distributing technology based curriculum materials to accommodate the learning styles of special populations.

4. Supplemental Support Services
A job developer and job placement coordinator work to help those students with the greatest needs to achieve employment.

In the academic area, the academic/vocational infusion program develops effective instructional strategies, methods and materials for the academic components of occupational/vocational programs. Teams of vocational and
academic teachers are established to develop and pilot strategies and materials necessary to deliver academics in occupational/vocational programs and to present these at inservice teacher education programs.

The inservice programs that are designed and offered by the teams have two main goals: first, to incorporate methods of teaching mathematics and writing skills within the occupational/vocational programs; second, to stress the importance of the academics that are inherent to the programs.
CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to research and evaluate the effect of inservice training programs on the outcomes of students' test scores. The specific inservices offered to teachers directly involved with the occupational/vocational programs focused on methods that stress the teaching of academics through the content. Instructional methodology in the academic skills was modeled by the curriculum specialists themselves within the framework of inservice training. The intent of this study was to evaluate the pretest and posttest scores of students enrolled in the district's occupational/vocational programs. This information provides the district with valuable statistics to determine the value of inservice teacher education training.

Traditionally, inservice education programs have served as vehicles for modifications in curricula and teaching behaviors. Teachers often resist participating in such programs because they feel they do not have enough time to do everything they want and need to do. The Fusion
Project added the enticement of paying the teachers for their time spent at the inservice programs. This pay, (3 hours each at their regular hourly rate of pay, which could be $40.00/hour or $120.00), may have served as an added incentive to give the project a chance. Furthermore, all of the inservices were of a "hands-on" nature vs. the normal drudge of "we tell you, you listen, and then, let you figure out how to do it" routine.

It was the intent of this study to assess student outcomes at 10 of the 11 district schools. The only district school that was not included in this study is a program for seriously emotionally disabled students; it does not offer any occupational/vocational programs. Table 1 and Table 2 illustrate by school the raw numbers and percentages of the 7,966 students involved in the testing program. Tables 3, 4 and 5 show percentages of students tested in each of the three major occupational/vocational areas: Business Education, Life Management, and Industrial Technology Education.

The tests were administered by the classroom teachers. Using the same testing instrument for both the pre- and posttest, the students' scores were separated into two groups to be evaluated for this study. Group A consisted of the 4,618 students pre- and posttested in classes of teachers who chose not to participate in the inservice teacher education training programs. Group B consisted of
Table 1: Number of Students Involved in Testing Program (by School)

* Based on total of 7966 students

Table 2: Percentages of Total Students Tested* (by School)

* Based on total of 7966 students
Table 3: Percentages of Students Tested in Business Education Programs (by School)

<table>
<thead>
<tr>
<th>School</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.3%</td>
</tr>
<tr>
<td>2</td>
<td>13.9%</td>
</tr>
<tr>
<td>3</td>
<td>12.0%</td>
</tr>
<tr>
<td>4</td>
<td>15.0%</td>
</tr>
<tr>
<td>5</td>
<td>7.9%</td>
</tr>
<tr>
<td>6</td>
<td>11.4%</td>
</tr>
<tr>
<td>7</td>
<td>9.2%</td>
</tr>
<tr>
<td>8</td>
<td>17.2%</td>
</tr>
<tr>
<td>9</td>
<td>1.1%</td>
</tr>
<tr>
<td>10</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

Total Students 4657

Table 4: Percentages of Students Tested in Life Management Programs (by School)

<table>
<thead>
<tr>
<th>School</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.5%</td>
</tr>
<tr>
<td>2</td>
<td>9.0%</td>
</tr>
<tr>
<td>3</td>
<td>5.7%</td>
</tr>
<tr>
<td>4</td>
<td>4.5%</td>
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<tr>
<td>5</td>
<td>11.0%</td>
</tr>
<tr>
<td>6</td>
<td>15.0%</td>
</tr>
<tr>
<td>7</td>
<td>11.9%</td>
</tr>
<tr>
<td>8</td>
<td>17.1%</td>
</tr>
<tr>
<td>9</td>
<td>0.0% *</td>
</tr>
<tr>
<td>10</td>
<td>18.3%</td>
</tr>
</tbody>
</table>

* No Life Management Program at 9

Total Students 1857
Table 5: Percentages of Students Tested in Industrial Technology Education Programs (by School)

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14.4%</td>
</tr>
<tr>
<td>2</td>
<td>11.6%</td>
</tr>
<tr>
<td>3</td>
<td>11.2%</td>
</tr>
<tr>
<td>4</td>
<td>5.2%</td>
</tr>
<tr>
<td>5</td>
<td>8.5%</td>
</tr>
<tr>
<td>6</td>
<td>15.7%</td>
</tr>
<tr>
<td>7</td>
<td>0.0%*</td>
</tr>
<tr>
<td>8</td>
<td>9.1%</td>
</tr>
<tr>
<td>9</td>
<td>0.0%*</td>
</tr>
<tr>
<td>10</td>
<td>24.2%</td>
</tr>
</tbody>
</table>

* No Industrial Technology Program at 7 or 9

Total Students 1452
the 557 students pre- and posttested in classes of teachers who did participate in the inservice teacher education training programs. The students' scores have been compared, contrasted, charted and graphed in order to determine the effects that the inservice teacher education training programs had on the outcomes of students.

Further, this study summarizes the results of a survey of both groups, participating and non-participating occupational/vocational teachers, showing their attitudes and interest in attending, participating in and utilizing the inservice teacher education programs to help teachers to infuse the academics and to help improve students' academic skill levels.

**Description of Methodology Selected**

Descriptive and inferential statistics comprise the means by which data obtained in the research study are analyzed. The study of inferential statistics applies statistics and other supporting information to test hypotheses and to determine if inferences to the population can be derived from the sample's result (Moore, 1983). In this study, the pretest and posttest scores were used to determine if there were significant differences among the groups.

Students who were selected for this study were enrolled in an occupational/vocational course or program
within the district. They were pretested in mathematics and/or in writing early in February 1993 and were posttested in May 1993. To be counted in this study, a student had to have taken at least one of the pretests. A student's scores were further studied if the student had also taken the posttest in May 1993 in one or both subject areas. The average of the pretest scores was subtracted from the average of the posttest scores. If there was evidence of an increase in the average of pretest vs. posttest math and writing scores, the scores counted as an increase. Any other outcomes, such as average score decreases or averages that remained the same, were not detailed, but rather were included in the count as students who were pre- and posttested. If a student did not take both tests in either area, his/her scores were included in the count as simply having been tested.

Sample Population

The sample population to be studied was 7,966 students from all of the ten district campuses who were enrolled in occupational/vocational classes. Participation in the inservices was at will.

Instrumentation

For the pretesting, all students were given a two-part mathematics test and a writing test. The instrument used
for the actual testing of the students, took much discussion and work on the part of the project faculty.

The mathematics tests, (which closely paralleled standardized tests), were developed by the academic curriculum specialists within the Fusion Project. The tests consisted of two sections, a basic skills section and an advanced skills section.

In the writing discipline area, a test was developed wherein the students were to write a letter requesting a letter of recommendation. The student letters were scored, for both the basic skills, and the advanced skills, by a team of two teachers, using a rubric similar to that used by the Arizona State Education Department. The teachers evaluated the writing against a list of criteria, assigning scores ranging from 0-4.

Students who scored 80% on each section of the mathematics test, and those students who achieved either a 3 or 4 on both the basic skills and advanced skills of the writing test, were deemed as "possessing the basic skills." This meant that they would not be included in the posttests.

Data Collection and Other Procedures

Pretests were scored and the scores were returned to the teachers to be shared with the students. The tests were retained. The posttest scores were likewise
disseminated. A comparison of the test scores was made. For this comparison, the students' pretest scores for both the basic and advanced skills sections in the mathematics and/or writing areas were added together and an average was found. The same process was done for the posttest scores of the student. The two averages were compared, if there was an increase then the student was counted as having shown improvement. The scores were compared by schools and by the occupational/vocational departments. In addition, the scores of students enrolled in classes of those teachers who participated in the inservice teacher education training programs were compared with the scores of students enrolled in classes of teachers who chose not to participate in the inservice teacher education training programs.
CHAPTER IV

PRESENTATION AND ANALYSIS OF THE DATA

TEST MEASUREMENTS

A total of 7,966 students were tested at least once in the testing program. Any student whose pretests scores indicated that they were "in possession of the basic skills" did not have to take the posttest. Furthermore, due to the transient nature of the district studied, many of the originally tested students were no longer enrolled in the same classes, same school or even in the same district and could not be posttested. Thus, the number of students who actually were both pretested and posttested decreased substantially from the original sample of 7,966 to 5,175. This study does not address the mean increase in student scores. The increases and percentages of increase reflect only the fact that the students showed an increase of a minimum of 1 point on any part of the posttest.

Scores are further separated into two major groups:

- **Group A** consists of 4,618 students who were enrolled in classes in which the teacher opted not to take the offered inservice teacher education training program.
- **Group B** consists of 557 students who were enrolled in classes in which the teacher did participate in the offered inservice teacher education training program.

The scores have been presented and compared in several ways.

- Table 6 is a summary descriptive table showing the total number of district-wide occupational/vocational students who were pretested, posttested or both. It illustrates the number & percentage of students tested in groups A and B who showed an increase in average scores.

Table 6 illustrates that of the 7,966 students enrolled in occupational/vocational programs in the district, 5,175 or 64.96% were both pretested and posttested. Of these 5,175 students, 4,618 or 89.24% were enrolled in Group A classes and 557 or 10.76% were enrolled in Group B classes. When examining the data in Group A for a statistically significant difference between the percentage of students in Group A and the percentage of students in Group B at each school that showed a change in test scores, it can be seen that at School 5 there was a significant difference \( (z = -2.380, p = 0.017) \) indicating that the inservice education training program at this school may have had a positive effect on student outcomes. There was also a statistically significant difference at School 6 \( (z = 3.294, p = 0.001) \). However, Group A showed a larger increase than did Group B indicating that the inservice education training program or some other factor may have had a negative impact on student outcomes. Table 6 further illustrates that there were 186
Table 6: Summary Descriptive Table of District-Wide Occupational/Vocational Students & Teachers in Group A & Group B Showing #'s of Increases in Scores (By Schools)

<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL # STUDENTS TESTED</td>
<td>641</td>
<td>986</td>
<td>826</td>
<td>886</td>
<td>677</td>
<td>1039</td>
<td>648</td>
<td>1252</td>
<td>50</td>
<td>961</td>
<td>7966</td>
</tr>
</tbody>
</table>

| GROUP A PRE/POST TESTED | 295 | 670 | 495 | 436 | 455 | 629 | 322 | 817 | 12 | 487 | *3875 |

| # STUDENTS SHOWING INCREASE | 163 | 440 | 272 | 254 | 305 | 342 | 199 | 539 | 3 | 274 | 2371 |

| % OF STUDENTS SHOWING INC | 55.3 | 65.7 | 55.0 | 58.3 | 67.0 | 54.4 | 61.8 | 66 | 25 | 56.3 | 61.2 |

| GROUP B PRE/POST TESTED | - | 37 | 88 | - | 57 | 71 | 103 | 34 | - | 167 | 557 |

| # STUDENTS SHOWING INCREASE | - | 30 | 54 | - | 47 | 24 | 68 | 22 | - | 96 | 341 |

| % OF STUDENTS SHOWING INC | -81.1 | 61.4 | -82.5 | 33.8 | 66 | 64.7 | -57.5 | 61.20 |

| p = ** | 0.05 | 0.265 | 0.017 | 0.001 | 0.44 | 0.879 | 0.782 | 0.722 |

| z = | -1.93 | -1.114 | -2.380 | -3.294 | -0.77 | -0.152 | -0.277 | -0.356 |

| TOTAL # TEACHERS GROUP A | 9 | 14 | 13 | 12 | 17 | 15 | 9 | 21 | 2 | 46 | 158 |

| TOTAL # TEACHERS GROUP B | 0 | 2 | 3 | 0 | 3 | 2 | 2 | 2 | 1 | 13 | 28 |

*Total does not include schools #1, 4 & 9 as these schools did not have an experimental group.

**Test of significance: comparison to determine if the % of increase in Group B is significantly different from the % of increase in Group A.
occupational/vocational teachers district-wide. Of this
group of teachers, 158 or 84.95% were Group A teachers, and
28 or 15.05% were Group B teachers.

- Table 7 is a graphic illustration of the percentages
of students in Groups A and B by school.

- Table 8 is a graphic illustration of the percentages
of teachers in Groups A and B by school.

- Table 9 is a summary descriptive table showing the
total number of students in Business Education
Programs, who participated in pre- and posttest, as
well as the number and percentage of students in
Groups A and B (where an experimental group existed)
who showed an increase in average scores.

Table 9 illustrates that of the total students enrolled
in occupational/vocational programs in the district, 4,657
were enrolled in Business Education classes. Table 9
indicates the number and percentages of students in both
groups who showed an increase in their scores. In Group A,
517 or 59.19% of the students showed an increase in their
scores whereas in Group B, 134 or 61.19% of the students
showed an increase. This is a district-wide increase of 2.00
percentage points.

The largest individual school improvement was in Group A
at School 10 with 70.09% increase. When looking for a
significant difference in the percentages at each school, at
School 10 the difference is significant (z = 2.677,
p = 0.007), however the increase is not in the direction
expected. The unusual outcome in this case could be
attributed to the makeup of the classes which were ESP
Table 7
Distribution of Sample Population of Group A and B Students
(By Schools)

Based on 5,175 students

Table 8
Distribution of Sample Population of Group A and B Teachers
(By Schools)

Based on 186 teachers
Table 9: Summary Descriptive Table of Business Education Students & Teachers in Group A & Group B Showing #'s of Increases in Scores (By Schools)

<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL # STUDENTS TESTED</td>
<td>293</td>
<td>649</td>
<td>557</td>
<td>728</td>
<td>347</td>
<td>533</td>
<td>427</td>
<td>803</td>
<td>50</td>
<td>270</td>
<td>4657</td>
</tr>
</tbody>
</table>

| GROUP A PRE/POST TESTED | 154 | 481 | 249 | 368 | 255 | 342 | 161 | 585 | 12 | 107 | 517* |
| # STUDENTS SHOWING INCREASE | 92 | 336 | 133 | 215 | 158 | 196 | 98 | 397 | 3 | 75 | 306 |
| % OF STUDENTS SHOWING INC | 59.7 | 69.8 | 53.4 | 58.4 | 62.0 | 57.3 | 60.9 | 67.9 | 25 | 70.1 | 59.2 |

| GROUP B PRE/POST TESTED |  |  |  |  |  |  |  |  |  |  |  |  |
| # STUDENTS SHOWING INCREASE |  |  |  |  |  |  |  |  |  |  |  |  |
| % OF STUDENTS SHOWING INC |  |  |  |  |  |  |  |  |  |  |  |  |

| p = ** | 0.194 | 0.398 | 0.007 | 0.613 |
| z = | -0.298 | -0.845 | -2.677 | -0.506 |

| TOTAL # TEACHERS GROUP A | 4 | 10 | 6 | 9 | 6 | 8 | 4 | 13 | 2 | 10 | 72 |
| TOTAL # TEACHERS GROUP B | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 3 | 7 |
| TOTAL # TEACHERS | 4 | 10 | 7 | 9 | 6 | 6 | 6 | 13 | 3 | 13 | 79 |

*Total does not include schools 1,2,4,5,6,8 & 9 as these schools did not have an experimental group. Original size: GROUP A = 2,714 Students GROUP B = 219 Students.

**Test of significance, z test of proportions. Comparison to determine if the % of increase in Group B is significantly different from the % of increase in Group A.
classes. The greatest positive impact was at School 3 with a 7.95% increase in the number of students who had increased scores of Group B over Group A. However, this was not a statistically significant difference (z = -1.298, p = 0.194).

Table 9 further illustrates that there were 79 Business Education teachers district-wide. Of this group of teachers, 72 were Group A teachers, and 7 were Group B teachers.

Table 10 is a summary descriptive table showing the total number of students in Life Management Programs, who participated in pre- and posttest, as well as the number and percentage of students in Groups A and B (where an experimental group existed) who showed an increase in average scores.

Table 10 illustrates that of the total students enrolled in occupational/vocational programs in the district, 1,857 were enrolled in Life Management classes. Table 10 indicates the numbers and percentages of students in both groups who showed an increase in their scores. In Group A, 223 or 56.17% of the students showed an increase in their scores whereas in Group B, 120 or 60.0% of the students showed an increase. This is a district-wide total increase of 5.64 percentage points.

The largest individual school improvement was in Group B at School 5 with an 82.5% increase. When looking for a significant difference in the percentages at each school, at School 5 with (z = -1.287, p = 0.198), however the increase is not statistically significant.

When examining the data for a significant difference in
<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL # STUDENTS TESTED</td>
<td>139</td>
<td>168</td>
<td>106</td>
<td>83</td>
<td>206</td>
<td>278</td>
<td>221</td>
<td>317</td>
<td>0</td>
<td>339</td>
<td>1857</td>
</tr>
</tbody>
</table>

| GROUP A PRE/POST TESTED | 60 | 83 | 49 | 14 | 101 | 159 | 58 | 166 | - | 130 | 397* |
| # STUDENTS SHOWING INCREASE | 47 | 43 | 15 | 8 | 66 | 80 | 32 | 94 | - | 63 | 223 |
| % OF STUDENTS SHOWING INC | 78.3 | 51.8 | 30.6 | 57.1 | 65.3 | 50.3 | 55.2 | 56.6 | - | 48.5 | 56.2 |

| GROUP B PRE/POST TESTED | - | - | - | - | 14 | - | - | 19 | - | 167 | 200 |
| # STUDENTS SHOWING INCREASE | - | - | - | - | 13 | - | - | 11 | - | 96 | 120 |
| % OF STUDENTS SHOWING INC | - | - | - | - | 82.5 | - | - | 57.9 | - | 57.5 | 60 |

\[ p = ** \]
\[ z = -1.287 \]
\[ -0.108 \]
\[ -1.543 \]
\[ 0.886 \]

| TOTAL # TEACHERS GROUP A | 2 | 3 | 3 | 1 | 9 | 4 | 5 | 6 | 0 | 17 | 50 |
| TOTAL # TEACHERS GROUP B | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 5 |
| TOTAL # TEACHERS | 2 | 3 | 3 | 1 | 10 | 4 | 5 | 7 | 0 | 20 | 55 |

*Total does not include schools 1, 2, 3, 4, 6, 7 & 9 as these schools did not have an experimental group. Original size: GROUP A =820 Students GROUP B =200 Students.

**Test of significance z test of proportions. Comparison to determine if the % of increase in Group B is significantly different from the % of increase in Group A.
the percentages at each school, it can be found that even though there was a larger percentage in Group B, there is not strong evidence that this difference is true in the population of all students. Even though there was an exhibition of increase at schools 5, 8 & 10, the difference was not significant. Table 10 further illustrates that there were 79 Life Management teachers district-wide. Of this group of teachers, 72 were Group A teachers, and 7 were Group B teachers.

Table 11 is a summary descriptive table showing the total number of students in Industrial Technology Education Programs, who participated in pre- and posttests, as well as the number and percentage of students in Groups A and B (where an experimental group existed) who showed an increase in average scores.

Table 11 illustrates that of 7,966 students enrolled in occupational/vocational programs in the district, 1,452 or were enrolled in Industrial Technology Education classes. Of these students, 828 were both pretested and posttested. Out of these 828 students, 566 were enrolled in Group A classes and 262 were enrolled in Group B classes. Table 11 further illustrates that there were 52 Industrial Technology Education teachers district-wide. Of this group of teachers, 36 were Group A teachers, and 16 were Group B teachers.

Table 11 indicates the numbers and percentages of students in both groups who showed an increase in their scores. In Group A, 301 or 53.18% of the students showed an
Table 11: Summary Descriptive Table of Industrial Technology Students & Teachers in Group A & Group B in Scores Showing #'s of Increases (By Schools)

<table>
<thead>
<tr>
<th>SCHOOLS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL # STUDENTS TESTED</td>
<td>209</td>
<td>169</td>
<td>163</td>
<td>75</td>
<td>124</td>
<td>228</td>
<td>0</td>
<td>132</td>
<td>0</td>
<td>352</td>
<td>1452</td>
</tr>
</tbody>
</table>

**GROUP A** PRE/POST TESTED | 137 | 58 | 109 | 37 | 42 | 67 | - | 14 | - | 102 | 566* |
| **# STUDENTS SHOWING INCREASE** | 53 | 31 | 70 | 24 | 34 | 35 | - | 9 | - | 45 | 301 |
| **% OF STUDENTS SHOWING INC** | 38.7 | 53.5 | 64.2 | 64.9 | 81 | 52.2 | - | 64.3 | - | 44.1 | 53.2 |

**GROUP A** PRE/POST TESTED * | - | 48 | - | - | 43 | 61 | - | 15 | - | 95 | 262 |
| **# STUDENTS SHOWING INCREASE** | - | 30 | - | - | 34 | 31 | - | 11 | - | 60 | 166 |
| **% OF STUDENTS SHOWING INC** | - | 62.5 | - | - | 79.1 | 50.8 | - | 73.3 | - | 63.2 | 63.4 |

\[
p = **
\]

\[
z =
-0.938
0.217
0.161
-0.526
-2.677
-2.747
\]

| TOTAL # TEACHERS GROUP A | 3 | 1 | 4 | 2 | 2 | 3 | 0 | 2 | 0 | 19 | 36 |
| TOTAL # TEACHERS GROUP B | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 1 | 0 | 7 | 16 |
| TOTAL # TEACHERS | 3 | 3 | 6 | 2 | 4 | 5 | 0 | 3 | 0 | 26 | 52 |

*Total does not include students from schools 1, 3, 4, 7 & 9 as these schools did not have an experimental group. Original size: GROUP A=635 Students GROUP B=262 Students.

**Test of significance z test of proportions. Comparison to determine if the % of increase in Group B is significantly different from the % of increase in Group A.
increase in their scores whereas in Group B, 166 or 63.36% of the students showed an increase. This is a district-wide total difference of 10.18 percentage points overall.

The greatest individual school improvement was in Group A at School 5 with 80.95% increase. The least individual school improvement was also in Group A at School 1. The greatest positive impact was at School 10 with a 19.04% increase in scores of Group B over Group A.

When looking for a significant difference in the percentages at each school, it can be seen that at School 10 the percentage of increase in Group B over Group A was significant \( z = -2.677, p = 0.007 \). A significant difference was also evidenced in the totals category \( z = -2.747, p = 0.006 \).

Tables 12, 13, 14, 15, 16 and 17 visually illustrate the increases in student scores for Group A and Group B in each of the three occupational/vocational clusters (by schools).

A survey of 100 occupational/vocational teachers was also included in this study. Fifty teachers who participated in the inservice teacher education training session and 50 who chose not to participate were surveyed. The number of returns was less than anticipated. However, many of the comments on the surveys were outstanding. Forty-five of the 100 surveys were received. Twenty-two of the 50 surveys to non-participating teachers (44%), and twenty-three of the 50
TABLE 12  BUSINESS EDUCATION SCORE INCREASES IN GROUPS A & B

<table>
<thead>
<tr>
<th>School #</th>
<th># of Increased Scores in Group A</th>
<th># of Increased Scores in Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
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</table>

No Experimental groups in Schools #1,2,4,5,6,8 & 9.

TABLE 13  BUSINESS EDUCATION SCORE INCREASE IN GROUP B

<table>
<thead>
<tr>
<th>School #</th>
<th>Total # of Students Pre/PostTesed</th>
<th>Total # of Students Showing Score Increases</th>
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</thead>
<tbody>
<tr>
<td>1</td>
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</table>

No Experimental groups in Schools #1,2,4,5,6,8 & 9.
TABLE 14 LIFE MANAGEMENT SCORE INCREASES IN GROUP A & B

<table>
<thead>
<tr>
<th>Numbers of Students</th>
<th>School #</th>
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</thead>
<tbody>
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<td>192</td>
<td>9</td>
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<tr>
<td>96</td>
<td>10</td>
</tr>
</tbody>
</table>

- □ # OF INCREASED SCORES IN GROUP A
- □ # OF INCREASED SCORES IN GROUP B

NO EXPERIMENTAL GROUPS IN SCHOOLS #1,2,3,4,6,7 & 9.

TABLE 15 LIFE MANAGEMENT SCORE INCREASES IN GROUP B

<table>
<thead>
<tr>
<th>Numbers of Students</th>
<th>School #</th>
</tr>
</thead>
<tbody>
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<td>34</td>
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<td>17</td>
<td>10</td>
</tr>
</tbody>
</table>

- □ TOTAL # OF STUDENTS PRE/POSTTESTED
- □ TOTAL # OF STUDENTS SHOWING INCREASES IN SCORES

NO EXPERIMENTAL GROUPS IN SCHOOLS #1,2,3,4,6,7 & 9.
TABLE 16  INDUSTRIAL TECHNOLOGY SCORE INCREASES IN GROUP A & B

<table>
<thead>
<tr>
<th>School #</th>
<th># OF INCREASED SCORES IN GROUP A</th>
<th># OF INCREASED SCORES IN GROUP B</th>
</tr>
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</table>

NO EXPERIMENTAL GROUPS IN SCHOOLS #1, 3, 4, 7 & 9.

TABLE 17  INDUSTRIAL TECHNOLOGY SCORE INCREASES IN GROUP B

<table>
<thead>
<tr>
<th>School #</th>
<th>TOTAL # STUDENTS PRE/POSTTESTED</th>
<th>TOTAL # SHOWING INCREASES</th>
</tr>
</thead>
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<td>10</td>
<td>95</td>
<td></td>
</tr>
</tbody>
</table>

NO EXPERIMENTAL GROUPS IN SCHOOLS #2, 3, 6, 8, & 9.
surveys to participating teachers (46%) were returned.

A copy of the original survey which was given to teachers who participated in the in-service training is included in Appendix A, and a listing of their responses is also included in Appendix B. The returns included diverse suggestions and positive comments as well. There appear to be some teachers who may not have read the survey questions very carefully, but their responses are included nevertheless.

Of the participating teachers who responded, 54.5% had attended four or more of the 6 inservices. Of these respondents, 91.3% were doing math activities that came from the inservices, and 52.2% were doing English or writing related activities from the inservices. In response to the questions of mode of instruction, 40.9% said they utilize "hands-on" learning, 27.3% do cooperative learning and lecture. All three types, and some other methods of learning each received 18.2%. The activities have been useful to 77.3%. In determining what mode of instruction they thought was modeled at the inservices, 63.6% thought it was cooperative learning, 59.1% thought that hands-on learning was modeled, 27.3% thought that lecture was modeled, and 22.7% felt that other methods were modeled. The inservice activities have changed 86.4% of the respondents' methods of addressing the academics, and 86.4% have placed a greater emphasis on academics in their teaching. The respondents
were asked to suggest other methods or activities that could be used. Somewhat specific activities or areas were suggested by 40.9% of the respondents, and 72.7% recommended general ideas such as "more of the same that have been done." Only 4.5% had no suggestions.

A copy of the original survey which was given to teachers who chose not to participate in the in-service training is included in Appendix C, and a listing of their responses is also included in Appendix D.

Of the non-participating teachers who responded, 60.9% had attended none of the 6 inservices. Of the remaining respondents, 39.1%, some possibly considered other phases of the Fusion Project as inservice activities. Approximately one-third (30.4%) of the respondents were unable to attend due primarily to the lack of time, 21.7% had not attended due to the scheduled time of the inservices. Thirteen percent of the respondents are already doing academic infusion, and 8.7% had other reasons for not attending. In the non-participating category, 47.8% are using lecture, cooperative learning, and hands-on modes of instruction; 34.8% primarily use hands-on instruction. Regarding the emphasis on academics changing their methods of teaching the academics, 73.9% of the respondents, have changed their teaching methods, 8.7% have made no change, and 4.3% of them don't know. Within this group 65.2% have placed a greater emphasis on academics since the fusion project began, 13% felt there
has been no change and 4.3% don't know. In response to question number 6, 39.1% of the respondents indicated that the Fusion Project is offering the occupational/vocational teachers something of value. Even though 60.9% of those surveyed did not attend any of the inservices, the material is made available to them through other delivery modes, such as in-classroom modeling.

Overall, it appears that the teachers who were involved in the inservice teacher education training are interested in continuing with the sessions.

Many of the teachers who attended the inservices attended as many as they could fit in and asked for more. These teachers often participated in the other programs that were offered by the project including the "in-classroom modeling" and Authorware program writing classes. Many of the participating occupational/vocational teachers are making a positive effort to utilize those items they have learned in the inservice sessions. Also, the survey resulted in a few suggestions as to what needs to be reinforced in the program, and what aspects may be omitted.

It is noteworthy that many respondents from both groups indicated that they want to have such inservice teacher education training programs continued in the future.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

This research was a descriptive study of the effect inservice teacher education training programs could have on the outcomes of student achievement in one school district in the Southwestern United States. The study compared pretest and posttest scores of students enrolled in classes of teachers who participated in the inservices to those enrolled in classes of teachers who chose not to participate.

The purpose of the study was to determine if the inservice teacher education programs, offered within a school district, could positively affect the outcomes of their students. The intent was to determine the correlation between the inservice training and student outcomes. Teacher-made tests were administered to the students in the form of a pretest and a posttest. The results of this study provided the managers of the inservice program with the data to assist them in making future decisions about the continuation or emphasis of the inservice offerings.

Overall, there was not a statistically significant difference in Group A and Group B outcomes.
An additional goal of this study was to survey both the teachers who chose to participate in the inservices and the teachers who chose not to participate. This survey and its results reveal an honest attitude about the purpose of the inservice: to integrate the academics into the districts' occupational/vocational programs.

Conclusions

With the help of Carl Perkins Act Funding, a school district in the Southwestern United States developed a plan to help integrate the academics into the district's occupational/vocational programs. Four academically certified teachers conducted inservice teacher education training programs for their occupational/vocational colleagues. These inservices were designed to demonstrate and model techniques that the teachers could utilize in their own classes to help their students to make the connection of academics and occupational/vocational classes.

All of the students enrolled in the district occupational/vocational programs were pretested in February, 1993. A total of 6 inservice programs were held, and students were posttested in May, 1993. The results of these tests indicated that even though there was only a small increase in achievement in the classes of participating teachers over the percentages of those
students in the classes of non-participating teachers, there still was a positive effect.

Furthermore, the results of the survey of the teachers in both groups indicate that there has been a change of attitude of occupational/vocational teachers toward the teaching of the academics. There is now a willingness of many teachers to participate where they were unable to before, and to utilize within their own classrooms many of the activities that the inservice programs modeled.

Teaching has been described as a chain reaction process. The teacher learns and then uses the information to teach the students. Yet classroom teachers are aware that there is not always a 1:1 correlation between teaching and achievement because many intervening factors influence learning. The magnitude of change in student scores of participating teachers may have been affected by several factors. The group that chose to participate may have felt less confident of their ability to teach academics. They may have felt less secure in these areas and therefore, chose to take the inservice teacher education programs to reinforce what was probably knowledge, but not skill area for them. The reader must bear in mind the originally stated limitations of the study that the participants in the inservice teacher education training programs were self-selected, and there was no formal method of monitoring that the information taught at the inservice programs was
Recommendations

The inservice education training programs used in this study that are part of the Fusion Project should be continued. However, a greater effort needs to be made to reach out to work with those teachers who have not attended the inservice training programs. The participating teachers hopefully will continue working with the academics in their programs, and benefit by taking more of the inservice classes. It is suggested that there be established a tighter means of monitoring the pre- and posttesting program, as to eliminate the instances of students not having a pre- and posttest score simply because they had transferred between classes or schools and their information was not as easily transferable as it may have been.

It would be an interesting comparison to study a similar program in a district that was similar in size but not as mobile. Perhaps there would be a greater number of students who would be able to increase their scores. This type of program could easily fit into a small rural setting as well as a large urban setting. The funding is not the essential element here; the essential part is to develop the strategies for working in teams to structure the occupational/vocational curriculum to include the
academics. It is important to have lines of communication between the occupational/vocational teachers and academic teachers to coordinate the curriculum. The goal should be to help the students to see the connections between the academic and the occupational/vocational programs.

References


Baldwin, Harold, District Occupational/Vocational Curriculum Specialist, Personal Interview.
REFERENCES


Hull, D., 1993 Every student wins! Tech Prep/Associate degree, delivering an education that works. Waco, Texas: Center for Occupational Research and Development: 5-19.


APPENDIX A

SURVEY SENT TO PARTICIPANTS OF IN-SERVICE TEACHER EDUCATION PROGRAMS
March 24, 1994

To: Occupational/Vocational Teachers  
From: Katie Elgar/Fusion Project

To assist us in our on-going research within the project, we are surveying those teachers who have participated in fusion project inservice activities in either mathematics or writing or both. We would appreciate your taking the time to complete the following survey and return it in the enclosed envelope by April 6, 1994. If more room is needed for your comments, please feel free to continue on the back. Thank you for your time.

1. How many after school in-service activities have you participated in through the fusion project?
   0 1 2 3 4 5 6

2. List the inservice activities you have used in your classroom

3. What is your typical mode of instruction: lecture, cooperative learning, hands-on other?

4. What applicable activities have the inservices provided you to use in your classroom?

5. What modes of instruction do you believe is modeled at the inservices?

6. How have the inservice activities changed your methods of addressing the academics in your instructional delivery?

7. How have you placed a greater emphasis on academics in your vocational programs?

8. What other methods or activities could be done to help to raise the academic achievement levels of students enrolled in your vocational programs?
APPENDIX B

RESPONSES TO SURVEY SENT TO PARTICIPANTS OF IN-SERVICE TEACHER EDUCATION PROGRAMS
March 24, 1994

To: Occupational/Vocational Teachers
From: Katie Elgar/Fusion Project

To assist us in our on-going research within the project, we are surveying those teachers who have participated in Fusion Project inservice activities in either mathematics or writing, or both. We would appreciate your taking the time to complete the following survey and return it in the enclosed envelope by April 6, 1994. If more room is needed for your comments, please feel free to continue on the back. Thank you for your time.

The survey question is in the bold type, the responses follow.

1. How many after school in-service activities have you participated in through the Fusion Project?
   0 1 2 3 4 5 6
   1 2 3 4 5 6
   3 4 3 5 1 6

2. List the inservice activities you have used in your classroom.
   -Authorware, various videos, math & English activities
   -bad habits, checkbook, writing process
   -counting change-writing check purpose orders
   -determining square feet & square inches, fraction/decimal conversion, etc.
   -fraction charts, making change
   -letter writing info, ruler info, shapes info
   -maintaining a checkbook
   -math
   -math/English
   -math project activities
   -math-several activities
   -math simulations, basic integration of math in class
   -measuring items in the room, percentages, fractions to
decimals checkbooks and balancing, ruler; Authorware.
-letter writing/ payroll time card
-programming VCR, Sales-menu-math-payroll building
-activities, interview, telephone
-square footage for homebuying, heating & cooling costs
-some math problem & letter writing from the writing
-workshop
-tabulation worksheet
-teaching area, percents, decimals, perimeter,
circumference
-teaching writing
-the math & writing: teaching strategies & special
instructions
-tips given at last inservice-project created by Sheryl
(team member)
-writing a business letter, money, math preparation for
fusion testing, etc.
-writing and knowing parts of a business letter
-writing/math innovations, authorware programs

3. What is your typical mode of instruction: lecture, cooperative learning, hands-on, other?

-all modes used
-all-vary the routine
-cooperative learning
-cooperative learning, hands-on all together
-co-operative learning, lecture, hands-on, guest speakers,
a combination of all circled.
-co-operative learning, lecture, hand-on, & students work
on "competency labs"
-hands-on (2)
-hands-on & cooperative learning (3)
-hands on, coop learning, self-paced
-hands-on, some lecture (2)
-lecture, co-operative learning, hands on
-lecture, group, co-operative learning
-lecture, hands-on (3)
-tabulation worksheet

4. What applicable activities have the inservices provided you to use in your classroom?

-all the material from the last inservice
-color code-fractions/decimal cards
-format of letter, how to teach ruler
-fractions and percentages
-good demo of several I plan to implement, more & more
as I become more experienced as a teacher
-lots of ideas in both areas, many basic stuff that
students should know but just can't grasp
- making change
- many from first 2 inservice, none from second 2, i.e. no calculators or materials. How to's yes, but no materials
- math problem solving, & (job) application letter
- money, calculators, white boards, markers (2)
- new ideas in developing writing & math skills in my classes
- payroll register using calculators computing income taxes
- practical uses for the keyboarding & computer classes
- some math problem & letter writing from the writing workshop
- stock market aids
- tabulation worksheet, parts of a paragraph
- your inservices (along with Sheryl's help in my classes) have helped me improve academic infusion

5. What modes on instruction do you believe is modeled at the inservices?

- co-operative learning
- co-operative learning, sharing ideas
- combination lecture & cooperative learning
- combination of all modes
- great, the leaders are well organized, and good time management
- hands-on (3)
- hands on and co-operative learning (3)
- hands-on, interactive group
- hands on & lecture
- lecture, co-operative learning, hands-on (3)
- lecture, co-operative learning, hands-on & students work on "competency labs"
- lecture, discussion, hands-on, co-operative learning
- lecture, hands-on occasional brainstorm some co-operative learning
- not sure what the question means

6. How have the inservice activities changed your methods of addressing the academics in your instructional delivery?

- better ideas on how to provide 'meaningful' math activities
- by making math more relevant to the students in their daily lives
- given me more different ways to approach the same stuff
- greater levels of consciousness with respect to math and English
- have given me an effective model of instruction to use
- I have changed very little, although I teach summarizing in magnet keyboarding for the World New Map Test
- I have included them more often in my lesson plan
- I place more emphasis on basic math skills!
- I set aside time to do particular activities
- I've always taught writing and math, but never geometry.
- It makes learning more fun & more applicable
- It's really made me more aware of how & what I'm doing with the academics
- Made it a separate part rather than in with content
- More aware of the need to teach students more math applications
- No change unless you would include covering more math
- None of these activities fit into what I normally do
- Raised interest level of awareness and thought of how academics fit into curriculum
- Use more student hands-on involvement
- Yes (2)
- Yes-I think they help me understand how to help the right way of conquering their fear of math or writing

7. How have you placed a greater emphasis on academics in your vocational programs?

- Accounting students write more, keyboarding students do math
- By concentrating on formulas in spreadsheet programs
- By incorporating math and English skills
- By realizing it needs to be taught as a separate part; the students don't have basic skills
- I believe my classroom is more academic than many so-called academic classes
- I have always felt that I needed to strengthen my students' math & writing skills. The Fusion Project has taught me creative ways in doing just that
- I just do more of it!
- Included math weekly, grammar, writing
- Integrating more academics-consciously thinking about more ways to incorporate both math and writing
- More math and creative writing
- More writing
- More writing; more math. I do something everyday in both areas
- Most definitely
- No
- Not so much greater, but am more aware of integrating them
- Spend more schedule time doing math
- Through the ideas learned in the workshops & stressing academics more.
- Using reading-writing speaking-math skills in weekly lesson plans
- Yes (2)
8. What other methods or activities could be done to help to raise the academic achievement levels of students enrolled in your vocational programs?

- cash register, making change, stock market game, more letter writing, field trips-movies, VCR available to Oct. schedule at Bostrom CD multiplayer would help - sound system sound blaster of another, faster computers-DOS upgrades program upgrades
- Continue your effective inservices next year - they are making a difference for me as a classroom teacher. You all have done a great job...Thanks for your help and patience!
- constant reinforcement
- don't know
- I think we need methods to increase motivation among the students. Could we come up with an innovated way to increase attendance?
- I would like to have the resource teachers work with my class more
- more authorware programs, more units w/simple worksheets
- more computer classes and in-services
- more hands-on machines in accounting calculating money more word problems, more algebraic problems used in everyday life situation Fusion Project purchase 2-4 money skills Interviewer machines or similar machines
- more of the same
- more of the same that you gave us in the last inservice that was the most helpful for me (March 17)
- more relevant materials to typing
- more student use of teacher-developed Authorware programs - we sure could use Spanish versions of these programs
- teach less content, teach more writing and math skills, mesh it with content where possible
- short math presentations - more writing activities
- when publisher materials are available, make sure there are funds to buy the whole package i.e. workbooks, not just the text
- specific lessons developed such as the one Sheryl has come up within the math area
APPENDIX C

SURVEY SENT TO NON-PARTICIPANTS OF IN-SERVICE TEACHER EDUCATION PROGRAMS
To: Occupational/Vocational Teachers  
From: Katie Elgar/Fusion Project

March 24, 1994

To assist us in our on-going research within the project, we are surveying those teachers who did not participate in any fusion project inservice activities in either mathematics or writing. We would appreciate your taking the time to complete the following survey and return it in the enclosed envelope by April 6, 1994. If more room is needed for your comments, please feel free to continue on the back. Thank you for your time.

1. How many after school in-service activities have you participated in through the fusion project? 0 1 2 3

2. What was your main reason for not attending any of the fusion project inservices? ____________________________________________________________

3. What is your typical mode of instruction: lecture, cooperative learning, hands-on other? _____________________________________________

4. How has the emphasis on academics in vocational programs changed your methods of teaching the academics in your instructional delivery? _____________________________________________________

5. How have you place a greater emphasis on academics in your vocational programs since the fusion project began? _____________

6. What other methods or activities could be done to help raise the academic achievement levels of students enrolled in your vocational programs? _____________________________________________________
APPENDIX D

RESPONSES TO SURVEY SENT TO NON-PARTICIPANTS OF IN-SERVICE TEACHER EDUCATION PROGRAMS
March 24, 1994

To: Occupational/Vocational Teachers
From: Katie Elgar/Fusion Project

To assist us in our on-going research within the project, we are surveying those teachers who did not participate in any fusion project inservice activities in either mathematics or writing. We would appreciate your taking the time to complete the following survey and return it in the enclosed envelope by April 6, 1994. If more room is needed for your comments, please feel free to continue on the back. Thank you for your time.

1. How many after school in-service activities have you participated in through the fusion project?
   0 1 2 3

   
   
   

2. What was your main reason for not attending any of the fusion project in-services?

- already convexing math & tech. writing in curriculum to the max
- coaching and taking classes at P.C. (community college)
- I start teaching at 4 PM and most inservices are after 3:30 PM
- I teach night school
- I would have liked to, but I had other commitments. I still would be interested.
- I'm involved in so many other activities I just haven't had time!
- involved in so many after-school activities and meetings
- lack of child care providers for my children
- lack of time—I am committed to too many other activities I want to participate and will try to join the classes if offered next year
- schedule did not permit
- sick
-time (2)
-time, suggest workshops beginning of summer-to
implement for the fall
-time-I'm taking two college classes; also, I have
done two writing in-services recently-one at school
and district
-update of skills and to learn something new
-we had a personal one with Shirley Lowe (team member)
on writing techniques. We are comfortable with our
math portion

3. What is your typical mode of instruction: lecture,
cooperative learning, hands-on, other?

-a little lecture, lots of hand-on
-all
-all mentioned but mostly hands on
-all of the above
-all of the above, lecture being the least
-all of the above. Use a variety of methods
-all of the above & same
-all of those, plus speakers and hopefully, upcoming
field trips
-cooperative & hands-on (2)
-cooperative learning, hands-on
-hands-on (3)
-hands-on, then lecture & then cooperative learning
-I do a mixture of all of these.
-I try a variety of methods. The students respond
best to hands-on and small group work
-lecture, cooperative, learning
-lecture, cooperative, learning, hands-on (2)
-little lecture lots of hands-on

4. How has the emphasis on academics in vocational
programs changed your methods of teaching the academics
in your instructional delivery?

-Always interested in new, innovative delivery to hold
& help students retain material
-being a new teacher, it has been very easy and natural
-greater awareness-place more emphasis on basic skills
-I am emphasizing academics more. My planning of
activities have more use of the academics
-I am too new on an instructor to know the difference
-I did so much anyway that it has changed but not
too much
-I emphasize it more, however I was already doing it
-In word processing I have always stressed the English
component, such as grammar & punctuation. Now, I am
utilizing the English teachers to work on writing
skills
I have always used vocational application for my academics but having visiting Fusion Teachers has really enhanced the classes.

I instituted a writing project this year. Every six weeks the student have a writing summary due on a health topic which includes looking up 3 new words. I try to integrate it when possible.

- less hands on
- made me more aware of techniques I need to use
- more aware of the need
- more emphasis
- more work
- none
- not changed - I was always that way.
- somewhat
- very little

5. How have you placed a greater emphasis on academics in your vocational programs since the fusion project began?

- hasn't changed
- I'm too new of an instructor to know the difference
- I was always that way
- I just include math & writing everyday so its very natural and the students have begun to see the importance
- incorporated more academics in lesson plans
- in word processing, I have always stressed the English component such as grammar & punctuation. Now, I am utilizing the English teachers to work on writing skills.
- I've paid more attention to delivery and testing students retention. It is surprising how many do not have the capability to do simple math-I haven't. I continue to teach social studies, English & math
- many handouts stressing academics are used on and increasing basis each year
- more aware of the need
- more writing and correct use of grammar, spelling, etc. Use more days, just on math concepts and application
- more math and writing
- no-I believe strongly in fusing the two
- reviewing basics and inviting fusion people in
- somewhat
- we now require weight conversion in centimeters as well as inches
- yes (2)
- yes, more emphasis
6. What other methods or activities could be done to help raise the academic achievement levels of students enrolled in your vocational programs?

-have math teachers relate their area to relevant uses in life--re: Tech Ed, Life, etc.
-I also need to work on some basic math skills, for example in setting up documents with desk top publishing.
-just keep offering opportunities as you have in the past. You are doing a great job!
-keep the para-educators teaching for a portion of each class period!
-Metro Tech-only population should be required to take academics also. (Metro Tech is district voc.ed.school)
-more school days
-overcome the attitude that "we don't do math - English etc. in this class"
-peer tutors, more aides
-send me sample problems (I can reproduce this original into a class set) then send me a copy w/the answers and its step-by-step procedure/method to acquiring these answers!
-having the fusion math teacher coming in to show how math can be used in the application of our curriculum has been very helpful!
-more hands on activities through newly published teacher's activities.
-work packets
-many hands-on
-more specific learning packets (activities)
-our students actively weigh & measure patients and write care plan every week. Their spelling really needs improvement, however.
-I don't know. If you have the answer please let us know. You will earn millions!!!!!
-I wish we had computers in General Business classes.
Kathie Carlene Elgar is a native of Western New York. She received her Associates Degree in Business Administration in 1972 from Erie Community College, and her Bachelor of Science Degree in Education from the State University of New York College at Buffalo in May 1974. She moved to Arizona in 1980 and has been a teacher in the Phoenix Union High School District since 1984.
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